

# Qualitative research of online drug misuse communities with reference to the novel psychoactive substances

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## Glossary of Abbreviations

2C-B	4-Bromo-2, 5-dimethoxyphenethylamine
2C-B-BZP	1-(4-Bromo-2, 5-dimethoxybenzyl) piperazine
2C-D	2, 5-Dimethoxy-4-methylphenethylamine
2C-I	2, 5-Dimethoxy-4-iodophenethylamine
2C-T7	2, 5-Dimethoxy-4-n-propylthiophenethylamine
2-FA	2-Fluoroamphetamine
3FA	3-Fluoroamphetamine
3-MeO-PCP	3-Methoxy Phencyclidine
4-AcO-DALT	4-Acetoxy-N, N-diallyl tryptamine
4-AcO-DET	4-Acetoxy-N, N-diethyltryptamine
4-AcO-DMT	4-Acetoxy-N, N-dimethyl tryptamine
4-FA	4-Fluoroamphetamine
4-FPP /pFPP	1-(4-Fluorophenyl) piperazine or para-Fluorophenyl piperazine
4-HO-DiPT	4-Hydroxy-di-isopropyl-tryptamine
4-MeO-PCP	1-[1-(4-Methoxyphenyl) cyclohexyl]-piperidine (or) 4-methoxy phencyclidine
4-MTA	4-Methylthioamphetamine
5-APB	5-(2-Aminopropyl) Benzofuran
5-HIAA	5-Hydroxyindoleaceticacid
5-HT	5-Hydroxytryptamine (or) serotonin
5-MeO-DALT	N, N-diallyl-5-methoxytryptamine
5-MeO-DiPT	5-Methoxy-diisopropyltryptamine
5-MeO-MiPT	5-Methoxy-N-methyl-N-isopropyltryptamine
6-APB	6-(2-Aminopropyl) benzofuran / Benzofury
6-APDB	6-(2-Aminopropyl)-2, 3-dihydrobenzofuran / Benzofury

25B-NBOMe	4-Bromo-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine
25C-NBOMe	4-Chloro-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine
25I-NBOMe	4-Iodo-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine
AIDS	Acquired immunodeficiency syndrome
Benzofury	see 6-APB & 6-APDB
BZP	N-benzylpiperazine or 1-benzylpiperazine
CEVs	Closed Eye Visualizations
CP-47,497	2-[(1R, 3S)-3-hydroxycyclohexyl]- 5-(2-methyloctan-2-yl)phenol
CPK	Creatinine phosphokinase
CPP	Chlorophenylpiperazine
CRP	C-reactive protein
Crystal meth	N-methyl-1-phenylpropan-2-amine (or) methamphetamine
DBZP	1, 4-dibenzylpiperazine
DEA	Drug Enforcement Administration
DF	Drugs Forum
DMAA	1, 3-dimethylamylamine
DOB	2, 5-Dimethoxy-4-bromoamphetamine
DOC	2, 5-Dimethoxy-4-chloroamphetamine
DOI	2, 5-Dimethoxy-4-iodoamphetamine
DXM	Dextromethorphan
ECG	Electrocardiogram
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
EWS	Early warning system
GC/MS	Gas Chromatography – Mass Spectrometry
HU-210	1, 1-Dimethylheptyl-11-hydroxytetrahydrocannabinol
JWH-018	1-Pentyl-3-(1-naphthoyl) indole
JWH-073	Naphthalen-1-yl-(1-butylindol-3-yl) methanone

JWH-210	4-Ethyl-naphthalen-1-yl-(1-pentylindol-3-yl) methanone
LC-MS	Liquid chromatography with tandem Mass Spectrometry
LSD	Lysergic acid diethylamide
LD <sub>50</sub>	Median lethal dose
MAOIs	Mono-amine oxidase inhibitors
MBDB	N-Methyl-1, 3-benzodioxolylbutanamine
MBZP	1-Methyl-4-benzylpiperazine
MDA	3, 4-Methylenedioxyamphetamine
MDBZP	Methylenedioxy benzyl piperazine
MDMA/ Ecstasy	3, 4-Methylenedioxy methamphetamine
MDPV	Methylenedioxypropylone
MeOPP	1-(4-Methoxyphenyl) piperazine or para Methoxyphenylpiperazine
mCPP	meta-Chlorophenylpiperazine or 1-(meta-chlorophenyl) piperazine) or 1-(3-chlorophenyl) piperazine)
Mephedrone	4-Methyl methcathinone
Naphyrone	Naphthyl propylone
NMDA	N-methyl d-aspartate
NPS	Novel Psychoactive Substances
NRG-1	1-(2-Naphthyl)-2-(1-pyrrolidinyl)-1-pentanone hydrochloride
NRG-2	(2 $\alpha$ ,3 $\alpha$ )-Epithio-17 $\alpha$ -methyl-17 $\beta$ -ol-N-Benzoyloxycarbonyl-d-proline - a counterfeit NPS designed to evade the law
PFA	para-Fluoroamphetamine
PiHKAL	Phenethylamines I have known and loved
ReDNet	The Recreational Drugs European Network project
SERT	Serotonin transporter
SSRIs	Selective serotonin reuptake inhibitors
STA	Systematic toxicological analysis

TiHKAL	Tryptamines I have known and loved
THC / $\Delta$ 9-THC	delta-9-Tetrahydrocannabinol
TFMPP	m-Trifluoromethylphenylpiperazine
UPLC-TOF-MS	Ultra liquid chromatography with time of flight mass spectrometer
UR-144	(1-Pentylindol-3-yl)-(2,2,3,3-tetramethylcyclopropyl) methanone

## **Abstract**

**Objective:** This research aimed at reviewing the information provided by the online drug misuse communities with reference to the available evidence-based literature on the novel psychoactive substances.

**Methodology:** Among hundreds of novel psychoactive substances, four groups (phenethylamines, tryptamines, piperazines and miscellaneous) were selected for the study. Various website drug fora were identified by Google and Yahoo search engines using a set of specific key words. The methods consisted of extracting and analysing qualitative data from the identified website fora. This was also supplemented by critical reviewing the existing evidence-based literature search for each of the selected psychoactive compounds.

**Results:** The combined search results identified 84 unique website fora from which qualitative data were extracted for thirty novel psychoactive substances and organised into technical folders. This data extracted from online communities has thrown some light on factors such as the mode of purchase, subjective experiences, reasons for use, combinations, legislation, mechanisms of action in the CNS, side effects, toxicity and its management. This would enable the clinicians to be obtain full history when assessing and would inform better treatment choices.

**Conclusions:** A range of novel psychoactive substances have been made recently available across the globe. The sale is easily achieved through the Internet. New legislations are made to control some recreational substances whilst newer substances appear. Furthermore, the distributors sell the backlog of products even after controlling of the substance has occurred and hence are liable to potentiating criminal investigations. It is here suggested as well that the 'genuinity' of each online substance is questionable. Evidence-based literature is scant for the vast majority of these substances. Accidental overdoses are common occurrences and some of the potential life-threatening clinical situations include sympathomimetic toxidrome and serotonin syndrome. Benzodiazepines appear to help with agitation and neuropsychiatric manifestations. Better levels of international cooperation and rapid share of available information may be needed to tackle the emerging problem of the novel psychoactive substances.

## **Introduction**

The use and misuse of alcohol and drugs has been an inseparable part of human society for centuries across the globe. Records from Mesopotamia (5000 to 4000 BC) indicate the use of opium (Lindensmith, 1968) and an Egyptian papyrus (3500 BC) mentioned the production of alcohol in a brewery (Ford, 1969). The first recorded use of cannabis as an intoxicant occurred in 2737 BC by the Chinese emperor Shen Nung (National commission on Marihuana and Drug Abuse, 1972; Ray and Ksir, 1995). The practice of coca-leaf chewing was relatively common in prehistoric human populations from the southern coast of Peru (Indriati and Buikstra, 2001). Psychoactive substances have been available for very long time and there seems to be a remarkable change in the pattern and prevalence of drug misuse over the last century or so (Herxheimer and Sanz, 2008). Among several reasons, few are worth mentioning.

First, improved cultivation of the plants yields higher concentration of the active ingredients and hence higher the potency of the drugs which are more pleasurable. For example, the THC content of marijuana has increased from 1.5% in 1980 to 2.5% in 1997 and to 15% in 2004 (Licata et al, 2005). The National Drug Intelligence Centre in the USA published in a report that higher potency marijuana from cannabis was cultivated as a result of improved cultivation techniques (Domestic Cannabis Cultivation Assessment, 2007). Moreover the 1980s marked the start of the use of recreational drugs which spread as an epidemic in the developed world along with the rapid spread of HIV disease. Researchers have found that the chronology and epidemiology of the recreational drug epidemics in American and European countries co-existed with AIDS epidemics, which led to the Drugs – AIDS hypothesis (Duesberg and Rasnick, 1997).

The term ‘Novel Psychoactive Substances’ is more appropriately used throughout- than the term ‘Legal Highs’, as the latter term may cause confusion among users. These substances may not be ‘legal’ as the law changes rapidly in many countries and also the term ‘High’ can be misleadingly interpreted as producing euphoria without any toxic effects. Hence this term is to be avoided (Corazza et al, 2012).

A group of 'Novel Psychoactive Substances' (NPS) produced by clandestine laboratories have appeared in the market (Henderson, 1988). These chemicals are analogues to the controlled psychoactive substances but may or may not be legally banned in many countries. They generate biological responses not only similar to but are also enhanced as compared to the parental compounds (Cooper, 1988). In the mid-1980s', one such drug, MDMA (Ecstasy), became popular and it was sold in massive amounts in certain parts of the western world (Collin and Godfrey, 1997). After a long and intense struggle in the courts, MDMA was permanently banned from the USA in 1988. However, there was a great demand for chemicals that were similar to ecstasy, but were not legally banned. When Alexander Shulgin published his books, PiHKAL (Shulgin and Shulgin, 1991) describing 179 phenethylamines and TiHKAL (Shulgin and Shulgin, 1997) describing 64 tryptamines synthesised in his laboratory, these drugs gained popularity. Recently, he also published 'Shulgin Index' with a comprehensive account of 126 substances including their synthesis, biochemistry, pharmacology and legal status (Shulgin et al, 2011). Thus more than 360 psychoactive substances have been synthesised and a number of such substances have appeared in the drug market in the last few years (e.g., 2C-T7; DOC; 4-acetoxy-DMT etc).

Another reason for the prevalence of novel psychoactive substances is that the Internet ('e-commerce market') (Schifano et. al, 2003) has become the most popular instrument for the dissemination of knowledge and sale of these drugs, apart from the conventional 'street market' and the 'free market' i.e., selling drugs through mobile phone communication and among groups of friends (Littlejohn et. al, 2005). The 'Operation Web Tryp' investigated Internet websites distributing highly dangerous 'designer' drugs and made few arrests in 2004 in the USA (DEA news release, 2004). Also among the innumerable clandestine laboratories in the USA, 132 "super labs" (capable of producing 10-20 or more pounds of substances per cooling cycle) were seized in 2003 and 5,471 clandestine "mom and pop" laboratories (small scale labs) were seized in 2004 (United States department of Health and Human Services, 2005).

Taking into account the above mentioned factors, it could be argued that as a result of the use of psychoactive substances either extracted or synthesised and easily marketed through the Internet, health related problems may be observed as a consequence. Therefore it is necessary that health care professionals have access to comprehensive data on the availability of the wide variety of novel psychoactive substances so that the information can be incorporated in

the treatment plan for the patients. But the evidence based literature on these drugs is scarcely available (Commission of the European Communities Directorate, 2002).

The data available in the literature pertaining to novel psychoactive substances is obtained from a limited number of indicators, including both acute toxicity events (reported to: hospitals; other health professionals; poisons' units etc), and the small number of seizures. However, reliable data are not typically extracted from the actual consumption by the drug misuse community. Furthermore, the number of seizures may be minimal compared to the enormous ongoing process of production in the clandestine laboratories, its sale through the Internet and its consumption by the drug misuse community. The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) has implemented an Early Warning System (EWS), which mostly relies on data from the above described parameters (The European Monitoring Centre for Drugs and Drug Addiction, 2004).

Another alarming factor is that the flood of drug related data available to vulnerable individuals due to both the ease and the rapidity of access to the Internet run constantly ahead of what is available to clinicians and regulatory authorities (Halpern and Pope, 2001). The Psychonaut Project 2002 made a valuable contribution in this area in identifying this lack of database for evolving drugs of misuse. This project contributed to the EWS by providing information about 100 new psychoactive compounds in 2002. Their findings may constitute a public health issue for vulnerable individuals, (i.e., children and adolescents) whose IT literacy can be surprisingly good but who are also at higher risk of experimenting with psychoactive substances (Commission of the European Communities Directorate, 2002).

Recently, the Recreational Drugs European Network [ReDNet] project (ReDNet project, 2012). was formed. This project has identified several hundreds of psychoactive compounds. It is a multi-site research study which has a goal to disseminate the information to professionals and young people about such psychoactive compounds' potential risks. The ReDNet project uses the existing Psychonaut [EWS] project database together with information from available literature and online searches to develop accurate information on new recreational drugs and to inform harm reduction strategies in research.

The 'psychedelic experience', produced by these drugs is characterised by visual, auditory, tactile, olfactory hallucinations, reminiscent thoughts, déjà vu experiences, confusion and ineffable experiences (Leary et. al). The users look out for a particular experience which is

known as ‘closed eye hallucinations’ or ‘closed eye visualizations’ (CEVs) (Bluelight, 2012). This experience is graded into five levels depending on their intensity (Wikipedia, 2012).

On the other hand, some of these drugs (e.g., MDMA, MDA) could cause serious complications such as hyperthermia, hypertension, seizures and cardiac arrest (Barone, 1997). Hence this study explored possible toxic effects experienced by the drug users as well.

Since most of the novel psychoactive substances are synthesised from the parental compounds by altering the basic chemical structure, their effects could be totally different to those of their parental compounds. In fact, it may be misleading to determine the psychoactive and other medical effects of these compounds simply by examining their chemical structure. As a result, it is necessary for the researcher to obtain information about their effects from the drug users’ perspective. This Internet-based study explored the views and experiences of such users of psycho active substances which were bought online. This qualitative data was supplemented by the existing evidence based literature, if any, available for each compounds.

**Ethical approval:** This research, supervised by Prof F Schifano and Dr P Deluca, forms a part of similar but larger projects known as the Psychonaut [web scanning] project and Recreational Drugs European Network [ReDNet] project, which are essentially an Information and Communications Technology [ICT] prevention service addressing the use of novel psychoactive substances in vulnerable individuals. Ethical approval for ReDNet was given by the University of Hertfordshire in 2010 and the protocol approval number is PHAEC: 10-42 (Appendix B). However, the Wandsworth Research Ethics Committee at St George's University of London advised that ethical approval was not required for the Psychonaut web scanning project under NHS research governance arrangements (Appendix C).

## Aims

1. To understand and identify the characteristics about novel psychoactive substances;
2. To review the available evidence based literature on these novel psychoactive substances;
3. To understand the subjective experience, the reasons for use, preference, combinations, any new insights about the drug misuse communities, sale websites etc;
4. To explore a wide range of toxic effects experienced by the users, either short- or long-term and to identify any reports of deaths related to the intake of these compounds discussed in the selected fora;
5. To obtain recommendations for the medical/psychiatric treatment for overdose or toxicity for NPS and;
6. Ultimately, to contribute to the 'Early Warning System' (EWS) where the information collected related to these four groups of psychoactive compounds would be made available at the European Union-wide level (EMCDDA) through the ReDNet Project / Psychonaut Project.

## **Methodology**

Huge number of unidentified novel psychoactive substances are easily available through the Internet. Of those, three groups (phenethylamines, tryptamines and piperazines) were selected for the present study, because of their growing recognition among online drug misuse communities, easy availability through the Internet and the lack of evidence based literature.

### A) Groups selection:

A wide variety of synthetic herbs/plants were also discussed by the online communities for their psychoactive effects. Hence these were also included as the fourth group (miscellaneous psychoactive substances). This research aims to explore the following four groups of compounds:

1. Phenethylamine - based psychoactive compounds
2. Tryptamine - based psychoactive compounds
3. Piperazine - based psychoactive compounds
4. Miscellaneous psychoactive compounds – (synthetic herbs/ plants)

### B) Selection of the total number of NPS:

It was necessary to define the number of novel psychoactive substances to be researched and to identify them. Phenethylamines form the largest group of novel psychoactive substances and contains at least a few hundreds of such substances. A Shulgin described 179 of such substances in his book, PiHKAL. He also described 64 novel psychoactive substances from the tryptamine class in his book, TiHKAL. Recently, a further 126 substances have been added to this list (Shulgin et al, 2011). Thus more than 360 psychoactive substances have been available. Numerous piperazine preparations have been produced and marketed as novel psychoactive substances. Apart from these three groups, there are several other novel psychoactive substances available (miscellaneous group) as well. Thus the overall numbers of novel psychoactive substances may exceed several hundreds of psychoactive substances.

As the total number of available novel psychoactive substances is enormous, it was decided (phase 1 progression viva at the University of Hertfordshire) to margin the number to thirty

novel psychoactive substances. Hence about ten novel psychoactive substances were selected from the phenethylamine group, which formed the largest group. The remaining twenty were equally divided among the other three groups. Thus the number of compounds for each of the four groups is given below:

1) Phenethylamines	= 10 psychoactive compounds
2) Tryptamines	= 07 psychoactive compounds
3) Piperazines	= 06 psychoactive compounds
4) Miscellaneous	= 07 psychoactive compounds
Total	= 30 psychoactive compounds

Once the thirty novel psychoactive substances were identified as above, the following methodology adopted from the literature (Deluca and Schifano, 2007) was used to carry out the required web searches. It was aimed at identifying various website fora through searching Google and Yahoo using specific key words and extracting qualitative data from the identified web fora. This was also supplemented by extensive evidence based literature search for each of the selected psychoactive compounds.

#### C) Web fora / keyword(s) search:

The key words were coined to capture webfora from all the four categories of compounds. The following key words were used to identify the unique web fora:

1. “Phenethylamines misuse forum”
2. “Piperazines misuse forum”
3. “Tryptamines misuse forum”
4. “Synthetic herbs/ plants forum”

Searches were carried out using the websites by means of specific key words using the popular search engines: Google<sup>TM</sup> and Yahoo<sup>TM</sup>. These two search engines were identified because of their popularity. For each set of the key words, the first 100 websites identified by Google<sup>TM</sup> and Yahoo<sup>TM</sup> were fully assessed, together with a further random samples selected by a specific web randomizer (Research Randomizer, 2012) of 5% of the remaining websites which were chosen among those actually available.

#### D) Unique website identification:

Out of the identified websites, only those websites discussing the chosen groups of the psychoactive compounds in the user fora were included in this study. All other websites that were unrelated (such as information, sales, music, movies) excluded from the study. All the remaining unique web sites were listed (Appendix A).

Most of the web fora can be viewed without becoming a member. However, to access certain contents such as picture files, attachments etc, a free registration is required. Most of the fora require free registration to post replies. The researcher obtained free registration for only one website (DF) and all the other websites were accessed without registration. No posts were made by the researcher. There were very few web fora which were completely closed and no information was obtained from such fora (Entheo-worldeyes, 2013).

#### E) 'Threads' and 'Posts' identification:

Once the unique website fora were identified, ways to access the website were analysed. Most of the website fora did not require registration to get access to the main fora. Very few websites required registration. In such cases, the researcher opened an account with a username, password and an e-mail account for few of such websites.

In each website forum, there were a number of 'threads' (the topics for discussion) and a number of 'replies' or 'posts' (the responses and discussion by forum members). Only the 'threads' discussing the thirty novel psychoactive compounds were included.

#### F) Selection of novel psychoactive substances:

A particular novel psychoactive substance was selected by various factors such as the popularity among the online drug misuse communities, novelty of the substances, levels of discussions on a particular substance ('hot topics'), any recent deaths reported in the newspapers (eg, Benzofury) etc. Thus the identified chemical and common names of these thirty novel psychoactive compounds are given below:

##### Phenethylamines

- 1) 4-Fluoroamphetamine (4-FA) or Para-Fluoroamphetamine (PFA)
- 2) 2, 5-Dimethoxy-4-chloroamphetamine (DOC)
- 3) 4-Methyl methcathinone (Mephedrone)
- 4) Naphthyl pyrovalerone (Naphyrone)

- 5) 2, 5-Dimethoxy-4-n-propylthiophenethylamine (2C-T7)
- 6) 4-Bromo-2,5-dimethoxy-N-(2-methoxybenzyl)phenethylamine(25B-NBOMe)
- 7) 4-Chloro-2,5-dimethoxy-N-(2-methoxybenzyl)phenethylamine(25C-NBOMe)
- 8) 4-Iodo-2, 5-dimethoxy-N-(2-methoxybenzyl)phenethylamine (25I-NBOMe)
- 9) 5-(2-Aminopropyl) Benzofuran (5-APB)
- 10) 6-(2-Aminopropyl) Benzofuran (6-APB)

#### Tryptamines

- 1) 4-Hydroxy-di-isopropyl-tryptamine (4-HO-DiPT)
- 2) 4-Acetoxy-N, N-dimethyl tryptamine (4-AcO-DMT)
- 3) 4-Acetoxy-N, N-diethyltryptamine (4-AcO-DET)
- 4) 4-Acetoxy-N, N-diallyl tryptamine (4-AcO-DALT)
- 5) N, N-diallyl-5-methoxytryptamine (5-MeO-DALT)
- 6) 5-methoxy-diisopropyltryptamine (5-MeO-DiPT)
- 7) 5-methoxy-N-methyl-N-isopropyltryptamine (5-MeO-MiPT)

#### Piperazines

- 1) 1-methyl-4-benzylpiperazine (MBZP)
- 2) methylenedioxy benzyl piperazine (MDBZP)
- 3) 1-(4-bromo-2, 5-dimethoxybenzyl) piperazine (2C-B-BZP)
- 4) meta-Chlorophenylpiperazine (mCPP)
- 5) 1-(4-Fluorophenyl) piperazine (4-FPP) or para-Fluorophenyl piperazine (pFPP)
- 6) para-Methoxyphenylpiperazine (MeOPP)

#### Miscellaneous compounds

- 1) 1-pentyl-3-(1-naphthoyl) indole (JWH-018)
- 2) naphthalen-1-yl-(1-butylyndol-3-yl) methanone (JWH-073)
- 3) 4-ethylnaphthalen-1-yl-(1-pentylyndol-3-yl) methanone (JWH-210)
- 4) 1, 1-dimethylheptyl-11-hydroxytetrahydrocannabinol (HU-210)
- 5) 2-[(1R, 3S)-3-hydroxycyclohexyl]- 5-(2-methyloctan-2-yl) phenol (CP-47,497)
- 6) (1-pentylyndol-3-yl)-(2,2,3,3-tetramethylcyclopropyl) methanone (UR-144)
- 7) 3-Methoxy Phencyclidine (3-MeO-PCP)

#### G) Evidence based literature search:

Although there existed hardly any evidence based literature on these compounds, it was important to search the literature for any published information on these psychoactive compounds. Hence searches were carried out on all of the following data-bases: the Cochrane library, Athens library, Medline, Medscape and Google Scholar.

H) Data analysis: Qualitative methods were applied to identify the key themes that emerge from the identified forum discussions. The systematic collection of information under the

headings for each of the psychoactive compound is known as the 'technical folders'. Thus the data was organised under the following headings for each of the psychoactive compounds:

- 1) Overview
- 2) Key points
- 3) Chemical characteristics of active constituents
- 4) Appearance
- 5) Available information on purchase price
- 6) Modalities of intake
- 7) Legal status
- 8) Current use/medicinal use
- 9) Information on recreational use/misuse in the E.U. (or elsewhere)
- 10) Use in combination with other compounds
- 11) Pharmacological characteristics
- 12) Toxicological effects
- 13) Desired psychoactive effects
- 14) Physical/medical untoward effects
- 15) Psychopathological disturbances associated with its use
- 16) Clinical advice
- 17) Related fatalities
- 18) You tube videos
- 19) Google insights
- 20) Bibliography
- 21) Sitography

## Results

The following procedure was carried out to identify the unique website fora. Comprehensive searches were done using Google and Yahoo search engines.

### 1) Google search results:

Searches were carried out using the 4 key word(s) using the Google search engine. For each key word(s), the first 100 websites and 5% of the remaining websites were analysed. A total of 2,016 websites for all the 4 key word(s) search were identified:

1.	“Phenethylamines misuse forum”	= 507
2.	“Piperazines misuse forum”	= 476
3.	“Tryptamines misuse forum”	= 585
4.	“Synthetic herbs/ plants forum”	= 448
	Total number of relevant website fora	= 2,016

Of these 2,016 websites identified by Google, there were however only 90 website fora as given below:

1.	“Phenethylamines misuse forum”	= 21
2.	“Piperazines misuse forum”	= 31
3.	“Tryptamines misuse forum”	= 20
4.	“Synthetic herbs/ plants forum”	= 18
	Total number of relevant website fora	= 90

### 2) Yahoo search results:

Similarly, searches were carried out using Yahoo Search engine using the same 4 key word(s). For each key word(s), the first 100 websites and 5% of the remaining websites were analysed. A total of 2,943 websites for all the 4 key word(s) search were identified:

1.	“Phenethylamines misuse forum”	= 724
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2. "Piperazines misuse forum"	= 1000
3. "Tryptamines misuse forum"	= 699
4. "Synthetic herbs/ plants forum"	= 520
Total number of websites	= 2943

Of these 2,943 websites identified by Yahoo, there were however only 61 websites.

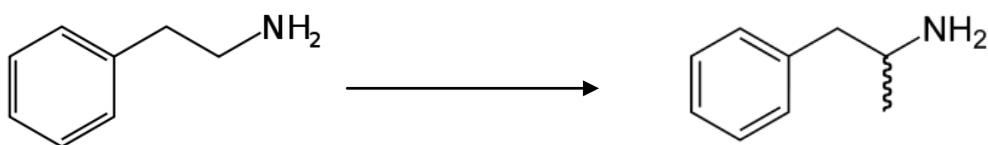
1. "Phenethylamines misuse forum"	= 19
2. "Piperazines misuse forum"	= 12
3. "Tryptamines misuse forum"	= 23
4. "Synthetic herbs/ plants forum"	= 07
Total number of relevant website fora	= 61

Combining Google and Yahoo relevant websites, the relevant website fora obtained by Google (90) and Yahoo (61) were analysed. All the duplicate website fora were identified and the duplicates removed. Few other websites were shut down. Thus final figures of **84 Unique Website fora** were identified (Appendix A).

The relevant information was derived from these 84 unique website fora and qualitative data extraction and analysis were done simultaneously.

The molecular structures of all these 30 compounds included in this study are given below:

**Basic molecular structures:**

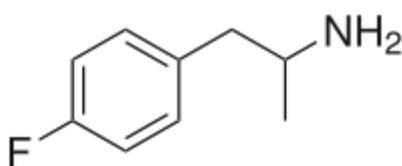


**Phenethylamine**

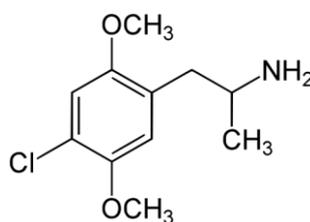
**Amphetamine  
( $\alpha$ -methyl phenethylamine)**

**A) Ring substituted amphetamines**

1. 4-FA

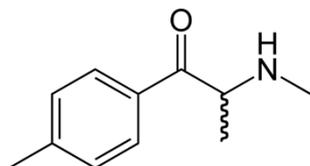


2.DOC

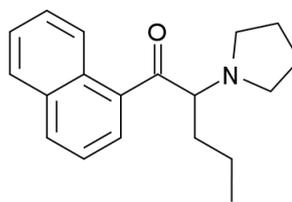


**B) Beta ketonated amphetamines (substituted cathinones)**

3. Mephedrone

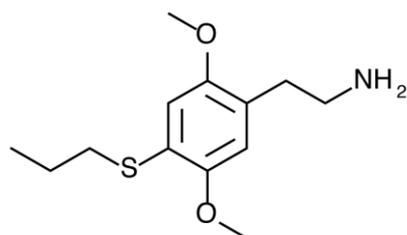


4. Naphyrone

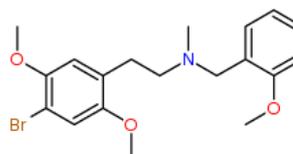


**C) Ring substituted phenethylamines**

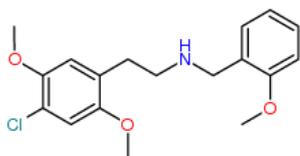
5. 2C-T7 (2C-series)



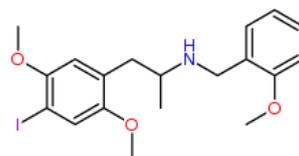
6. 25B-NBOMe



7. 25C-NBOMe

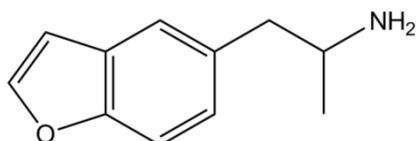


8. 25I-NBOMe

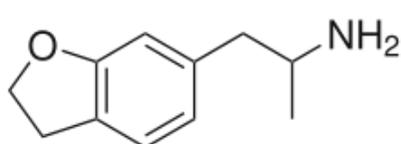
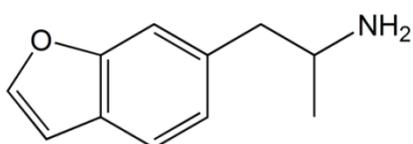


#### D) Ring substituted methylenedioxy amphetamines

9. 5-APB



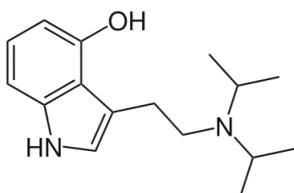
10. 6-APB and 6-APDB



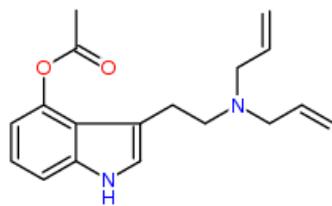
#### Tryptamines

##### A) Simple tryptamines: Ring 4- substituted

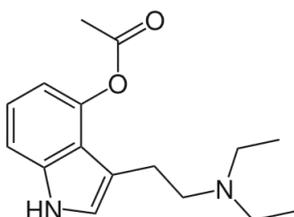
11. 4-HO-DiPT



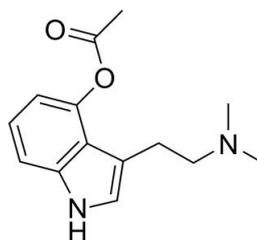
12. 4-AcO-DALT



13. 4-AcO-DET

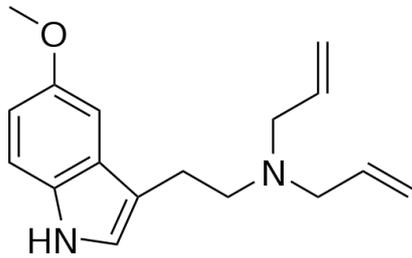


14. 4-AcO-DMT

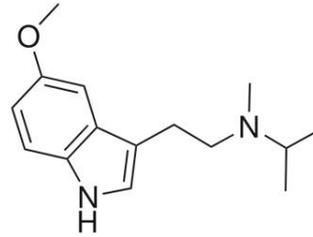


## B) Simple tryptamines: Ring 5-substituted

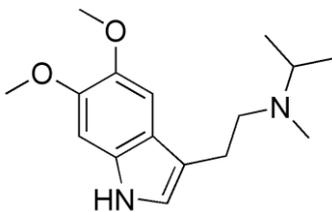
15. 5-MeO-DALT



16. 5-MeO-DiPT



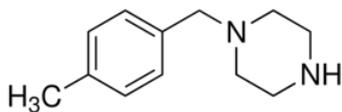
17. 5-MeO-MiPT



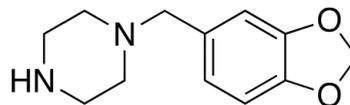
## Piperazines

### A) Benzylpiperazines

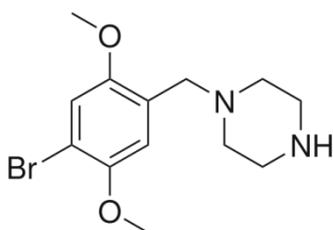
18. MBZP



19. MDBZP

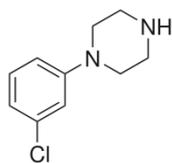


20. 2C-B-BZP

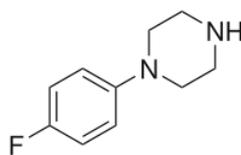


### B) Phenylpiperazines

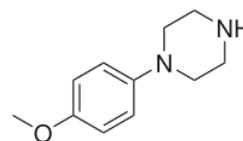
21. mCPP



22. 4-FPP or pFPP

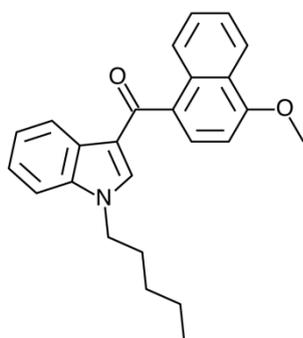


23. MeoPP

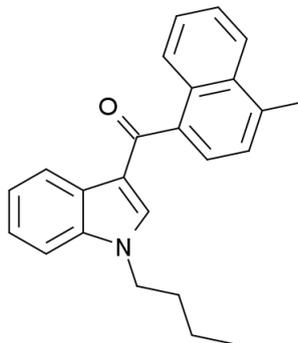


**Miscellaneous compounds – A) Synthetic cannabinoids**

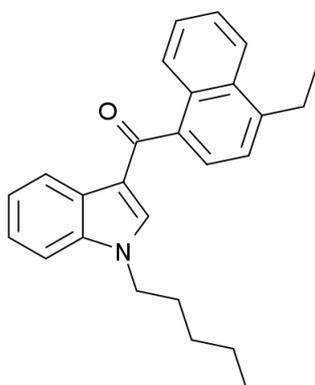
24. JWH-018



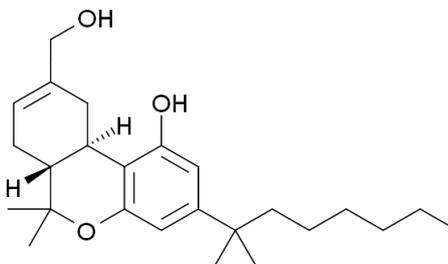
25. JWH-073



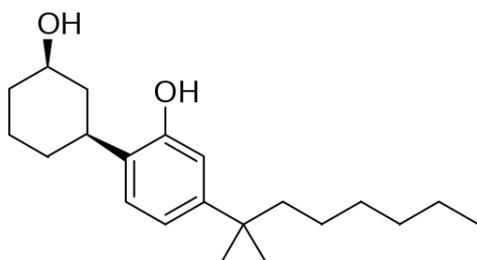
26. JWH-210



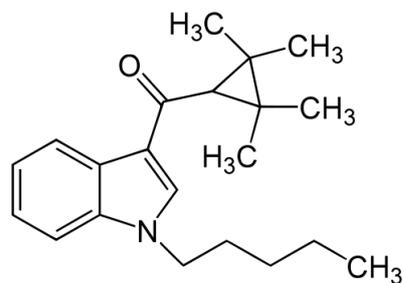
27. HU-210



28. CP-47497

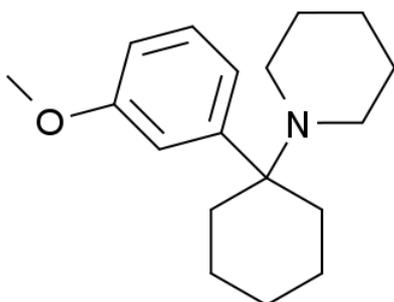


29. UR-144



**Miscellaneous compounds – B) Dissociative compound**

30. 3-MeO-PCP



## Chapter I: PHENETHYLAMINES

### Introduction

The aryl alkyl amine molecular structure forms the basis for majority of ‘Classic Hallucinogens’ from which two major groups of compounds are formed: the indole alkyl amine group (e.g., tryptamines) and the phenalkylamine group. Substitutions of the latter group further form phenethylamine or phenisopropylamine. A number of analogues could be formed by simple alteration of the parent molecule. This could potentially result in the formation of immeasurable compounds with altered characteristics.

Phenethylamine (PEA), a derivative of the amino acid Phenylalanine, is a typical example where substitutions/ alterations of the basic parent molecule lead to hundreds of new compounds. N- $\alpha$ -methyl substitution in the terminal amine group of Phenethylamine results in the formation of  $\alpha$ -methylphenethylamine which is commonly known as ‘Amphetamine’. The stimulant property of amphetamine requires the presence of unmodified aromatic ring,  $\alpha$ -carbon with methyl group (-CH<sub>3</sub>) and the terminal amino group (-NH<sub>2</sub>) and the structure of PEA and Amphetamine confers stimulant properties through release of catecholamines, mainly dopamine (Nichols, 1994).

Phenylalanine  $\longrightarrow$  Phenethylamine  $\longrightarrow$  Amphetamine

Thus, the ‘novel’ substitution could occur in a number of possible ways either in phenethylamine molecule or amphetamine molecule leading to altered or enhanced psychoactive properties (Nichols, 1994; Hill and Thomas, 2011) For example, substitution of the aromatic ring of PEA leads to 2C- series of compounds (2C-B, 2C-I etc) where as substitution of the aromatic ring of amphetamine leads to the formation of D- series of compounds (DOB, DOC, DOI etc). This D-series compounds, also known as ‘hallucinogenic amphetamines’, act via 5HT<sub>2a</sub> agonism (Nichols, 1994; Acuna-Castillo et. al, 2002) and possess several folds of hallucinogenic properties compared to the ‘parent’ amphetamine molecule.

In another example of substitution, addition of ketone group to the  $\beta$ -carbon of amphetamine molecule ( $\beta$ -ketone) produces cathinones which are similar to the naturally occurring chemicals found in Khat. Further substitution of cathinone would result in a number of

compounds such as mephedrone, flephedrone etc. The presence of  $\beta$ -ketone group increases the polarity of the molecule and there by reduces entry into CNS (Hill and Thomas, 2011; Gibbons and Zloh, 2010). Hence re-dosing / use of high doses are common to gain entry into CNS for ‘psychedelic effects’, but with toxic peripheral effects and higher mortality (Hill and Thomas, 2011).

Thus a countless novel psychoactive compounds have been emerging through the online market and their synthesis is marked by simple modification of its structure giving rise to an altered molecule with altered function. Here the characteristics of ten psychoactive compounds that belong to phenethylamine group are described:

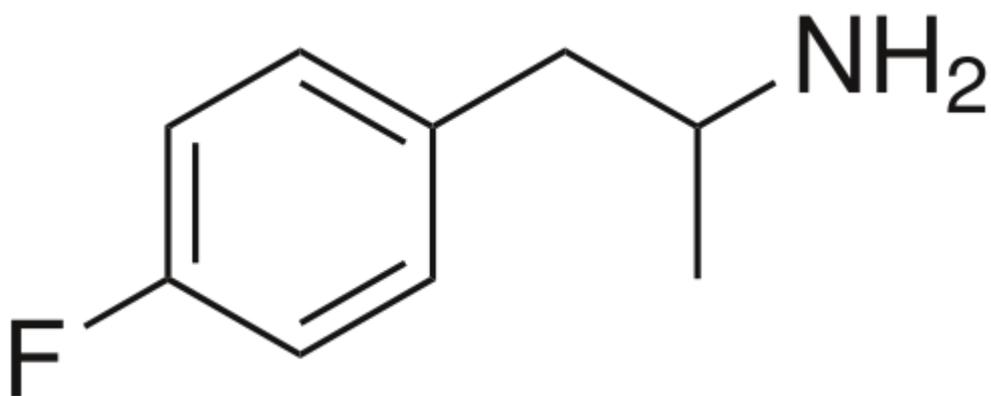
- I.I 4-Fluoroamphetamine (4-FA) or Para-Fluoroamphetamine (PFA)
- I.II 2, 5-Dimethoxy-4-chloroamphetamine (DOC)
- I.III 4-Methyl methcathinone (Mephedrone)
- I.IV Naphthyl pyrovalerone (Naphyrone)
- I.V 2, 5-Dimethoxy-4-n-propylthiophenethylamine (2C-T7)
- I.VI 4-Bromo-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine (25B-NBOMe)
- I.VII 4-Chloro-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine (25C-NBOMe)
- I.VIII 4-Iodo-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine (25I-NBOMe)
- I.IX 5-(2-Aminopropyl) Benzofuran (5-APB)
- I.X 6-(2-Aminopropyl) Benzofuran (6-APB)

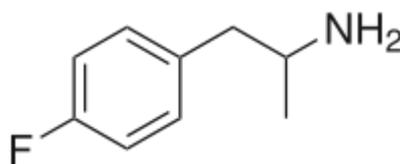
I.I 4-Fluoroamphetamine (4-FA)

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# 4-FA Report

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## OVERVIEW

Chemical name: 4-Fluoroamphetamine

Synonyms: 4-FA; Para-fluoroamphetamine; PFA; PAL-303; Flux; Flits; R2D2; p-Fluoro-alpha-methylphenethylamine; 4-Fluoro-alpha-methylphenethylamine.

Active constituents: 4-Fluoroamphetamine

Type: Research chemical – Phenethylamine

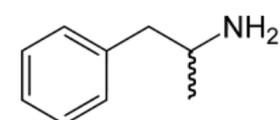
Origin: It is not known who first synthesised 4-FA but there are references to this compound in the literature since 1960s. However, the first seizure of 4-FA prepared in a clandestine laboratory for recreational purposes was reported in January 2003 in Germany.

Status: Novel

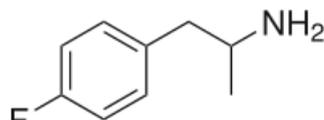
Chronology: Though the compound is known for many decades, its potential as a recreational compound was only known since 2003.

[a] [1] [2] [3] [4]

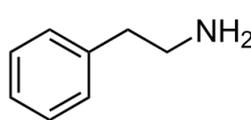
## KEY POINTS



*Amphetamine*



*4-Fluoroamphetamine*



*Phenethylamine*

4-Fluoroamphetamine (4-FA) is a ring substituted amphetamine belonging to alpha methylated phenethylamine group. It closely resembles the structure of phenethylamine and amphetamine. There are three positional ring isomers: 2-Fluoroamphetamine (2-FA), 3-Fluoroamphetamine (3-FA) and 4-Fluoroamphetamine (4-FA) as well as two fluoro methoxy amphetamines. Unknown compounds seized in Germany were analysed by the gold standard Gas Chromatography and Mass Spectrometry (GC/MS). But the analysis confirmed the presence of isomeric fluoro amphetamines but could not differentiate among them. Hence a higher instrumentation (Gas chromatography–infrared spectroscopy and  $^1\text{H}$ - and  $^{13}\text{C}$ -nuclear magnetic resonance) was required to differentiate between fluoroamphetamines and fluoromethoxy amphetamines.

[a]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-(4-fluorophenyl) propan-2-amine

Molecular weight: 153.196683 [g/mol]

Molecular formula: C<sub>9</sub>H<sub>12</sub>FN

CAS Number: 459-02-9

[1] [2] [3] [4]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product description</b>
<b>Isomerism</b> 4-Fluoroamphetamine is a psychoactive drug and research chemical of the phenethylamine and amphetamine chemical classes. It produces stimulant and possibly entactogenic effects. [5]
<b>Sense Aromatic</b> 4FA aka para-fluoroamphetamine (PFA) is one of the latest additions to our stock. Its the highest quality powder form that we are going to supply for our loyal customers. [6] <b>4FA IS STRICTLY NOT FOR HUMAN CONSUMPTION</b>
<b>Soilek Chemicals</b> 4-FA (100g) 4-Fluoroamphetamine CAS: 459-02-9 \$400.00 [7]

## AVAILABLE INFORMATION ON PURCHASE PRICE

Different websites quote different price depending upon the country of sale and the geographical location of the supplier. The following are examples from three different websites:

- 10g for \$90, 25g for \$187, 50g for \$300, 100g for \$480, 250g for \$1200, 500g for \$2100 and 1Kg for \$3200

- 1g for £13, 2g for £22, 10g for £72, 25g for £174, 50g for £272 and 100g for £390
- 50g for \$300, 100g for \$400, 250g for \$600 and 1Kg for \$1800

[5] [6] [7]

## MODALITIES OF INTAKE

Oral ingestion is the common mode of consumption. Nasal insufflation is not as common as it could be very painful in some cases. Intravenous route was tried very rarely by few users who advice to reduce the dose (about half the oral dose) but the duration of action was reported to be much shorter.

[8] [9] [10] [11]

## LEGAL STATUS

4-FA is not controlled in the USA, but it can be considered as an analogue of phenethylamine and hence covered under the Federal Analogue Act.

It is controlled in Poland, Israel (2007), Slovak Republic (2011) and Hungary (2012).

4-FA is reported by the forum users to be a class A drug in the UK according to the Misuse of the Drugs Act 1971 (modification) Order 1977.

[12] [13] [14] [15] [16] [17]

## CURRENT USE / MEDICINAL USE

4-FA is not used for medicinal purposes. It is not intended for human consumption.

In 1970s, 4-CA, a related compound, was tried as an antidepressant at 75mg/day. But it was not well tolerated due to raphe nuclear degeneration and neurotoxicity in animal studies. Also 4-CA was found to reduce the concentration of serotonin in brain which was much against the widely accepted hypothesis (in the 70s - increased concentrations of serotonin worked as an antidepressant). Hence it was discontinued as an antidepressant.

[b] [c] [18]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

Several studies have shown that the substitution of hydrogen atom in the amphetamine by fluorine atom makes it more lipophilic so that it can easily pass

through the blood brain barrier. Hence Fluoroamphetamines enters the brain more readily to produce potent effects. Thus 4-FA has become a recreational drug.

The usual starting oral dose is about 50mgs to 80mgs for first time users. Regular users reported ingesting doses above 100mgs and also re-dosing in one session was a common occurrence to prolong the effects. The overall effects last more than 15 hours.

In Denmark, a study was carried out recently to detect the presence of Fluoroamphetamines in forensic cases. Most of these cases were motorists driving under the influence of drugs. The compounds were identified from the blood samples of subjects by ultra performance liquid chromatography with time of flight mass spectrometer (UPLC-TOF-MS) as well as by UPLC tandem mass spectrometer. Thirteen cases were confirmed with 4-FA intoxication and three cases with 2-FA intoxication. Another study reported two cases who had taken 4-FA in Germany. The serum concentrations of 4-FA were found by GS/MS method to be 350ng/mL and 475ng/mL at which level the compound was active. It produced sympathomimetic effects as well as Psychostimulant effects.

[d] [e] [j] [k] [19]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With 2C-B
- With 2C-D (severe side effects – nausea, severe vomiting, sweating)
- With piracetam and methylone
- With amphetamine and sertraline (palpitation, intense anxiety, prolonged nausea, increased body temperature and intense sweating) – It looked like a ‘possible’ serotonin syndrome at its milder forms.
- With methylone (tachycardia, hypertension -169/95mmHg followed by pulse rate falling down to 44beates /minute)
- 250mgs of 4-FA with 10mgs of paroxetine and 100mgs of codeine (this combination produced no euphoria but insomnia and loss of appetite)

[20] [21] [22] [23]

## PHARMACOLOGICAL CHARACTERISTICS

The pharmacology of halogenated amphetamines (eg, Fluoro amphetamine, Chloro amphetamine) has been studied extensively over the last few decades. Older studies showed 4-FA to be a serotonin depletor, but more recent studies have established that it is a stronger dopaminergic and weaker serotonergic compound with actions similar to amphetamine.

Studies on structural activity relationship studies established that the activity of para-substituted phenylalkylamines differed from their respective parent compound.

It was observed in several studies in the 1960s that halogenated amphetamines lowered the serotonin level in the brain. The serotonin depletion failed to last longer for 4-FA when compared with 4-CA.

In the 70s, a study was carried out to find out the ability of 4-haloamphetamines to deplete the serotonin in the animal brain. It highlighted that 4-FA produced a transient and reversible depletion of serotonin in comparison with other halogenated amphetamines. The depletion of serotonin by 4-FA lasted only few hours when compared with 4-CA or 4-BA which lasted longer. Thus 4-chloroamphetamine produced both a short term reversible and a long term irreversible depletion of serotonin and 5 Hydroxyindoleacetic acid (5HIAA). Hence it concluded that 4-FA possesses pharmacological properties that are different from its related compounds (4-BA and 4-CA) and also 4-FA was metabolised in a different manner to that of other 4-haloamphetamines.

Fenfluramine, a serotonergic agent, is a compound which is structurally similar to 4-FA. Animal experiment has confirmed that the effects of fenfluramine were similar to 4-FA in releasing serotonin.

Pharmacological properties of 4-FA was compared with amphetamine and other halogenated amphetamines (4-CA, 4BA). When compared with 4-CA or 4-BA, 4-FA showed stronger inhibition of dopamine than 5HT uptake in rat brain synaptosomes. These studies indicated that the pharmacological characteristic of 4-FA was distinct from other halogenated amphetamines and that it resemble more closely to amphetamines (stimulant effects) than halogenated amphetamines.

[a] [f] [g] [h] [i] [j] [k] [l] [m]

## TOXICOLOGICAL EFFECTS

The first accounts of neurotoxicity of halogenated amphetamines were derived from animal studies carried out in late 1970s. It was shown that a single injection of 4-CA (4-chloroamphetamine) produced irreversible depletion of serotonin and 5-Hydroxyindoleacetic acid (5-HIAA) for more than 4 months. 4-BA (4-bromoamphetamine) also reproduced the same results. However 4-FA produced depletion that lasted less than 24hours. The long term toxicity of 4-FA is not yet established. Online users' seriously cautioned against regular use of any fluorinated compounds to avoid 'bone mutations' and possible neurotoxicity.

[n] [24] [25]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria
- Music appreciation
- Socialising
- Energetic
- Fun
- Sexual enhancement

[26] [27] [28]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Loss of appetite
- Insomnia
- Sympathomimetic effects (eg, Tachycardia)

[29] [30]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- One user reported that his friend became psychotic and jumped out of the window and fractured his bones after ingesting 4-FA.
- Psychosis
- Hallucinations
- Violent behaviour

[m] [31]

## CLINICAL ADVICE

4-FA is a weak serotonergic agonistic action and hence it could cause ‘Serotonin syndrome’ especially if combined with other serotonin releasing compounds.

[20] [21] [22] [23]

## RELATED FATALITIES

None.

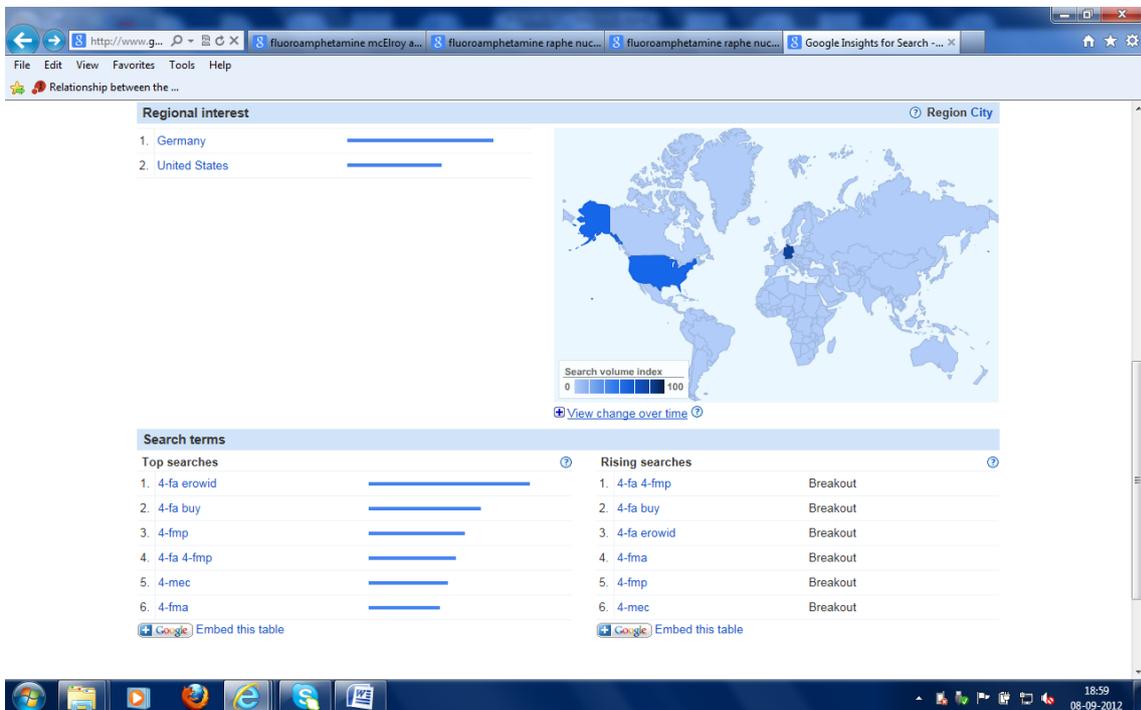
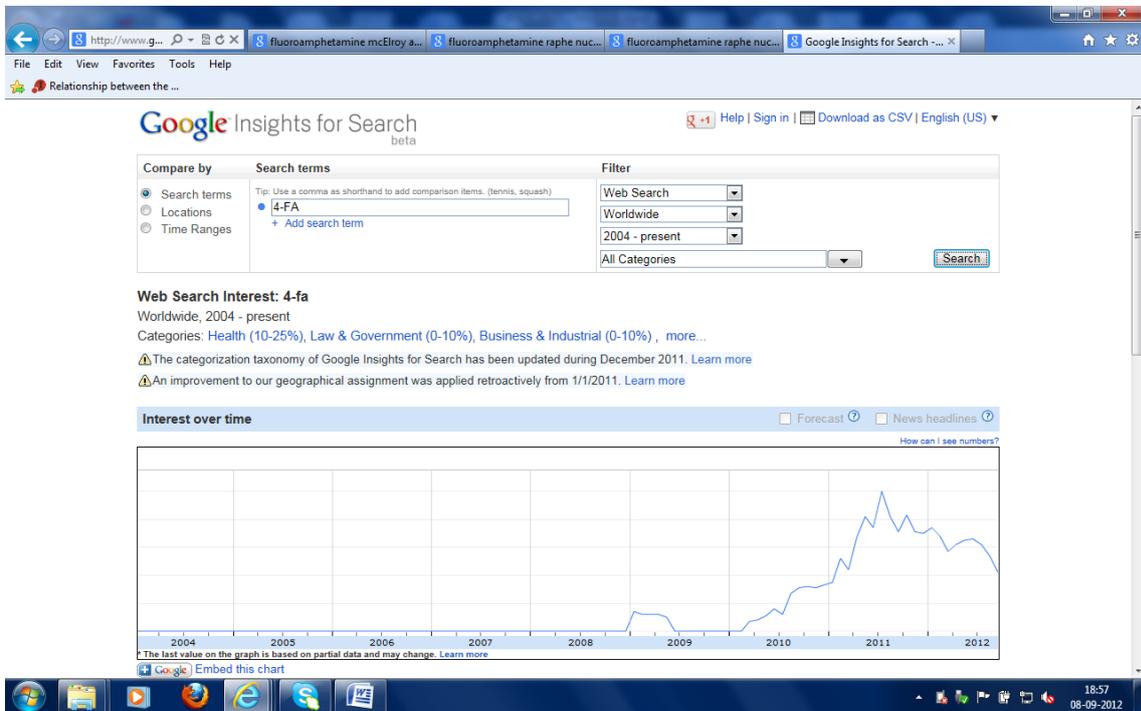
## YOU TUBE VIDEOS

There was only one video for sale of 4-FA found on You Tube. [32]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below

includes a graph with the search volume, indicating interest over time (GMT) for 4-fluoroamphetamine, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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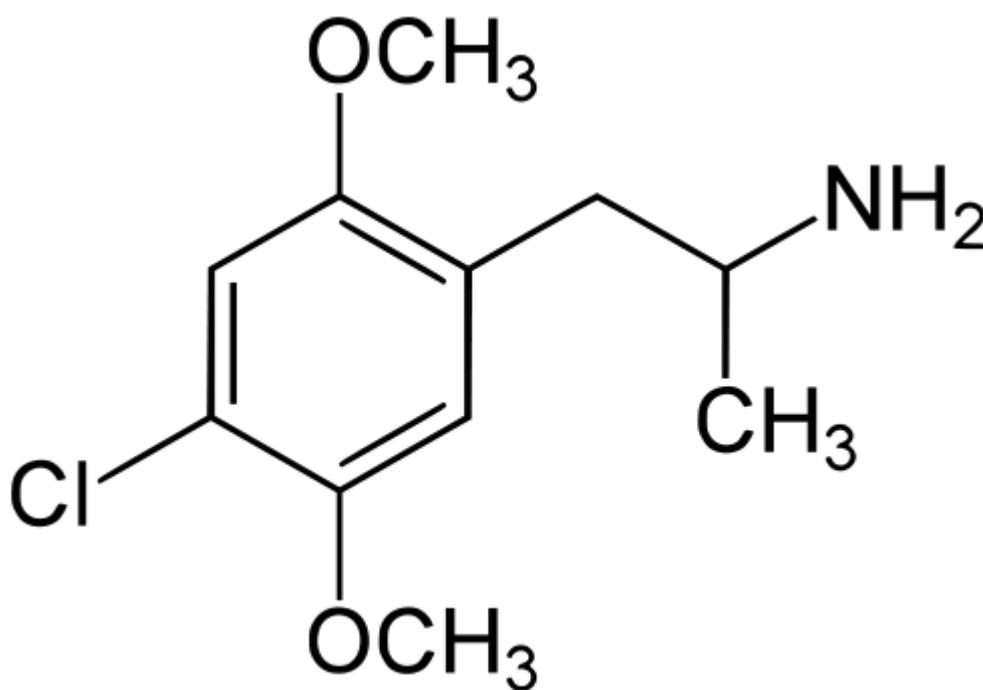
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I.II 2, 5-Dimethoxy-4-chloroamphetamine (DOC)

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# DOC Report

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## OVERVIEW

Chemical name: 2, 5-Dimethoxy-4-chloroamphetamine

Synonyms: DOC

Active constituents: 2, 5-Dimethoxy-4-chloroamphetamine

Type: Research chemical – Phenethylamine

Origin: It was first synthesised by Coutts and Malicky whilst synthesising analogues of 1-(2, 5-Dimethoxy-4-methylphenyl)-2-aminopropane (DOM) in 1972. It was also synthesised and tried by A Shulgin which was later published in his book, PiHKAL in 1991.

Status: Novel

Chronology: Online users report the availability of DOC on the market since 2005.

[a] [b] [1] [2]

## KEY POINTS

2, 5-Dimethoxy-4-chloroamphetamine (DOC) is a ring substituted alpha methylated phenethylamine. The characteristic features of this compound are its activity at small doses and its longer duration of action. It produces strong CEVs, increased appreciation of music and movements. However it could potentially cause serious toxicity since it is active at a very low dose compared with other compounds from the same class.

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-(4-chloro-2,5-dimethoxy-phenyl)propan-2-amine

Molecular weight: 229.70 g/mol

Molecular formula: C<sub>11</sub>H<sub>16</sub>ClNO<sub>2</sub>

CAS Number: 123431-31-2

[2] [3] [4]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product description
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### All legal herbal

2,5-Dimethoxy-4-chloroamphetamine is a chemical that belongs to amphetamine class. 2,5-Dimethoxy-4-chloroamphetamine is also known as DOC and is considered a psychedelic drug that influences activity of the 5-HT<sub>2A</sub> receptor. CAS number:123431-31-2 [5]

**Tradett** (from China)

2,5-Dimethoxy-4-chloroamphetamine [6]

“CONTACT NOW Click here to send enquiry”

Hi-Supplier (from China)

**Wuhan Entai Technology Development Co., Ltd**

2 5-Dimethoxy-4-chloroamphetamine [7]

“CONTACT NOW Click here to send enquiry”

## AVAILABLE INFORMATION ON PURCHASE PRICE

There are several whole sale suppliers of this compound originating from different parts of the world, but largely from China. The websites advertise to contact their company to get more information on price, mode of payment, delivery etc. However one website quoted \$240 for 10g of DOC. [5] [6] [7]

## MODALITIES OF INTAKE

Nasal insufflation is the common mode of intake. Equally, oral ingestion of the powder is also common. [8] [9]

## LEGAL STATUS

In late 2005 and late 2007, DOC was sold on blotting paper which was hard to detect by the human eye. A seizure in the USA confirmed the presence of 2,5-dimethoxy-4-chloroamphetamine (DOC) by GC/MS in 2007.

In the USA 2,5-dimethoxy-4-chloroamphetamine (DOC) is not explicitly listed as a controlled drug. But 2,5-dimethoxy-4-bromoamphetamine (DOB) is a Schedule 1 drug and so DOC could be covered under The Federal Analog Act and hence possibly prosecuted for possession (for human consumption) of this compound.

In the UK, DOC is controlled under the Misuse of Drugs Act (1971). However in the rest of the EU, it is still legal to possess DOC. [c] [d]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical and not intended for human consumption.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

It is a very popular psychedelic compound among online users who believe that DOC has got the shortest duration of action among other D-series compounds. It is active at a very small dose of 1.5mgs. The duration is usually longer and lasts between 12 and 24 hours. A typical user experience on DOC is as follows:

[T+00:00] oral ingestion of 4 mgs of DOC.

[T+00:43] euphoria started

[T+01:45] music appreciation

[T+02:56] visual effects similar to low dose LSD; Euphoria still strong.

[T+03:26] strong ++ and intensifying sounds

[T+03:55] nasal insufflation of 0.5-1 mg to accelerate the come-up.

[T+04:08] nasal insufflation of additional 0.5-1 mg

[T+05:14] strong visuals

[T+06:45] nasal insufflation of another 1-2 mg

[T+07:39] mental confusion

[T+08:01] cascade of visuals appear

[T+08:32] body discomfort

[T+08:41] CEV (Very strong +++)

[T+09:03] low pulse rate (70-75).

[10] [11] [12] [13] [14]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With MDMA
- With mushrooms, opium and 2C-C
- With LSD
- With LSD and 2C-B
- With DOM and cannabis
- With 2C-I and alprazolam

- With Kratom
- With cocaine (extreme anxiety)

[d] [15]

## PHARMACOLOGICAL CHARACTERISTICS

It is well known that hallucinogens exert their effects by binding to 5HT2 receptors. However it is not clear which of the sub-receptors are involved. An interesting study evaluated about 17 phenylisopropylamines at 5-HT2A, 5-HT2B, and 5-HT2C receptors in human population. The Ki value for DOC at the 5HT2a, 5HT2b and 5HT2c receptors were 1.4, 31.8 and 2.0 respectively implying a greater affinity for 5HT2a and 5HT2c than for 5HT2b. The study concluded that the hallucinogenic effects were exerted predominantly through 5HT2a receptors than 5HT2b or 5HT2c. [e]

## TOXICOLOGICAL EFFECTS

DOC is considered to possess severe toxicological effects in high doses. Compared with LSD, DOC does not have a confirmed safety profile. A case report confirmed sympathomimetic toxicity in a 20 year old man who consumed DOC. He had no significant past medical history. He suffered from a tonic clonic seizure with reduced level of consciousness (Glasgow Coma Scale of 3/15). He had tachycardia (152/min), blood pressure of 144/57 mmHg and non reactive, dilated (6mm) pupils. Biochemical and haematological analysis revealed random blood glucose of 9.6mmol/L, albumin (30g/L) and creatinine kinase 1314 IU/L (initially) which peaked to 4924 IU/L. He also had metabolic acidosis which was corrected. He was extubated after 22hours and was then discharged. Other toxic effects include extreme fatigue lasting for days and persistent tachycardia. [d] [10] [16]

## DESIRED PSYCHOACTIVE EFFECTS

- Strong euphoria lasting longer
- Good music and colour appreciation

[17]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Sympathomimetic effects (palpitation)
- Tiredness [d]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Paranoid delusions
- Visual hallucinations
- Drug induced psychosis
- Intense anxiety and produced mental ‘trauma’
- Poor concentration

[18] [19] [20]

## CLINICAL ADVICE

DOC is active at small doses as little as 1.5mgs. Hence accurate measurement is necessary. Accidental overdoses are common if there was error in measurement. Online users post warning messages to measure doses accurately and start at very small dose. The short term toxicity is essentially of sympathetic overactivity and hence it can be treated symptomatically at the Emergency Departments. [d]

## RELATED FATALITIES

There were no death reports directly linked to DOC. However, there were several overdoses reported. [21]

## YOU TUBE VIDEOS

There was only one video available under the title “Buy DOC research chemical”. [22]

## GOOGLE INSIGHTS

Google Insight for Search was unable to show search volume patterns for specific key words such as 2, 5-Dimethoxy-4-chloroamphetamine or DOC.

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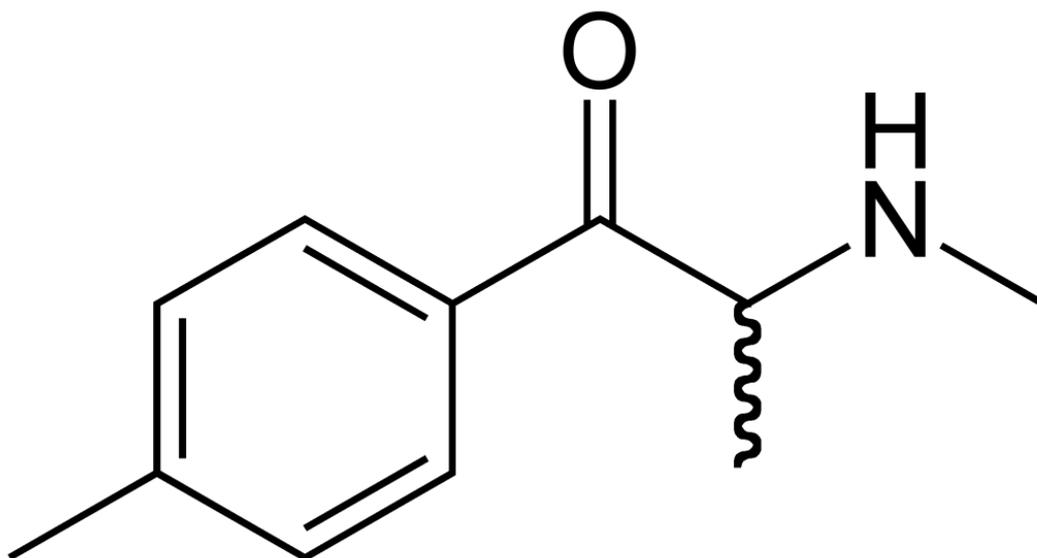
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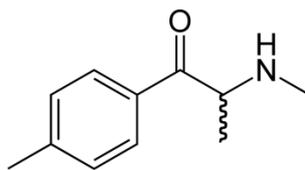
# Mephedrone

## Report

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# Mephedrone



## OVERVIEW

Chemical name: 4-Methyl methcathinone

Synonyms: 4-MMC; 4MMC; MMCat; Meph; Drone; Rush; Bubbleluv pill; Meow Meow/ Miaow Miaow (UK esp. Brighton and Hove); Plant feeder; lobster smelling compound; MD3; Roxy; Mefedron (Norway); Krabba (Sweden); Bubbles; White magic; Rush; Challenge (= Mephedrone + Ketamine)

Active constituents: 4-Methyl methcathinone

Type: Research Chemical (RC) – Phenethylamine

Origin: Mephedrone was first synthesised in 1929. It is a phenethylamine with a relatively short history of human consumption. Forum users report about their availability since 2007.

Status: Novel

[a] [1] [2]

## KEY POINTS

4-Methyl methcathinone (mephedrone) is a derivative of cathinone, a compound found in Khat. Mephedrone belongs to the family of phenethylamine. It is a stimulant / empathogen and has been compared to other stimulant drugs such as amphetamine, MDMA, MBDB and methylone. It was placed under Class B category according to the Misuse of Drugs Act 1971 on 16<sup>th</sup> April 2010.

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 2-methylamino-1-p-tolylpropan-1-one

Molecular weight: 177.242 g/mol

Molecular formula: C<sub>11</sub>H<sub>15</sub>NO

CAS Number: 923013-67-6

[1] [3] [4]

## APPEARANCE

In addition to its physical characteristics (white crystalline powder with a light yellow hue), mephedrone is characterised by a distinctive, unpleasant odour (vanilla and bleach, stale urine, electric circuit boards) that can make the eyes water (lacrimator). [4][5][6][7][8][9]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product Description
<p><b>PLANTFEEDSHOP</b> <b>We are one of international premium providers of 4-MMC/Mephedrone, bk-MDMA/Methylone,MDAI, 4-MEC/Modified mephedrone and MDPV.</b> We are proud of offer high quality product, one of most reliable company on the market and get satisfied feedback from our customers. <b>Our price includes registered air mail delivery.</b> Delivery time 4- 10 days. [10]</p>
<p>We are one of Asia's premium providers of 4-MMC/Mephedrone.  Watch how 99.9% pure 4-MMC/Mephedrone (4-Methylmethcathinone) will magically transform your garden right before your very own eyes. Thus leaving you with the most desired garden in your street, for every envious eye to see.  <b>THE CHEMICALS SOLD BY SLYPLANTS ARE STRICTLY NOT FOR HUMAN INTAKE.</b> [11]</p>
<p>4MMC  We purchase all 4MMC POWDER/CRYSTAL directly from our International Manufacturer who have developed this great product over the past 6 months of tireless research and development. Purchasing via this route of supply means we can not only guarantee the best prices in the UK <b>07413873XXX</b> [12]</p>

Popular websites bearing the names of mephedrone (meow right now; mephedrone2u; buymephedrone) do not sell mephedrone any more. One website announced that mephedrone was not available for sale after 15<sup>th</sup> April 2010 (one day before its ban). Instead, the same websites sold other new compounds such as DXM (dextromethorphan), 4-MeO-PCP, 5-MeO-DALT, Benzofury, Ethylphenidate etc.

Another website (Neorganics.net) sold mephedrone under brand names such as 'Spirit'; 'Neo Doves'; 'S.C.' before its ban (2010). The same website currently sells products named 'Neo 7'; 'Neo Dove 2'; 'S.C.D.' through (redirect to) a different website. There were no information available apart from a general description such as the one given below: "*The ultimate MDMA analogue by*

*Neorganics. Still available*". It remains unclear if these products still contain mephedrone or an entirely different compound.

Packaging and/or product descriptions of these commercial products describing Mephedrone as 'plant feeder', 'bath salts', 'multivitamins' or 'not for human consumption' often include detailed instructions suggesting the legitimate use of the products as 'plant feeder' or 'bath salts'. However, instructions may also implicitly suggest how to use the product as a drug. This type of marketing is employed to circumvent laws and regulations controlling medicines and other legal substances not intended for human consumption.

[10] [11] [12] [13] [14] [15] [16] [17]

## AVAILABLE INFORMATION ON PURCHASE PRICE

One website sold 10 grams of mephedrone for \$169.99 as on 1<sup>st</sup> Aug 2012. Another website displayed the price (for varying quantity) as follows: 5g for \$96.00; 10g for \$160.00; 20g for \$240.00; 250g for \$1500.00; 500g for \$2100.00 and 1Kg for \$3100.00.

[16] [17] [18]

## MODALITIES OF INTAKE

The most common modalities of intake are:

- Oral ingestion by either swallowing capsules or 'bombing' (wrapping mephedrone powder in cigarette papers and swallowing)
- Insufflation

Of these two, oral ingestion is probably the preferred method of administration (but not necessarily most common) by recreational users due to the unpleasant side effects of insufflation (see Physical/medical untoward effects).

Less common methods of administration include:

- Rectal administration by either plugging or by administering an enema of mephedrone dissolved in water
- Smokeable formulation
- IV administration (a more recent/less tested method): It is recommended that dosage for IV administration to be  $\frac{1}{2}$  to  $\frac{2}{3}$  of a 'normal' oral dose.

It is recommended that mephedrone must be taken on an empty stomach.

Re-dosing in a single session is common, and is recommended prior to the 'come-down' effect, and to be of equal or higher weight than the previous dose.

20-50mg reportedly elicits some effect. However, doses usually vary between 100mg – 1g over an entire session (including re-doses).

[4][5][6][7][8][9]

## LEGAL STATUS

Mephedrone was placed under Class B category according to the Misuse of Drugs 1971 on 16<sup>th</sup> April 2010. It is also controlled in many countries like Austria, Belgium, Croatia, Denmark, Estonia, France, Finland, Germany, Hungary, Italy, Israel, Lithuania, Norway, Netherlands, Poland, Romania, Russia, Spain and Sweden.

In the USA, mephedrone along with methylone and MDPV was placed under temporary scheduling on 21<sup>st</sup> Oct 2011.

[b] [19] [20] [21]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical and not intended for human consumption.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

Mephedrone is a legal stimulant/ empathogen and research chemical, and has been compared variously to speed (amphetamine), ecstasy, amphetamine-cocaine, amphetamine-MDMA, bk-MBDB, and methylone. Mephedrone is a semi-synthetic compound related to cathinone which is identified in the khat plant. It is not detected in standard drug tests according to online users.

Recreationally, Mephedrone is desirable as it elicits euphoria, sociability, stimulation, and music appreciation, with a smoother ‘come-up’ and ‘come-down’ than MDMA (similar to methylone) and with the absence of a hangover the following day. However, it is considered less potent than MDMA gram for gram (approximately ½), and the elicited effects are much shorter in duration. The duration of mephedrone effects are on average:-

Come up: 10-20mins                      Peak: 45-60mins                      Come down: 60-120mins

According to users there is a highly addictive quality to the substance i.e., a strong compulsion to re-dose (this may be related to the duration of effects). This addictive quality means that binges in which large amounts of the substance are consumed in single sessions are common. Users also report the development of tolerance to the substance after prolonged use. In response to an increase in reports of individuals experiencing ‘Mephedrone addiction’ specific threads discussion on issue related to this have been established.

Lack of information about long-term side effects and toxicity, as well as reports of impurities identified by differences in colour, odour, side effects etc. in commercially available mephedrone has led some online users to label it a ‘dirty drug’. However, other forum members still favour mephedrone due to its effects and accessibility. Indeed, some forum members are concerned about recent media attention and YouTube videos about the substance and how this might affect its legal status. One forum in particular has restricted its membership policy and access to certain forum threads.

Mephedrone appears to be particularly popular in the UK from a European perspective. The 2009 UK MixMag Drug Survey revealed 41.7% of respondents had tried the drug and 33.6% had tried the drug in the last month. Moreover, reports from drug and alcohol teams, GPs and health services to the Psychonaut Web Mapping project indicate that a number of people reporting having used mephedrone, as well as the number of people reporting adverse effects, is increasing. The popularity of Mephedrone and other similar research chemicals (i.e., keto-amphetamines) appears to be related to its psychoactive effects, accessibility, and legal status. In addition, the decreasing purity of cocaine and MDMA may also play a vital role in popularising mephedrone.

In terms of the rest of the world, it does not seem to have become popular in the USA but is increasing in popularity in Australia.

Mephedrone is sold through online shops. As at August 2012, a search of ‘buy mephedrone’ in Google Search retrieved many results. However, a number of dedicated websites selling Mephedrone have been shut down (e.g., [www.topdogplantfood.co.uk](http://www.topdogplantfood.co.uk), [www.shopmephedrone.co.uk](http://www.shopmephedrone.co.uk), [www.plantfeeders.co.uk](http://www.plantfeeders.co.uk), [www.buymephedrone.co.uk](http://www.buymephedrone.co.uk), [www.4-mmishop.co.uk](http://www.4-mmishop.co.uk), [www.4-mmc.com](http://www.4-mmc.com)). Some websites which sold mephedrone before its ban, sell other legal compounds instead of Mephedrone (e.g., [www.plantfoodpalace.co.uk](http://www.plantfoodpalace.co.uk), [www.mephedrone2u.com](http://www.mephedrone2u.com)). Few websites automatically got redirected to a different website selling different compounds (e.g., [www.mrmeph.com](http://www.mrmeph.com) redirected to [www.mrlegals.com](http://www.mrlegals.com)). In addition, advertising for Mephedrone and dedicated pages/ groups/ members associated with Mephedrone (and the sale of Mephedrone) have also been found on social networking sites, Facebook, Twitter. In the UK, forum users have also suggested that street level dealers have started to supply Mephedrone (sometime sold as ‘Rush’) as an alternative to cocaine.

[c][n][4][5][6][7][8][9][23][24]

## USE IN COMBINATION WITH OTHER COMPOUNDS

Mephedrone is taken in combination with a variety of other compounds including:

- Alcohol
- Other research chemicals (e.g., Methylone, MDPV, Butylone)
- Cocaine
- MDMA
- Ketamine (combination also known as Challenge)
- GBL
- Heroin (similar to ‘speedball’)
- Cannabis
- Kratom (often taken during ‘come-down’ period)
- Pharmaceutical depressants (e.g., Benzodiazepines, Hydrocodone (often taken during ‘come-down’ period)
- Pharmaceutical stimulants e.g., Modafinil, Adderall
- Viagra
- BZP, TFMPP or DMAA (1,3-Dimethylamylamine; ClearShot)
- Nitrous Oxide
- Isobutyl nitrite (Poppers)
- Metamfepramone, Phthalimidopropiophenone, Caffeine – in commercial products.

[4] [5] [6] [7] [8] [9]

## PHARMACOLOGICAL CHARACTERISTICS

It is reported that the synthesis of mephedrone is similar to that of amphetamine or MDMA. There are few published papers on the neuropharmacological effects of mephedrone. A recent article reported that mephedrone inhibits serotonin (5-HT) and noradrenaline uptake provided they are available endogenously. This could possibly lead to the sympathetic effects exerted by mephedrone.

Another study concluded that the effects of mephedrone resembled that of MDMA and amphetamine. Mephedrone caused rapid release and destruction of dopamine and serotonin (5-HT) in nucleus accumbens. Since it works through the dopamine reward pathways it could potentially cause dependence.

A survey based on websites reported that the users compared the effects of mephedrone to that of MDMA and believed that the effects were marginally safer and more pleasurable.

Form users reported that the action of mephedrone was essentially sympathomimetic similar to ecstasy and cocaine. The possible mechanisms of action of mephedrone are discussed in detail in advanced drug discussion web fora. The following speculations were made:-

A) It can be speculated that the para substituted compound 4-methylmethcathinone may have reduced stimulant activity, but, it is likely to have additional affect on serotonin via both monoamine reuptake/ SERT inhibition and direct agonist affects of the 5HT2b receptors. Concerns have been

raised regarding the actions of 4-methylmethcathinone in relation to peripheral 5HT (serotonin) stimulation and how that, combined with other catecholamine activity, may be dangerous to the heart.

The peripheral 5-HT<sub>2b</sub> activity coupled with catecholamine activation likely accommodates for most of the peripheral side-effects (vasoconstriction) of mephedrone. In addition, the persistent anxiety, confusion, and depression also support the idea that norepinephrine/ dopaminergic activity exacerbated the likely peripheral serotonergic activity of mephedrone.

B) The 'blue-limb' effect was attenuated by lying down flat, and also that the first part of the body to turn blue were the knees followed by the feet (lower body joints). This suggests that the vaso constrictive activity was dependent upon postural orientation.

C) High doses of mephedrone probably trigger the complement at some level or other immune system activation, creating a temporary vasculitis. A vasculitis would be more consistent than vasoconstriction given the symptoms since it is thin areas of skin rather than distal extremities which show changes. Colour changes around lips, gums and around the eyes (black / green) - possible caused by methemoglobinemia.

D) Ergotism: It may also explain posture-dependent bruising and occasional convulsions. Mephedrone may thin the blood (thrombocytopenia), thereby directly contributing to it's anti-immune and bruising activity; this might be why so many individuals get sick and observe sores in the mouth.

E) The skin symptoms are similar to some of the symptoms of dermatomyositis, which is an autoimmune disease of the skin and muscles. The actual mechanism may possibly a focal vasculitis seen at the joints (knee, elbow, knuckles) which is mediated by the compliment pathway of the immune system clogging up capillaries.

A study investigating the pharmacokinetics of mephedrone, using Gas Chromatography/ Mass Spectrometry (GC/MS) technique conducted on samples of rat and human urine has identified the key metabolic steps as follows:

- N-demethylation to the primary amine (formation of the nor-mephedrone, nor-dihydro mephedrone and nor-hydroxytolyl mephedrone metabolites)
- reduction of the keto moiety to the respective alcohol (formation of the nor-dihydro mephedrone and 4-carboxy-dihydro mephedrone metabolites)
- oxidation of the tolyl moiety to the corresponding alcohols and carboxylic acid (formation of the hydroxytolyl mephedrone and nor-hydroxytolyl mephedrone metabolites)

The metabolites of mephedrone such as nor-mephedrone, nor-dihydro mephedrone, hydroxytolyl mephedrone, and nor-hydroxytolyl mephedrone were detected in the urine. The author concluded that using the systematic toxicological analysis recreational drugs such as mephedrone, butylone and methyone can be detected from the urine. However the paper could not provide any information on the time limit for detection of the metabolites in urine.

[d][e][f][g][h][4][5][6][7][8][9][24][25][26][27][28][29][30]

## TOXICOLOGICAL EFFECTS

A case series presented the toxicity symptoms subsequent to the review of 15 patients who attended the Emergency Department following self-reported ingestion of mephedrone. The significant clinical features included agitation in 53%, tachycardia in 40%, systolic hypertension in 20% and seizures in 20%. In this study toxicological analysis was not done.

In another case series, toxicological analyses of serum samples were done using a standardised method GC/MS. In addition, Liquid Chromatography with tandem Mass Spectrometry (LC-MS) which is a powerful technique to identify compounds in a complex mixture and to qualitatively analyse mephedrone use. The result confirmed the presence of mephedrone in all the 7 samples and showed acute mephedrone-related toxicity with symptoms of agitation, palpitation, hypertension, chest pain, seizures (self- limiting) and headaches.

Anecdotal reports posted by users on fora indicate the following potential toxicological effects:

- Potential peripheral neuropathy and/ or pronounced vasoconstriction/ ischemia. Reported symptoms include foot drop/ intermittent pain in feet, cyanosis in fingernails/ toes, and numbing sensation/neuralgic-type pain on left side of head/ scalp. Other associated symptoms include, flash headaches, tinnitus and other audio distortions. As these are anecdotal reports from users and not the results of scientific studies it is not certain whether these symptoms are related to mephedrone use or something other, or if these are the effects of mephedrone or of rumoured impurities in commercial mephedrone/ mephedrone products. Immunological toxicity. Reported symptoms include vasculitis (as opposed to vasoconstriction), infections (e.g., influenza), and ulcerations (e.g., in the mouth)
- Other symptoms that may be attributed to mephedrone toxicity including kidney pain (nephrotoxicity), cardiac problems (cardiotoxicity), and respiratory problems (respirotoxicity).

Users also report that these symptoms become more pronounced/more chronic with sustained use of mephedrone. This may indicate mephedrone toxicity with prolonged use.

A forum user reported symptoms such as anxiety, agoraphobia, depression and ‘few heart problems – irregular heart beats / angina’ following continuous use for about 6 months on mephedrone. He also reported a prolonged withdrawal syndrome consisting of day time hallucinations, night terrors and sleep paralysis (also known as ‘old-hag syndrome’).

[i][j][4][5][6][7][8][9][31]

## DESIRED PSYCHOACTIVE EFFECTS

Desired psychoactive include:-

- Euphoria
- Empathy
- Stimulation (shivers/rushes/‘speediness’) (mellow and relaxed in moderate doses but intense/pushy in higher doses – similar to MDMA)
- Intensification of sensory experience stimulation (particularly auditory e.g., music appreciation)
- Mild sexual stimulation
- Mood enhancement
- Decreased hostility/insecurity
- Increased insight and/or mental clarity
- Hallucinations

[4][5][6][7][8][9]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

A confirmed case of myocardial damage induced by mephedrone was reported. According to online users, negative side effects increase exponentially with heavy use. These include:-

- Loss of appetite.
- Insomnia
- Increase in mean body temperature (sweating/‘mephedrone sweat’ and hot flushes)
- Decrease in mean body temperature
- Tense jaw, mild muscle clenching, stiff neck, bruxia (teeth grinding)
- Elevated heart rate (tachycardia) and blood pressure, and chest pains

- Respiratory difficulties
- Dehydration and dry mouth
- Nausea/vomiting and stomach discomfort/abdomen pain
- Influenza like symptoms
- Dermatitis like symptoms (Itch and rash), ulcerations on skin
- Numbness and lack of tactile sensitivity with very large amounts.
- Painful joints
- Discolouration of extremities/joints
- Mydriasis (abnormal pupil dilation)
- Nystagmus
- Painful nasal drip following insufflation is associated with the presence of blood clots/mucous the day after consumption, and burns/ulcerations in the mouth
- Light-headedness and dizziness
- Cervicogenic / flash headaches
- Tremors and convulsions
- Cravings and compulsive bingeing
- Nightmares
- Fatigue
- Loss of concentration and memory loss/amnesia
- Anxiety
- Paranoia
- Dysphoria
- Depression
- Hallucinations
- Cold extremities
- Purple elbows / legs ('permanent')

[k][4][5][6][7][8][9][24][25][26][27][28][29][30][32]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

They include, possible mild dopamine induced psychosis (short-term) and mania. In addition, symptoms of depression initially reported as side effects reportedly last for longer periods of time with prolonged/increased use. Forum users have speculated whether this represents a depletion of serotonin and/or dopamine as a result of mephedrone use. As yet, none of these have been supported by experimental/clinical data. [1]

## CLINICAL ADVICE

It is a research chemical with a relatively short history of human consumption for recreation, although there have been no confirmed safety data on humans.

## RELATED FATALITIES

There have been reports of several deaths attributed to mephedrone since 2010. In a recent paper, at least 125 deaths have been alleged to use of mephedrone in the UK and the Channel Islands, although some of them were not related to mephedrone use. This has been reported to the National Programme on Substance Misuse Deaths (np-SAD). A summary of the findings is given below:

Mephedrone not found at post mortem = 25 cases

Results still pending = 13 cases

Confirmed at post-mortem = 87 cases

Apart from these published materials, online users discuss the toxicity and fatalities on web fora. One users who lived close to the Suffolk and Essex border reported (Nov 2011) that many teenagers around this area had used mephedrone and some of them died as a result of ‘heart attack’ due to mephedrone use. He believed that these teenagers who consumed mephedrone attended the Papworth and Basildon and Thurrock University Hospitals and their deaths were recorded as myocardial infarction but not as a result of mephedrone use in a way to avoid a formal Inquest to which the press and the public would have full access. Therefore he concluded that there were far more deaths due to the use of mephedrone than it were actually reported.

[m] [n] [o] [p] [q] [r] [u] [16][17][18][19][20][21][33]

## YOU TUBE VIDEOS

There were more than 500 You Tube videos available using the search term ‘Mephedrone’ as on 16<sup>th</sup> August 2012. The top four videos are described below:

**Mephedrone to be made banned Class B drug:** This short clip uploaded on 29<sup>th</sup> March 2010 by ITN News shows a speech from the Home Secretary Alan Johnson about plans to ban mephedrone and other related synthetic compounds. Few weeks later, mephedrone was banned in the UK. This has got 2,775 views as on 16<sup>th</sup> Aug 2012. [34]

**Mephedrone - Chemistry Behind the Headlines 1:** This video was ‘Uploaded by ‘Professor Dave at York’ on Mar 17, 2010. In this video Professor Dave inferred the possible action/ toxicity of mephedrone by comparing its molecular structure with that of MDMA, amphetamine and methamphetamine (crystal meth). About 2 and ½ years after the upload of this video, a person commented (July 2012) that Professor Dave’s logic was in error as the actions of methamphetamine and mephedrone are dissimilar though they have close molecular resemblance. Professor Dave replied that he was only trying to give some information about this compound 2 and ½ years ago, when there was no information available to the public who assumed that this compound was just a

plant extract. It has got the most number of views (183,925 views) as on 16<sup>th</sup> Aug 2012. [35]

**Mephedrone's Ramifications (HD):** This well edited video clip shows mephedrone use and its effects portrayed using graphics. This video was uploaded by diegobaud on Oct 31, 2011 and has 4,769 views as on 16<sup>th</sup> Aug 2012. [36]

**Mephedrone Student Documentary - 'Not For Human Consumption':** This video shows Chris Pendlebury, the presenter, travelling to various places such as the market place in Camden and St. George's, London and interviewing people like a dealer, a medical student and Dr John Ramsay, director of TICTAC company to get more information on mephedrone. The highlights of this video are the comments made by Dr J Ramsay (quote) "*it (mephedrone) has never been tested for safety or efficacy by anybody. So if we think we know about it ...is by observing young people who bought it and finding out what happens to them...*". After this, he completed this clip with his personal opinion on mephedrone. This video was uploaded by Mattpoz1 on Mar 17, 2010 and has earned 42,977 views as on 16<sup>th</sup> Aug 2012. [37]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for Mephedrone, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.

Google Insights for Search beta

Compare by: Search terms (selected), Locations, Time Ranges

Search terms: Mephedrone, 4-Methyl methcathinone

Filter: Web Search, Worldwide, 2004 - present, All Categories

**Web Search Interest: mephedrone, 4-methyl methcathinone**  
Worldwide, 2004 - present  
Categories: Health, People & Society, Reference, Business & Industrial, Arts & Entertainment, more...

Totals: mephedrone, 4-methyl methcathi...

**Interest over time**

How can I see numbers?

See worldwide top rising searches by clearing the search terms

- A) Man 'used home of blind friend' to store suspected mephedrone
- B) John Port School pupils found with mephedrone
- C) Teenage thug, 16, Tasered in the testicles after attacking police officers while high on mephedrone
- D) Selkirk man Greg Alexander died after mephedrone 'bomb'
- E) Bristol arrest after mephedrone worth £1m found in car
- F) Three in ten mephedrone users could be addicted
- G) Nine treated in Liverpool after mephedrone use

18:16 16-08-2012

Google Insights for Search

**Regional interest**

1. Cameroon
2. United Kingdom
3. Ireland
4. Sweden
5. Hungary
6. New Zealand
7. Netherlands
8. Australia
9. United States
10. Austria

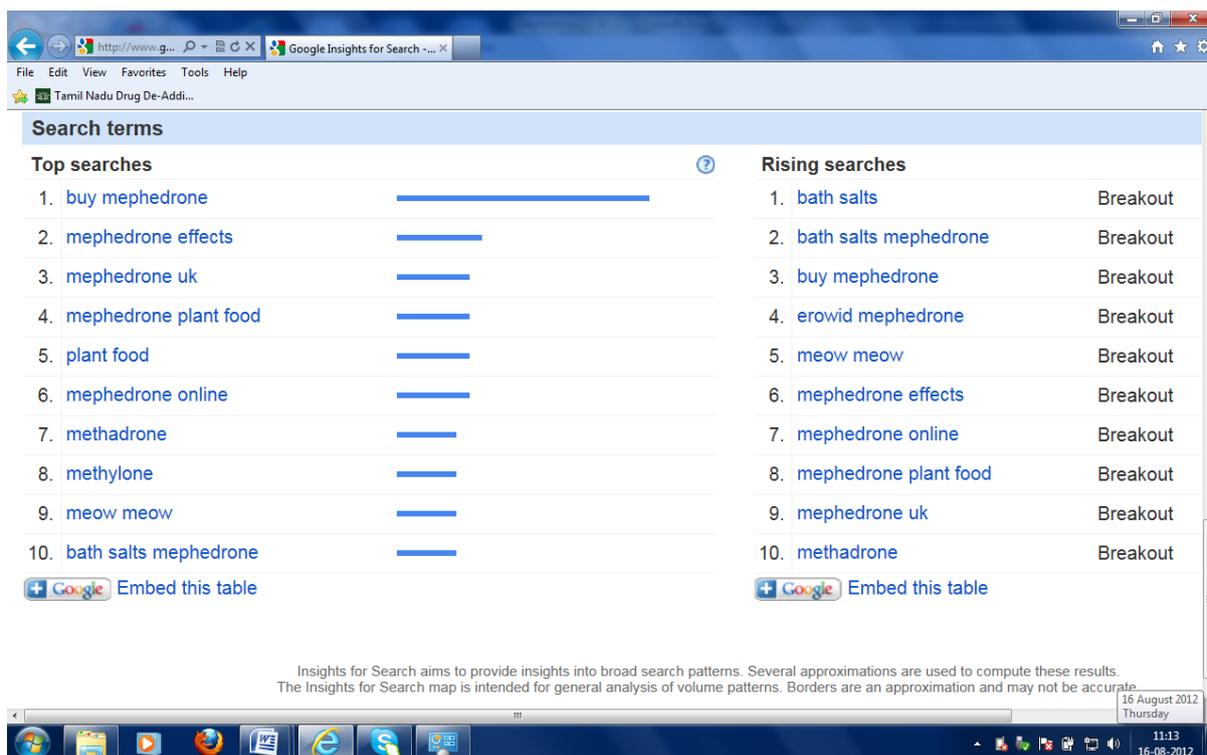
Search volume index: 0 to 100

**Search terms**

Top searches: [empty]

Rising searches: [empty]

11:13 16-08-2012



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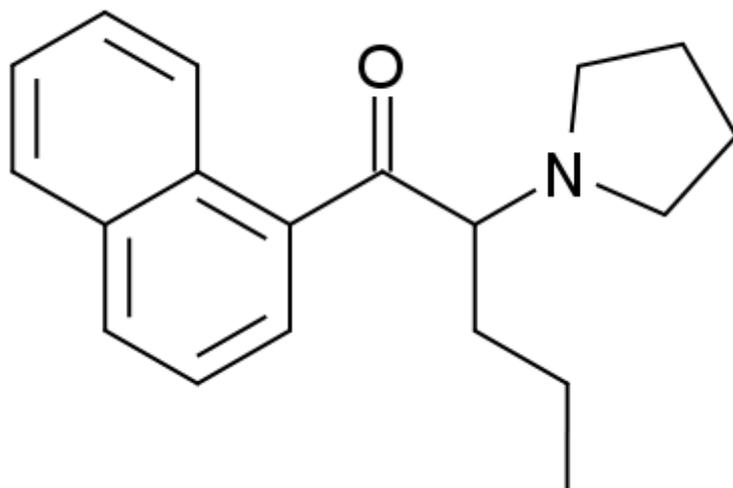
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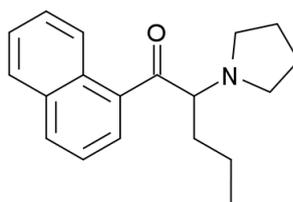
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# **NRG-1 or Naphyrone Report**

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# Naphyrone



## OVERVIEW

Chemical name: naphthyl pyrovalerone

Synonyms: Energy-1, NRG-1, Naphyrone, O-2482

Active constituents: naphthyl pyrovalerone

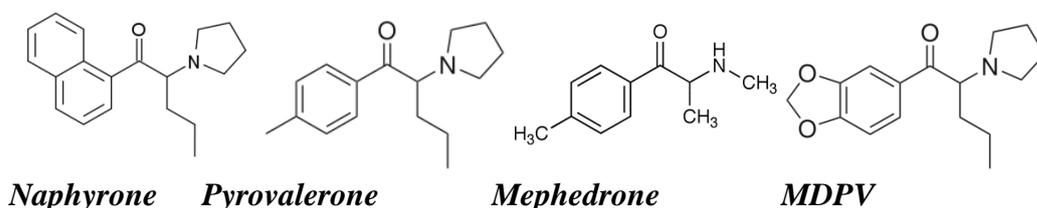
Type: Research chemical – Phenethylamine

Origin: Unknown

Status: Novel

Chronology: It has relatively a short history of human consumption. Meltzer and colleagues described the synthesis of Naphyrone. Google Insight suggests NRG-1 became popular among online users by the end of 2009. [a]

## KEY POINTS



NRG-1 or Naphyrone is a naphthyl analogue of the cathinones. It structurally resembles compounds such as pyrovalerone, mephedrone and methylenedioxy pyrovalerone (MDPV).

The identity of products sold as NRG-1 remains dubious. Following the ban of mephedrone in April 2010, a replacement product (known as NRG-1) was sold online. However, few review papers reported that only few products contained NRG-1 and many others sold as NRG-1 contained other compounds such as cathinone mixtures including mephedrone, butylone, 4-methyl-N-ethylcathinone, flephedrone and MDPV. Another report described that a batch of “NRG-1” contained a 1:1 mixture of MDPV and a ring-fluorinated methcathinone.

Furthermore, there have been two structural isomers (alpha and beta-naphthyl isomers) sold online. It is usually the beta-naphthyl isomer which is well known and published but descriptions on the alpha-naphthyl isomer is very limited.

[b] [c] [j] [1] [2] [3]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: (RS)-1-naphthalen-2-yl-2-pyrrolidin-1-ylpentan-1-one

Molecular weight: 281.391 g/mol

Molecular formula: C<sub>19</sub>H<sub>23</sub>NO

CAS Number: 850352-53-3 and 850352-11-3 (hydrochloride)

[4] [5] [6]

## APPEARANCE OF COMMERCIAL PRODUCTS

NRG-1 has the appearance of a white crystalline powder. Forum users report that it tasted sour like vinegar with a very sticky consistency (even stickier than MDPV). [7]

<b>Product description</b>
<b>Legal powder Ltd.</b> Naphyrone (O-2482, Nrg-1) Very pure crystalline product from China, 99.5% purity. [8]
<b>Chemicals Trading Co.</b> Naphyrone is a drug derived from pyrovalerone that acts as a triple reuptake inhibitor, producing stimulant effects and has been reported as a novel designer drug.[9]
<b>Cayman Chem.</b> Pyrovalerone is a psychoactive compound with stimulatory effects. It is a controlled drug that has been found as a contaminant in products sold as bath salts. Naphyrone (hydrochloride) is an analogue of pyrovalerone that is characterized by the substitution of the methylphenyl group of pyrovalerone with a naphthyl group. [10]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price varied considerably among different websites. One website quoted the following price: 100g for \$500; 500g for \$1,200; 1Kg for \$2,100; 2Kg for \$3,200; 5Kg for \$5,600; 10Kg for \$7,500.

Another website quoted the following price: 10g for \$250; 500g for \$2,450; 1Kg for \$3,950.

[8] [9] [10]

## MODALITIES OF INTAKE

Nasal insufflation was the common mode of intake. It can also be ingested orally. Users report that NRG-1 was inactive when smoked. Rarely it was taken Intra venously which produced the same effects as nasal insufflation.

[7] [11] [12] [13]

## LEGAL STATUS

In the UK, several cathinones such as mephedrone and MDPV were placed as Class B under the Misuse of Drugs Act 1971 on 16<sup>th</sup> April 2010. However, Naphyrone was not included under this ban. Hence a number of websites reported the sale of Naphyrone as a mephedrone replacement. On 12<sup>th</sup> July 2010, Naphyrone was made a class B drug in the UK.

The Drug Enforcement Administration (DEA) requested for information on naphyrone on April 2011. It is not a controlled substance in the USA or other EU countries.

[d] [e] [14]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical and not intended for human consumption.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

NRG-1 was sold as glass or jewellery cleaner to circumvent the law in some countries. It is potent at a very low dose. The usual dose is 25mgs which is at least 10 times lower than the usual dose of mephedrone.

Come up: several minutes      Peak: 3 to 4 hours      Come down: 7 to 10 hours

A typical users experience is described below:

T+00 Nasal insufflation of 10mgs of NRG-1.

T+20 Mild effects of high; Re-dosed with 20mgs of NRG-1.

T+30 No empathy or euphoria.

T+60 Re-dosed another 25mg.

T+70 Walking easy.

T+90 A background buzz.

T+360 Everything interesting.  
T+12 hours Effects started subsiding.

[f] [7] [15]

## USE IN COMBINATION WITH OTHER COMPOUNDS

IV NRG-1 and IV 5MeO-DALT (intense tripping effects started immediately, but very unpleasant).

[16]

## PHARMACOLOGICAL CHARACTERISTICS

There are no data on the pharmacokinetics or pharmacodynamics on human subjects. A study reported the synthesis of naphyrone and other pyrovalerone analogues. This study also compared the ability of these compounds to affect the reuptake of the monoamine neurotransmitters such as serotonin, dopamine and norepinephrine by interacting with the serotonin transporter, dopamine transporter, and norepinephrine transporter. It concluded that naphyrone was the only compound which had the ability to inhibit the reuptake of all the three neurotransmitters at very low concentrations.

A recent study showed that naphyrone acts as a non-selective monoamine reuptake inhibitor similar to cocaine. It was also found that the permeability of the blood-brain was high in an *in vitro* model.

[a] [g] [17]

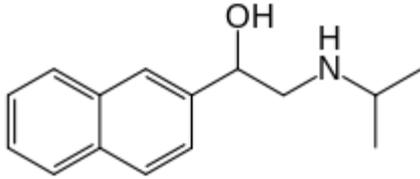
## TOXICOLOGICAL EFFECTS

There are no human toxicological data. However, there are several reports from patients experiencing toxic effects and attending emergency departments. This could be due to the effects of NRG-1 at a very low dose compared with mephedrone. Since it was advertised as a replacement for mephedrone, users believed that the same dose could be taken as the recommended dose and hence the toxic effects.

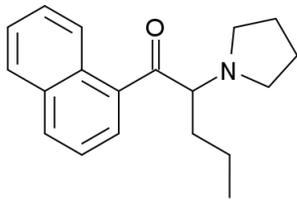
A case report documented a patient presented with acute sympathomimetic toxicity following ingestion of 100mgs of NRG-1. He displayed restlessness, insomnia, anxiety, and hallucinations lasting for 2 days. A blood sample analysed by Gas Chromatography with Mass Spectrometry (GC/MS) showed a concentration of 0.03mg/L and 0.02 mg/L, 40 h and 60 h after drug intake, respectively.

A major concern among online users was the carcinogenicity of naphyrone. Since naphyrone has not yet been studied on human or animal models, the

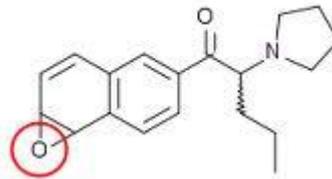
closest match would be pronethalol which was investigated on animal model. The epoxidized naphyrone, which is formed through the oxidation of naphthalene ring, was reported to be a carcinogen. Since naphyrone possesses a similar naphthalene ring, it is speculated that it could trigger carcinogenesis on long term.



Pronethalol



Naphyrone



Epoxidized naphyrone

[h] [j] [k] [23] [24]

## DESIRED PSYCHOACTIVE EFFECTS

- Very mild euphoria
- No emapathogenic quality
- Socialising
- Energetic

[18] [19]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Tachycardia (>145/ minute) (on doses above 200mgs)
- Cold blue fingers
- Tingling sensation over extremities
- Insomnia
- Loss of appetite
- Vascular: colour changes: blue or green or purple - hands, arms and knees;
- Burning hands and feet; pins and needles sensation
- High blood pressure
- Sweating
- Increased body temperature
- Jaw stiffness

[15] [18] [19] [20]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Paranoia
- Visual hallucinations occurring for 48 hours
- Disorganised thoughts
- Intense anxiety
- Depression
- Obsessive symptoms
- Poor concentration
- Insomnia lasting for more than 5 days
- Short term memory loss
- Lack of motivation
- Low self esteem

One user reported having depression and anxiety lasting for about 6 months after regular use of NRG-1 for a year. He made several suicidal attempts. He was treated with anti depressant medication.

[7] [15] [21] [22]

## CLINICAL ADVICE

It is speculated that the vendors were selling off their old stocks of mephedrone (after its ban) and re naming it as NRG-1. The potential problem that could be anticipated is that when the genuine stocks of NRG-1 becomes available; the users may take the same dose as before which could result in significant toxicity. This is because the dose of NRG-1 is significantly lower than the dose of mephedrone.

It is reported that NRG-1 could cause carcinogenicity, due to the presence of naphthyl ring which could possibly be metabolised to an extremely reactive naphthylepoide.

[h] [i]

## RELATED FATALITIES

There are several reports of toxicity and few death reports are linked to the consumption of NRG-1. However there has not been any coroner's report to confirm deaths linked to NRG-1.

[i] [k]

## YOU TUBE VIDEOS

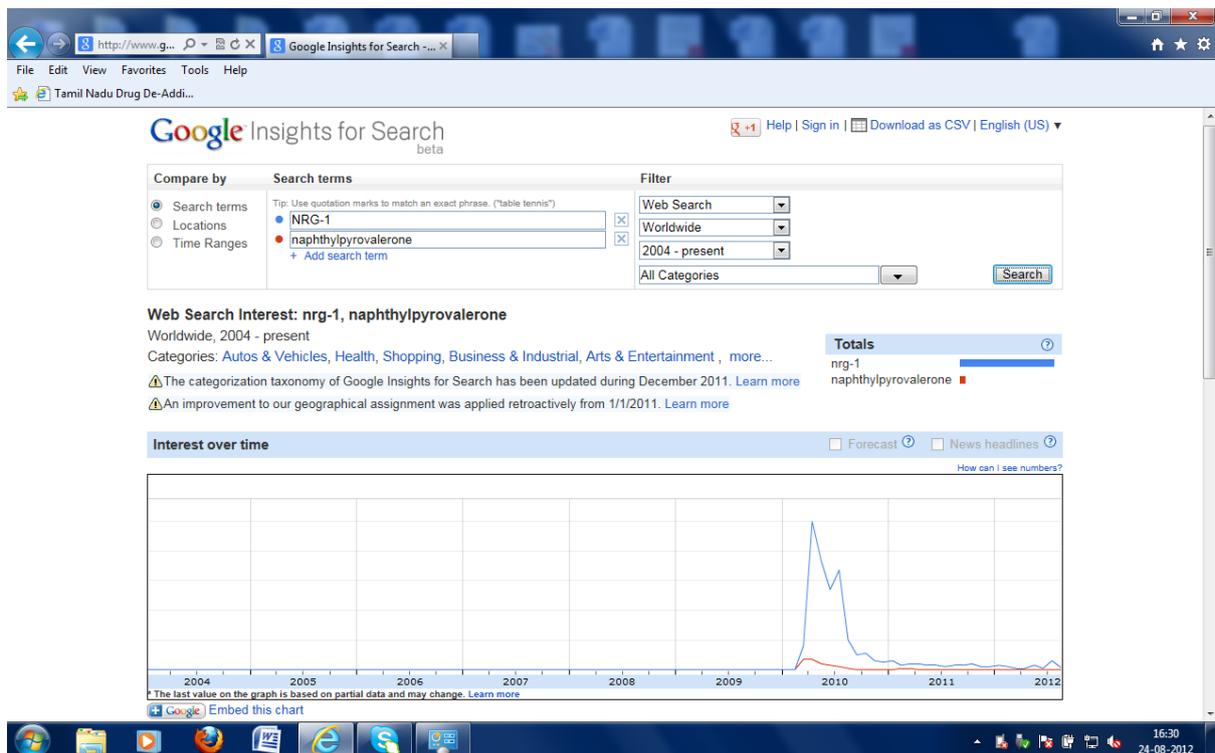
There are several videos on NRG-1 and few interesting video clips are given below:

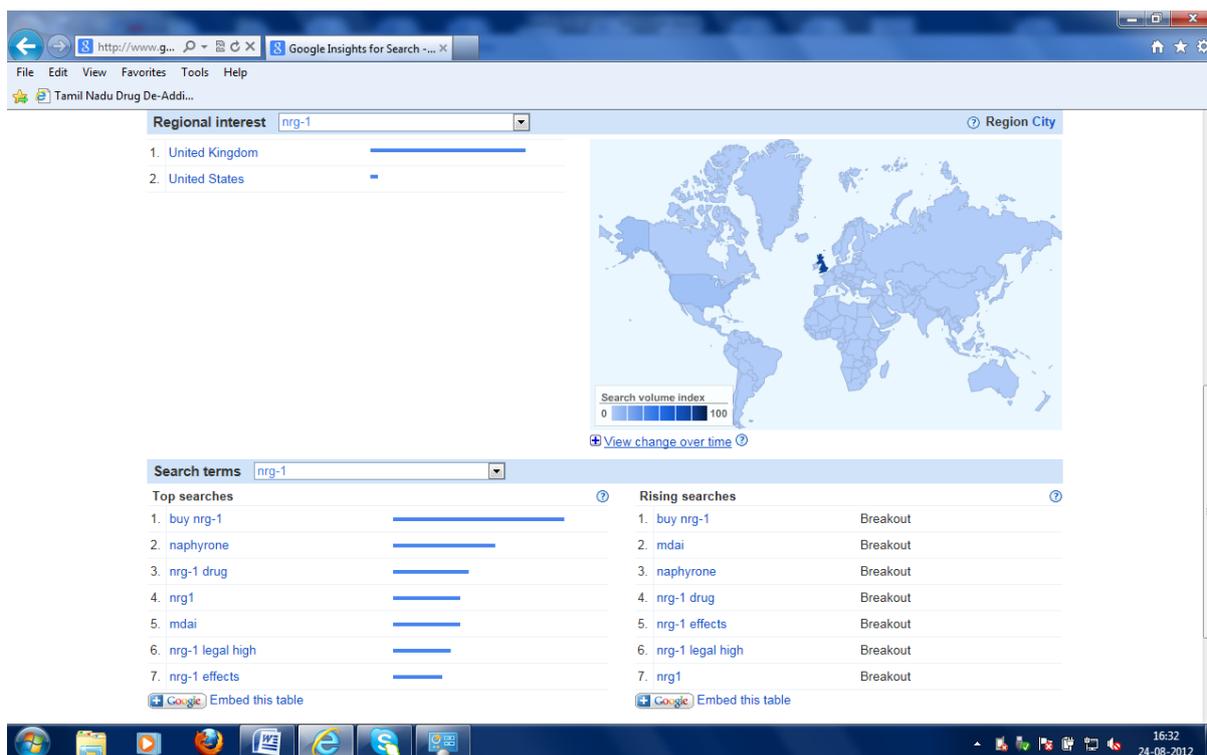
- Naphyrone - NRG-1 - Chemistry Behind The Headlines 2 (Professor Dave)
- NRG-1 (whole sale)
- NRG-1, aka Naphyrone, the new legal high, reported by Sky News
- Naphyrone (NRG-1) THE NEW KILLER!
- NRG 1 to be banned 2day or next week the government have said, (a user pleading not to ban NRG-1)
- Buy naphyrone

[25] [26] [27] [28] [29] [30]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for NRG-1, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.





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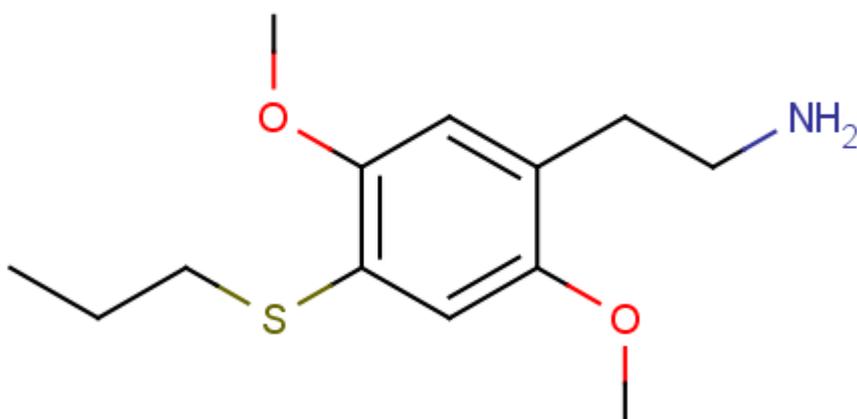
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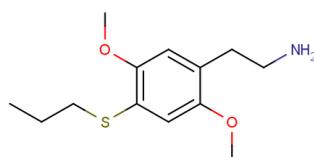
I.V 2, 5-Dimethoxy-4-n-propylthiophenethylamine (2C-T7)

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# 2C-T-7 Report

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## 2C-T-7

### OVERVIEW

Chemical name: 2, 5-Dimethoxy-4-n-propylthiophenethylamine

Synonyms: Blue Mystic, 7<sup>th</sup> Heaven, Tweety-Bird Mescaline, Lucky 7, Beautiful, Belladonna, Red raspberry, T7, Tripstasy, 7-Up, PT-DM-PEA

Active constituents: 2, 5 Dimethoxy-4-(propylthio) phenethylamine

Type: Research chemical – Phenethylamine

Origin: 2C-T-7 was first synthesised by Alexander Shulgin in Jan 1986. This was published in his book, PiHKAL in 1991. An informal review reported that 2C-T-7 appeared on ‘smart shops’ in Netherlands in 1999, following the ban on 2C-T-2.

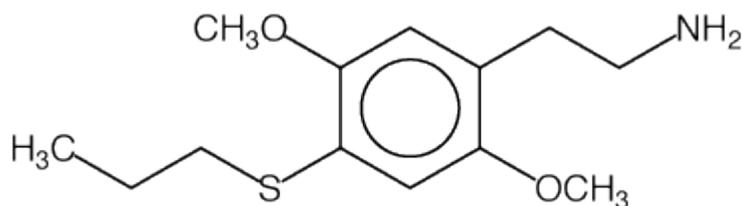
Status: Novel

Chronology: Though it was reported to be synthesised in small kitchen-type laboratory in the USA in 1999, the first confirmed seizure occurred in 2001.

[a] [b] [c] [d] [e] [1]

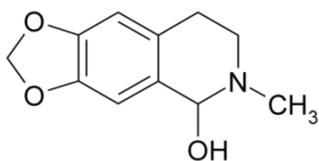
### KEY POINTS

2C-T-7 is reported by the online users to be the most potent compound among the 2C-x family of phenethylamines. A Shulgin in his book, PiHKAL, ranked 2C-T-7 on the top along with 2C-T-2, 2C-B, 2C-E and Mescaline.

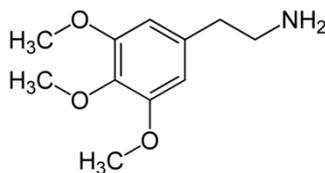


#### Structure of 2C-T-7

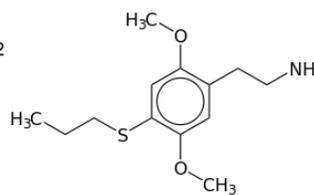
The name 2C-T-7 is derived from 2-C which stands for the 2-Carbon amino ethane chain and T (thio) which stands for the substitution of the sulphur.



**MDMA**



**Mescaline**



**2C-T-7**

2C-T-7 is a psychedelic compound belonging to phenethylamine class. Structurally, it closely resembles MDMA and Mescaline.

[f] [1] [2] [3] [4] [5] [6]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 2-(2, 5-dimethoxy-4-propylsulfanylphenyl) ethanamine

Molecular weight: 255.37634 g/mol

Molecular formula: C<sub>13</sub>H<sub>21</sub>NO<sub>2</sub>S

CAS Number: 207740-26-9 [7] [8] [9]

## APPEARANCE OF COMMERCIAL PRODUCTS

<p><b>Product description</b></p>
<p><b>Legal Powder Ltd.</b></p> <p><b>Packing:</b> This product comes in a polyethylene package is fully sealed, with glued tag "powder for polishing, also be accompanied by a certificate.</p> <p>Order 2C-T-7 On-Line</p> <p>To buy 2C-T-7 or other legal powders, please fill out the form and we will contact you. [10]</p>
<p><b>Cayman Chemical</b></p> <p>This product requires special processing and/or additional information before it can be shipped. A Customer Service representative will contact you within 24 hours of receipt of your order. Warning This product is not for human or veterinary use. See distributor in your area for pricing.</p>
<p><b>Promos-Chem (pure chemicals)</b></p> <p>2,5-Dimethoxy-4-n-propylthiophenethylamine</p> <p>CAS: 207740-26-9</p> <p>This product is NOT for human consumption! [12]</p>

## AVAILABLE INFORMATION ON PURCHASE PRICE

There were not many websites selling this compound. One company (Promos) sold 50g for €950. The price of another company (Legal powder) is as follows: 100g for 580 USD; 500g for 1320 USD; 1000g for 2190 USD; 2000g for 3400 USD; 5000g for 5810 USD; 10000g for 8000 USD.

[10] [11] [12]

## MODALITIES OF INTAKE

- Oral ingestion of the powder seems to be the popular method of use.
- Vapour inhalation of the substance was popularly known as ‘Chasing the dragon’. Users recommend a small dose of 3mgs to start with. The compound was placed in an aluminium foil and the vapours inhaled.
- Intra venous (IV) and intra muscular (IM) injections, though rarely practised causes severe and prolonged nausea and vomiting.
- Nasal insufflation was reported to be more potent than the oral route. A 12 mgs dose of nasal insufflation equals 30mgs of the oral dose – as reported by the users.

[13] [14] [15] [16] [17]

## LEGAL STATUS

2C-T-7 was temporarily banned in 2002 by the Drug Enforcement Administration (DEA) and was permanently placed under Schedule 1 in the USA in 2004. It was banned in Australia (2005), Denmark (2003), Estonia (2011), Greece (2003), Italy (2005), Portugal (2005), Slovakia (2009) and Sweden (2004).

In the UK, it is categorised under Class A of the Misuse of Drugs Act 1971, as it is a derivative of phenethylamines. It is reported to be legal in Austria, Canada etc.

[18] [19] [20] [21]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical and not intended for human consumption.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

Shulgin in his book, PiHKAL, reported that 2C-T-7 produces psychedelic and entheogenic effects lasting between 8 to 15 hours with an oral dose range of 10-30mgs. However users have tried doses higher than his recommended dose and there have been many reports of toxicity and death.

Come up: 1 to 2 hours      Peak: 6-8 hours      Come down: 15 hours

A typical user's trip experience is summarised below:

T+ 0 min: 24.5 mg of 2C-T-7 ingested

T+36min: enhanced visual distortions, inability to speak.

T+74min: 'stories seem to emerge from inanimate objects like a toilet or guitar'.

T+ 112min: Stomach cramps observed.

T+ 142min: Very strong visual distortions.

T+ 194min: Significant body 'load' and unpleasant mental cloudiness.

T+ 225min: fluctuations of body temperature.

T+ 269min: jaw tension and a minor headache.

[f] [22]

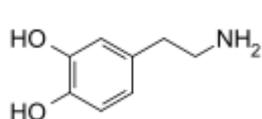
## USE IN COMBINATION WITH OTHER COMPOUNDS

Some users advised not to use 2C-T-7 in combination with other compounds as it could increase the risk of cardio toxicity. However, few examples of the combinations used by the online users are given below:

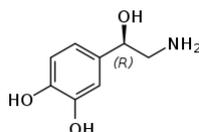
- With LSD ('very intense and scary experience; would not recommend to anyone')
- With AMT, methamphetamine, cannabis (Violence towards police; later in coma for a week)
- With DMT
- With MDMA
- With mushrooms
- With ketamine
- With 2C-I, MDMA, methylone
- With Salvia Divinorum

[23] [24] [25]

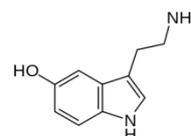
## PHARMACOLOGICAL CHARACTERISTICS



Dopamine



Norepinephrine



Serotonin

There are naturally occurring mono amine neurotransmitters such as the Dopamine, Norepinephrine, Serotonin etc. The basic phenethylamine skeletal

structure forms the base of these compounds. 2C-T-7 which closely resembles these neurotransmitters also bind to the protein substrates to produce various biochemical effects. These are not well studied in human population but there are few animal studies available.

A study concluded using animal model that 2C-T-7 showed greater affinity for 5-HT<sub>2A</sub> and 5-HT<sub>2C</sub> receptors and lower affinity for 5-HT<sub>1A</sub> receptors.

Another study showed the potent and selective ability of 2C-T-7 to reversibly inhibit MAO-A activity and no significant MAO-B activity.

There were no human studies on the metabolism of 2C-T-7. An animal study identified the steps in metabolism of 2C-T-7 using GC/MS from rat urine. The steps involved in the metabolism of 2C-T-7 follows two pathways:

- The major pathway involved the hydroxylation of the propyl side chain followed by N-acetylation and sulfoxidation and also by deamination followed by oxidation to acid or by reduction to alcohol.
- A minor pathway involved S-dealkylation followed by N-acetylation, S-methylation and sulfoxidation.

[g] [h] [i]

## TOXICOLOGICAL EFFECTS

One user reported his friend consuming 2C-T-7 with AMT, methamphetamine and cannabis. He became violent, confused and was in coma for a week. [26]

## DESIRED PSYCHOACTIVE EFFECTS

- ‘sense of inner peace’
- Increased music appreciation
- Empathogenic effects
- Mood lift/ euphoria

[27] [28]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Severe and persistent vomiting reported by many users
- Acute effects on nasal insufflation of 15mgs of 2C-T-7: Heart rate (180/minute), high blood pressure, dyspnoea, severe sweating and stomach cramps – needed admission to Emergency Department.
- Very high blood pressure
- Delirium
- Seizure

- Clot in the lungs (D-Dimer test done at the emergency department showed positive result for a person who took 33mgs of 2C-T-7) (it was reported that usually death occurred due to pulmonary oedema).
- Jaw clenching
- Dilated pupil and blurring of vision
- Cardiac arrhythmias
- Sexual dysfunction
- Muscular spasms

[d] [29] [30] [31] [32] [33]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Delusions lasting for 24hours (on 70mgs of 2C-T-7)
- Hallucinations - 'couldn't see the real world' (on 60mgs)
- Auditory and visual hallucinations on 15mgs
- Violent behaviour
- Anxiety
- Panic attacks
- Distortion of time sense
- Insomnia
- Memory loss

[j] [34] [35] [36]

## CLINICAL ADVICE

Two doses of Ativan (lorazepam) were given to a patient who took 15mgs of 2C-T-7 and was hallucinating uncontrollably. Lorazepam helped the patient to sleep and the symptoms disappeared in a short while. [37]

## RELATED FATALITIES

There are a number of death reports (both confirmed and unconfirmed) available. There were two deaths resulted from snorting 10mgs of 2C-T-7. Other death reports include:

- Jake Duroy, October 2000, Oklahoma, Insufflation – this was the first confirmed death report by coroner due to the presence of 2C-T-7 in the blood sample.
- Joshua Robbins, April 1 2001, Memphis, Insufflation
- Name Withheld, April 8 2001, Seattle, Oral – combined with 2C-T-7 and MDMA

A 20 year old man died after ingesting 35mgs of 2C-T-7. The post-mortem findings confirmed the presence of this compound using Gas Chromatography with Nitrogen Phosphorus Detection (GC-NPD) and electron ionization Gas Chromatography-Mass Spectrometry (GS/MS). It also showed that a large quantity of 2C-T-7 was excreted unchanged in urine.

[k] [38] [39] [40]

## YOU TUBE VIDEOS

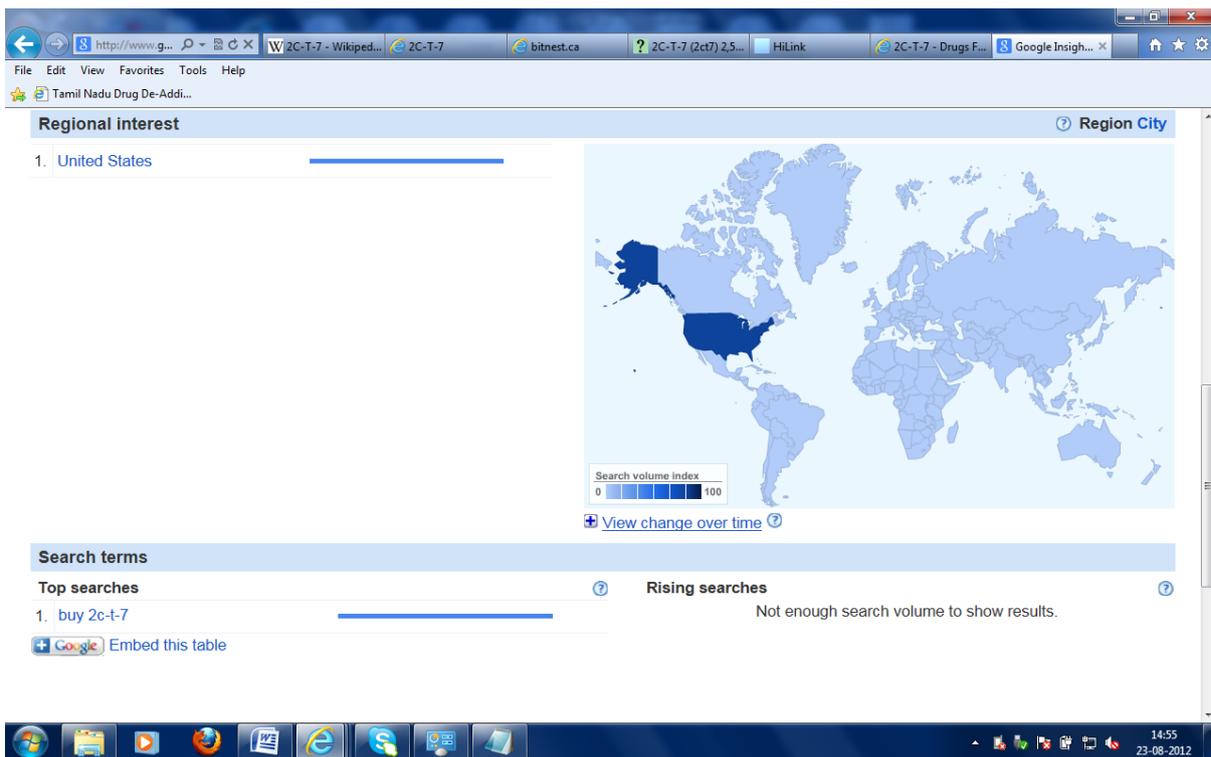
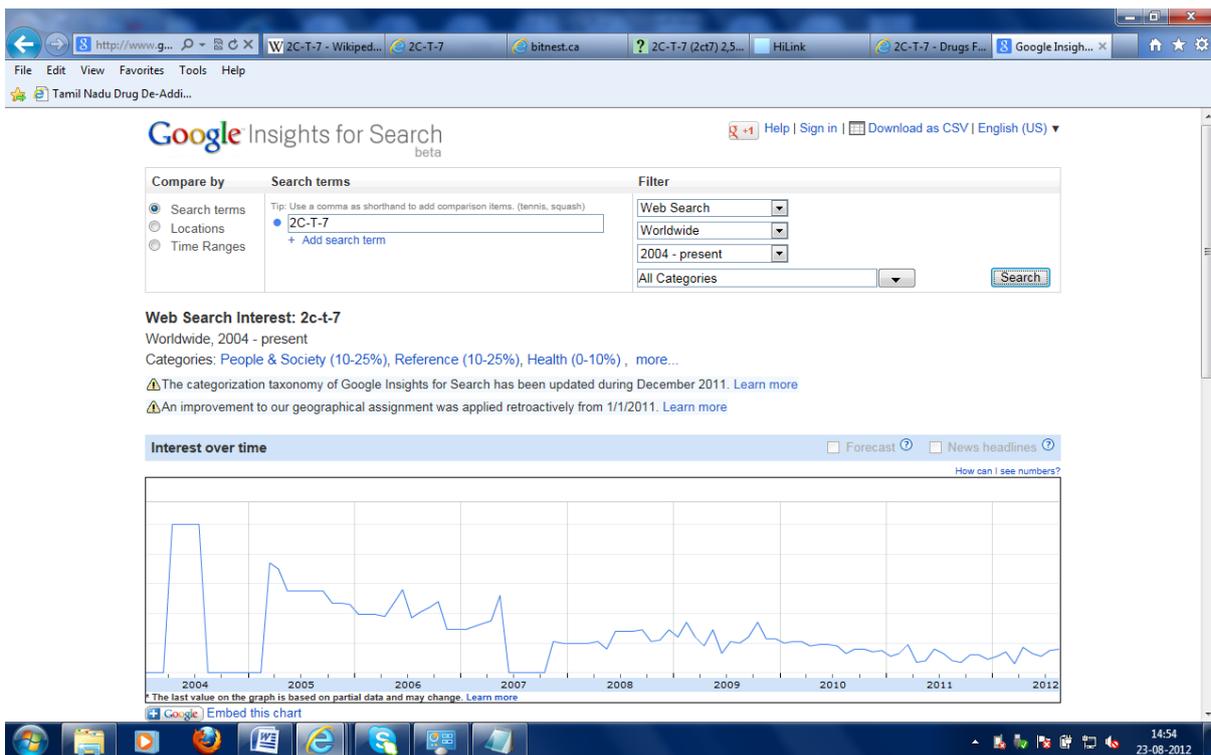
There were no sale videos in the You Tube, but there were few clips where A Shulgin spoke about phenethylamine group of compounds including 2C-T-7.

- **1, 2 and 3 of 3 Sasha Shulgin - Drugs of Perception:** In these 3 video clips, A. Shulgin Shulgin speaks at the Psychedelic conference Santa Barbra in 1983.
- **A Conversation with Terence Mckenna and Alexander (Sasha) Shulgin 1993**

[41] [42] [43] [44]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 2C-T-7, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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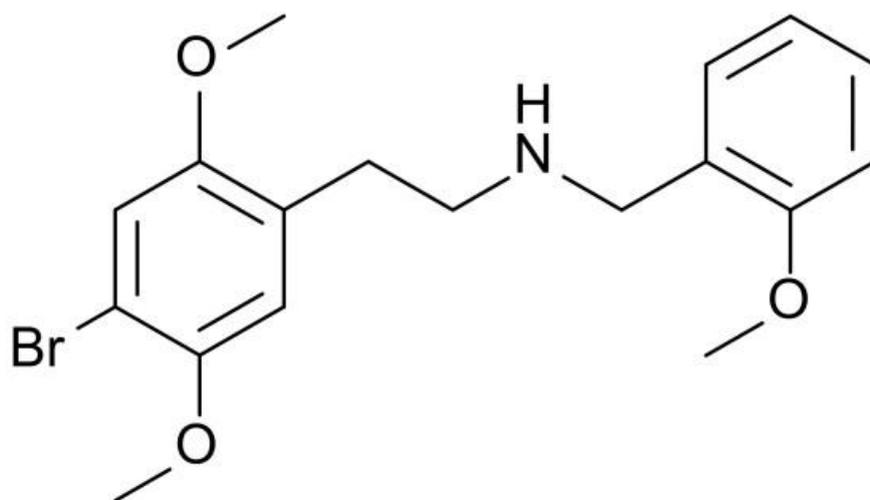
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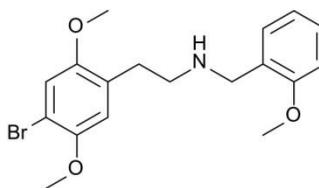
I.VI 4-Bromo-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine  
(25B-NBOMe)

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# 25B-NBOMe Report

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# 25B-NBOMe

## OVERVIEW

Chemical name: 25B-NBOMe

Synonyms: CIMBI-36; NBOMe-2C-B; BOM 2-CB; 25B-NBMeO; NBOMe-2CB; 4-Bromo-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine; N-(2-Methoxybenzyl)-4-bromo-2, 5-dimethoxyphenethylamine;

Active constituents: 25B-NBOMe

Type: Research chemical – Phenethylamine

Origin: 25B-NBOMe was discovered by Ralf Heim at the Free University of Berlin in 2003. It was made popular by David Nicholas and team at Purdue University. 25B-NBOMe is derived from the phenethylamine 2C-Br by substitution on the amine with a 2-methoxybenzyl (BOMe) group.

Status: Novel

Chronology: The 25B-NBOMe is claimed to have first appeared online in 2010.

[1] [2]

## KEY POINTS

25B-NBOMe is a N-o-methoxybenzyl analogue of the 2C-x family of phenethylamines, and is agonist of 5-HT<sub>2a</sub> receptor which can cause hallucinations. It becomes active at extremely low doses similar to LSD.

Since 25B-NBOMe acts as a highly potent and selective agonist for the human 5-HT<sub>2a</sub> receptor, a radio-labelled form of 25I-NBOMe can be used as a tool for mapping the distribution of 5-HT<sub>2a</sub> receptors in the brain. However, this compound has become a drug of misuse because of its characteristic effect on serotonin receptor. [a] [b] [c] [d]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 2-(4-Bromo-2, 5-dimethoxyphenyl)-N-(2-methoxybenzyl) ethanamine

Molecular weight: 380.275 g/mol

Molecular formula: C<sub>18</sub>H<sub>22</sub>BrNO<sub>3</sub>

CAS Number: 1026511-90-9

[3] [4]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product Description
<p><b>EC21: Hoffman: Nbometrade GmbH.</b></p> <p>25B-NBOMe (NBOMe)</p> <p>Free sample available!!!! only from us!!!</p> <p>Don't hesitate to contact us for this unique chemical which is available for sale on very cheap price.</p> <p>Lab. location: Germany [5]</p>
<p><b>Isomerism</b></p> <p>25B-NBOMe (NBOMe-2C-B, BOM 2-CB, Cimbi-36)</p> <p>Lab. location: Asia (CN) [6]</p>
<p><b>Promos-Chem</b></p> <p>25B-NBOME</p> <p>This product is NOT for human consumption!</p> <p>Can be used for laboratory purposes only![7]</p>

## AVAILABLE INFORMATION ON PURCHASE PRICE

Prices varied considerably depending on the websites. One website sold the powder as follows: 100mgs for \$25 or €20; 200mgs for \$40 or €35; 500mgs for \$80 or €70. Another website sold as follows: 100 milligrams for \$70; 1 gram for \$250; 5 grams for \$1,100. Yet another website sold 1 gram for €200.

[8] [9] [10]

## MODALITIES OF INTAKE

25B-NBOMe powder is extremely potent at very low doses (in micrograms). It does not mix well with water. So it is generally mixed with some solvents such as alcohol to make a mixture and calculate the dose to ingest the liquid orally.

The liquid can be instilled nasally, which is a popular method.

Also interestingly, few users have experimented with soaking the liquid on a blotter and keeping it on the buccal mucosa for several minutes. Buccal absorption can be enhanced by adding Cyclodextrins. Some users apply the method of buccal absorption which was demonstrated by Josef in 1991 in his research paper. They recommend addition of HPBCD (Hydroxy-Propyl-Beta-CycloDextrin) to improve the buccal absorption to about 95%. [11] [12] [13] [14] [15] [e] [f]

## LEGAL STATUS

25B-NBOMe is currently uncontrolled in the United Kingdom, as N-benzyl derivatives of phenethylamine are not covered by the phenethylamine derivatives clause of the Misuse of Drugs Act 1971. Hence this compound remains as a 'Novel psychoactive substance'.

[16]

## CURRENT USE / MEDICINAL USE

None.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The usual dose is between 300 to 600 micrograms.

Come up: 10 to 30 minutes    Peak:1-2 hours    Come down: >4hours

[17]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With amphetamine (MDMA) [18]

## PHARMACOLOGICAL CHARACTERISTICS

An experiment was conducted to show the affinity of 25B-NBOMe for the 5-HT<sub>2a</sub> receptors in pig's brain. This study (Ettrup A et al, 2010) noted that when compared with other NBOMe series of compounds, 25B-NBOMe (CIMBI-36)

has the highest potency, highest affinity and highly selective agonism to 5-HT<sub>2a</sub> receptor. [b]

## TOXICOLOGICAL EFFECTS

As this is fairly recently available online, no further information is available.

## DESIRED PSYCHOACTIVE EFFECTS

- Strong sound distortions
- Spasmodic body high
- Complete loss of ego [19]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Nausea
- Extreme anxiety [20]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Disorientation in time, place and person [19]

## CLINICAL ADVICE

25B-NBOMe is very active in extremely small doses. The users may not have sophisticated weighing scale; hence the chances of accidental overdoses are quite high.

## RELATED FATALITIES

None.

## YOU TUBE VIDEOS

- NBOMe research chemical [21]

## GOOGLE INSIGHTS

There are not enough search volume to show some graph.

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I.VII 4-Chloro-2, 5-dimethoxy-N-(2-methoxybenzyl)  
phenethylamine (25C-NBOMe)

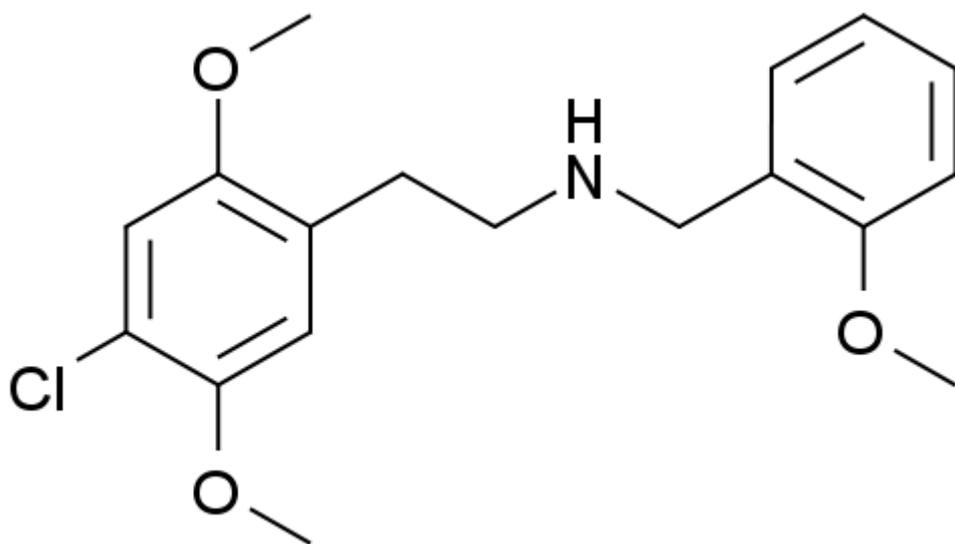
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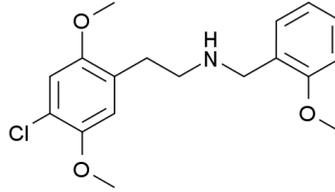
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# 25C-NBOMe Report

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# 25C-NBOMe

## OVERVIEW

Chemical name: 25C-NBOMe

Synonyms: CIMBI-82; PANDORA; DIME; NBOMe-2C-C; 4-Chloro-2, 5-dimethoxy-N-(2-methoxybenzyl) phenethylamine; N-(2-Methoxybenzyl)-4-chloro-2, 5-dimethoxyphenethylamine;

Active constituents: 25C-NBOMe

Type: Research chemical – Phenethylamine

Origin: The first compound in the NBOMe series, 25I-NBOMe, was discovered by Ralf Heim at the Free University of Berlin in 2003. It was made popular by David Nicholas and team at Purdue University. 25I-NBOMe is derived from the phenethylamine 2C-I by substitution on the amine with a 2-methoxybenzyl (BOMe) group.

25C-NBOMe is also claimed to have been first synthesised by Dr Anders Ettrup, at the Neurobiology Research Unit, Denmark in 2009 and this work was published in 2011. Structurally, it is obtained by substituting Chloro for Iodo at R4 position in the 25I-NBOMe molecule.

Status: Novel

Chronology: The 25C-NBOMe is claimed to have first appeared online in 2010.

[1] [2] [a] [b] [c] [d]

## KEY POINTS

25C-NBOMe is a N-o-methoxybenzyl analog of the 2C-x family of phenyl ethylamines, and is agonist of 5-HT<sub>2a</sub> receptor which can cause hallucinations. It becomes active at extremely low doses similar to LSD.

Since 25C-NBOMe acts as a highly potent and selective agonist for the human 5-HT<sub>2a</sub> receptor, a radio-labelled form of 25I-NBOMe can be used as a tool for mapping the distribution of 5-HT<sub>2A</sub> receptors in the brain. However, this compound has become a drug of misuse because of its characteristic effect on serotonin receptor. [1] [2] [a] [b] [c] [d]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 2-(4-Chloro-2, 5-dimethoxyphenyl)-N-(2-methoxybenzyl) ethanamine

Molecular weight: 335.824 g/mol

Molecular formula: C<sub>18</sub>H<sub>22</sub>ClNO<sub>3</sub>

CAS Number: 1227608-02-7 [1] [2]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product Description
<b>Isomerism</b> 2C-C-NBOMe (NBOMe-2C-C, 25C-NBOMe, Cimbi-82, Pandora, Dime) CAS# 1227608-02-7 Form: HCl Purity 99%+ Lab. location: Asia (CN) [3]
<b>9W Pharmaceutical Technology Co., Ltd</b> 25c-nbome Appearance: White or Similar crystalline powder Assay: >99.5% Packing: 1kg/Aluminium foil bag or Customized Usage: For Research Storage: Keep away from fire and heat source; hermetically deposit; keep in shady, cool and dry condition; protect against the tide.[4]
<b>EC21: Jahn Haffman: Nbometrade GmbH</b> 25C-NBOMe (NBOMe) is a derivative of the cc, which acts as a potent partial agonist for the receptor, and has been studied in its radiolabelled form as a potential ligand for mapping the distribution of 5ht receptors, using positron emission tomography (PET). Anecdotal reports suggest 25C-NBOMe to be an active at as little as 200-500mcg .[5]

## AVAILABLE INFORMATION ON PURCHASE PRICE

Prices vary depending on the vendors distribution areas. In Europe, 10grams is sold for €300; 50grams for €850; 100grams for €1,400; 500grams for €5,100. As on 31<sup>st</sup> May 2012, few websites announced that this product was sold out. 100gram powder is sold for £95 and 500grams for £280 in the UK (but currently out of stock). In the USA, 1gram is sold for \$300; 5grams for \$1,300; 10grams for \$2,100. [6] [7] [8]

## MODALITIES OF INTAKE

25C-NBOMe powder is extremely potent at very low doses (in micrograms). It does not mix well with water. So it is generally mixed with some solvents such as alcohol to make a mixture and calculate the dose to ingest the liquid orally.

Also interestingly, few users have experimented with soaking the liquid on a blotter and keeping it on the buccal mucosa for several minutes. Buccal absorption can be enhanced by adding Cyclodextrins. Some users apply the method of buccal absorption which was demonstrated by Josef in 1991 in his research paper. They recommend addition of HPBCD (Hydroxy-Propyl-Beta-CycloDextrin) to improve the buccal absorption to about 95%. Others methods include:

- Sublingual route – placing the liquid on a blotter paper
- Another method is to prepare the mixture (powder with a solvent) and placing one drop on a foil and inhaling the vapour.
- Nasal insufflation of the powder or the liquid preparation is also tried by users.
- Snorting the powder [9a] [9b] [e] [f]

## LEGAL STATUS

25C-NBOMe is currently uncontrolled in the United Kingdom, as N-benzyl derivatives of phenethylamine are not covered by the phenethylamine derivatives clause of the Misuse of Drugs Act 1971. Hence this compound remains as a ‘Novel psychoactive substance’. [10]

## CURRENT USE / MEDICINAL USE

None.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The dose has to be carefully adjusted, as it is very potent in micrograms. The forum users emphasise the precise weighing of the compound and caution against accidental overdose. Users also suggested various ways to make the preparation of the mixture and to accurately measure the dose. One such example is (quote): “for example, 2mgs of 25C was dissolved in 1ml of water to make 2mgs/ml of water; then 1/4 ml (0.25 ml; 250 ul) with an oral 1ml syringe to deliver 500 ug and insufflate the liquid”.

Usual dose: 250micrograms to 500 micrograms

Come up: 30minutes

Peak: 1-2 hours

Come down: 5-8 hours

A user tested for allergic reaction using 50micrograms per drop. As no effects were noted, further test with 3 drops sublingual was tried few weeks later. After a month, the user tried 600micro grams sublingual. A typical experience is given below:

00:00 - Mood was starting to be lifted; dancing.

01:00 – Euphoria; music sounds better than normal; mild visuals noted. The feeling is reminiscent of the come up of my MDMA experiences.

01:15 - Intense euphoria for at least 20 minutes.

01:35 – Peak is reached; still strong euphoria, very similar to MDMA along with some visuals.

02:30 - Feelings still going strong,

03:30 - Still lots of euphoria, the music appreciation still present.

05:00 - At this point I feel the effects are starting to subside.

08:00 - Small residual effects.

[11] [12]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With 4-AcO-DMT
- With Cannabis
- With MDMA
- With 4-Aco-DMT and DXM

[13] [14] [15] [16]

## PHARMACOLOGICAL CHARACTERISTICS

An experiment was conducted to show the affinity of 25C-NBOMe for the 5-HT<sub>2a</sub> receptors in pig's brain. This study (Ettrup A et al, 2010) noted that when compared with other NBOMe series of compounds, 25C-NBOMe has the high potency, high affinity and high selective agonism to 5-HT<sub>2a</sub> receptor.

This study (Ettrup A et al, 2010) compared the uptake of tracers by different NBOMe series of compounds [b].

## TOXICOLOGICAL EFFECTS

In Auckland, Dr Paul Fitzmaurice, Crown Research Institute, commented that a sample of DIME was tested in their drugs lab (GC/MS analysis) and the sample was found to contain 25C-NBOMe (also known as Pandora or Cimbi-82).

Convulsions have been reported following its intake.

[17] [18] [19] [20] [21]

## DESIRED PSYCHOACTIVE EFFECTS

Users compare the effects of 25C with that of 2-C and report that it was light on the body, less stimulating, less prone to anxiety and more euphoric.

- Strong visuals
- Enhanced sense of humour [22] [23]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Light headache towards the end
- vasoconstriction,
- nausea
- irregular heartbeat [24]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

A dissociative experience filled with intense anxiety, loss of touch with reality with graphic visual and auditory hallucinations; underlying these experiences was a short live paranoid delusional state which disappeared after the trip.

- Visual hallucination ('seeing angels')
- Paranoid delusions/ Schizophrenia like symptoms.

[17] [18] [19] [25]

## CLINICAL ADVICE

25C-NBOMe is very active in extremely small doses. The users may not have sophisticated weighing scale; hence the chances of accidental overdoses are quite high.

## RELATED FATALITIES

None.

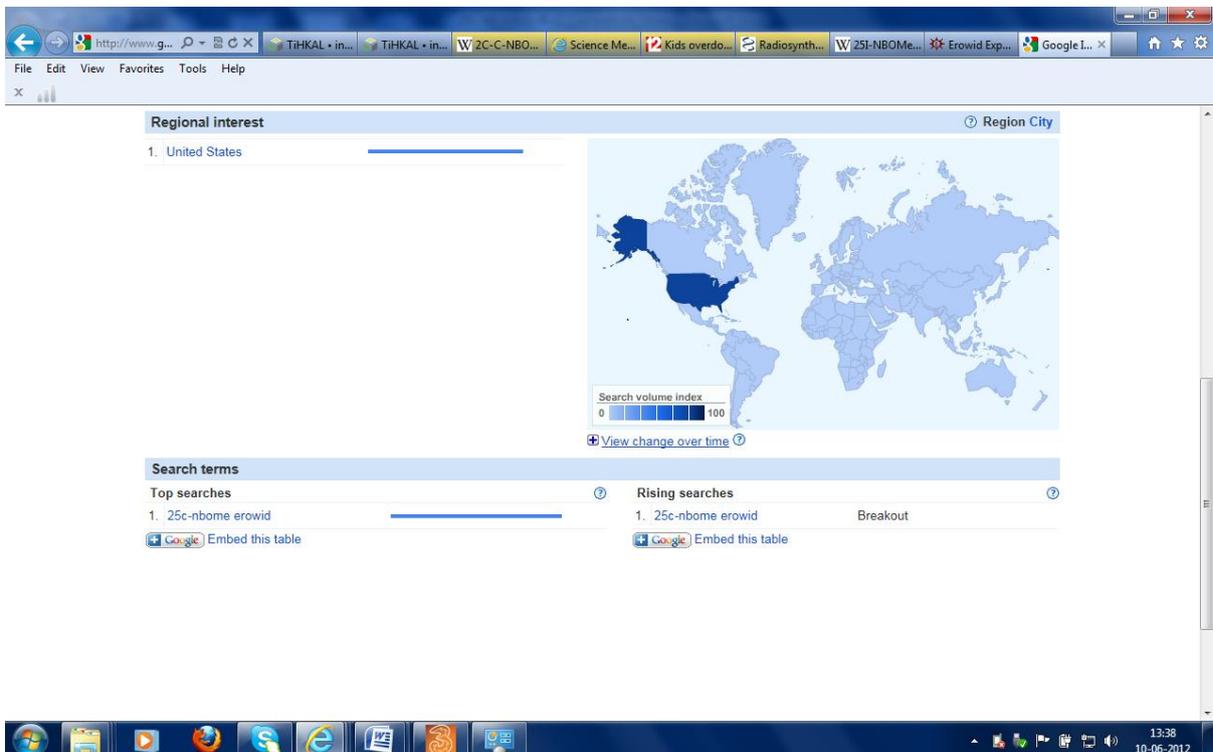
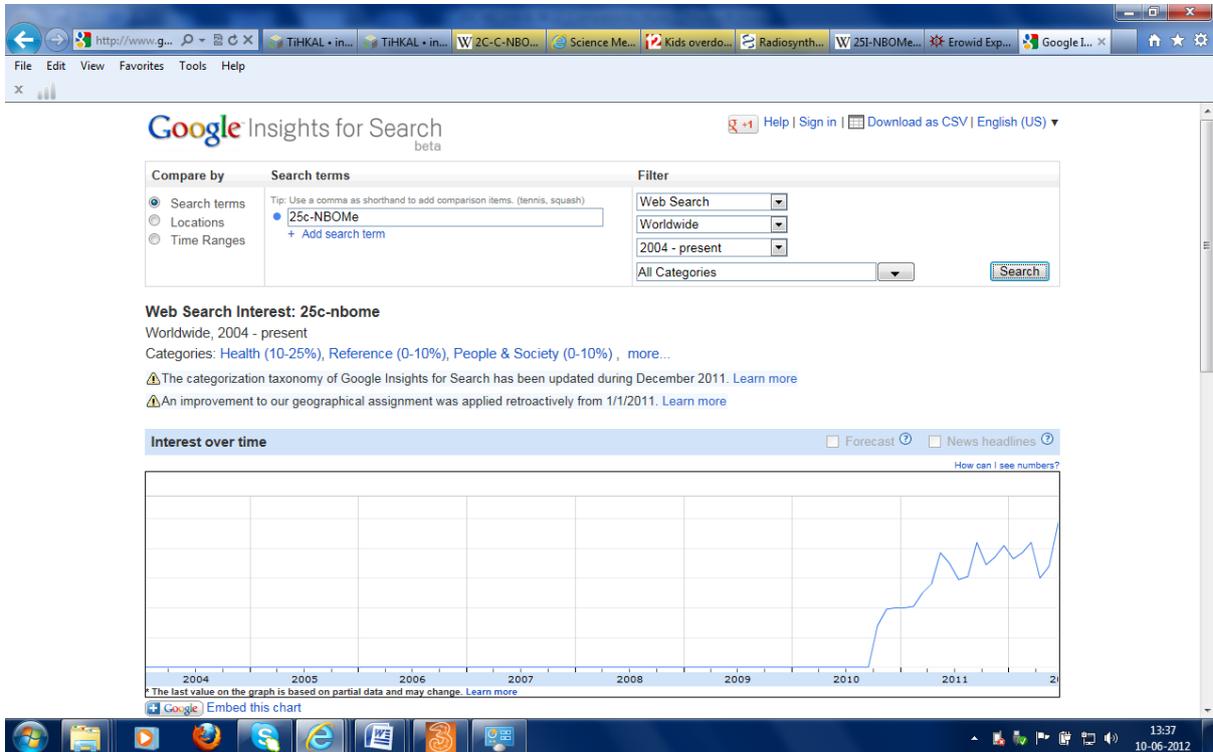
## YOU TUBE VIDEOS

There was a video clip on the You Tube for sale. "NBOMe research chemical"  
[26]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT)

for 25C-NBOMe, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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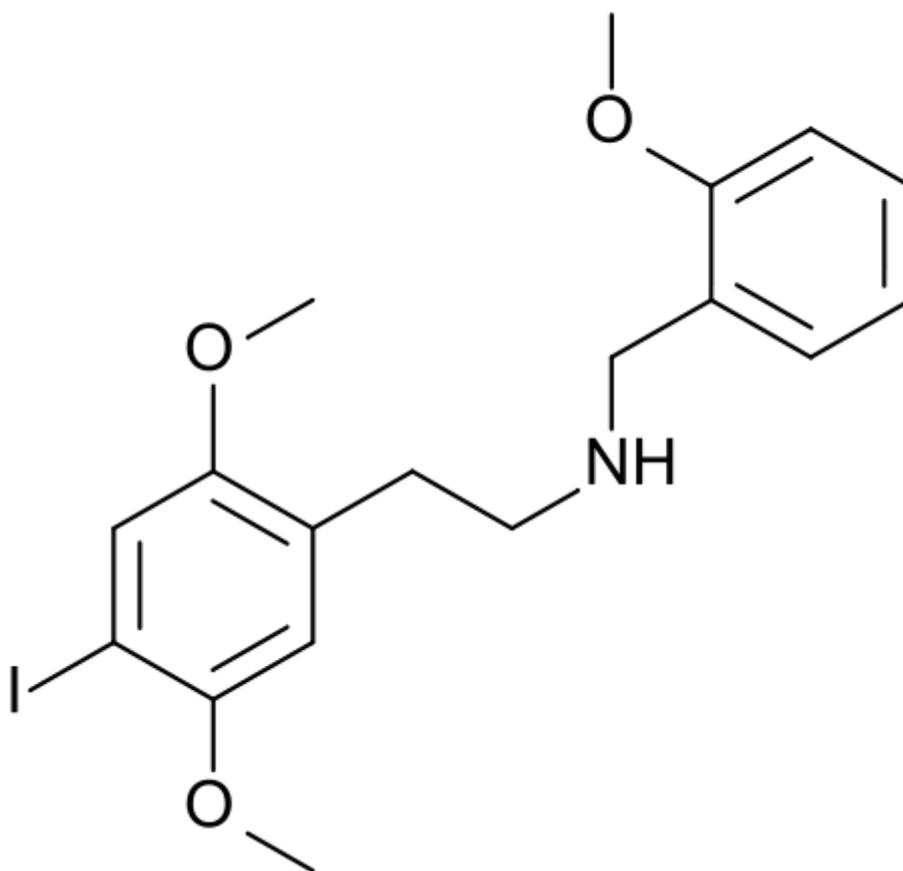
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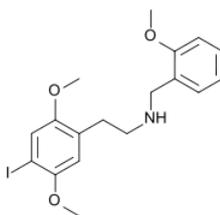
I.VIII 4-Iodo-2, 5-dimethoxy-N-(2-methoxybenzyl)  
phenethylamine (25I-NBOMe)

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# 25I-NBOMe Report

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# 25I-NBOMe

## OVERVIEW

Chemical name: 25I-NBOMe

Synonyms: Solaris; CIMBI-5-2; CIMBI-5; 25I-NBMeO; INBMeO; 2C-I-NBOMe; 25I; NBOMe-2C-I

Active constituents: 25I-NBOMe

Type: Research chemical – Phenethylamine

Origin: The NBOMe series of chemicals are mainly N-o-methoxybenzyl analogs of the 2C-x family of phenyl ethylamines, and are agonists of 5-HT<sub>2a</sub> receptor which can cause hallucinations. These hallucinogenic compounds become active at extremely low doses similar to LSD.

Status: Novel

Chronology: It is reported to have first appeared on line for recreational purpose under the brand name ‘Solaris’ in 2007.

[1] [2] [3]

## KEY POINTS

The first compound in the NBOMe series, 25I-NBOMe, was discovered by Ralf Heim at the Free University of Berlin in 2003. It was made popular by David Nicholas and team at Purdue University. 25I-NBOMe is derived from the phenethylamine 2C-I by substitution on the amine with a 2-methoxybenzyl (BOMe) group. Since it acts as a highly potent and selective agonist for the human 5-HT<sub>2A</sub> receptor, a radio-labelled form of 25I-NBOMe can be used as a tool for mapping the distribution of 5-HT<sub>2A</sub> receptors in the brain. However, this compound has become a drug of misuse because of its characteristic effect on serotonin receptor.

[a] [b] [c] [d] [4]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name:

2-(4-iodo-2,5-dimethoxyphenyl)-N-[(2methoxyphenyl) methyl] ethanamine

or

2-(4-Iodo-2,5-dimethoxyphenyl)-N-(2-[11C] methoxybenzyl) ethanamine

Molecular weight: 426.277384 [g/mol]

Molecular formula: C18H22INO3

CAS Number: 919797-19-6; 1043868-97-8 (hydrochloride)

[5] [6]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product Description
<p><b>EC Plaza Global</b></p> <p>Any amount is available from mg to kg from as little price as 25 usd or 20 euro buy 25I-nbome which is for sale on very cheap price so you can sell this easily! We are the best online vendor for Nbome! Free sample available!!!! CAS number 919797-19-6 1043868-97-8 (hydrochloride) [7]</p>
<p><b>Joychem Co., Ltd</b></p> <p>Categories: Research Chemicals</p> <p>Grade Standard: Medicine Grade</p> <p>CAS No.: 1043868-97-8</p> <p>Other Names: 25I-NBOMe(hcl)</p> <p>Purity: 99.9%</p> <p>Appearance: white powder/crystal [8]</p>
<p><b>Shining Stuff</b></p> <p>99.9% Pure 25i-nbome</p> <p>Contact tony montana: 99.9% pure 25i-NBOME, 25C-NBOME, Mephedrone, Methylone, Methedrone, Bulytone, MDAI, JWH, MDPV and other RSC for sale [9]</p>

## AVAILABLE INFORMATION ON PURCHASE PRICE

Prices vary depending on the vendors distribution areas. In Europe, 5grams is sold for €200; 50grams for €900; 100grams for €1,600; 500grams for €6,350. As on 31<sup>st</sup> May 2012, few websites announced that this product was sold out.

100gram powder is sold for £95 and 500grams for £280 in the UK (but currently out of stock). In the USA, 1gram is sold for \$280; 5grams for \$1,100; 10grams for \$1,900. [10] [11] [12] [13]

## MODALITIES OF INTAKE

25I-NBOMe powder is extremely potent at very low doses (in micrograms). It does not mix well with water. So it is generally mixed with some solvents such as alcohol to make a mixture and calculate the dose to ingest the liquid orally.

Also interestingly, few users have experimented with soaking the liquid on a blotter and keeping it on the buccal mucosa for several minutes. Buccal absorption can be enhanced by adding Cyclodextrins. Some users apply the method of buccal absorption which was demonstrated by Josef in 1991 in his research paper. They recommend addition of HPBCD (Hydroxy-Propyl-Beta-CycloDextrin) to improve the buccal absorption to about 95%.

Another method is to prepare the mixture (powder with a solvent) and placing one drop (about 250 micrograms) on a foil and inhaling the vapour.

Nasal insufflation of about 500micrograms of the powder is also tried by users. Very rarely, it can be injected intra muscularly. [14] [15] [16] [17]

## LEGAL STATUS

25I-NBOMe is currently uncontrolled in the United Kingdom, as N-benzyl derivatives of phenethylamine are not covered by the phenethylamine derivatives clause of the Misuse of Drugs Act 1971. Hence this compound remains as a 'Novel psychoactive substance'. [18]

## CURRENT USE / MEDICINAL USE

None.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

Users reported that it produces more of empathic feelings than MDMA. It also causes smaller anxiety levels on come down when compared with 2C-I compounds.

The dose has to be carefully adjusted, as it is very potent in micrograms. Users report that it is at least 17 times more potent than 2C-I compound. So the forum users emphasise the precise weighing of the compound and caution against accidental overdose. Users also suggested various ways to make the preparation of the mixture and to accurately measure the dose. Once such example is (quote) "to add 100mg of 25i-nbome to 50ml of 95% etoh (instead of 100ml of 95% etoh) for a final drug ratio of 200ug per each 0.100ml on the insulin syringe".

Following nasal insufflation of the powder, it has a rapid onset of action (usually within 20minutes). Usual dose: 350micrograms to 500 micrograms.

Come up: 20 minutes                      Peak: 2 hours                      Come down: 6-8 hours

[e] [f] [19] [20]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With 5 MeO –MIPT to get stronger visuals.
- With 6-APB

[21]

## PHARMACOLOGICAL CHARACTERISTICS

Studies on classical hallucinogens suggest that various types of these compounds (Phenyl alkyl amine hallucinogens) act at 5-HT receptors which consist of 5-HT2a, 5-HT2b, 5-HT2c etc. Recent studies have compared only few Phenyl alkyl amine hallucinogens and it seems that these compounds show little selectivity for one subpopulation over the other. In the case of 25I-NBOMe, the affinity for 5HT2a & 5-HT2c seems to be stronger than any other compounds such as LSD. Lower Ki value corresponds to higher receptor binding ability. The affinity (Ki value) for 5-HT2a is at 0.044 and for 5-HT2c is at 2.0. For comparison, in case of LSD the Ki value is only 3.55 at HT2a and 23.0 at 5-HT2c.

[g] [h] [22] [23] [24]

## TOXICOLOGICAL EFFECTS

These are very early days, as the compound has recently entered the market. There are reports of (at least five) individuals ingesting 25I and being hospitalised in Virginia, Richmond, USA. Two of them were reported to have cerebral bleeding.

Another user took 500micrograms of 25I-NBOMe (powder mixed with alcohol) and became unresponsive to any stimuli. He was taken to the emergency department and was found to have developed dangerously low hypomagnesaemia and hypokalemia. He was treated in the hospital for 5 days.

Neuro toxicity: seizure like activity, confusion and disorientation.

[25] [26] [27a] [27b]

## DESIRED PSYCHOACTIVE EFFECTS

- Strong visuals

- Extremely colourful visuals
- Body high
- No nervous feelings

[28]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Severe headache (on coming down)
- Severe breathlessness, choking sensation requiring endotracheal intubation.
- ‘Near death experience’ resulted in coma – required hospitalisation.

[29] [30]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Episodes of depression.
- Violent outbursts.
- Visual hallucinations, intense hallucinations
- Extreme anxiety
- Panic attacks
- Intense synaesthesia and spatial distortion (on 2.5mg sublingual dose)
- Auditory as well as visual hallucinations occurring together

[31] [32a] [32b]

## CLINICAL ADVICE

It is about 16 times more potent than 2C-1 and is active at a dose of 500microgram. Since the dosage is extremely small and the users may not have sophisticated weighing scale, the chances of accidental overdoses are quite high.

## RELATED FATALITIES

None.

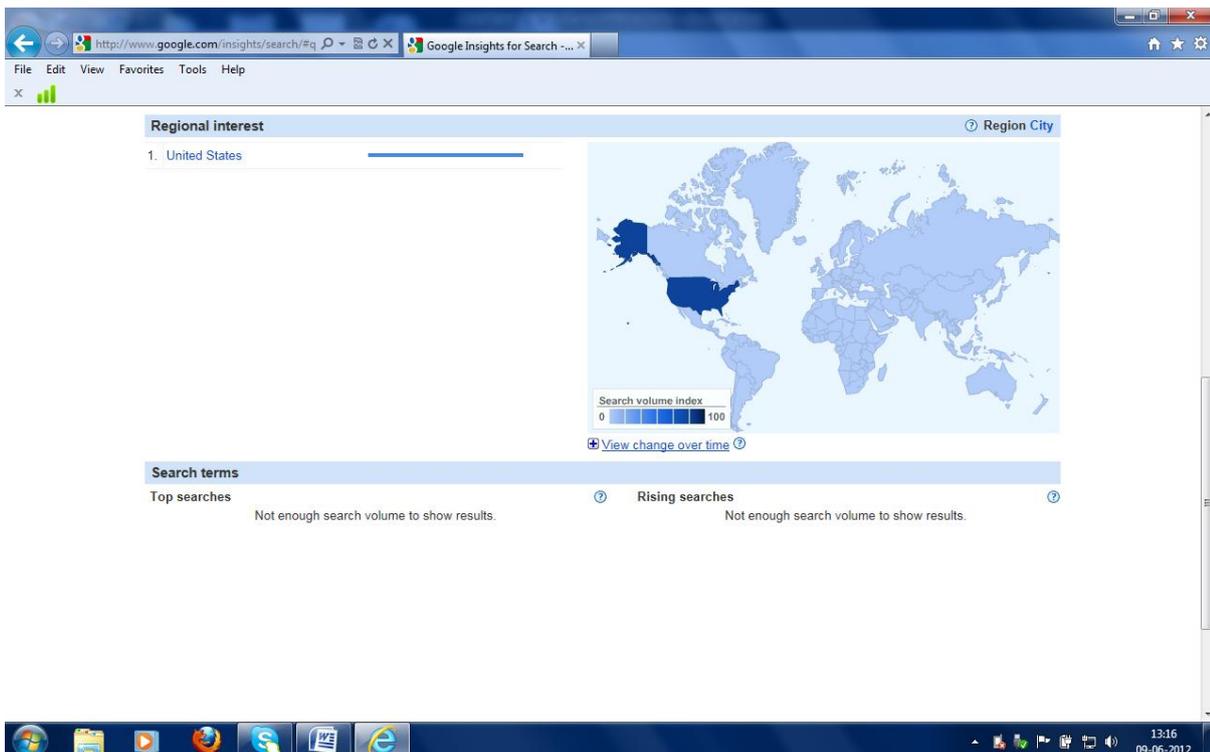
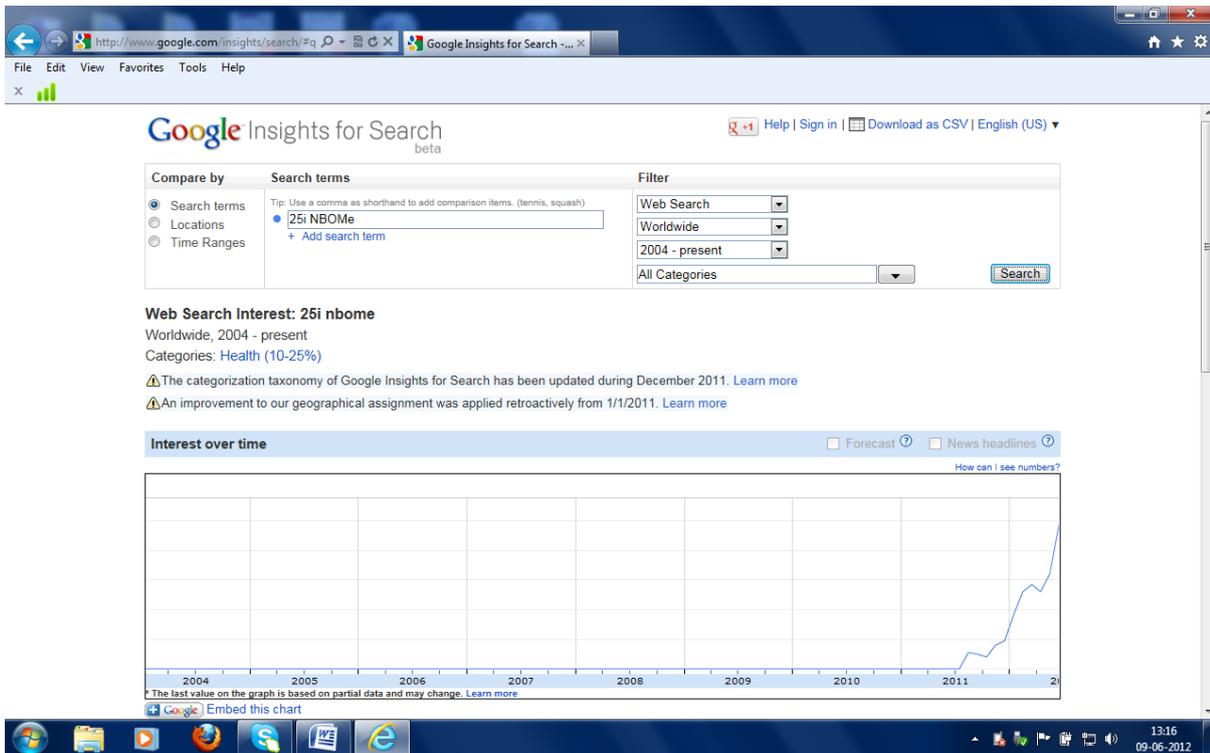
## YOU TUBE VIDEOS

1. Tripping on 25i NBOMe
2. NBOMe research chemical
3. Tripping 25i NBOMe coming down

[33] [34] [35]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 25I-NBOMe, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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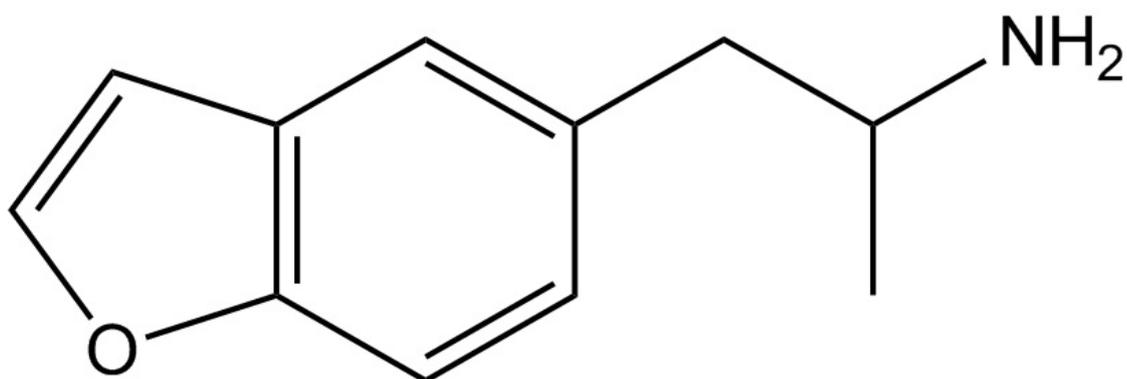
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I.IX 5-(2-Aminopropyl) Benzofuran (5-APB)

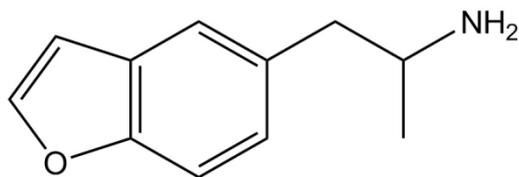
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# 5-APB Report

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# 5-APB



## OVERVIEW

Chemical name: 5-(2-Amino Propyl) Benzofuran (5-APB)

Synonyms: APB, 5-(2-Aminopropyl) benzofuran; 1-(1-Benzofuran-5-yl) propan-2-amine.

Active constituents: 5-(2-Aminopropyl) benzofuran

Type: Research chemical – Phenethylamine and amphetamine class; it acts as an entactogen and Psychostimulant.

Origin: 5-APB was synthesised by David E Nichols and his team in 1990s.

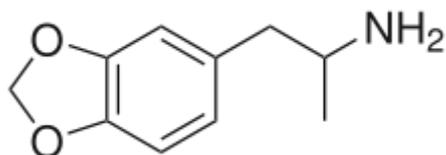
Status: Novel

Chronology: Since its synthesis, many compounds or derivatives are being synthesised. 5-APB has two isomers (4-APB and 6-APB) and about 20 analogues such as MDA (3, 4-Methylenedioxyamphetamine), 5-IT (5-(2-Aminopropyl) Indole), 5-APDB, 6-APDB etc.

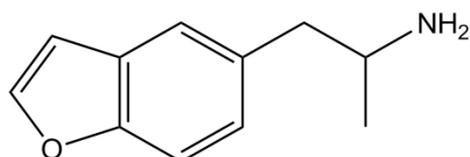
[1] [2] [3] [4]

## KEY POINTS

MDA is one of its analogues where the 3, 4-methylenedioxyphenyl ring system has been replaced with benzofuran ring. The molecular diagram of both MDA and 5-APB is given below:



MDA (3, 4-Methylene Dioxy Amphetamine)



5-APB 5-(2-Aminopropyl) benzofuran [5]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 5-(2-aminopropyl) benzofuran

Molecular weight: 175.23 g/mol

Molecular formula: C<sub>11</sub>H<sub>13</sub>NO

CAS Number: 286834-80-8 [6] [7]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product Description
<p><b>Professor Nutty</b></p> <p>Description: 5-APB is capped for your convenience and supplied in discreet packaging.</p> <p>Now a well-established research chemical 5-APB is the 'little-brother' of 6-APB. 5-APB produces less psychedelic but more stimulating and empathogenic effects. [8]</p>
<p><b>Benzo Fury</b></p> <p>We are pleased to announce that genuine 5-APB 1-(1-benzofuran-5-yl) propan-2-amine is in stock now.</p> <p>5-APB is a derivative of 6-APB or Benzo Fury as it is known and the Official 5 are once again proud to be the only official suppliers of this chemical. [9]</p>
<p><b>V X Chem</b></p> <p>5-APB is also a variant of 6-APB, but at least 30% stronger than 6-APB.</p> <p>For scientific research purposes only, strictly not for human consumption. [10]</p>

One particular vendor published a report on their sale product (5-APB) which was allegedly tested by NMR and a GC/MS on 24/01/2012 and was alleged to be a genuine product. Their report was also put on their sale page. [11]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The prices vary considerably from website to website. Various vendors quote a price range from £29 to £82 per 1 gram. Some vendors even attract customers by putting up a 50% off on 5 APB using specific codes.

[12] [13] [14] [15]

## MODALITIES OF INTAKE

Oral ingestion: The pellet forms can be swallowed. The powder can be insufflated or snorted. Nasal insufflation can be painful, but a lower dose range (25-50mgs) is suggested.

Rectal route: Very rarely, users take this produce through enema.

[16] [17]

## LEGAL STATUS

It is uncontrolled in the USA. It is still legal in the UK.

## CURRENT USE / MEDICINAL USE

None.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The usual dose is between 75mgs to 100 mgs.

Come up: 40-60min.                      Peak: 2 hours                      Come down: 6-8 hours

5-APB is discussed to be 30% stronger than 6-APB.

[18] [19] [20] [21]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- The usual combination is with 6-APB to intensify the effects. This combination is also used to prolong (for days) the euphoric effects. One user re-dosed on this combination and the effects lasted for 2 and ½ days.
- Few users have suggested combining 5 & 6 APB with mushrooms.

[22] [23] [24]

## PHARMACOLOGICAL CHARACTERISTICS

5-APB belongs to the class of Phenethylamine and Amphetamine and it is also an analogue of MDA. Based on the characteristics of these class of compounds (Phenyl alkyl amine hallucinogens), they act as agonist on the 5-HT<sub>2a</sub> serotonin receptors. Studies on classical hallucinogens suggest that various types of these compounds (Phenyl alkyl amine hallucinogens) act at 5-HT receptors which consist of 5-HT<sub>2a</sub>, 5-HT<sub>2b</sub>, 5-HT<sub>2c</sub> etc. Recent studies have compared only few Phenyl alkyl amine hallucinogens and it seems that these compounds show little selectivity for one subpopulation over the other. [a]

## TOXICOLOGICAL EFFECTS

Usually it occurs when the dose is above 250mgs or used in combination with other compounds. The symptoms of toxicity are given below:

- Nausea
- Vomiting
- Stomach cramps
- Tachycardia [25a]

## DESIRED PSYCHOACTIVE EFFECTS

- Mild euphoria
- Mild visuals
- Sexual stimulation
- Enhanced music appreciation [25b]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Nausea
- Lethargy
- Body load
- Yawning
- Headaches
- Dizziness
- Restless, agitation
- Unable to stay still
- Pupillary dilatation – sensitivity to light
- Terrible hangover the following day  
[26a] [26b]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Visual hallucinations (transient)
- Short lived paranoid delusions similar to psychotic episode [27]

## CLINICAL ADVICE

As 5-APB is thought to act on serotonergic receptor, it could potentially cause ‘serotonin syndrome’; so people with overdose could be treated along those treatment lines.

## RELATED FATALITIES

None.

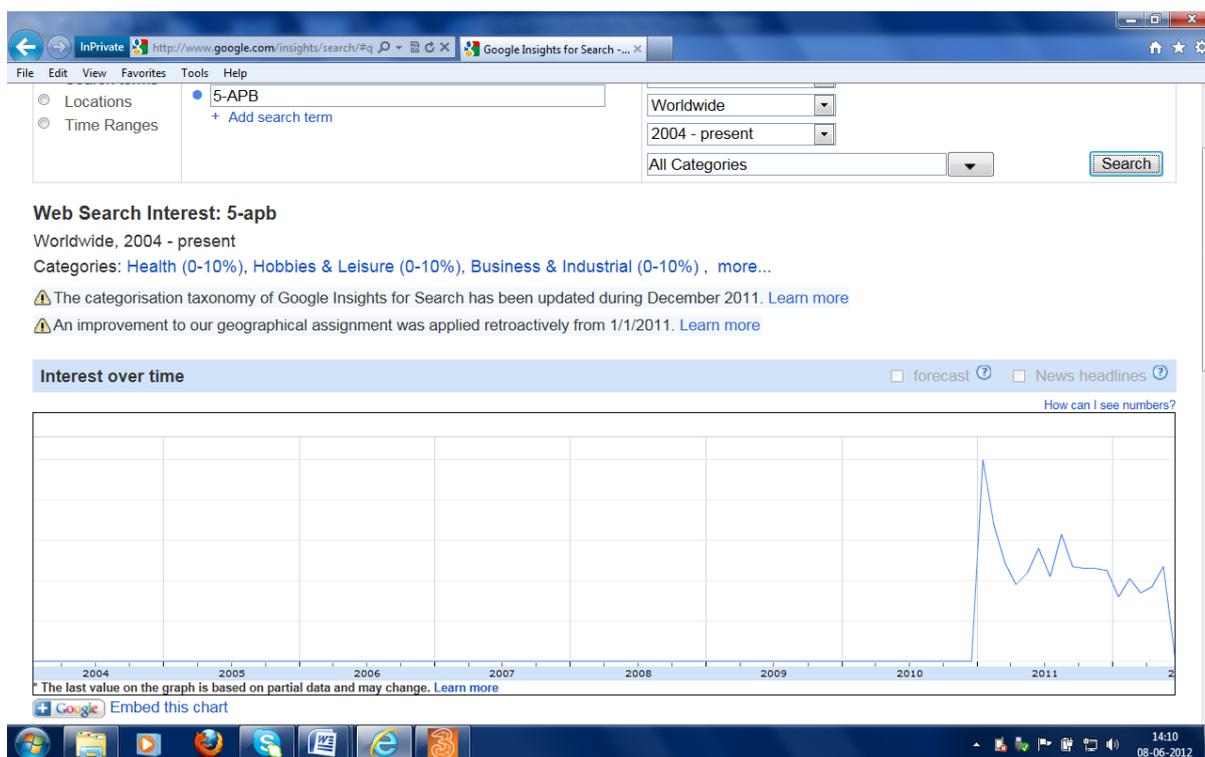
## YOU TUBE VIDEOS

1. EZ Test Mecke for 5-APB
2. 5-APB research chemical testing by Benzofury me

[28] [29]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 5-APB, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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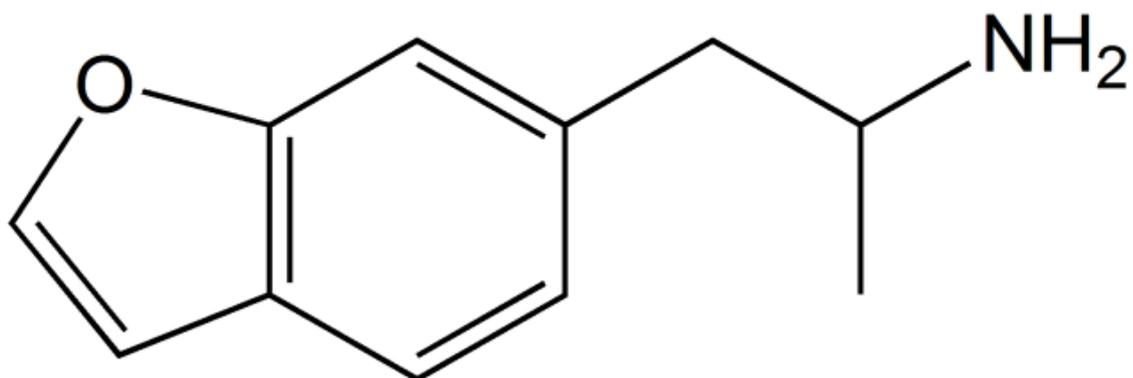
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I.X 6-(2-Aminopropyl) Benzofuran (6-APB)

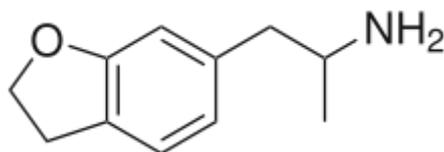
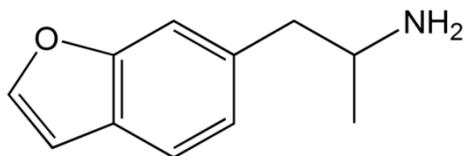
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# 6 APB Report

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## 6-APB & 6-APDB



### OVERVIEW

The molecular structure of 6-APDB and 6-APB are very similar except that the 6-APB contains a double bond between carbons 2 and 3 on the furan ring (see left side). The 6-APDB molecule does not have a double bond, but pairs of hydrogen atoms on carbons 2 and 3.

This subtle difference between the two molecular structures can produce entirely different effects, side-effects and toxicity. The structure of 6-APDB and 6-APB closely resemble MDA.

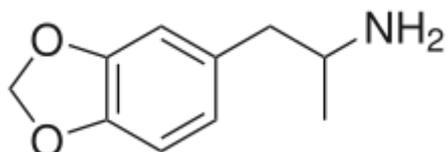
Chemical names:	6-(2-aminopropyl) benzofuran = 6 APB 6-(2-aminopropyl)-2, 3-dihydrobenzofuran = 6 APDB [1] 4-Desoxy-MDA = 6 APDB
Synonyms:	Benzofury; often 6-apdb & 6-apb are regarded as the same; but they are different compounds.
Type:	Research Chemical – a derivative of Phenethylamine
Origin:	It is a Research Chemical with very short history of human consumption.
Active constituents:	6-(2-aminopropyl) Benzofuran (= 6 APB) and 6-(2-Aminopropyl)-2, 3- dihydro benzofuran (= 6 APDB)
Status:	Legal
Chronology:	David Nichols with team synthesized 6-APB in 1993 whilst investigating non-neurotoxic MDMA analogues. 6-APDB is often confused with 6-APB which is a derivative of 6-APDB [a]

### KEY POINTS

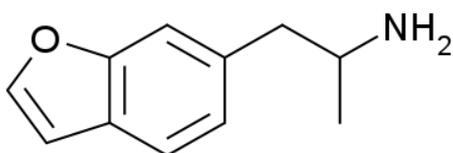
It is an analogue of MDA where the heterocyclic 4-position oxygen from the 3, 4-methylenedioxy ring has been replaced with a methylene group.

[2]

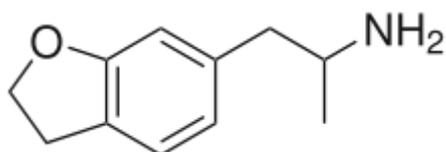
The molecular diagrams of all three compounds look quite similar:



MDA (3, 4-Methylene dioxy amphetamine)



6-APB (Note the double bond on the furan ring) [3]



6-APDB (Note: No double bond on carbons 2 and 3 on the furan ring) [4]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

### 6-APB

IUPAC Name: 6-(2-aminopropyl) benzofuran

CAS Number: 286834-85-3 (racemic free base)

286834-84-2 (racemic hydrochloride salt)

Formula: C<sub>11</sub>H<sub>13</sub>NO

Molar Mass: 175.23 g/mol

### 6-APDB

IUPAC Name: 1-(2, 3-dihydro-1-benzofuran-6-yl) propan-2-amine hydrochloride

CAS Number: 152623-93-3

Formula: C<sub>11</sub>H<sub>15</sub>NO

Molar Mass: 177.22702 g/mol

[5] [6]

## APPEARANCE OF COMMERCIAL PRODUCTS

It's a tan grainy type of powder which is supposed to be pure. The pellet form which contain varying doses of 6-APB mixed with caffeine and potentially another trivial stimulant (from analysis). Usually 6-APB is mixed with

magnesium stearate as a cutting agent. One user thinks it's not magnesium stearate but glucose was used in his case [7] [8].

## Product Description

This product is a research chemical. As with all of our products this is for chemical research purposes only. Strictly NOT for human consumption, please refer to our Conditions of Use for further information.

~~Regular Price:£40.00~~ **Special Price:£36.00** [12]

**6-APB** is a synthetic raw chemical compound made popular around the world as the main active substance in Benzo Fury Pellets. We are proud to offer the highest purity **6-APB Powder** sold anywhere online in an environment which has been saturated with low-grade and imitation 6-APB. Our 6APB comes as a low density flour-like brown/off-white powder which is soluble in water and responds well to marquis tests. As with all our research chemicals we advise that you are a qualified chemist with access to a lab capable of handling responsive raw materials. Please also be aware that 6-APB is under no circumstances permitted for in-vivo testing. [13]

**Our Price: £37.00** (Inc. 20% VAT) *Earn 37 Loyalty Points*

The Official 6-APB Pellets are a tried and tested RC proving to be very popular. You can buy 50 Pellets from this page; free standard delivery is included with this product.

IF YOUR LAB IS NOT EQUIPPED WITH AN ANALYTICAL BALANCE CAPABLE OF KWEIGHING ACCURATELY DOWN AS LOW AS 10MG WITH AN ACCURACY OF +- 5 MG (THIS IS THE MINIMUM SPEC) THEN PLEASE DON'T ORDER THIS PRODUCT BECAUSE YOU ARE CLEARLY NOT PREPARED FOR ANY BONAFIDE SCIENTIFIC RESEARCH.[14]

## AVAILABLE INFORMATION ON PURCHASE PRICE

2011 prices can be seen in the above picture. The prices have fallen almost to half in 2012, for e.g., the price for 1g is £32 and 25g costs £400. [15] [16]

## MODALITIES OF INTAKE

Usual mode of use is oral ingestion.

Few users have tried nasal route – it was a very painful experience [11].

## LEGAL STATUS

6-APB is currently legal in the UK. It is also uncontrolled in the USA.

## CURRENT USE / MEDICINAL USE

None.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The forum users for 6-APB report very strong effects at 100mgs and 200mgs produce even more powerful experience than MDA. The psychedelic experiences for 6-APB was more intense than MDA and MDMA (6-APB>MDA>MDMA). Yet the ‘magical’ experience was hardly ever reached for 6-APB (MDMA>MDA>6-APB). The euphoria was followed by a wave of nostalgia. A typical example of progression of effects:

Come up: 30-60 min                      Peak: 3-4 hours                      Come down: 2 to 12 hours.

T+15: green purple visuals and breathing walls

T+30: strong sense of nausea and sickness on and off; also experiences body lightness similar to experience on MDMA; the eye wiggles started (vibrating visual field) – so unable to focus on any objects

T+30-60: visuals getting stronger but remained clear headed. Colours and shadows intensified and the nausea subsided

T+60: remained on peak for about 3-4 hours

T+ 4hours: still very visual with sparkles (the computer screen is animated and extra coloured).

T+5hours: physical exhaustion

T+7hours: euphoric and seeing visuals spark and colour shifts again.

T+12hours: still getting visuals; insomnia for long time & tiredness.

## USE IN COMBINATION WITH OTHER COMPOUNDS

Usual combinations are given below:

- With 5-APB to get more euphoria and to prolong the effects
- With 1,4 Butanediol to make the user more sociable
- With methylone to add more euphoria and to get feel like MDM
- With Mephedrone, Methylone and MDAI – severe toxic effect (heart – severe tachycardia; brain- insomnia, headaches) lasted for 3 days.

[17] [18] [19] [35]

## PHARMACOLOGICAL CHARACTERISTICS

6-APB is believed to release serotonin, norepinephrine and dopamine. Although it has not been assayed or validated, it is thought to be an agonist at the 5-HT<sub>2C</sub> serotonin receptor as well as at the 5-HT<sub>2A</sub> and 5-HT<sub>2B</sub> receptor. [20]

## TOXICOLOGICAL EFFECTS

There is no sound evidence but it could reasonably be expected to cause neurological changes like MDA or MDMA because of the increased cytoplasmic monoamine concentrations and the oxidative stress that result particularly from dopamine. It seems rational to suppose that both 6-APB and APDB inhibit VMAT-2 and prevent vesicular uptake of monoamines, just as all monoamine releasers do.

Serotonin syndrome: Forum users warn about the possibility of serotonin syndrome especially if combined with other serotonergic compounds and the outcome can be poor (1 in 10 death rate). The compounds include psychoactive compounds such as MDAT, MDAI, 5-IAI etc as well as medications such as MAOIs, SSRIs etc. However one user who was already on an SSRI antidepressant did not find any toxicity.

The cardiovascular effects possibly result from sympathetic stimulation.

1. Supra Ventricular tachycardia.
2. Tachycardia for a long time.
3. High blood pressure.
4. Effect on liver (due to the presence of furans)
5. Jaw or whole head shaking, sometimes involve the whole body
6. It could have the potential to cause neurotoxicity.

[11] [21] [22a][22b][23] [24]

## DESIRED PSYCHOACTIVE EFFECTS

(Refer to the section on ‘Information on recreational use’)

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

The side-effects are similar to that of MDA but much more prominent than that of MDMA/ MDA. They occur as a result of sympathetic stimulation. These include:

- Many users warn about neurotoxicity and brain damage
- Severe nausea and sickness (‘violent vomiting’ ‘very distressing vomiting’ as described by some users) (very common - possibly due to serotonin release)
- tachycardia
- persistent (resting) tachycardia (even 2-3 days after ingestion)
- high blood pressure → could lead to hypertensive crisis
- high temperature
- Severe sweating

- visual disturbance
- severe headaches, not responding to analgesics
- Agitation
- Jaw and teeth clenching
- Deep midline tongue ulcer (healed in 5 days)
- Ulcers in the buccal mucosa, possibly due to biting and clenching teeth
- dry mouth
- Extreme dry eyes
- Insomnia
- Loin pain
- Prolonged diarrhoea
- Sensitivity to light
- drowsiness
- hang over the next few days
- clonus of hand and feet  
[22b] [35] [36]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Depression
- Anxiety
- Panic attacks
- Insomnia for 3-4 days
- Severe paranoid symptoms (lasting longer than that due to mephedrone)  
[25] [26] [27] [35]

## CLINICAL ADVICE

This molecule is postulated to be releasing serotonin from the nerve ending. Repetitive administration can cause serious serotonin dysfunction. Some forum user suggested that it could cause ‘serotonin syndrome’. Hence anyone with suspected overdose with 6APB could be treated as that of treatment for serotonin syndrome.

The UK National Poisons Information Service reported that it received about 32 telephone calls related to “Benzofury” toxicity. The symptoms were reported to be lasting more than 48 hours. Symptoms include hypertension, tachycardia and agitation.

[20] [b]

## RELATED FATALITIES

The Sky news reported that Alex Herriot, 19, from Edinburgh, collapsed at the RockNess Festival after taking benzofury. Two other members in his group were treated in hospital. Alex died in the hospital on 11<sup>th</sup> June 2012. The results of the post-mortem for confirmation of the substance are not yet available.

[28] [37]

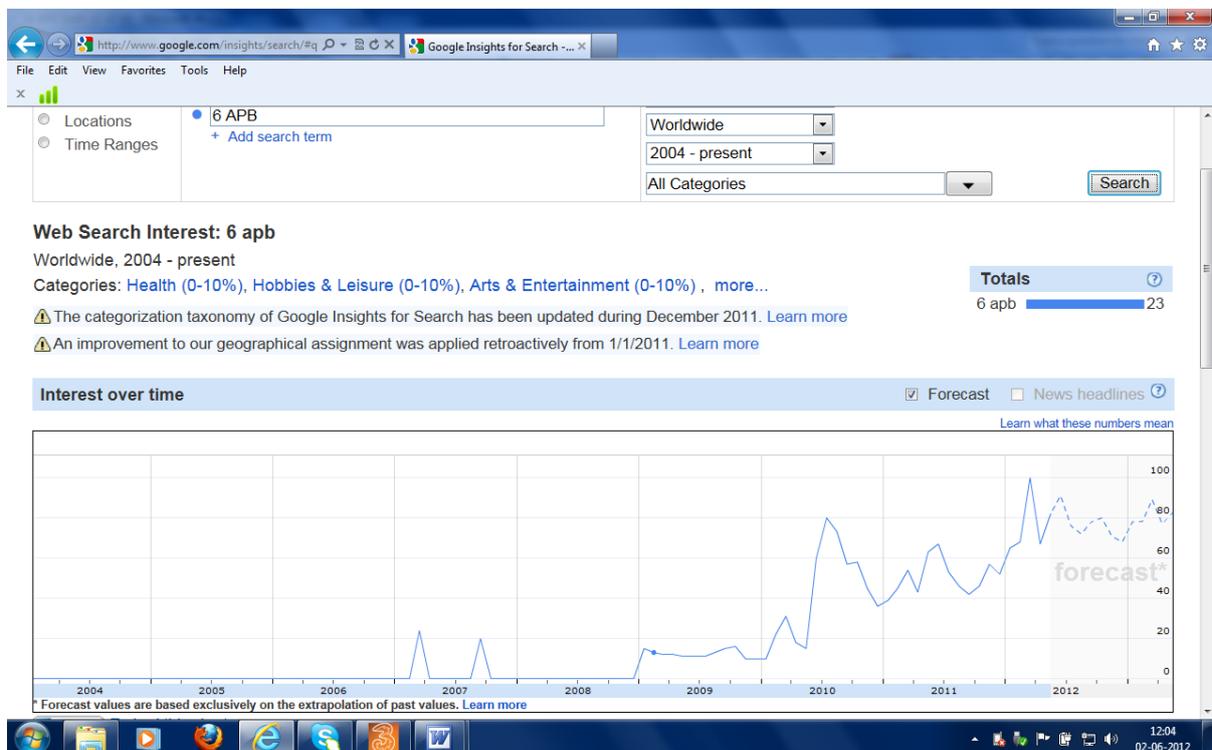
## YOU TUBE VIDEOS

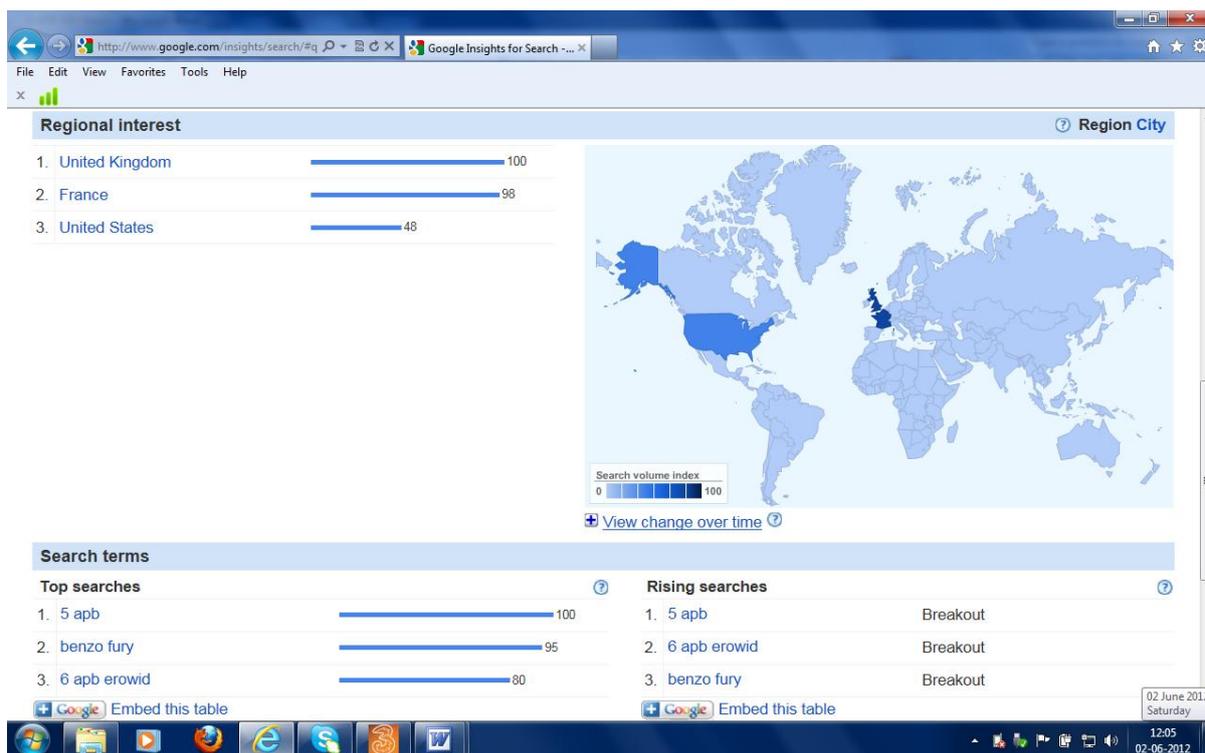
1. VMNews: Death of 19-year-old at Rockness festival linked to novel psychoactive substance 'Benzo Fury'
2. Genuine Benzo Fury EZ Test
3. Benzo Fury Official Distributors
4. Reseach Drugs
5. The Original Benzo Fury Monkey Dance
6. Heat sealer working for foil bags BENZO FURY
7. Benzo Fury in United Kingdom

[28] [29] [30] [31] [32] [33] [34]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 6-APB, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.





## 6 APDB

Web Search Interest for 6 APDB produced no result as there were not enough search volume to show graphs.

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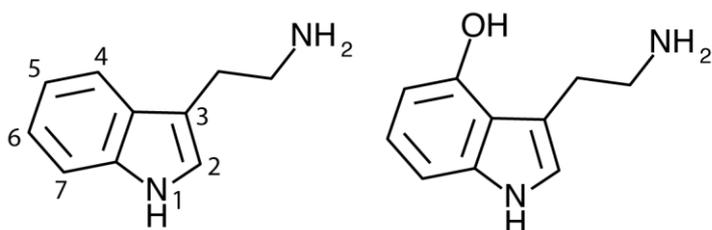
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- [33] YouTube video 6: <http://www.youtube.com/watch?v=Y3pMq-Z6ono> (Accessed May 12, 2012)
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## Chapter II: TRYPTAMINES

As discussed in Chapter I, tryptamines belongs to the group of indole alkyl amines. Tryptamines are found in a wide variety of naturally occurring resources such as plants, fungi, animals (Jones, 1982; Scott et. al, 2006). Psilocybin, a phosphoryloxy ester of tryptamine, is a hallucinogen found in ‘magic mushrooms’. Traces of DMT found in Mimosa Hostilis plant (Meckes-Lozoya et. al, 1990) is another example.

They are also found in the mammalian brain though at a very low concentrations (Scott et. al, 2006; Boulton et. al, 1982) (0.1 – 100ng/g of tissue). Serotonin, a major neurotransmitter and melatonin, involved in the sleep-wake cycle are examples of tryptamine derivatives in the brain.

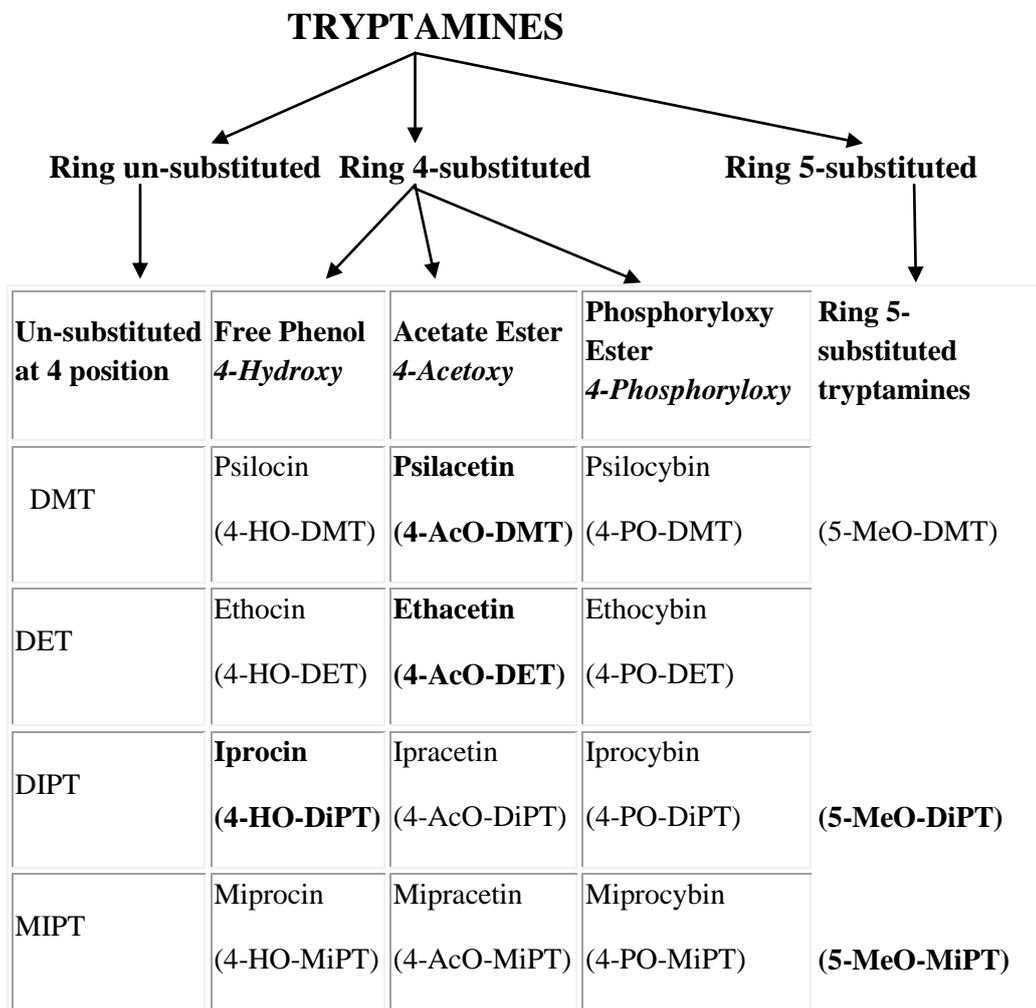


### *Structure of tryptamine and 4-hydroxy tryptamine (Countyourculture, 2013)*

Its molecular structure shows the presence of an indole ring which is formed by a bicyclic fusion of a pyrrole and benzene rings. This indole ring is attached to the terminal amine ( $-NH_2$ ) group by  $\alpha$  and  $\beta$  carbon side chain. Alteration of this molecule is done to produce compounds with hallucinogenic properties. The usual alteration occurs in the terminal amine ( $-NH_2$ ) or substitution at 4<sup>th</sup> or the 5<sup>th</sup> position of the ring.

Replacement of the two hydrogen atoms of the terminal amine group with methyl, ethyl, isopropyl or methylisopropyl leads to the formation of DMT, DET, DiPT or MiPT respectively. Further alteration of the DMT molecule with hydroxy, acetoxy and phosphoryloxy moiety at the 4<sup>th</sup> ring position gives rise to 4-HO-DMT (Psilocin), 4-AcO-DMT (Psilacetin) and 4-PO-DMT (Psilocybin) respectively. In the same way, substitution occurs for DET, DiPT and MiPT to form their respective hydroxy, acetoxy and phosphoryloxy counterparts. Substitution at the ring 5<sup>th</sup> position also forms newer

compounds. A classification (Fantegrossi et. al, 2008) of designer tryptamines is given below:



***Classification based on Fantegrossi et al.***

Thus ring substitution, especially at the 4<sup>th</sup> or 5<sup>th</sup> position of the tryptamine molecule leads to the formation of psychoactive compounds. About seven of such compounds have been discussed below in separate technical folders:

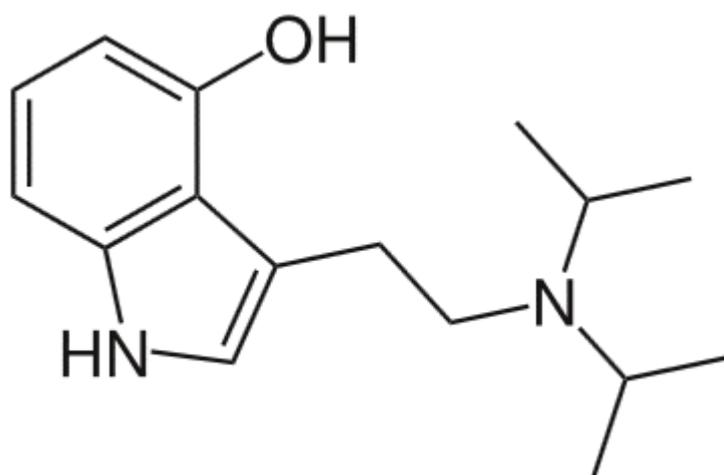
- II. I            4-Hydroxy-di-isopropyl-tryptamine (4-HO-DiPT)
- II. II           4-Acetoxy-N, N-dimethyl tryptamine (4-AcO-DMT)
- II. III          4-Acetoxy-N, N-diethyltryptamine (4-AcO-DET)
- II. IV          4-Acetoxy-N, N-diallyl tryptamine (4-AcO-DALT)
- II. V           N, N-diallyl-5-methoxytryptamine (5-MeO-DALT)

- II. VI      5-methoxy-diisopropyltryptamine (5-MeO-DiPT)
- II. VII     5-methoxy-N-methyl-N-isopropyltryptamine (5-MeO-MiPT)

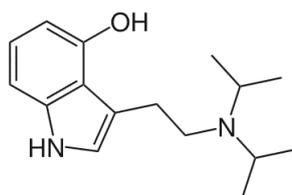
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# 4-HO-DiPT Report

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# 4-HO-DiPT



## OVERVIEW

Chemical name: 4-Hydroxy-di-isopropyl-tryptamine

Synonyms: It is commonly referred as 'Iprocin' by the online users. Other street name include Ho-Dipped; Tangerine; Jitter; Phour; Aura

Active constituents: 4-Hydroxy-di-isopropyl-tryptamine

Type: Research chemical – 4 substituted tryptamines

Origin: Alexander Shulgin has described the synthesis of this compound in his book, TiHKAL. It is not clear if anyone else synthesised 4-HO-DiPT prior to this.

Status: Novel

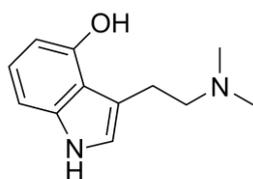
Chronology: TiHKAL was published in 1997. The compound was possibly known to the online community since 2004, as suggested by the Google Insight search.

[a] [1] [2]

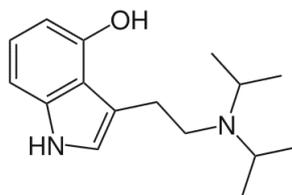
## KEY POINTS

The 4- Substituted tryptamines possess some psychedelic activity. Most popular among them are the classical Psilocin and Psilocybin. Esters can be attached to the 4<sup>th</sup> position of the indole ring giving rise to different compounds such as the 4-hydroxy or 4-acetoxy or 4-phosphoryloxy esters but with similar pharmacological properties. A table lists the possible substitution at 4-ring position and their examples.

<b>Un-substituted at 4 position</b>	<b>Free Phenol 4-Hydroxy</b>	<b>Acetate Ester 4-Acetoxy</b>	<b>Phosphoryloxy Ester 4-Phosphoryloxy</b>
DMT	Psilocin	Psilacetin	Psilocybin
DET	Ethocin	Ethacetin (4-AcO-DET)	Ethocybin
DIPT	<b>Iprocin (4-HO-DiPT)</b>	Ipracetin	Iprocybin
MIPT	Miprocin	Mipracetin	Miprocybin



Psilocin



4-HO-DiPT

4-HO-DiPT is an example of such substitution.

[b] [3] [4]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 3-[2-(diisopropylamino) ethyl]-1H-indol-4-ol

Molecular weight: 260.38 g/mol

Molecular formula: C<sub>16</sub>H<sub>24</sub>N<sub>2</sub>O

CAS Number: 63065-90-7

[5] [6]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product descriptions
Chemical Shop Ltd, Cameroon Inquire now. [7]
Want to buy 4-ho-dipt (Quantity: 250mg) Quantity Required: Contact Via Email [8]
Supplier Location – China Click to post buying lead. [9]

## AVAILABLE INFORMATION ON PURCHASE PRICE

None of the websites selling these compounds displayed the price and all of them requested the buyer to contact them through email or leave a message with contact details of the buyer in the advertising website. [7] [8] [9]

## MODALITIES OF INTAKE

4-HO-DiPT is usually taken orally at a dose of 15mgs or 20mgs and its effects last longer than other routes. Nasal insufflation is another method and the effects are felt within 5-10 minutes, but the total duration of action lasts for an hour. Users reported that smoking this compound produced immediate effect which wore off in about 10 minutes. [10] [11]

## LEGAL STATUS

4-HO-DiPT is a controlled substance in Sweden as on 1<sup>st</sup> March 2005. It is also controlled in Japan.

It is unscheduled in the USA. However, 4-HO-DiPT can be considered as an analogue of Psilocin and hence it can be covered through the Federal Analogue Act in the USA.

The UK Misuse of Drugs Act (Part 1 Class A drugs) states that (quote) “Any compound structurally derived from Tryptamine or from a ring-hydroxy Tryptamine by substitution at the nitrogen atom of a side-chain with one or more alkyl substituents but no other substituent”. This includes (quote) “mono- or di-N-substitution (e.g. DPT, DIPT, NMT, NET, MET, MPT, MIPT, EIPT, etc.), and their ring hydroxy (4-HO-DET, 4-HO-DIPT, 4-HO-MIPT, 5-HO-DET, etc.) analogues.”

This also extends to (quote) “ethers and esters of controlled substances, thereby embracing the ethers 5-MeO-DET, 5-MeO-DIPT, 5-MeO MIPT, the esters 4-Acetoxy DMT and 4-Phosphoryloxy DMT, and countless others.”

Hence 4-HO-DiPT is a class A substance in the UK. [c] [12] [13]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical. It is not intended for human consumption.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

In TiHKAL the dose range was mentioned as between 15mgs to 20mgs. The online users reported that a dose between 30mgs and 40mgs was reasonable.

Come up: 20- 30 min                      Peak: 1 hour                      Come down: 2 to 3 hours

[10] [11]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With alcohol and cannabis (the user had ‘cold chills’ and dyspnoea)
- With 5-MeO-DiPT and diazepam
- With 2C-E
- With cannabis
- With citalopram - a user reported that he was on citalopram 40mgs for about 2 months. He ingested 10mgs of 4-HO-DiPT and found the experience was more intense and lasted longer than 3 hours. He suggested that the combination with citalopram (SSRI) could have potentiated the actions of 4-HO-DiPT.

[14] [15] [16] [17]

## PHARMACOLOGICAL CHARACTERISTICS

4-HO-DiPT (4-Hydroxy-di-isopropyl-tryptamine) is 4-substituted tryptamine. There is no documented information on pharmacokinetic or pharmacodynamic characteristics on this compound. However, it is closely related to psilocin (4-Hydroxy-N,N-dimethyltryptamine), a partial 5HT<sub>2a</sub> agonist which is a well studied compound.

## TOXICOLOGICAL EFFECTS

- Sudden loss of consciousness
- Loss of consciousness fluctuation (on 24mgs) – needed treatment at the emergency department
- Severe nausea
- Constant clenching of muscles throughout the body (24mgs).
- Hypertension
- Tremors
- ‘Painful’ tremors all over the body
- Muscle spasm
- Red and dilated pupils – blur vision

[18] [19] [20] [21]

## DESIRED PSYCHOACTIVE EFFECTS

- Mild psychedelic effects
- Mild high [22]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Insomnia

- Headache [23]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

Its effects are reported to be comparatively mild. Psychotic symptoms (paranoid or visual hallucinations) are not reported by the users.

## CLINICAL ADVICE

Users advice caution in measurement of the compound, as erroneously taken high dose could lead to toxicity. [24]

## RELATED FATALITIES

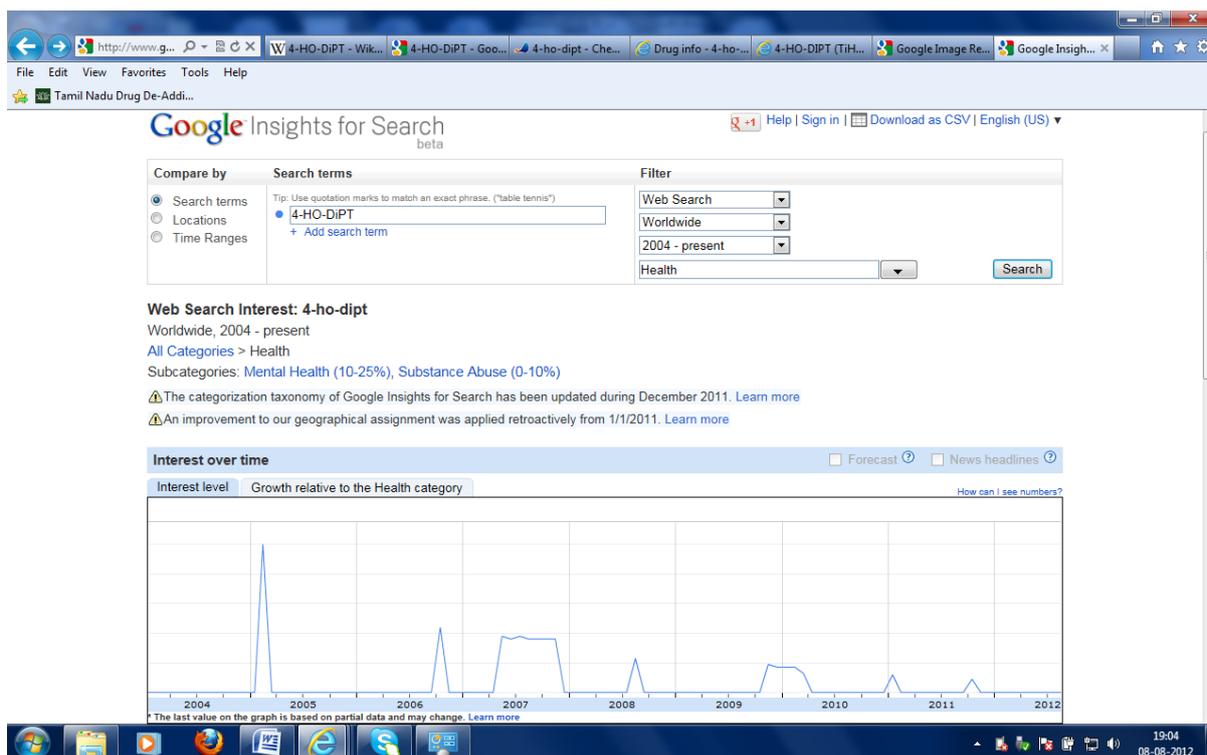
None.

## YOU TUBE VIDEOS

No You Tube videos are found on 4-HO-DiPT.

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 4-HO-DiPT, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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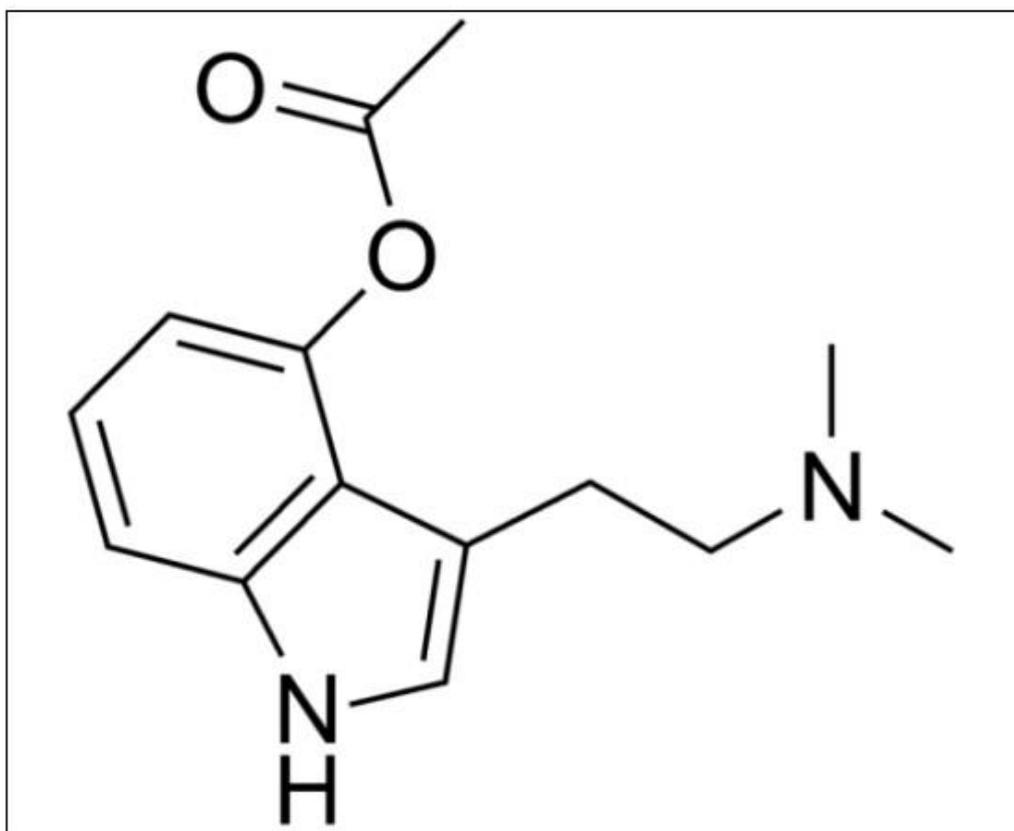
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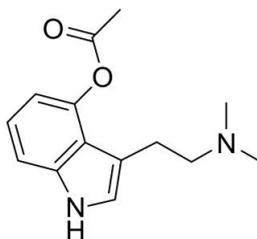
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# 4-AcO-DMT Report

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# 4-AcO-DMT



## OVERVIEW

Chemical name: 4-Acetoxy-N, N-dimethyl tryptamine

Synonyms: O-Acetylpsilocin, psilacetin, 4-AcO-DMT

Active constituents: 4-Acetoxy-N, N-dimethyl tryptamine

Type: Research chemical - Tryptamines

Origin: Forum users debate about the scientist who first synthesised this compound. Names such as Alexander Shulgin, David E. Nicholas and Hoffman were among the discussion. It is well documented in TiKAL that Shulgin synthesised 4-HO-DMT (psilocin) and he has commented about its ester, 4-AcO-DMT but not sure if he had first synthesised this compound.

Status: Novel

Chronology: It is reported by the forum users that this compounds was available to buy online since 2007.

[1] [2] [3] [4]

## KEY POINTS

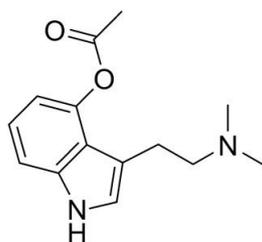
4-AcO-DMT is a psychedelic and hallucinogenic compound in the tryptamine class similar to LSD and psilocybin. It is the acetylated form of psilocin (4-HO-DMT) and is a more stable compound than psilocin, and has a longer shelf life. Forum users refer to this compound by the name "psilacetin". It is usually found in crystalline or powder form and it is sold as a fumarate or a hydrochloride salt.

Dimethyl tryptamine (DMT), Diethyl tryptamine (DET) are examples of unsubstituted tryptamines. Most popular among them are the classical Psilocin and Psilocybin. Methylated psilocin is Psilacetin and phosphorylated psilocin is psilocybin.

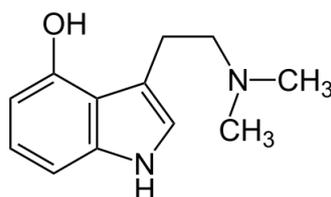
The 4- Substituted tryptamines possess psychedelic activity similar to psilocin but in an attenuated form. Esters can be attached to the 4<sup>th</sup> position of the indole ring giving rise to different compounds such as the 4-hydroxy or 4-acetoxy or 4-

phosphoryloxy esters but with similar pharmacological properties. A table lists the possible substitution at 4-ring position and their examples.

<b>Un-substituted at 4 position</b>	<b>Free Phenol 4-Hydroxy</b>	<b>Acetate Ester 4-Acetoxy</b>	<b>Phosphoryloxy Ester 4-Phosphoryloxy</b>
DMT	Psilocin	<b>Psilacetin (4-AcO-DMT)</b>	Psilocybin
DET	Ethocin	Ethacetin (4-AcO-DET)	Ethocybin
DIPT	Iprocin	Ipracetin	Iprocybin
MIPT	Miprocin	Mipracetin	Miprocybin



4-AcO-DMT



Psilocin

4-AcO-DMT is an example of such substitution.

[5] [6]

#### CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 3-[2-(Dimethylamino) ethyl]-1H-indol-4-yl acetate

Molecular weight: 246.3049 g/mol

Molecular formula: C<sub>14</sub>H<sub>18</sub>N<sub>2</sub>O<sub>2</sub>

CAS Number: 92292-84-7

[7]

#### APPEARANCE OF COMMERCIAL PRODUCTS

##### Product Description

##### Progressive research (Canada)

All compounds are priced very competitively but discounts are available on some compounds if you plan on purchasing multiple products. E-mail us to work out a price if you plan on making a larger order. All prices are in Canadian Dollars and all sales are final. Tax is included. Minimum order is \$50 before shipping. [8]

### Biochem Distribution

19 June 2012 4-AcO-DMT Freebase / 2C-D / Specials / News

We just received 4-AcO-DMT Freebase in stock. 4-AcO-DMT FREEBASE (NOT FUMARATE, 98.85% pure, color WHITE/PALE) [9]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price varied among websites. It was also dependent upon the country of delivery. One web quoted the following prices:

100mg for 13.99\$; 250mg for 27.99\$; 500mg for 54.99\$; 1g for 99.99\$; 3g for 275.99\$

Another website put a lower price as follows:

1 gram = \$120; 5 grams = \$400; 10 grams = \$700

[8] [9] [10]

## MODALITIES OF INTAKE

The most common modalities of intake are:

- oral ingestion by either swallowing the powder contained in capsules or 'bombing' (wrapping the powder in paper/ foil and swallowing); some users mixed the powder with juice and drink the mixture.
- nasal insufflation is another common method

Less common methods of administration include:

- Rectal administration
- Intra muscular injections

Rarely, few try eye-balling method.

[11]

## LEGAL STATUS

4-AcO-DMT is unscheduled in the United States, but through the Federal Analogue Act, possession could be prosecuted.

The UK Misuse of Drugs Act (Part 1 Class A drugs) states that (quote) "Any compound structurally derived from Tryptamine or from a ring-hydroxy Tryptamine by substitution at the nitrogen atom of a side-chain with one or more alkyl substituents but no other substituent". This includes (quote) "mono- or di-

N-substitution (e.g. DPT, DIPT, NMT, NET, MET, MPT, MIPT, EIPT, etc.), and their ring hydroxy (4-HO-DET, 4-HO-DIPT, 4-HO-MIPT, 5-HO-DET, etc.) analogues.”

This also extends to (quote) “ethers and esters of controlled substances, thereby embracing the ethers 5-MeO-DET, 5-MeO-DIPT, 5-MeO MIPT, the esters 4-Acetoxy DMT and 4-Phosphoryloxy DMT, and countless others.” Hence 4-AcO-DMT is a class A substance in the UK. [a]

## CURRENT USE / MEDICINAL USE

None.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

It is smoother to come up. The usual starting dose is about 10 to 25mgs. At higher doses (25mgs), body image was heavily distorted.

Come up: 30 – 40min                      Peak: 2 hour                      Come down: 4 - 6 hours

[12] [13]

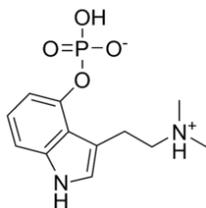
## USE IN COMBINATION WITH OTHER COMPOUNDS

- With MXE (Visuals candy, but more confusing)
- With 4-HO-MET (considered self harming, visual hallucination of devil, angels and death cat)
- With 4-ACO-MIPT (Paranoia)
- With 2C-C-NBOMe and DXM
- With 5-MeO-DMT
- With 2C-T7
- With 2C-E
- With DMT
- With alcohol, ketamine and nitrous oxide
- With cannabis
- With 6-APB

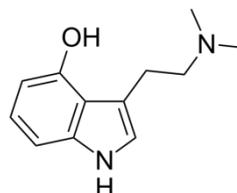
[14] [15]

## PHARMACOLOGICAL CHARACTERISTICS

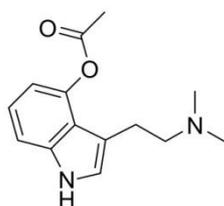
The structural similarity with other well known compounds such as psilocin and psilocybin is given below:



Psilocybin (4-Phosphoryloxy-DMT)



Psilocin (4-Hydroxy-DMT)



Psilacetin (4-Acetoxy-DMT)

4-AcO-DMT is quickly de-acetylated in the liver to psilocin by the enzyme Deacetylases. [16] [17]

## TOXICOLOGICAL EFFECTS

Its action may be similar to that of psilocybin given the structural similarities. However, there are no human toxicological studies and hence its harmful effects are unknown. It is reported by few users that it may produce idiosyncratic reactions.

Users warn other not to combine 4-Acetoxy-DMT with MAOI type of antidepressants such as phenelzine, tranylcypromine, isocarboxazide and moclobemide. [18]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria
- Increased energy
- Increased stimulation
- Enhanced tactile sensations
- Enhanced appreciation of music
- Sense of spiritual insight and fulfilment

[19]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Severe headache
- Nausea
- Temporary hypertension (elevated blood pressure)
- Jaw clenching / gurning
- Gastrointestinal discomfort (nausea, abdominal cramps, diarrhoea)
- Muscle weakness
- Mydriasis (pupil dilation)
- Compulsive yawning

[20] [21]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Strong amplification of emotions (both positive and negative)
- Altered perception of space and time (especially at high doses)
- Inability to concentrate
- Obsessive behaviour and random compulsions
- Severe psychotic syndrome characterised by ‘ego death’, nihilistic / somatic delusions (belief that ‘internally bleeding’ and ‘contracted a fatal disease from the dog’ and ‘I’m going to die’). The user suffered severe symptoms and he vowed that he would not try research chemicals again.
- Visual and auditory hallucinations
- Accelerated but unfocussed thought processes
- Emotional instability (sense of terror, paranoia, panic attacks, psychotic episodes)
- Dysphoria and confusion (increased risk of inadvertent injury)

[22] 23]

## CLINICAL ADVICE

None.

## RELATED FATALITIES

None.

## YOU TUBE VIDEOS

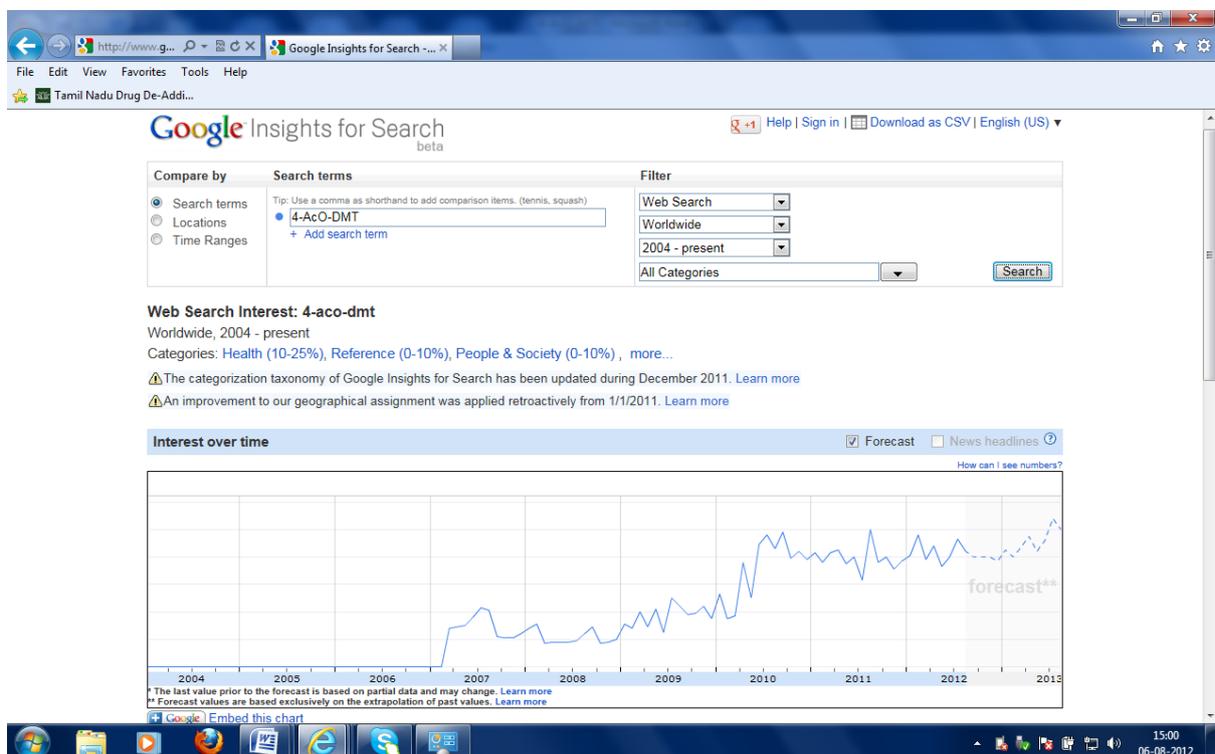
1. You Tube Video 1: 4-AcO-DMT
2. You Tube Video 2: 4-AcO-DMT trip report
3. You Tube Video 3: 4-AcO-DMT
4. You Tube Video 4: Buy 4-AcO-DMT
5. You Tube Video 5: 4-AcO-DMT M.S.D.S (Material Safety Data Sheet)

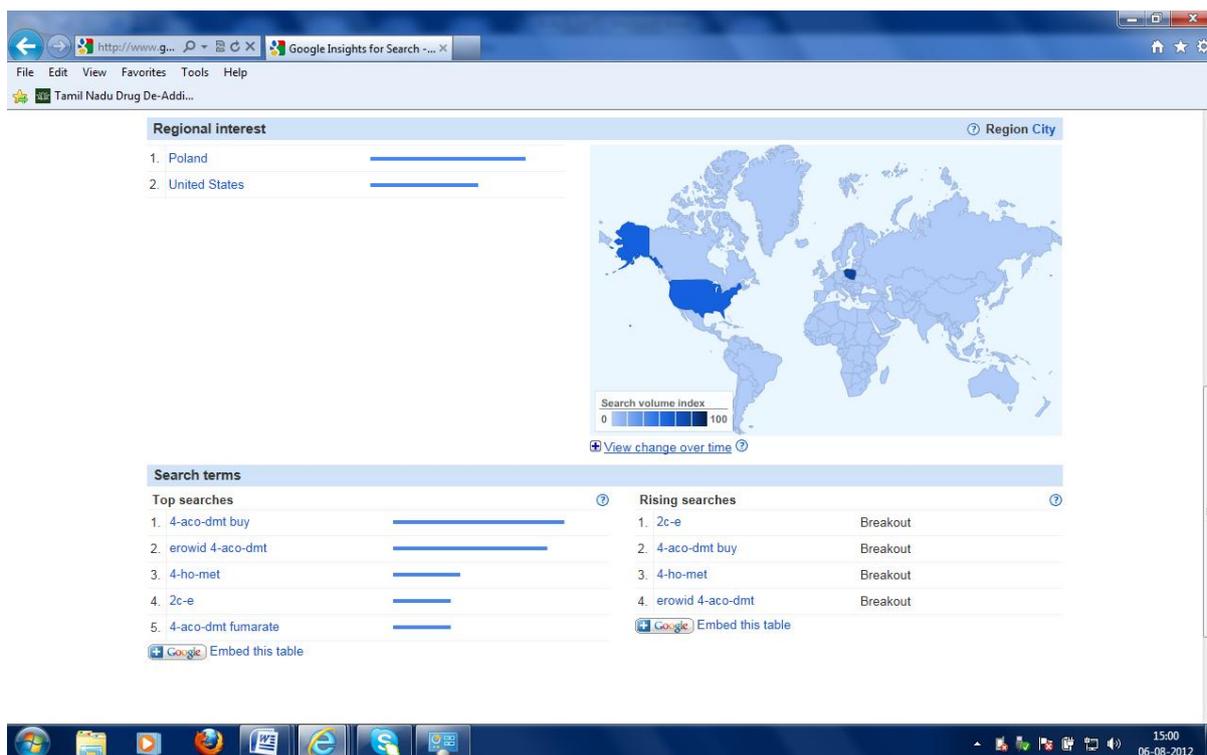
## 6. You Tube Video 6: trip report 80mgs 4-AcO-DMT

[24] [25] [26] [27] [28] [29]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 4-AcO-DMT, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.





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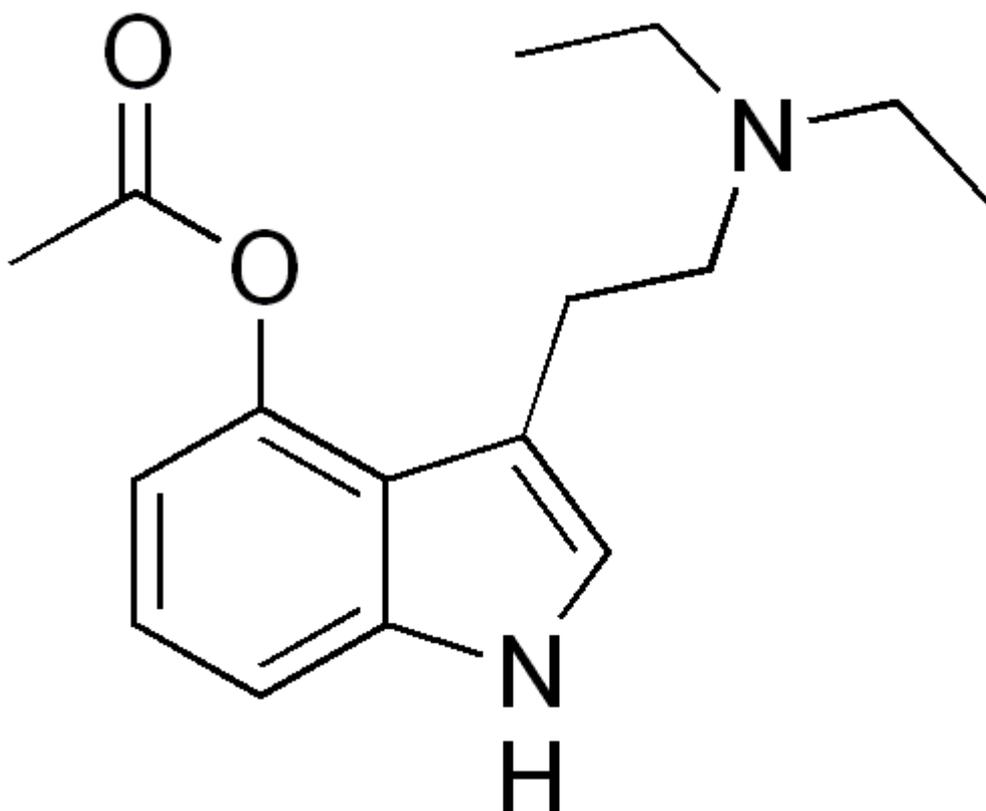
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- [18] [http://www.erowid.org/chemicals/4\\_acetoxy\\_dmt/4\\_acetoxy\\_dmt\\_basics.shtml](http://www.erowid.org/chemicals/4_acetoxy_dmt/4_acetoxy_dmt_basics.shtml) (Accessed July 15, 2012)
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- [20] <http://www.drugs-forum.com/forum/showwiki.php?title=4-AcO-DMT> (Accessed July 15, 2012)
- [21] <http://www.bluelight.ru/vb/threads/262868-The-Big-and-Dandy-4-AcO-DMT-Thread/page21> (Accessed July 15, 2012)
- [22] <https://mycotopia.net/fora/shroom-dump/64369-4-aco-dmt-qualitative-comments.html> (Accessed July 15, 2012)
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- [26] YouTube video 3: <http://www.youtube.com/watch?v=-rnXs7RL6GY> (Accessed July 15, 2012)
- [27] YouTube video 4: <http://www.youtube.com/watch?v=sECmxH6k2mE> (Accessed July 15, 2012)
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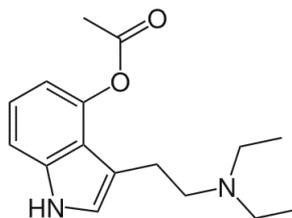
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# 4-AcO-DET Report

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# 4-AcO-DET



## OVERVIEW

Chemical name: 4-Acetoxy-N, N-diethyltryptamine

Synonyms: 4-Acetoxy-DET, ethacetin, ethylacybin or 4-AcO-DET

Active constituents: 4-Acetoxy-N, N-diethyltryptamine

Type: Research chemical – Tryptamine class

Origin: Albert Hofmann synthesised this compound first in 1958 in Sandoz laboratory.

Status: Novel

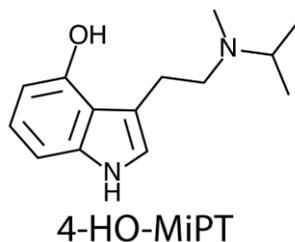
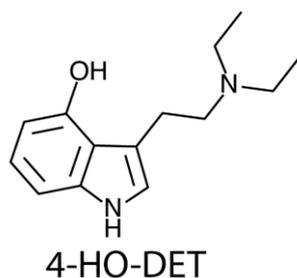
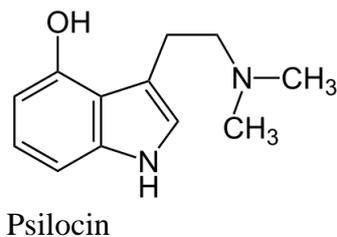
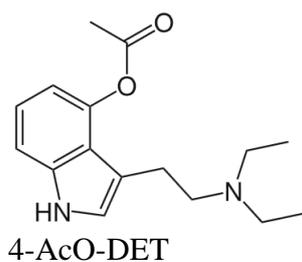
Chronology: Though the compound was synthesised long back, its use in the black market was known since 2001.

[1]

## KEY POINTS

DMT, DET are examples of un-substituted tryptamines. The 4- Substituted tryptamines possess psychedelic activity. Most popular among them are the classical Psilocin and Psilocybin. Esters can be attached to the 4<sup>th</sup> position of the indole ring giving rise to different compounds such as the 4-hydroxy or 4-acetoxy or 4-phosphoryloxy esters but with similar pharmacological properties. A table lists the possible substitution at 4-ring position and their examples.

<b>Un-substituted at 4 position</b>	<b>Free Phenol 4-Hydroxy</b>	<b>Acetate Ester 4-Acetoxy</b>	<b>Phosphoryloxy Ester 4-Phosphoryloxy</b>
DMT	Psilocin	Psilacetin	Psilocybin
DET	Ethocin	<b>Ethacetin (4-AcO-DET)</b>	Ethocybin
DIPT	Iprocin	Ipracetin	Iprocybin
MIPT	Miprocin	Mipracetin	Miprocybin



4-AcO-DET is an example of such substitution. [1] [2] [a]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 3-(2-Diethylaminoethyl)-1H-indol-4-yl acetate

Molecular weight: 273.36 g/mol

Molecular formula: C<sub>16</sub>H<sub>22</sub>N<sub>2</sub>O<sub>2</sub>

CAS Number: Unknown

[3] [4]

## APPEARANCE OF COMMERCIAL PRODUCTS

### Product description

#### Best RC

Strictly not for human consumption!

If you are from Sweden, Finland... Customs in your country are very strict; packages/letters are being seized very often; notice that we do not take any responsibility for seizures. Think twice before you order. [5]

#### Promos-Chem (Europe)

This product can be delivered only via courier service.

This product is NOT for human consumption!

Can be used for laboratory purposes only!

Contact us: [sales@xxxxxx-xxxx.com](mailto:sales@xxxxxx-xxxx.com) [6]

### Progressive research (Canada)

All compounds are priced very competitively but discounts are available on some compounds if you plan on purchasing multiple products. E-mail us to work out a price if you plan on making a larger order. All prices are in Canadian Dollars and all sales are final. Tax is included. Minimum order is \$50 before shipping. [7]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price varied among websites. It was also dependent upon the country of delivery. One web quoted the following price: 100mgs costs €18; 500mgs €68; 1 gram €120; 5 grams €500

Another website quoted a lower price as follows: 5 grams €330; 25 grams €900

Another website quoted the following prices in dollars:

<b>4-AcO- DET</b>	250 mg	500 mg	1000 mg	2000 mg	5000 mg
	\$70	\$105	\$182	\$350	\$725

[5] [6] [7]

## MODALITIES OF INTAKE

The most common modalities of intake are:

- Oral ingestion by either swallowing the powder contained in capsules or 'bombing' (wrapping the powder in paper/ foil and swallowing); some users mixes the powder with juice and drink the mixture.
- Nasal insufflation is another common method

Less common methods of administration include:

- Rectal administration
- Intra muscular injections

[1] [8]

## LEGAL STATUS

The UK Misuse of Drugs Act (Part 1 Class A drugs) states that (quote) "Any compound structurally derived from Tryptamine or from a ring-hydroxy Tryptamine by substitution at the nitrogen atom of a side-chain with one or more alkyl substituents but no other substituent". This includes (quote) "mono- or di-N-substitution (e.g. DPT, DIPT, NMT, NET, MET, MPT, MIPT, EIPT, etc.),

and their ring hydroxy (4-HO-DET, 4-HO-DIPT, 4-HO-MIPT, 5-HO-DET, etc.) analogues.” This also extends to (quote) “ethers and esters of controlled substances, thereby embracing the ethers 5-MeO-DET, 5-MeO-DIPT, 5-MeO MIPT, the esters 4-Acetoxy DMT and 4-Phosphoryloxy DMT, and countless others.”

4-AcO-DET is a 4-substituted acetate ester of tryptamine and hence a class A substance in the United Kingdom.

It is unscheduled in the United States, but through the Federal Analogue Act, possession could be prosecuted. [b]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The users report effects similar to that of psilocybin, but at a very milder experience. Some users their dislike for this compound due to its lack of the ‘depth’ of experience and the ‘magic’ experience of mushrooms. The usual starting dose is about 5 to 10mgs. At higher doses (25mgs), body image was heavily distorted. The hang over could last for about 2 days.

Come up: 10 – 20min            Peak: 1 hour            Come down: 3 - 4 hours

[8] [9]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With Ketamine
- With 2C-T2, salvia, mushroom and opium
- With 4-Acetoxt-DIPT
- With 5-MeO-DIPT
- With MBDB
- With nitrous oxide
- With 2C-1 and oxycodon

[10]

## PHARMACOLOGICAL CHARACTERISTICS

It is rapidly hydrolysed into 4-HO-DET by esterases. It has relatively short duration of action.

[11]

## TOXICOLOGICAL EFFECTS

- Extreme anxiety during the peak
- Insomnia
- Tiredness

[12] [13]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria
- Body high
- Sexual stimulation
- Out of body experience
- Out of touch with reality
- Religious experience/ introspection
- Overwhelming emotions
- Good visuals

[14] [15]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Palpitation
- Increased body temperature
- raised blood pressure
- nausea
- hypersalivation
- reduced reaction of the pupils indicating mydriasis
- increased reflexes
- coordination disturbances
- difficulty in speech articulation
- dysphoria
- restlessness
- clouded consciousness

[16]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

4-AcO-DET produces psychopathological disturbances similar to that of psilocin, LSD, and mescaline. The most frequent effects reported were:

- distortion of body image (very common)
- visual hallucinations (very common)
- auditory hallucinations
- paranoid delusions
- time distortion
- At higher doses, extreme psychotic symptoms - depersonalization, delirium, schizophrenia like symptoms (delusions/ hallucinations, catatonia).

[16] [17] [18] [19] [a]

## CLINICAL ADVICE

None.

## RELATED FATALITIES

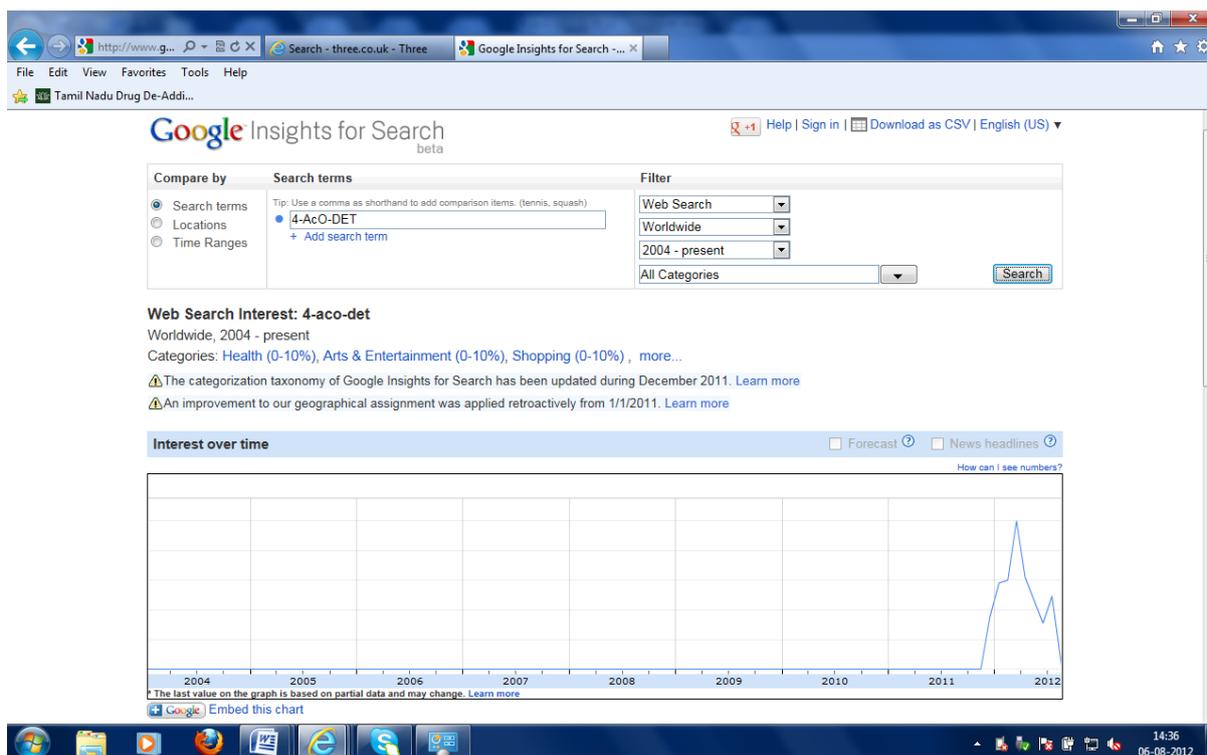
None reported.

## YOU TUBE VIDEOS

There are no you tube videos on 4-AcO-DET.

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 4-AcO-DET, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



There was not enough volume to show regional interest.

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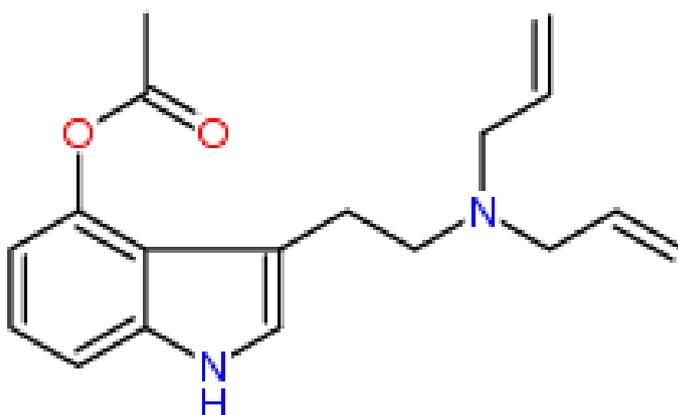
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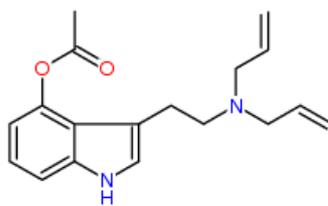
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# 4-AcO-DALT Report

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# 4-AcO-DALT



## OVERVIEW

Chemical name: 4-Acetoxy-N, N-diallyl tryptamine

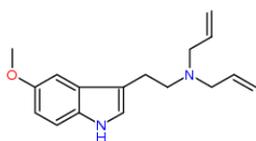
Synonyms: 4-AcO-DALT, 4-Acetoxy-DALT

Active constituents: 4-Acetoxy-N, N-diallyltryptamine; 3-[2-(Diprop-2-en-1-ylamino) ethyl]-1H-indol-4-yl acetate

Type: Research chemical – Tryptamines (Indole alkyl amine group)

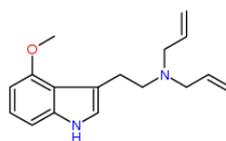
Origin: Shulgin gave the description for the preparation of 5-MeO-DALT. While exploring a number of changes to the 5 MeO DALT (Figure 1), he suggested relocation of the oxygen in the indole ring over to the 4<sup>th</sup> position which gives rise to 4 MeO DALT. By hydrogenation the benzyl ether (Figure 2) another product 4-HO-DALT is formed, which is an analogue of Psilocin. Then by acetylation of 4-HO-DALT, this new compound (4-AcO-DALT) is formed. [1]

Figure 1



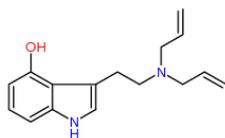
5 MeO DALT →

Figure 2



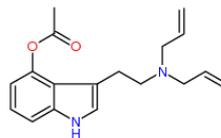
4 MeO DALT

Figure 3



4 HO-DALT →

Figure 4



4 AcO DALT

Status: Novel

## KEY POINTS

4-AcO-DALT is a tryptamine and can be obtained by acetylation of its analogue 4-HO-DALT. This is not a very popular compound and very little is known about it.

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 3-[2-(Diprop-2-en-1-ylamino) ethyl]-1H-indol-4-yl acetate  
Molecular weight: Not available  
Molecular formula: C<sub>18</sub>H<sub>22</sub>N<sub>2</sub>O<sub>2</sub>  
CAS Number: Not available [1] [2]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product Description
<b>Al.khowahir.chemicals.trading.ltd</b> Minimum order: 100grams Place of origin: Dubai, UAE [3]
<b>Gong Chang</b> Min. Order Quantity: 10 Gram Port: Moscow Price: 10-15 USD /Gram Payment Terms: Western Union, MoneyGram Delivery Time: 2 days, 3 days Maximum [4] [5]

## AVAILABLE INFORMATION ON PURCHASE PRICE

100mgs of 4 Aco-DALT cost €28.00/ 250 mgs costs €55.00/ 1gram costs €192.00

Some websites do not offer any price but requests the buyers to contact them by email. [6]

## MODALITIES OF INTAKE

Oral ingestion is the usual mode of intake. Users complain about bitter taste which is persistent for long time.

Very rarely, the IV route was tried. The psychoactive compound was mixed with citric acid in a saline solution and given as IV bolus. A smaller dose  $\frac{1}{2}$  to  $\frac{1}{3}$ <sup>rd</sup> of the original dose (15-20mg) was used.

It can be smoked as well, but does not produce intense effect.

Nasal route was also tried at 20mgs but no burning sensation was reported.

[7] [8] [9] [10]

## LEGAL STATUS

The UK Misuse of Drugs Act (Part 1 Class A drugs) states that (quote) “Any compound structurally derived from Tryptamine or from a ring-hydroxy Tryptamine by substitution at the nitrogen atom of a side-chain with one or more alkyl substituents but no other substituent”. This includes (quote) “mono- or di-N-substitution (e.g. DPT, DIPT, NMT, NET, MET, MPT, MIPT, EIPT, etc.), and their ring hydroxy (4-HO-DET, 4-HO-DIPT, 4-HO-MIPT, 5-HO-DET, etc.) analogues.”

This also extends to (quote) “ethers and esters of controlled substances, thereby embracing the ethers 5-MeO-DET, 5-MeO-DIPT, 5-MeO MIPT, the esters 4-Acetoxy DMT and 4-Phosphoryloxy DMT, and countless others”. Hence 4-AcO-DALT is a class A substance in the UK.

[a]

## CURRENT USE / MEDICINAL USE

One user suggested trying for cluster headaches, possibly due to the strong 5-HT agonistic effect.

[11]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The usual start dose is 35mgs, although few users have found no effect til 50mgs.

Recreational, it the effects produced are comparable to those produced by mushrooms.

Come up: 30min      Peak: 2 hours      Come down: 6 hours (Oral use)

Come up: Instant      Peak: few minutes      Come down: 60 min (IV use)

[12] [13] [14]

## USE IN COMBINATION WITH OTHER COMPOUNDS

None reported.

## PHARMACOLOGICAL CHARACTERISTICS

None available.

## TOXICOLOGICAL EFFECTS

Re-dosing produced a feeling that the person was going to die.

Smoking this compound could cause harm to the lungs due to the by produce, Psilocin.

[14] [15]

## DESIRED PSYCHOACTIVE EFFECTS

- Increased talkativeness
- Mild raised sexual feelings
- Euphoria; very playful
- Mild visuals [16]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Redness on face
- Tachycardia
- Intense anxiety (as if going to die)
- Users described it as ‘a near death experience’ requiring emergency services to be altered and treated at the A&E department.
- Violent vomiting
- Clenching the jaws
- Chest tightness similar to DMT
- Joint laxity [17]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Depression
- Frequent crying
- Huge release of emotions [18]

## CLINICAL ADVICE

It is a research chemical belonging to the class of Tryptamines. They seem to act on the 5-HT<sub>2</sub> receptors. Combinations with other compounds or antidepressants (MAOIs, TCAs, SSRIs) or overdose can produce the ‘serotonin syndrome’; so the users need to be cautious and avoid such combinations.

## RELATED FATALITIES

None reported so far.

## YOU TUBE VIDEOS

None available.

## GOOGLE INSIGHTS

A search from 2004 to the present did not show graphs.

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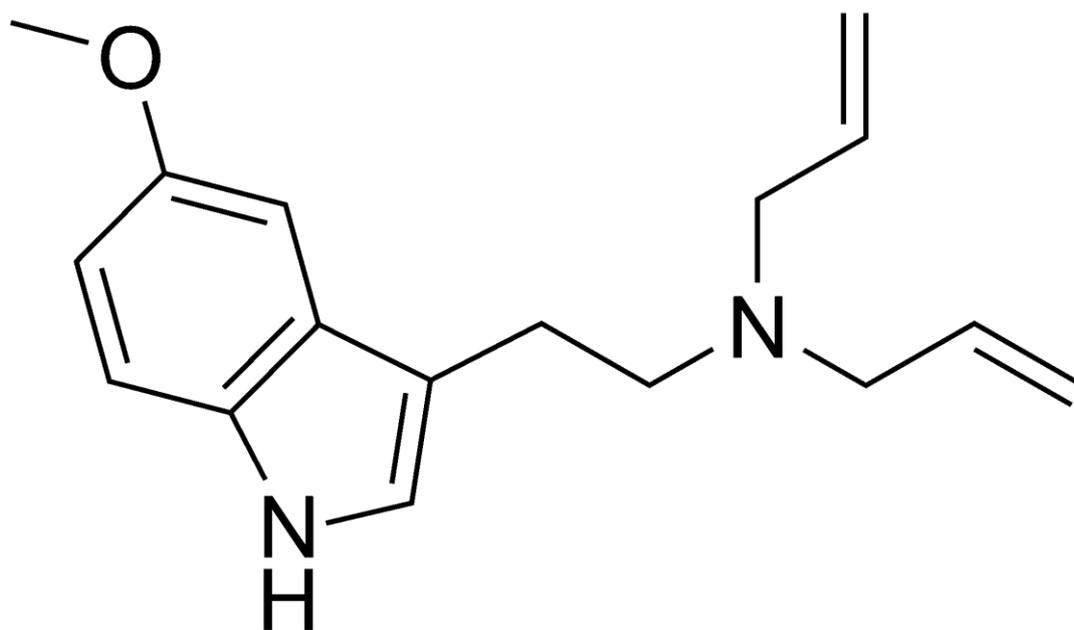
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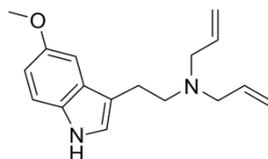
# 5-MeO-DALT Report

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# 5-MeO-DALT



## OVERVIEW

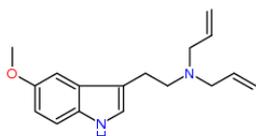
Chemical name: N, N-diallyl-5-methoxytryptamine

Synonyms: 5-MeO-DALT, 5-Methoxy-DALT; Tryptamine, N, N-diallyl-5-methoxy; N,N-Diallyl-5-methoxytryptamine; Indole, 3-[2-(diallylamino)ethyl]-5-methoxy; 3-[2-(Diallylamino)ethyl]-5-methoxyindole

Active constituents: N, N-diallyl-5-methoxytryptamine

Type: Research chemical – Tryptamine (Psychostimulant)

Origin: Shulgin gave the description for the preparation of 5-MeO-DALT in 2004. [1a]



5 MeO DALT

Status: Novel

## KEY POINTS

5 MeO DALT is, surprisingly not a popular compound possibly due to its low intensity of psychedelic experience. It is unique in that it has got rapid onset of action and very quick duration of action with peak occurring in minutes and the total duration lasts only several minutes. It is rapidly absorbed from the stomach and metabolised rapidly. [1a]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: N-allyl-N-[2-(5-methoxy-1H-indol-3-yl) ethyl] prop-2-en-1-amine

Molecular weight: 270.375 g/mol

Molecular formula: C<sub>17</sub>H<sub>22</sub>N<sub>2</sub>O

CAS Number: 928822-98-4 [1b] [2]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product description</b>
<b>GKM Global Chemicals</b>  We have available 5-MeO-DALT research chemical  A fine white powder  Contact us for more details [3]
<b>Herbal Shop</b>  The full chemical name of N,N-diallyl-5-methoxytryptamine is N-allyl-N-[2-(5-methoxy-1H-indol-3-yl)ethyl]prop-2-en-1-amine. <b>5-MeO-DALT</b> has a strong structural relationship to DALT and 5-MeO-DPT. Its chemical formula is C <sub>17</sub> H <sub>22</sub> N <sub>2</sub> O and molecular  ON SALE! \$8.00 tax incl. [4]
<b>Bulk Research Chemicals</b>  Our 5-MeO-Dalt is certified at 99%+ Purity. You can buy 2g from this page; free standard delivery is included with this product.  £44.00 tax incl. [5]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price varied marginally from different vendors. One website quoted a price of £40 for 3 grams of 5 Meo DALT and another quoted £44 for 2 grams. [6] [7]

## MODALITIES OF INTAKE

Most common methods:

Oral ingestion is the usual way but this compound can be inhaled by vaporisation (through a water pipe).

Another popular method is known as 'Bombing' – rolling the powder in a rizla paper and then orally ingesting the bomb.

Least common:

They include nasal insufflations and IV route.

[8a] [8b] [8c]

## LEGAL STATUS

Some users argue that 5-MeO-DALT (N, N-diallyl-5-methoxytryptamine) is a derivative of tryptamine which is legal in the UK. Their debate is based on the following: The (UK) law requires the alkyl group (C<sub>n</sub>H<sub>2n+1</sub>) to be present in the Tryptamine to make it illegal. In this compound the alkyl group is substituted by the allyl group (H<sub>2</sub>C=CH-CH<sub>2</sub>R) to make it legal.

However, the UK Misuse of Drugs Act (Part 1 Class A drugs) states that (quote) “Any compound structurally derived from Tryptamine or from a ring-hydroxy Tryptamine by substitution at the nitrogen atom of a side-chain with one or more alkyl substituents but no other substituent”. This includes (quote) “mono- or di-N-substitution (e.g. DPT, DIPT, NMT, NET, MET, MPT, MIPT, EIPT, etc.), and their ring hydroxy (4-HO-DET, 4-HO-DIPT, 4-HO-MIPT, 5-HO-DET, etc.) analogues.”

This also extends to (quote) “ethers and esters of controlled substances, thereby embracing the ethers 5-MeO-DET, 5-MeO-DIPT, 5-MeO MIPT, the esters 4-Acetoxy DMT and 4-Phosphoryloxy DMT, and countless others”.

Hence 5-MeO-DALT is a class A substance in the UK.

[a] [8d] [8e]

## CURRENT USE / MEDICINAL USE

None.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

This compound is very short acting one and hence it is a preferred compound for people who work, as the total experience can be completed within 2 hours. The usual dose is between 12 to 20mgs.

Come up: 15 minutes                      Peak: 60 minutes                      Come down: 2-4 hours

## USE IN COMBINATION WITH OTHER COMPOUNDS

As the effects produced can be mild, the forum users suggest combining with cannabis to get psychedelic effects similar to LSD.

Combination of JWH-018 and JWH-073 with 25 mgs of 5 MeO-DALT produced extreme tachycardia and intense fear of dying. Also another combination with JWH-250 was reported.

It is also combined with salvia to intensify the effects.

The combination with 2C-C was to intensify the euphoria, but precipitated severe anxiety. [9] [10] [11a] [11b]

## PHARMACOLOGICAL CHARACTERISTICS

An animal experiment (Nonaka, et al 2007) revealed that 5-MeO-DALT was highly potent and achieved G-protein activation through 5HT1 receptor. However it did not have any effect on dopamine or norepinephrine system.

[b]

## TOXICOLOGICAL EFFECTS

- Retrograde amnesia
- Violent vomiting
- Tightness of chest and difficulty in breathing
- Seizure; required treatment at the A&E department

[12] [13]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoric rush
- Empathy
- Dissociative state (as described as +++) can be extremely fearful

[14]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Burning sensation under the tongue
- Nausea
- Vomiting [15]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- The compound causes altered sensorium, dream like state
- Anxiety
- Transient paranoid delusions
- Transient auditory hallucinations [16]

## CLINICAL ADVICE

The forum users warn not to use with other compounds as the effects and toxicity is more pronounced and also not go above the dose of 20mgs.

## RELATED FATALITIES

None.

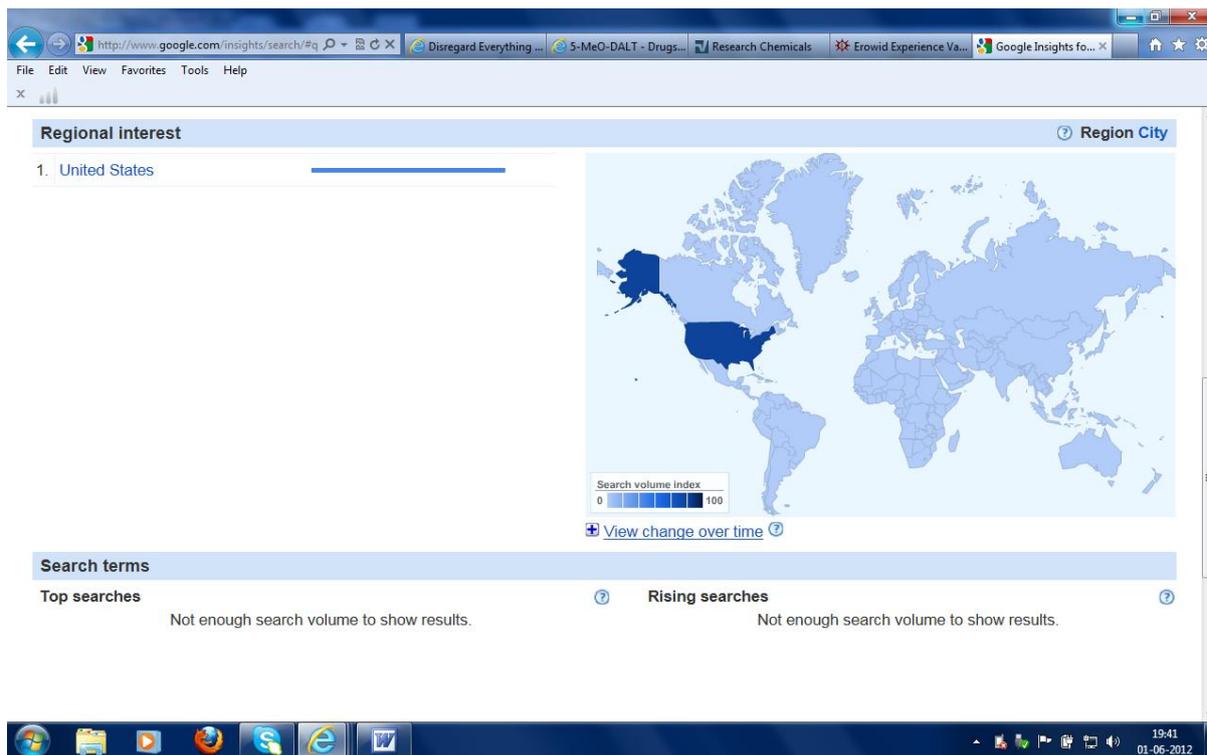
## YOU TUBE VIDEOS

None.

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 5-MeO-DALT, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.





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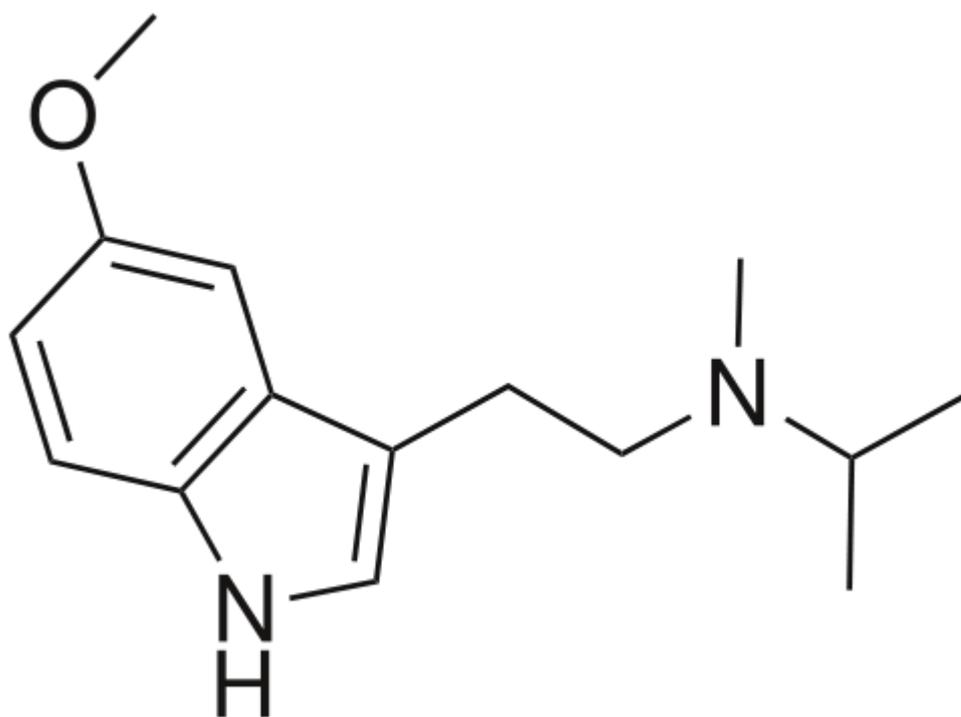
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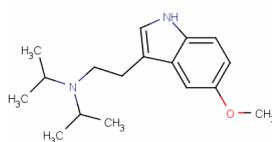
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# 5-MeO-DiPT Report

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# 5-MeO-DiPT

## OVERVIEW

Chemical name: 5-methoxy-diisopropyltryptamine (5-MeO-DiPT)

Synonyms: Foxy; Foxy methoxy; 5-MeO-DiPT

Active constituents: 5-methoxy-diisopropyltryptamine

Type: Research chemical – Ring position 5- substituted tryptamine

Origin: Shulgin synthesised 5-MeO-DiPT and published it in 1981. It was also included in his book, TiHKAL, published in 1997.

Status: Novel

Chronology: It was reported to be a very popular compound among online users from 1999 to 2003. However, subsequent to its ban in 2003 in the USA, the sale had gone down. Yet it is still available on line for purchase.

[1]

## KEY POINTS

5-MeO-DiPT is a psychedelic tryptamine which is formed by attaching a methoxyl group at position 5 of the tryptamine ring. Generally, its effects are greater when compared with un-substituted tryptamine.

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: N-[2-(5-methoxy-1H-indol-3-yl) ethyl]-N-propan-2-ylpropan-2-amine

Molecular weight: 274.40114

Molecular formula: C<sub>17</sub>H<sub>26</sub>N<sub>2</sub>O

CAS Number: 4021-34-5

[2] [3] [4] [5]

## APPEARANCE OF COMMERCIAL PRODUCTS

### Product Description

#### **Buy Best RC**

WE DID NOT CREATE this list. This list does not have in common with legality in each countries etc. We got this list from a third party company and we are FORCED to comply with it. Buyers are responsible to check legality before making a purchase!

5-MeO-DiPT: No shipping to: Germany, Denmark, Sweden, Greece, USA [6]

#### **Tiger food**

We are now able to accept bulk orders- please have a look at the available products.

None of the products sold on this site are intended for human consumption. All sales are for over 18's only. [7]

## AVAILABLE INFORMATION ON PURCHASE PRICE

Most websites requested the buyer to contact them through email or leave a reply message on their advertising website or message board. One website quoted the following price for 5-MeO-DiPT: 100mg €18; 250mgs €35; 500mgs €68; 1g €120; 2g €225; 3g €330. [6] [7]

## MODALITIES OF INTAKE

Oral ingestion is the common method of consumption.

Smoking - unlike other synthetic tryptamines such as DMT or 5-MeO DMT, the effects of 5-MeO-DiPT gradually build up and last longer.

It can be injected intra venously or intra muscularly. The users advice to start at a very low dose (lower than the oral dose – 4mgs). The injection was reported to be very painful.

A case report mentioned per rectal administration of aqueous solution of 5-MeO-DiPT. [b] [4] [8] [9]

## LEGAL STATUS

In the USA, 5-MeO-DiPT was placed under temporary scheduling along with AMT (alpha methyl tryptamine) in 2003 and then permanently under Class 1 of the Controlled Substances Act in 2004.

The UK Misuse of Drugs Act (Part 1 Class A drugs) states that (quote) “Any compound structurally derived from Tryptamine or from a ring-hydroxy Tryptamine by substitution at the nitrogen atom of a side-chain with one or more alkyl substituents but no other substituent”. This includes (quote) “mono- or di-N-substitution (e.g. DPT, DIPT, NMT, NET, MET, MPT, MIPT, EIPT, etc.), and their ring hydroxy (4-HO-DET, 4-HO-DIPT, 4-HO-MIPT, 5-HO-DET, etc.) analogues.” This also extends to (quote) “ethers and esters of controlled substances, thereby embracing the ethers 5-MeO-DET, 5-MeO-DIPT, 5-MeO MIPT, the esters 4-Acetoxy DMT and 4-Phosphoryloxy DMT, and countless others.” Hence 5-MeO-DiPT is a class A substance in the UK.

It is a controlled substance in countries such as Germany, Greece, Denmark, Japan, Singapore and Sweden.

[d] [10] [11]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical and not intended for human consumption.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

It has a strong smell and taste (due to indole) and hence it could be unpleasant to take it orally. Users blend it with juice and drink the mixture. The usual dose is between 6mgs and 12 mgs.

Come up: several minutes      Peak: 2 hours      Come down: 4 to 6 hours

[4] [12]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With MDMA and alprazolam (unconfirmed death report on this combination)
- With 2C-B (severe sickness and increased body load)
- With ketamine (very unpleasant and anxiety provoking)

[12] [13]

## PHARMACOLOGICAL CHARACTERISTICS

5 MeO-DiPT is a synthetic tryptamine discovered recently by the online drug misuse communities. A study showed that 5 MeO-DiPT inhibited the re-uptake of monoamines such as dopamine, serotonin and norepinephrine, but it had very little effect on their release. [f]

## TOXICOLOGICAL EFFECTS

- Temporary paralysis of limbs and mild hallucinations
- Flash backs
- Acute cardiac failure
- Neurotoxicity
- Rhabdomyolysis and possibly serotonin syndrome

[a] [c] [e] [14]

## DESIRED PSYCHOACTIVE EFFECTS

- Mild euphoria
- Empathy
- Sexual stimulation

[b] [15] [1] [1] [1]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Excess salivation
- Severe nausea and vomiting, especially doses more than 12mgs
- Visual and auditory distortions
- Insomnia

[b] [16] [17] [4]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

It causes paranoia and hallucinations.

A case of hallucinogen-persisting perception disorder was reported in Japan. It was characterised by transient recurrence of perceptual disturbances experienced as flash back phenomenon even after terminating the use of 5-MeO-DiPT. This experience was similar to the well established LSD induced flash backs.

[b] [e] [18]

## CLINICAL ADVICE

None.

## RELATED FATALITIES

A confirmed case of death in Japan following ingestion of 5-MeO-DiPT was published. The user died as a result of ingestion of a mixture of 5-MeO-DiPT, 5-

OH-DiPT and 5-MeO-NiPT. The urine and blood samples collected about 4 hours after ingestion showed the level of 5-MeO-DIPT, 5-OH-DIPT and 5-MeO-NIPT in blood and urine was 0.412, 0.327 and 0.020 micrograms /ml, and 1.67, 27.0 and 0.32 micrograms/ml, respectively. The autopsy finding revealed periarteritis nodosa in heart and liver, myocardial ischaemia, pulmonary congestion and pulmonary alveolar haemorrhage and periprostatic haemorrhage. There are several unconfirmed death reports available online.

[a] [8] [19] [1] [1]

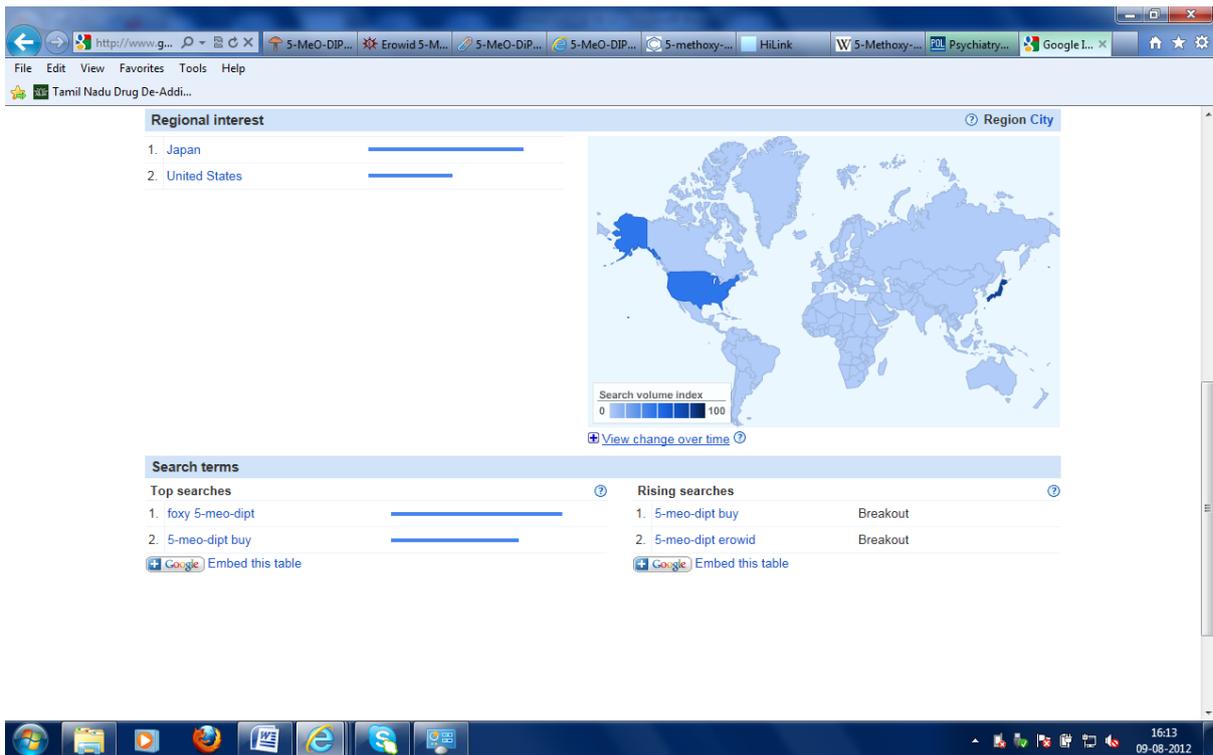
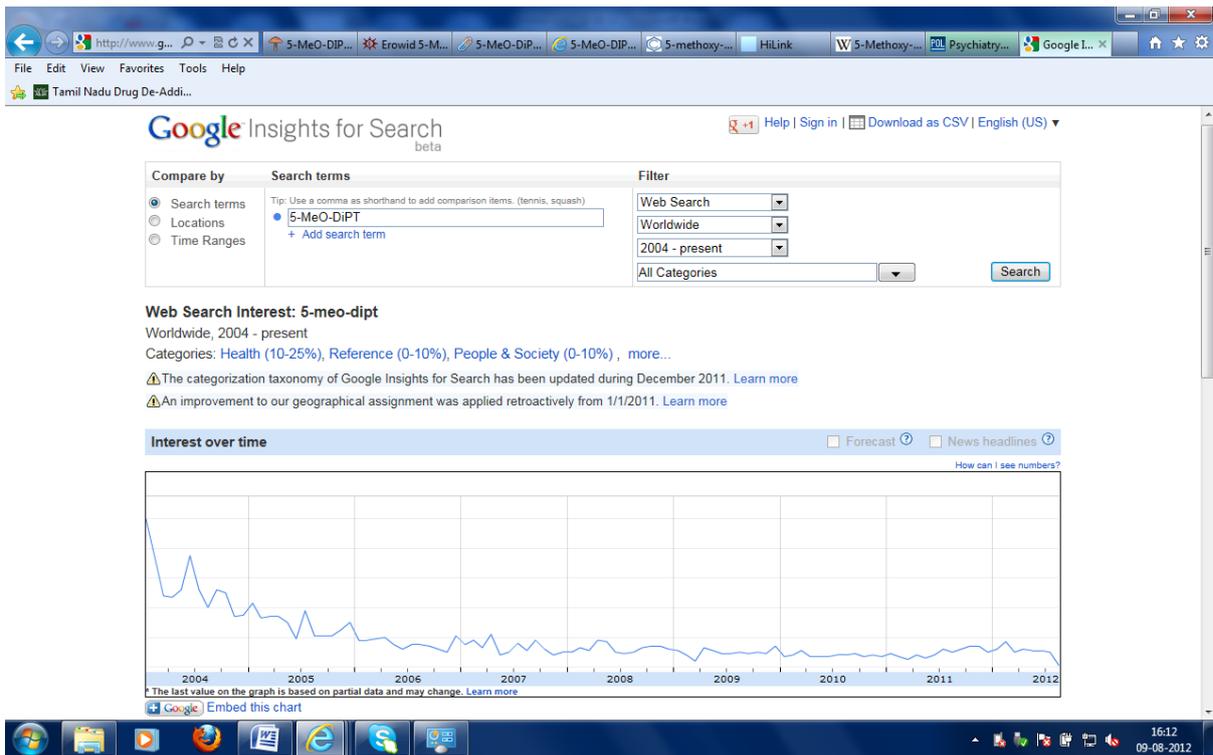
## YOU TUBE VIDEOS

- 5-MeO-DiPT (foreign language video)
- Terence Mckenna - 5-MeO-DMT & nDMT

[20] [21]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 5-MeO-DiPT, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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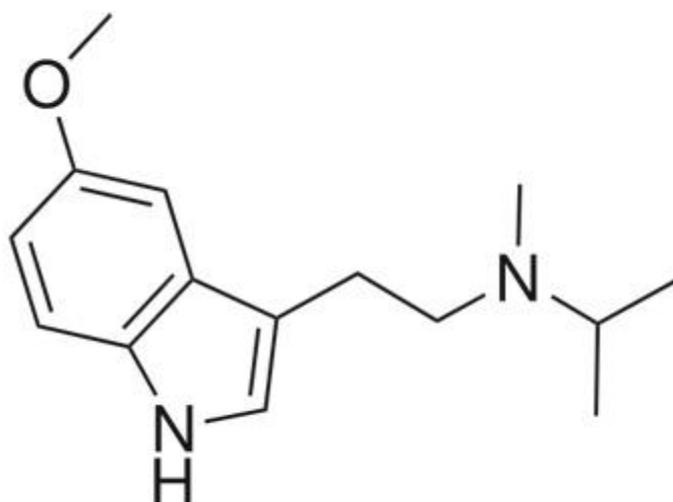
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II. VII5-MeO-MiPT

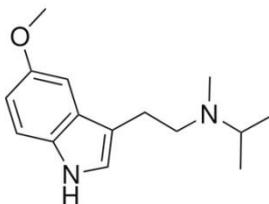
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# 5-MeO-MiPT Report

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# 5-MeO-MiPT



## OVERVIEW

Chemical name: 5-methoxy-N-methyl-N-isopropyltryptamine

Synonyms: Moxxy; Moxie; 5-MeO-MIPT; Tryptamine ecstasy; MDMA Tryptamine; N-isopropyl-5-methoxy-N-methyl

Active constituents: 5-methoxy-N-methyl-N-isopropyltryptamine

Type: Research chemical – Ring 5-substituted Tryptamine

Origin: Alexander Shulgin has narrated the synthesis of 5-MeO-MiPT in his book, TiHKAL. It is not clear if he was the first one to synthesise this compound.

Status: Novel

[1] [2] [3] [4]

## KEY POINTS

5-MeO-MiPT is a 5-substituted tryptamine where the methoxy group is attached to position 5 of the tryptamine ring. It has psychedelic and hallucinogenic properties. Structurally, it is quite similar to compounds such as 5-MeO-DiPT, DiPT, and MiPT. It is frequently used as a "replacement" for 5-MeO-DiPT and is commonly referred by the street name "Moxxy" or "Moxie".

[1] [2] [3] [4]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: N-[2-(5-methoxy-1H-indol-3-yl) ethyl]-N-methylpropan-2-amine

Molecular weight: 246.35 g/mol

Molecular formula: C<sub>15</sub>H<sub>22</sub>N<sub>2</sub>O

CAS Number: 96096-55-8

[1] [2] [3] [4]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product Description</b>
<b>Buy best RC</b>  Strictly not for human consumption!  If you are from Sweden, Finland... Customs in your country are very strict; packages/letters are being seized very often; notice that we do not take any responsibility for seizures. Think twice before you order. [5]
<b>Promos-Chem (Europe)</b>  This product can be delivered only via courier service.  This product is NOT for human consumption!  Can be used for laboratory purposes only!  sales@xxxxx-xxxx.com [6]
<b>Cayman Chemical</b>  5 mg      See a distributor in your region for pricing [7]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price varied among websites. It was also dependent upon the country of delivery. One web quoted the following price: 500mgs costs €62.20

Another website put up the price as follows: 5g €310; 10g €500; 25g €825

[5] [6] [7] [8]

## MODALITIES OF INTAKE

The most common modalities of intake are:

- oral ingestion by either swallowing the powder contained in capsules or ‘bombing’ (wrapping the powder in paper/ foil and swallowing); some users mixes the powder with juice and drink the mixture.
- nasal insufflation is another common method

Less common methods of administration include:

- Rectal administration [9]

## LEGAL STATUS

5-MeO-MiPT, a methoxy ester of tryptamine is a class A substance in the United Kingdom. It was made illegal in Romania in January 2011. It is unscheduled in the USA.

[a] [2] [10] [11]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The dosage is between 4mgs to 6mgs.

Come up: 15 to 20 min.      Peak: 2-3 hours      Come down: 4- 6 hours

A typical experience is as follows:

T+0:15: Tachycardia and dizziness started.

T+0:25: Heart rate slows down.

T+0:30: Dizziness again accompanied with irregular heartbeat; blood pressure increased; feeling nauseous.

T+0:35: Mild euphoria with good appreciation of music.

T+0:45: Irregular pulse (unpredictably varied between 75 and 95).

T+1:15: Pulse rate raised over 100 beats per minute.

T+1:30: Body temperature drops to 95.6 degrees Fahrenheit.

T+2:00: Pulse rate continued to be high (107 beats per minute) and temperature is 96.5 F (still slightly reduced).

T+2:25: Very slight visuals continue to come and go.

T+2:30: Pulse continued to be raised (105 beats per minute).

T+3:00: Pulse rate dropped (92 beats per minute) and temperature rose to 97.2 F.

T+3:30: Pulse rate dropped further (85 beats per minute); faint traces of visual activity.

T+4:50: The effects wore off slowly; agitation and uncomfortable feeling continued; pulse rate was back to normal (82 beats per minute).

T+5:30: Back to baseline.

[12] [13] [14]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With 2C-I (improved euphoria)
- With Methylone – it potentiates the effects / toxicity of 5-MeO-MiPT and a case report confirms it.
- With 4-AcO-DMT (cross tolerance was noted and also users warn other to carefully titrate from smaller doses)
- With cannabis
- With MDMA
- With 2C-B and 2C-C
- With LSD, MDMA and cannabis
- With ketamine and cannabis
- With 4-HO-MET, MXE and 2C-C

[b] [15] [16] [17] [18] [19]

## PHARMACOLOGICAL CHARACTERISTICS

5-MeO-MiPT inhibits monoamine re-uptake but it has narrow effect on monoamine release. It is metabolised by the liver enzyme, cytochrome P-450 through de-methylation which is followed by conjugation with glucuronide or sulphide.

[c] [d]

## TOXICOLOGICAL EFFECTS

- Muscle spasm especially the jaw and neck muscles as well as back, legs and they were stiff even after 48 hours after ingesting 5mgs of 5-MeO-MiPT. This patient attended the emergency department and was given lorazepam which helped.
- Missed heart beats and pain in the cardiac area lasting for a week.

[20] [21]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria
- Relaxing effects
- Positive mood

- Increased sexual feelings

[22]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Unsteady gait
- Whole body tremor
- Headache lasting for more than 24hours

[23]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Anxiety/ fear
- Emotional lability
- At high doses (25mgs) it precipitated psychotic episode which required admission to emergency service and the symptoms lasting for few days but complete resolution took place only after few months.

[24] [25]

## CLINICAL ADVICE

Since higher doses produce psychopathological disturbances and other physical side effects, it is important to weigh the doses carefully and use it cautiously. Also with combined effects with other psychoactive compounds, the chances of toxicity are significantly higher.

## RELATED FATALITIES

None reported.

## YOU TUBE VIDEOS

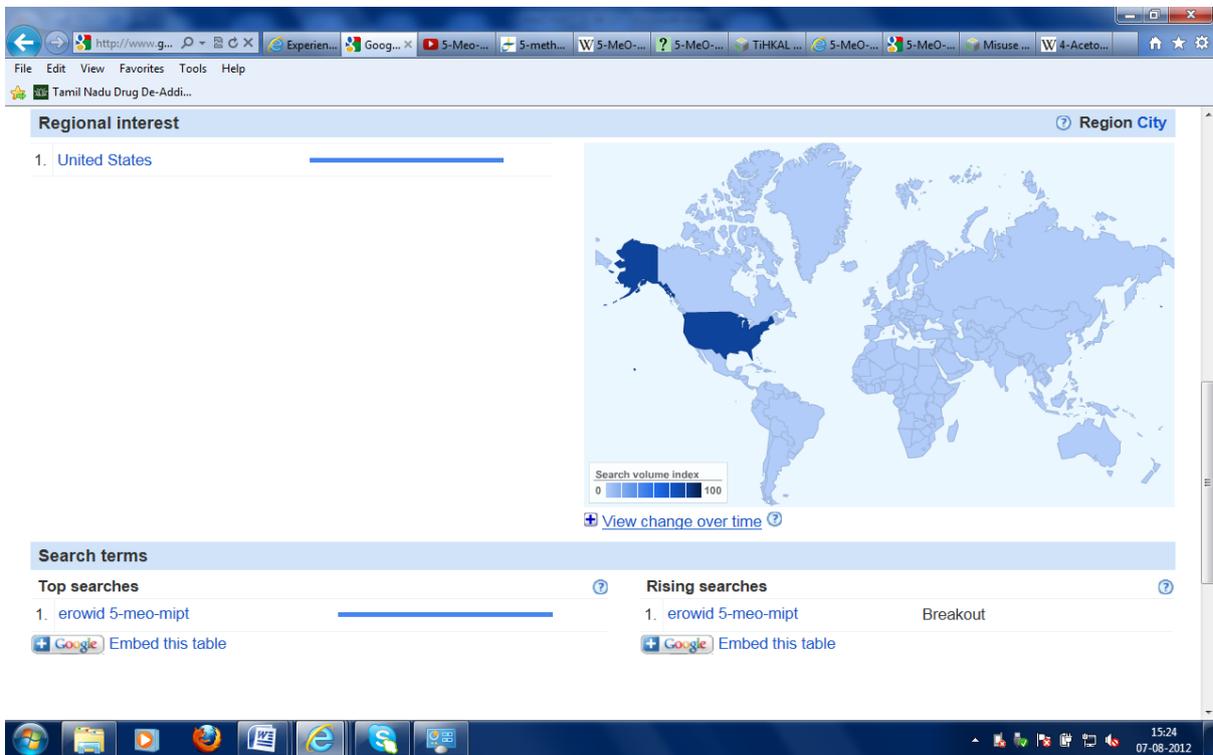
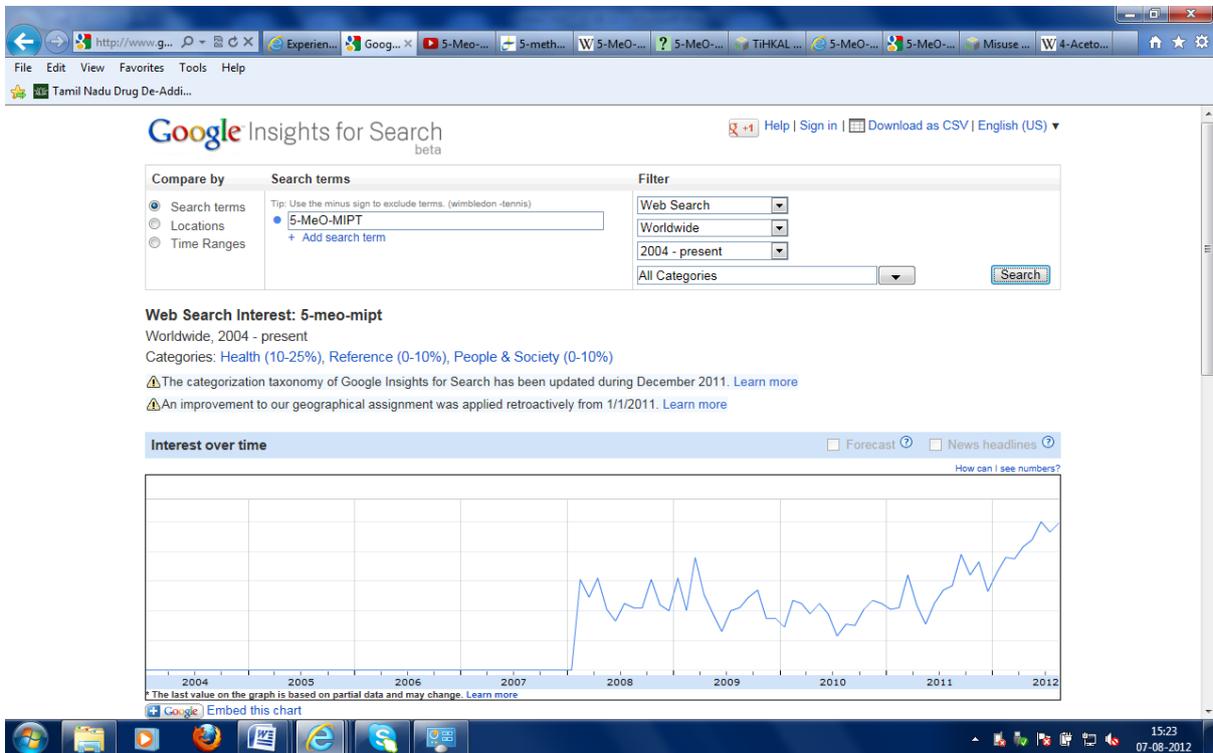
1. Moxie [5-MeO-MiPT], Tryptamine MDMA?
2. Moxy (5-meo-mipt) (foreign language)
3. buy 5-MeO-MiPT

[26] [27] [28]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below

includes a graph with the search volume, indicating interest over time (GMT) for 5-MeO-MiPT, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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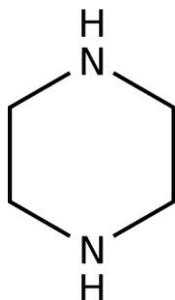
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## Chapter III: PIPERAZINES

Unlike the tryptamines, there are no examples of piperazines available in nature (Hill and Thomas, 2011). All these compounds were synthesised for its various applications. Initially, synthetic preparations were available as anti-helminthic agents as early as the 1950s. It was used as an antidepressant (trazodone, nefazodone etc) in the 1970s as well as typical antipsychotic medications (fluophenazine, perphenazine, trifluoperazine etc). Recently, the piperazine group forms part of the newer antipsychotic medications (aripiprazole, olanzapine).



### *Structure of piperazine*

Piperazine ring contains two nitrogen atoms in opposite positions as seen in this diagram. It is classified into: a) benzyl piperazines (MBZP, MDBZP) and b) phenyl piperazines (mCPP, pFPP). Substitutions at the nitrogen level leads to formation of newer compounds which have been used for recreational purposes. About six of such compounds are presented in technical folders:

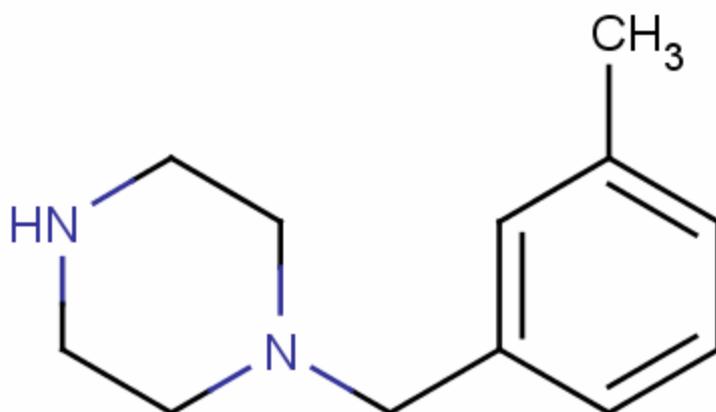
- III.I            1-methyl-4-benzylpiperazine (MBZP)
- III.II            methylenedioxy benzyl piperazine (MDBZP)
- III.III            1-(4-bromo-2, 5-dimethoxybenzyl) piperazine (2C-B-BZP)
- III.IV            meta-Chlorophenylpiperazine (mCPP)
- III.V            1-(4-Fluorophenyl) piperazine (4-FPP) or para-Fluorophenyl piperazine (pFPP)
- III.VI            para-Methoxyphenylpiperazine (MeOPP)

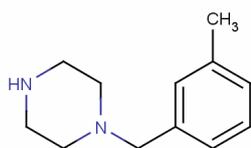
III.I 1-methyl-4-benzylpiperazine (MBZP)

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# MBZP Report

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## MBZP

### OVERVIEW

Chemical name: 1-methyl-4-benzylpiperazine

Synonyms: Party pills

Active constituents: 1-methyl-4-benzylpiperazine

Type: Research chemical – Piperazine group

Origin: The synthesis and origin of MBZP is unknown.

Status: Novel

Chronology: Piperazine compounds were sold as ‘party pills’ in New Zealand until its ban in 2008. It was later known in other parts of the world. The party pills contain various piperazine compounds such as BZP, MeoPP, TFMPP, PFPP, MBZP etc. mixed with other substances such as caffeine, cathinone.

[1] [2] [3]

### KEY POINTS

MBZP is a synthetic piperazine derived from Benzylpiperazine by the addition of methyl group to the benzene ring at position 1. It is reported to have similar characteristics of benzylpiperazine but with weaker effects and less side effects and toxicity. It has simulant properties (amphetamine like effects) and sold as a replacement for ‘Ecstasy’ tablets in countries where ‘Ecstasy’ was banned.

### CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-benzyl-4-methylpiperazine

Molecular weight: 190.294 g/mol

Molecular formula: C<sub>12</sub>H<sub>18</sub>N<sub>2</sub>

CAS Number: 374898-00-7

[1] [2] [3]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product description</b>
<b>Spice Store 24/7</b>  MBZP - Methylbenzylpiperazine is a derivate of bezylpiperazine. Effect of MBZP is stronly euphoric. MBZP has been sold as ingredient in very popular party pills in New Zealand. Buy MBZP for your research today and get your parcel delivery for free. [4]
<b>Re Chem Co</b>  1-Benzyl-4-methylpiperazine hydrochloride  Chemical properties: White crystal powder  In case of contact with eyes immediately thoroughly rinse with water and seek medical advice. Wear suitable protective clothing at work. This product is intended for research and forensic applications. [5]
<b>Karayak</b>  Mbzp (HCL Salt) Sample Size 10g - Only up to 50g samples can be sent at this time. (The product is a HCL, hydrochloride salt piperazine)  <b>Price:</b> \$180.00  <b>Product Code:</b> MBZP-10G  In Stock: 25 [6]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price of MBZP given in a website is as follows: 500 for €1.44 each; 1000 for €0.48 each; 3000 for €0.36 each; 50000 for €0.24 each. It did not display any information on the quantity of 'each'.

In another website 10g was sold for \$180.00; 20g for \$265.00 and 50g for \$560.00.

Spice store sold 'one unit' of MBZP for €24.95 and the quantity was not mentioned in their website.

[4] [5] [6]

## MODALITIES OF INTAKE

Oral ingestion of the pills is the common mode of intake.

It can be smoked. MBZP was usually mixed with TFMPP (ration 4:1) and 'blue lotus' resin smoked to get more stimulation. [7]

## LEGAL STATUS

MBZP is classified as Class C substance in 2010 in the UK.

In New Zealand, MBZP is placed under Schedule 3 (of Class C controlled drugs) along with other piperazine compounds such as BZP, TFMPP, pFPP, MeOPP and mCPP on 1<sup>st</sup> April 2008.

It is unscheduled in the USA. However, MBZP can be covered through the Federal Analogue Act in the USA.

[8] [9] [10] [a]

## CURRENT USE / MEDICINAL USE

Historically, piperazine compounds were used as antihelminths and (older generation) anti depressants. In the last decade synthetic piperazine compounds were synthesised in clandestine laboratories and sold on websites worldwide. They lack any medicinal value.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

Users compare the effects of MBZP with BZP. The overall opinion is that MBZP is weaker than BZP but do not possess any major side effects of BZP.

Some users have commented that mBZP failed to produce euphoria similar to ecstasy. Some commented they did not get any hang over the next day when the dose was below 200mgs to 300mgs.

In a study, 26 psychoactive compounds ('novel psychoactive substances') were bought from 5 different websites over 6 month period. The products were analysed for the presence of the exact compound specified in the product. In 75% of the compounds, it contained the same compound advertised. However a quarter of the samples did not contain the specified compound. For example, MBZP was substituted for BZP or vice versa.

In another study, NMR technique was used to identify the (piperazine based) compounds advertised in various products in the UK. The result showed most of them contained BZP,TFMPP, DBZP, mCPP, pCPP and caffeine in addition to MBZP.

**Table <sup>[C]</sup>: UK products containing MBZP**

Product name	Supplier	Content (NMR)	Date published
Socialite	Red Eye Frog	MBZP	April 2008
Head Rush	AM-HI-CO	MBZP, TFMPP, CPP (m / p)	Feb 2009
Xtacy	AM-HI-CO	MBZP, TFMPP, CPP (m / p)	Feb 2009
Exotix Super Extra Strength	AM-HI-CO	MBZP, BZP, DBZP	Feb 2009
Space Trips	AM-HI-CO	MBZP, TFMPP	Feb 2009
Cherries RetroPills	Red Eye Frog	MBZP, TFMPP, Caffeine	Feb 2009

[b] [c] [11] [12] [13] [14] [15]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With pFPP (to augment the effects of MBZP) [16]

## PHARMACOLOGICAL CHARACTERISTICS

MBZP is sympathomimetic stimulant belonging to synthetic piperazine group. It has similar effects to BZP but in an attenuated form. No information is available on its pharmacokinetics.

## TOXICOLOGICAL EFFECTS

It is reported to be devoid of any serious toxicity if used under 200mg. Typical side effects of BZP such as severe headache and nausea are less common with MBZP. However, it produces toxicity similar to BZP in higher doses.

## DESIRED PSYCHOACTIVE EFFECTS

- Rapid mood elevation
- Enhanced sociability
- Repetitive thought patterns
- "Rushing" sensation
- Mild euphoria
- Time Dysmorphia

However, some users have commented that MBZP failed to produce euphoria similar to ecstasy. [17] [18]

## PHYSICAL / MEDICAL UNTOWARD EFFECTS

- Headache (less intense than that due to BZP)
- Nausea (less intense than that due to BZP)

- Hangover (at high doses usually)
- Fatigue
- Insomnia
- Confusion
- Loss of appetite
- Changes in body temperature
- Palpitation
- Dilation of pupils and blurring of vision
- Decreased appetite
- Mild to moderate synesthesia
- Skin tingling
- Temporary impotence

[19] [20]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

MBZP could cause paranoid psychosis in large doses similar to BZP.

## CLINICAL ADVICE

None.

## RELATED FATALITIES

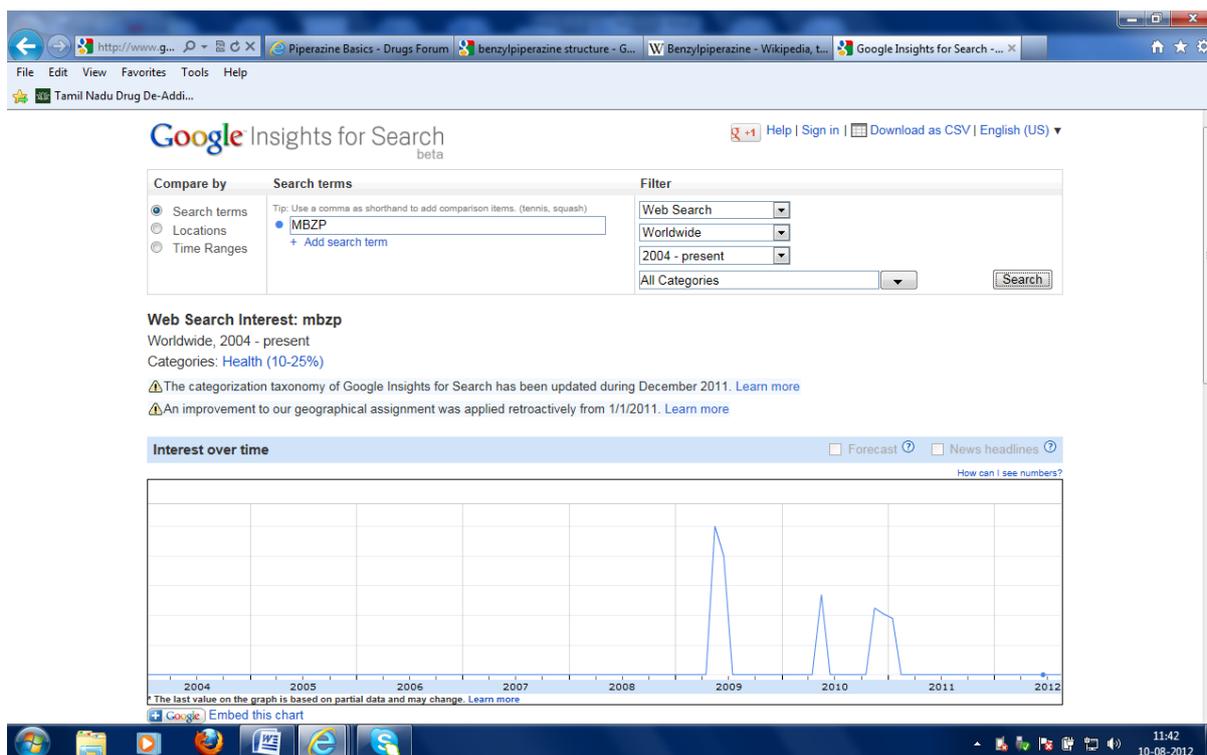
None reported.

## YOU TUBE VIDEOS

There are no You Tube videos found on MBZP.

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for MBZP, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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[c] Table: Davies S, Archer R, Ramsey J. Mass spectrum of MBZP: 1-Methyl-4-benzylpiperazine (MBZP) identity confirmed by NMR, 2009. Available from:  
[http://homepixel.ru/bibl/1-Methyl-4-benzylpiperazine\\_\(MBZP\).pdf](http://homepixel.ru/bibl/1-Methyl-4-benzylpiperazine_(MBZP).pdf)

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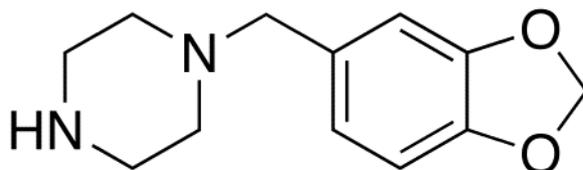
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III.II Methylenedioxy benzyl piperazine (MDBZP)

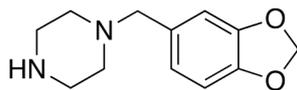
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# MDBZP Report

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# MDBZP



## OVERVIEW

Chemical name: methylenedioxy benzyl piperazine

Synonyms: MDBZP; 1-piperonylpiperazine

Active constituents: 1-(3, 4-methylenedioxybenzyl) piperazine

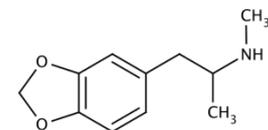
Type: Research chemical - Piperazine

Origin: Unknown

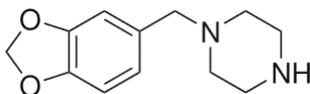
Status: Novel

Chronology: Unknown

## KEY POINTS



MDMA



MDBZP

Structurally, MDMA and MDBZP have the same benzene ring with the substitution (methylene dioxy). However it has not been reported that MDBZP has any 'ecstasy' like activity. It is worthy to note that the prediction of the activity of a compound entirely based upon the structure is unreliable.

There are some animal studies to suggest that MDBZP counters the neurotoxic effect induced by MDMA.

[1]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-(1,3-benzodioxol-5-ylmethyl) piperazine

Molecular weight: 220.268 g/mol

Molecular formula: C<sub>12</sub>H<sub>16</sub>N<sub>2</sub>O<sub>2</sub>

CAS Number: 32231-06-4

[2]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product Description</b>
<b>Catapharma (India) Pvt. Ltd. India</b> Minimum Order Quantity: 200 Kilogram Send your message to this supplier. [3]
<b>Clearsynth Labs Pvt. Ltd. India</b> Send enquiry / get a quote [4]
<b>Guide Chem</b> Click to post buying lead [5]

### AVAILABLE INFORMATION ON PURCHASE PRICE

Almost all the websites advertising the sale of this compound do not provide any information on the price in their websites. Rather they either request to contact the seller through email or to leave a message on their site.

### MODALITIES OF INTAKE

Oral ingestion is the common mode of intake. Information on other possible routes of intake is not available.

### LEGAL STATUS

It is legal in most of the countries including the UK.

### CURRENT USE / MEDICINAL USE

None. It is a research chemical.

### INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

It has been tried by users who report that it is either non active (without any psychedelic action) or very mildly stimulant. One user reported no effect up to 500mgs while others have found some activity (stimulation but no euphoria) at 5 to 10mgs.

[6] [7]

### USE IN COMBINATION WITH OTHER COMPOUNDS

- With MDMA (to augment its effects) [8]

## PHARMACOLOGICAL CHARACTERISTICS

The metabolism of Methylenedioxy benzyl piperazine (MDBP) is described as follows: Initially demethylenation takes place to form N-(4-hydroxy-3-methoxybenzyl) piperazine which undergoes either partial glucuronidation or sulfation. Finally the piperazine moiety is converted to N-(3,4-methylenedioxybenzyl) ethylenediamine and 3,4-methylenedioxy benzylamine and N-dealkylation to piperazine.

[a]

## TOXICOLOGICAL EFFECTS

Animal studies suggest that MDMA induced neurotoxicity was antagonised by the effects on MDBZP.

Systematic Toxicological Analysis (STA) performed using Gas Chromatography and Mass Spectrometry (GC/MS) on rat urine showed the presence of MDBZP after single dose. The author concluded that STA could be used for detection of MDBZP in human urine sample.

[a] [b] [c] [d] [8]

## DESIRED PSYCHOACTIVE EFFECTS

MDBZP is reported to be a very mild stimulant and users speculate that there might be some activity in very high doses (in grams). [9]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Cold hands and feet
- Headache
- Dizziness
- Nausea
- Convulsions

[8] [10]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

No information available.

## CLINICAL ADVICE

None.

## RELATED FATALITIES

None reported.

## YOU TUBE VIDEOS

There are no You Tube videos on MDBZP.

## GOOGLE INSIGHTS

There is not enough search volume to show graphs.

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[b] Hashimoto K, Maeda H, Goromaru T. Antagonism of 3,4-methylenedioxy methamphetamine-induced neurotoxicity in rat brain by 1-piperonylpiperazine. *European Journal of Pharmacology* 228(2-3):171-4, 1992

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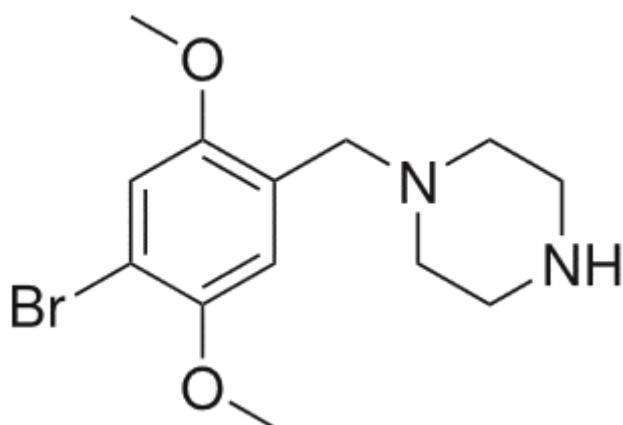
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III.III 1-(4-bromo-2, 5-dimethoxybenzyl) piperazine (2C-B-BZP)

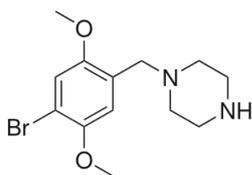
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# 2C-B-BZP Report

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## 2C-B-BZP



### OVERVIEW

Chemical name: 1-(4-bromo-2, 5-dimethoxybenzyl) piperazine

Synonyms: 2C-B-BZP

Active constituents: 1-(4-bromo-2, 5-dimethoxybenzyl) piperazine

Type: Research chemical – Piperazine

Origin: Unknown. It is claimed to be seized for the first time in Germany in 2009 and using instrumentation such as Gas Chromatography Mass Spectroscopy, the compound was confirmed to be 2C-B-BZP.

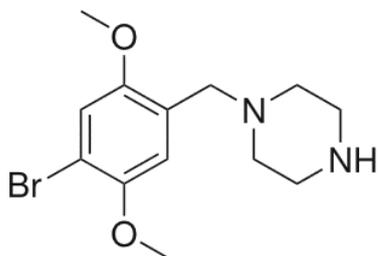
Status: Novel

Chronology: The first confirmed sample was in 2009. However it may have appeared on novel psychoactive substance market earlier than that.

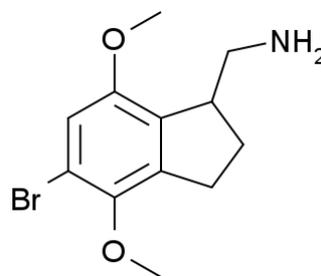
[a] [b]

### KEY POINTS

The molecular structure of 2C-B-BZP (piperazine) may appear as an extension of 2C-B (phenyl ethylamine), however they both are unrelated belonging to different class of compounds with entirely different effects. It is claimed to be a stimulant without much psychedelic effects due to lack of 5HT-2a receptor stimulation.



2C-B- BZP



2C- B

[a] [b] [1]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-(4-bromo-2, 5-dimethoxybenzyl) piperazine

Molecular weight: 315.2085 g/mol

Molecular formula: C<sub>13</sub>H<sub>19</sub>BrN<sub>2</sub>O<sub>2</sub>

CAS Number: Unknown

[2] [3]

## APPEARANCE OF COMMERCIAL PRODUCTS

No information available.

## AVAILABLE INFORMATION ON PURCHASE PRICE

No information available.

## MODALITIES OF INTAKE

Oral ingestion is the common mode of intake.

## LEGAL STATUS

It is legal in the USA, UK and rest of Europe.

## CURRENT USE / MEDICINAL USE

None. It is a research chemical.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The usual dose is between 50mgs to 75mgs. However some users have used it up to 200mgs. It lasts between 3 to 6 hours.

[4] [5]

## USE IN COMBINATION WITH OTHER COMPOUNDS

Since it lacks psychedelic activity, it is usually combined with other compounds to get euphoria.

- With Methylone
- With 2C-B
- With 2C-E
- With MDMA

[6] [7]

## PHARMACOLOGICAL CHARACTERISTICS

See Key points above. No further information is available.

## TOXICOLOGICAL EFFECTS

No information available.

## DESIRED PSYCHOACTIVE EFFECTS

It is not a very popular compound because of little psychedelic activity (see above).

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Headaches (above 150mgs)
- Nausea

[8] [9]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

No information available.

## CLINICAL ADVICE

No information available.

## RELATED FATALITIES

None reported.

## YOU TUBE VIDEOS

There were no videos available on this compound.

## GOOGLE INSIGHTS

There was not enough search volume to show graphs on this compound as on 1<sup>st</sup> August 2012.

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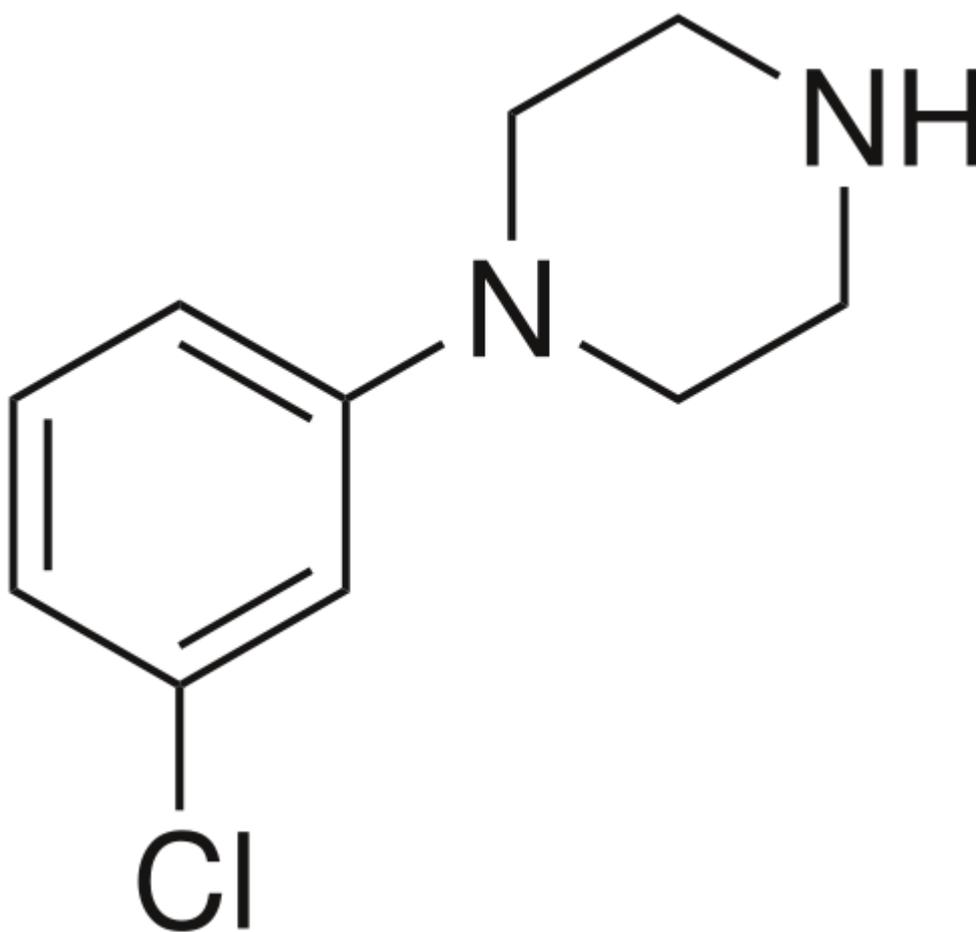
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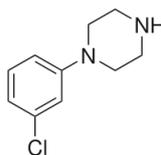
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# **mCPP Report**

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# mCPP



## OVERVIEW

Chemical name: meta-Chlorophenylpiperazine

Synonyms: mCPP, 1-3-CPP, 3Cl-PP, 3CPP, 1-(m-Chlorophenyl) piperazine, 3-Chlorophenyl piperazine, 'Explosion' (Netherlands), X4

Active constituents: meta-Chlorophenylpiperazine

Type: Research chemical - Piperazine

Origin: There are references to this compound in the literature since the 1960s. Their effect as an appetite suppressant through 5HT1b/2c receptor agonism was extensively studied in 1970s. There is no information available on the web about its first synthesis.

Status: Novel

Chronology: It was reported to be first identified in 'street shops' by the Drug Information and Monitoring System in Netherlands in 2005.

[a] [b] [c] [d] [1] [2]

## KEY POINTS

mCPP is a phenyl piperazine with stimulant and hallucinogenic properties comparable to MDMA. It exerts agonistic effects on serotonergic receptors (5-HT1a/1b/1d, 5-HT2a and 5-HT2c) and antagonistic action on 5-HT3 receptor. It was sold as ecstasy replacement in New Zealand, Europe and USA.

[d] [e] [f] [g] [1] [2] [3]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-(3-chlorophenyl) piperazine

Molecular weight: 196.676 g/mol

Molecular formula: C<sub>10</sub>H<sub>13</sub>ClN<sub>2</sub>

CAS Number: 51639-49-7

[1] [2]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product description</b>
<b>Legal Party Drug</b>  Sun Rise mCPP powder: 1-(meta-chlorophenyl) piperazine (mCPP) is a 5HT releaser that possesses mixed 5HT <sub>2A/2C</sub> receptor agonist/ antagonist actions. It shares several pharmacological properties with MDMA (ecstasy).  In laboratory administration studies, individuals with prior experience of the drug ecstasy reported that mCPP in doses from 17.5 to 52.5 mg/70kg body weight produced MDMA (ecstasy)-like stimulant and hallucinogenic effects. However, unlike MDMA, no increase in blood pressure and heart rate were recorded. Other studies have confirmed these findings in other groups of ecstasy user and cocaine dependent individuals. mcPP is legal in the USA. [4]
<b>Best buy API</b>  Chemical Name:1-(2-chlorophenyl) piperazine HCl  Package:25KGS/Card Board Drum [5]
<b>Look chem: Junkai (Tianjin) Chemical Co., Ltd.</b>  CAS No.:6640-24-0  Name: 3-Chlorophenyl piperazine  Formula:C <sub>10</sub> H <sub>13</sub> ClN <sub>2</sub> [6]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price of mCPP differed depending upon the sale of the country of delivery. 1gram costs £18 in the UK. The price in the USA is as follows: 10gram cost \$186.20; 100g for \$325.85; 500g for \$510.72; 1kg for \$851.20. [4] [5] [6]

## MODALITIES OF INTAKE

Oral ingestion of the pill or powder is the common route of intake. Nasal insufflation or IV injections were rarely used.

[7] [8] [9] [10]

## LEGAL STATUS

mCPP is still legal in many countries including the UK. It is unscheduled in the USA. However, this compound could be covered through the Federal Analogue Act in the USA.

In New Zealand, mCPP was placed under Schedule 3 (of Class C controlled drugs) of The Misuse of Drugs Act 1975 along with other piperazine compounds such as BZP, TFMPP, MeOPP and pFPP on 1<sup>st</sup> April 2008.

It was made a controlled substance in other countries such as Denmark, Belgium, Czech Republic, Malta and Hungary.

[h] [i] [j] [11] [12]

## CURRENT USE / MEDICINAL USE

Due to its agonistic effects on serotonin receptors, it was used as a challenge drug in research. It was evaluated to study the central serotonergic function among adolescents. mCPP is an active intermediate metabolite of Trazodone. It is postulated that mCPP may contribute to the antidepressant activity of Trazodone, though it has not been proved. Its use as a treatment for migraine was also tried but failed. [k] [13] [14]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

mCPP is sold in powder or capsule form. 50mgs is the usual starting dose. A typical user's experience is described below:

T0:00 : 50mgs of mCPP swallowed

T0:30 : Mild euphoria started

T1:30 : Intense nausea.

T2:00 : Short term memory loss.

T5:00 : Body load started to reduce.

T8:00 : Passed out.

Next day: Tired with headache

Studies from Netherlands report that mCPP has been sold either on its own or in combination with MDMA and it is very difficult to distinguish these two types of tablets by the appearance. It has been tried as a non-neurotoxic alternative to MDMA but the users review has predominantly been negative.

NMR technique was used to identify the (piperazine based) compounds advertised in various products in the UK. The result showed most of them contained BZP, TFMPP, DBZP, MBZP, pCPP and caffeine in addition to mCPP.

**Table. UK products containing mCPP**

Product name	Supplier	Content (NMR)	Date published
Socialite	Red Eye Frog	MBZP	April 2008
Head Rush	AM-HI-CO	MBZP, TFMPP,	Feb 2009

		CPP (m / p)	
Xtacy	AM-HI-CO	MBZP, TFMPP, CPP (m / p)	Feb 2009
Exotix Super Extra Strength	AM-HI-CO	MBZP, BZP, DBZP	Feb 2009
Space Trips	AM-HI-CO	MBZP, TFMPP	Feb 2009
Cherries RetroPills	Red Eye Frog	MBZP, TFMPP, Caffeine	Feb 2009

[1] [za] [zb] [15]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With MDMA (very common)
- With GBL (no stimulation)
- With BZP, TFMPP, GHB (psychotic episode)
- With alcohol (severe nausea and headache)
- With cannabis (intense shivering and visual hallucinations)
- With MeOPP

[16] [17] [18] [19] [20] [21]

## PHARMACOLOGICAL CHARACTERISTICS

The earliest studies on mCPP focused on the median lethal dose of mCPP which was found to be (LD<sub>50</sub>) 185mgs/kg. Since then there were enormous interest on the pharmacology of mCPP and several studies have been published.

The metabolism of mCPP initiated with hydroxylation of the aromatic ring followed by the degradation of the piperazine moiety to ethylenediamine. The active metabolite of the antidepressant, Trazadone is mCPP. A study reported that mCPP was metabolised in the liver by the liver microsomal enzyme (Cytochrome P450 3A4). Another study suggested mCPP was metabolised by Cytochrome P450 2D6.

There are several studies to suggest that mCPP exert its effects through serotonergic pathways. It is confirmed that mCPP causes agonism at 5HT<sub>1a/1b/1d</sub>, 5HT<sub>2c</sub> receptors and antagonistic action on 5-HT<sub>3</sub> receptor.

In healthy human volunteers, mCPP produced 5HT receptor hypersensitivity at low dose (0.25mg/Kg) and 5HT receptor hyposensitivity at higher doses (0.5mg/Kg). Also panic attacks were observed in more subjects at higher doses.

A randomised double blind study on human volunteers involving daily infusions of mCPP as a dose of 0.08mg/Kg induced physical symptoms of anxiety as well as elevated biochemical parameters (plasma ACTH, cortisol, prolactin).

Another study showed that in comparison with d-fenfluramine, mCPP was a 5HT releasor but did not cause long term 5HT depletion.

An experimental study aimed to find out its effect on pituitary hormones. It reported that ACTH, prolactin and cortisol were significantly raised following mCPP infusion. However it produced unpleasant side effects such as extreme fear, tremor, increased sensitivity to sound and light. The study concluded that mCPP is not a suitable compound for challenge tests.

[m] [n] [o] [p] [q] [r] [s] [t] [u]

## TOXICOLOGICAL EFFECTS

A study conducted on healthy as well as panic disorder patients showed mCPP induced panic attacks in almost half the patients and more than a quarter of healthy subjects.

Study on healthy and patients with history of migraine attacks showed mCPP induced more migraine at a dose of 0.5mg/kg on both groups of patients. This also confirmed the actions of mCPP on 5HT2b, 5HT2c and 5HT1a receptors which are consistent with pathophysiology of migraine.

Accidental ingestion of 300mgs of mCPP produced continuous vomiting for more than 4 hours. It also produced migraine, palpitation, muscle cramps, severe body tremor and raised body temperature. The episode ended when he fell unconscious for few hours.

[v] [w] [22]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria (less than that produced by MDMA)
- Empathy
- Music appreciation

[23] [24]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Stomach discomfort
- Nausea

[25]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Psychotic episode
- Intense anxiety (through post synaptic 5HT2c agonism) (Gibson et al, 1994)

[x]

## CLINICAL ADVICE

Even a single dose (0.5mg/Kg body weight) of mCPP could precipitate 'serotonin syndrome' in psychiatric patients consisting of cognitive symptoms (confusion, irritability, tiredness), autonomic hyperactivity (tachycardia, hyperthermia, nausea, vomiting, diarrhoea) and neuromuscular symptoms (hyper-reflexia, rigidity, myoclonus).

[j] [y] [z]

## RELATED FATALITIES

There has been no death reports directly linked to use of mCPP. However there are confirmed deaths due to Trazodone toxicity, but it is unclear whether, mCPP, an intermediate metabolite of Trazodone, played a role in it.

A case report described toxicity from mCPP (three tablets) overdose (Kovaleva et al, 2008). The concentration of mCPP was 320ng/mL (plasma) and 2300ng/mL (urine). The patient was on regular Trazadone (antidepressant) medication and had also ingested other substances (amphetamine, benzoylecgonine, alcohol). The concentration of mCPP was six times higher than normal (56ng/mL). She presented with tachycardia, anxiety, sedation, agitation and visual disturbances.

[j] [zc]

## YOU TUBE VIDEOS

There are videos on piperazine compounds in general, but no videos found on mCPP on You Tube.

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for mCPP, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.

Google Insights for Search beta

Compare by:  Search terms,  Locations,  Time Ranges

Search terms: mCPP, mChlorophenylpiperazine

Filter: Web Search, Worldwide, 2004 - present, All Categories

**Web Search Interest: mcpp, mchlorophenylpiperazine**  
 Worldwide, 2004 - present  
 Categories: Health, Business & Industrial, Home & Garden, Law & Government, more...

Totals: mcpp, mchlorophenylpiperazine

Interest over time:  Forecast,  News headlines

See worldwide top rising searches by clearing the search terms:

- A) MCPP-koneita poliisin haaviin
- B) Nova droga sintética, o MCPP, é apreendida pela primeira vez em SP
- C) A MCPP É A NOVA DROGA DA MODA NA EUROPA
- D) SecureAll Systems and Microsoft Sign License Agreement for Microsoft Communications Protocol Program (MCPP)

Regional interest: mcpp

1. Netherlands	High
2. Japan	Medium
3. Germany	Low
4. United States	Low
5. United Kingdom	Low

Search volume index: 0 to 100

Search terms: mcpp

Top searches	Rising searches
1. mcpp mcopa	1. herbicide mcpp
2. mcopa	2. mcop
3. 除草剂 mcpp	3. mcopa
4. 除草剂	4. mcpp drug
5. herbicide mcpp	5. mcpp mcopa
6. mcpp drug	6. mcpp pills
7. mcop	7. mcpp xtc
8. mcpp xtc	8. tfmpp
9. tfmpp	9. 除草剂
10. mcpp pills	10. 除草剂 mcpp

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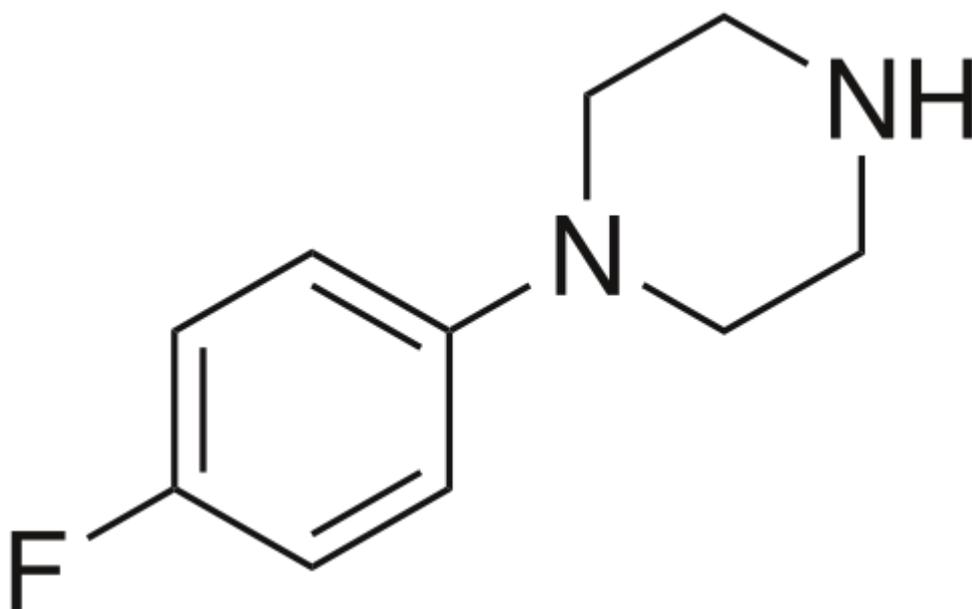
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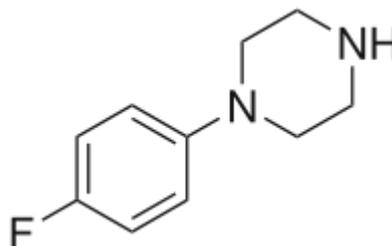
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# 4-FPP / pFPP Report

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# pFPP or 4-FPP



## OVERVIEW

Chemical name: 1-(4-Fluorophenyl) piperazine

Synonyms: pFPP; 4-FPP; Fluoperazine; Flipiperazine; Party pills; the Big Grin; Mashed; Extreme Beans (New Zealand); Fantasy – incense (Canada)

Active constituents: 1-(4-Fluorophenyl) piperazine

Type: Research chemical - Piperazine

Origin: pFPP was reported to be discovered unintentionally whilst investigating the properties of a sedating antihistamine, niaprazine in 1982. pFPP was formed as an intermediate metabolite which failed to cause any sedation but produced serotonergic stimulation.

Status: Novel

Chronology: pFPP was later re-discovered in 2003 as a potential drug of misuse and was sold as ‘party pills’ in New Zealand until its ban in 2008. It was later known in other parts of the world and was sold as ecstasy tablets in other countries. The party pills contain various piperazine compounds such as BZP, MeoPP, TFMPP, pFPP, MBZP etc. mixed with other substances such as caffeine, cathinone.

[a] [b] [1]

## KEY POINTS

4-FPP or pFPP is a synthetic piperazine which is reported to have strong 5HT<sub>2a</sub> agonistic properties and weaker 5HT<sub>2b</sub> and 5HT<sub>2c</sub> agonism. Although it does not produce effects similar to ecstasy, it became popular as a substitute for ecstasy in countries where it was banned.

[2]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-(4-fluorophenyl) piperazine

Molecular weight: 180.222 g/mol  
Molecular formula: C10H13FN2  
CAS Number: 2252-63-3; 64090-19-3

[3] [4]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product description</b>
<b>Intatrade Chemicals GmbH, Germany</b> Contact now [5]
<b>Mol Port</b> Request custom quote [6]
<b>Sunrise (pFPP)</b> WE ARE CURRENTLY OUT OF STOCK OF PFPP. SORRY FOR THE INCONVENIENCE. [7]

## AVAILABLE INFORMATION ON PURCHASE PRICE

Most of the websites do not display a price, but they can be contacted for price. However, a website quoted the prices as 1gram for £18, but they were out of stock as on 25<sup>th</sup> July 2012.

[5] [6] [7] [8]

## MODALITIES OF INTAKE

Oral ingestion is the popular method of intake. Forum users post warning messages against using 4-FPP intravenously or by insufflation. In general they advise not to use any piperazine based compounds by these modes.

[1]

## LEGAL STATUS

pFPP is still legal in many countries including the UK. It is unscheduled in the USA. However, pFPP can be covered through the Federal Analogue Act in the USA.

In New Zealand, pFPP was placed under Schedule 3 (of Class C controlled drugs) along with other piperazine compounds such as BZP, TFMPP, MeOPP and mCPP on 1<sup>st</sup> April 2008.

[c]

## CURRENT USE / MEDICINAL USE

None. It is a research chemical and not intended for human consumption.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

Though ecstasy-like pills are commonly reported to contain a combination of BZP/TFMPP around the world, a seizure (12 red Playboy bunny tablet) in California showed the presence of pFPP by Gass Chromatography/ Mass Spectrometry method.

The online users commonly use the term ‘pFPP’ to refer to 1-(4-Fluorophenyl) piperazine rather than 4-FPP. The usual starting dose is 20mgs. Experienced users have tried up to 90mgs or more.

Come up: 20 to 30min      Peak: 1-5 hours      Come down: 5 – 7 hours

A typical user’s experience is given below:

**T+0** Oral ingestion of 24.1mgs of pFPP weighed in a five digit analytical scale.

**T+20m** The effect started.

**T +30m** Mild nausea and sweating noted

**T +1h** Peak effect. The effect lasted for few hours

**T +5h** Return to baseline started.

**T+5:45h** Mild headache.

**T +6:30h** Baseline reached.

**T +1day** Tired and slept extra long hours; also loss of appetite.

[d] [9] [10] [11]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With MDMA (the user believed that this combination would prevent serotonin syndrome)

[12]

## PHARMACOLOGICAL CHARACTERISTICS

One animal study showed that pFPP reduced the uptake of 5-HT and NA uptake in vitro. It also reduced the turn over of 5-HT and DA in rat brains. However the application of this information on human subjects has not been tested.

A rapid method of synthesis of 1-(4-Fluorophenyl) piperazine was developed. This compound was used as a precursor in (18F) labelling for PET studies.

[a] [e]

## TOXICOLOGICAL EFFECTS

None reported.

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria, elation (less extent only)
- Enhanced sociability
- Repetitive thought patterns, incoherence
- Decreased appetite
- "Rushing" sensation
- Mild to moderate synesthesia
- Tactile sensation

[13] [14]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Sometimes the effects are unpredictable, even though the dose was carefully measures on a precision scale
- Head aches
- Jaw clenching and
- Tenderness in facial muscles.
- Large dilated pupils.
- Powerful appetite suppression
- Insomnia
- Increased heart rate
- Hang over symptoms – prolonged tiredness (hence users may not be able to use it regularly)

[14] [15]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Confusion
- Hallucinations with music

[14]

## CLINICAL ADVICE

None.

## RELATED FATALITIES

None reported.

## YOU TUBE VIDEOS

There are no You Tube videos as on 25<sup>th</sup> July 2012.

## GOOGLE INSIGHTS

There is not enough search volume to produce a graph as on 25<sup>th</sup> July 2012.

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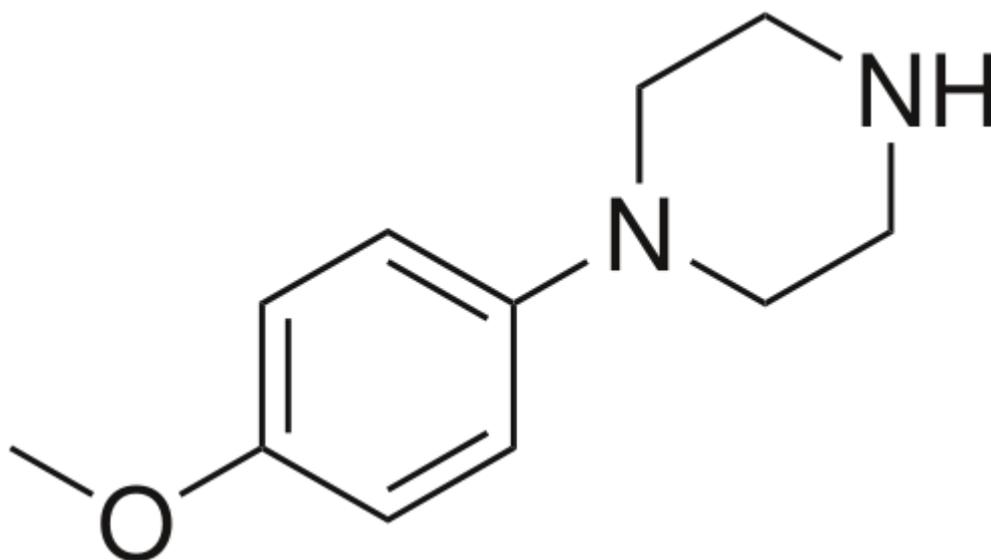
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- [13] <http://www.bluelight.ru/vb/archive/index.php/t-278106.html> (Accessed July 25, 2012)
- [14] [http://www.party-pill.biz/html/pfpp\\_\\_parafluorophenylpiperazi.html](http://www.party-pill.biz/html/pfpp__parafluorophenylpiperazi.html) (Accessed July 25, 2012)
- [15] <http://www.drugs-forum.com/forum/showthread.php?t=160889> (Accessed July 25, 2012)

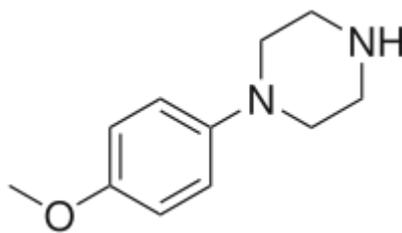
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# MeOPP Report

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# MeOPP



## OVERVIEW

Chemical name: para-Methoxyphenylpiperazine

Synonyms: MeOPP; pMPP; 4-MeOPP; pMeOPP; 4-MPP (in Japan); Paraperazine; Party pills (New Zealand); Methoxyphenylpiperazine; p-methoxyphenylpiperazine; 1-(4-Anisyl) piperazine. It is sold as 'Ecstasy' replacement ('PEP' / 'Twisted') usually in combination with other piperazine compounds such as BZP/ TFMPP/ MBZP etc. Please note that these street names are not exclusive only for MeOPP.

Active constituents: para-Methoxyphenylpiperazine

Type: Research chemical - Piperazine

Origin: There are no available data on its origin or synthesis.

Status: Novel

Chronology: Although the exact year of its appearance on the online market is unknown, it is thought to be available on the online market since 2000. The first confirmed seizure of MeOPP was in 2006 in the USA.

[a] [b]

## KEY POINTS

MeOPP is a synthetic piperazine which is a mild hallucinogen and a mild stimulant. A study reported that MeOPP inhibited the reuptake of dopamine, serotonin and norepinephrine as well as facilitated their release. Ortho (2-MeOPP) and para (4-MeOPP) positional isomers exist for Methoxyphenylpiperazine. However, only the par isomer (4-MeOPP) is reported to be active. [a] [b]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-(4-methoxyphenyl) piperazine

Molecular weight: 192.258 g/mol

Molecular formula: C<sub>11</sub>H<sub>16</sub>N<sub>2</sub>O

CAS Number: 38212-30-5 (free base) [a] [1] [2]

## APPEARANCE OF COMMERCIAL PRODUCTS

### Product description

#### **BZP Shop**

1-(4-Methoxyphenyl) piperazine (meOPP) is an interesting piperazine that some users claim that it gives them a similar empathy as MDMA (ecstasy) does.

Piperazines can interact with anti depressant medication. If you have a history of mental health issues, heart disorders or high blood pressure problems or are currently on any other medication please do not purchase this product.

We can't ship this product to Greece or Sweden or people under the age of 18. Please check your local laws before ordering. [3]

#### **New Chemicals**

CAS: 38212-30-5

IUPAC: 1-(4-methoxyphenyl)piperazine

Appearance: white to off-white powder [4]

#### **Legal Party Drugs**

##### **SunRise**

MeOPP powder - 1 gram

meOPP is a relaxing Piperazine which is used as a recreational drug.

The effects of 4-methoxyphenylpiperazine (meOPP) powder is similar to ecstasy. Users report mild euphoric rushes with a sense of well being and relaxation. Users report a ratio of meOPP 1:1 with BZP can bring a warming sense of empathy to the regular BZP experience.

Please check your local laws before ordering. We don't sell meOPP to Denmark or any country where it is illegal.[5]

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price for 1 gram of MeOPP varies between £18 and £22 (BZP shop) in the UK. In rest of the Europe the price is given below (New Chem): 1g for €15.5; 3g for €28.12; 25g for €84.00; 100g for €199.50; 500g for €666.00; 1000g for €1079.00.

Although discussion on price is not allowed in web fora, one user posted that he bought MeOPP 25g for €51,65.

[3] [4] [5] [6]

## MODALITIES OF INTAKE

Oral ingestion is the usual mode of intake. It can be insufflated nasally or smoked. [a] [7]

## LEGAL STATUS

MeOPP was classified as Class C substance in 2010 in the UK along with other substituted piperazines (mCPP, pCPP, mMPP, pMPP, TFMPP, pFPP etc).

In New Zealand, MeOPP is placed under Schedule 3 (of Class C controlled drugs) along with other piperazine compounds such as BZP, TFMPP, pFPP, MBZP and mCPP on 1<sup>st</sup> April 2008.

It is unscheduled in the USA. However, MeOPP can be covered through the Federal Analogue Act in the USA.

MeOPP was banned in Denmark along with BZP, TFMPP and mCPP in Dec 2005. [c] [d] [8]

## CURRENT USE / MEDICINAL USE

No information available. MeOPP is a research chemical and not intended for human consumption.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

There are a range of products available in the market sold as ‘herbal’ pill as an alternative to illegal drugs. They have been advertised as safe alternatives. The ingredients are dubious and may contain several compounds including some herbs and could contain several unknown and untested compounds. MeOPP could be one of the ingredients. The product can also contain vitamins and supplements. Online users post warning messages against using such chemicals.

Generally, MeOPP can be sold in powder or pill (tablet / capsule) form. The dose varies between 100 to 500mgs.

[a] [9] [10] [11]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With mCPP (provided with low mood, confusion and discomfort)
- With BZP, pFPP and hydrocodone
- With BZP and TFMPP
- With BZP and TFMPP and pFPP

[12] [13] [14] [15]

## PHARMACOLOGICAL CHARACTERISTICS

There are only limited pharmacological data available for MeOPP.

In an animal study (Staack et al, 2004), MeOPP was reported to be metabolised to 1-(4-hydroxyphenyl) piperazine (4-HO-PP) by demethylation and the piperazine moiety was degraded. There was also involvement of polymorphic CYP2D6 (cytochrome P450 enzyme) in the demethylation.

Another study (Nagai et al, 2007) found that MeOPP inhibited the monoamine re-uptake (dopamine, 5HT, and norepinephrine) and accelerated their release. Hence one could expect an interaction with similar compound that have an effect on the monoamine pathways such as the SSRI antidepressants as well as drugs with misuse potential ('Ecstasy'). The risk of development of 'Serotonin Syndrome' could be a possibility when combining MeOPP with SSRIs. [b] [e]

## TOXICOLOGICAL EFFECTS

Most users believe that most of the compounds belonging to the piperazine family do not cause toxicity. Some users believed that only doses above 1000mgs could cause toxicity. The usual doses (100 to 500mgs) were reported not to cause any significant toxicity in the short term. Any long term toxicity of these compounds have not been discussed or documented. However, other users warn that piperazine compounds are more toxic compounds than other scheduled drugs.

The argument that was made against the notion that 'piperazines are relatively safer compounds' is this: TFMPP, a piperazine compound, was removed from scheduling in the USA. This is because of the low potential for misuse due to lack of euphoria and stimulation. This did not necessarily mean it was a safe drug to use. Piperazines are reported to cause seizures, hypothermia, coma and death.

[16] [17]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria
- Appreciation of music
- Relaxation / anxiolytic / 'calming effect'
- Closed eye visuals (weak).

[18]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Nausea.

- Loss of appetite.
- Headache.
- High body temperature - could cause hyperthermia

[19] [20]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

MeOPP along with other similar piperazines can cause psychosis rarely in high doses or in combinations. [21] [22]

## CLINICAL ADVICE

- As MeOPP imparts its (agonistic) effect through the monamine system, combinations with serotonergic compounds are not advised. Its synergistic combination could potentially cause ‘Serotonin Syndrome’.
- The presence of several piperazine based compounds such as MeoPP, BZP, TFMPP, MDBZP, mCPP could be identified and quantified using Gas Chromatography and Mass Spectrometry (GC/MS) method using human plasma.
- Recently a relatively rapid method of determination of the presence of MeOPP in the urine has been described. [f] [g]

## RELATED FATALITIES

No death report has been recorded due to MeOPP as on 1<sup>st</sup> Aug 2012.

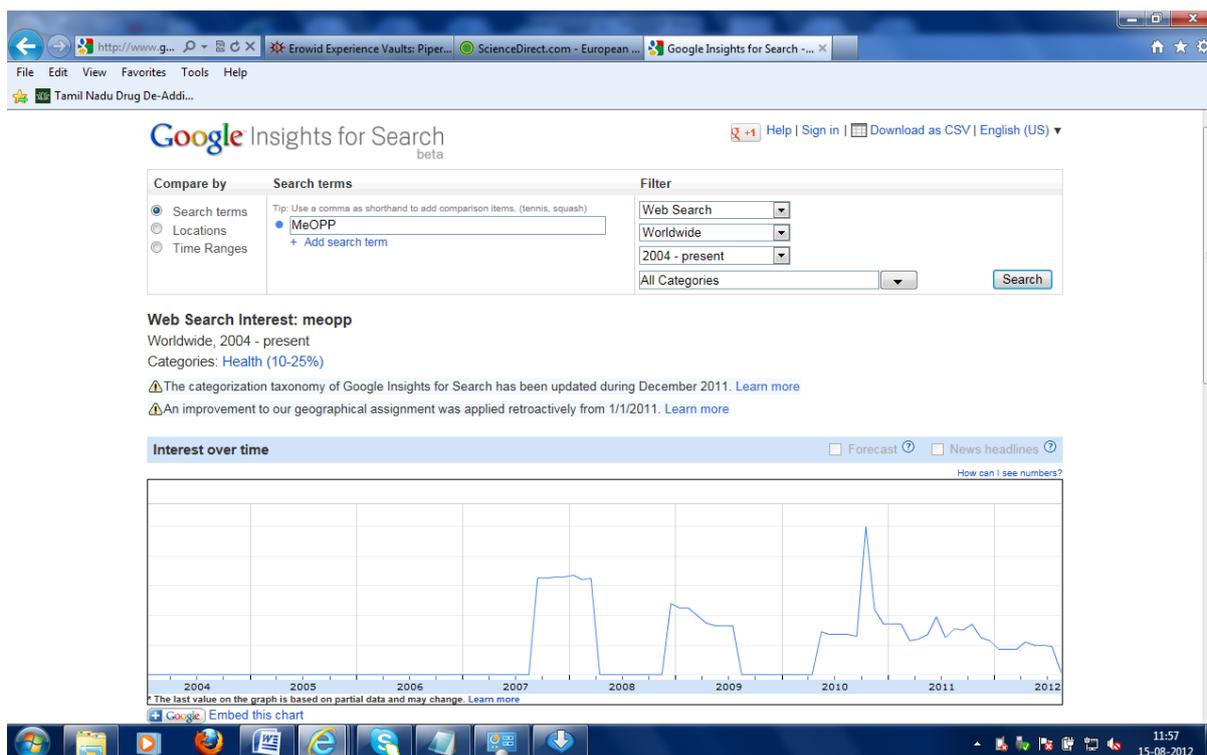
## YOU TUBE VIDEOS

- MeOPP mCPP
- Piperazine pill effects

[23] [24]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for MeOPP, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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## Chapter IV: MISCELLANEOUS COMPOUNDS

Several synthetic cannabinoids are sold as ‘herbal incense’ online. Professor J W Huffman and many other scientists have synthesised over 450 synthetic cannabinoid compounds which are several folds potent than natural cannabis. They act on CB1 and/or CB2 receptors. They are classified (Howlett et. al, 2002; Thakur et. al, 2005; Advisory Council on the Misuse of Drugs, 2009) according to their molecular structure as follows:

1. Classical cannabinoids (THC and their synthetic analogues e. g. HU-210, AM-906, AM-411, O-1184).
2. Nonclassical (cyclohexylphenols or 3-arylcyclohexanols CP-47,497).
3. Hybrid (classical and non-classical cannabinoids, e. g. AM-4030).
4. Aminoalkylindoles (AAIs): naphthoylindoles (e. g. JWH-018, JWH-073, JWH-210); phenylacetylindoles (e. g. JWH-250); naphthylmethylindoles and benzoylindoles (e. g. pravadoline, AM-694, RSC-4).
5. Eicosanoids (endocannabinoids such as anandamide) and others.

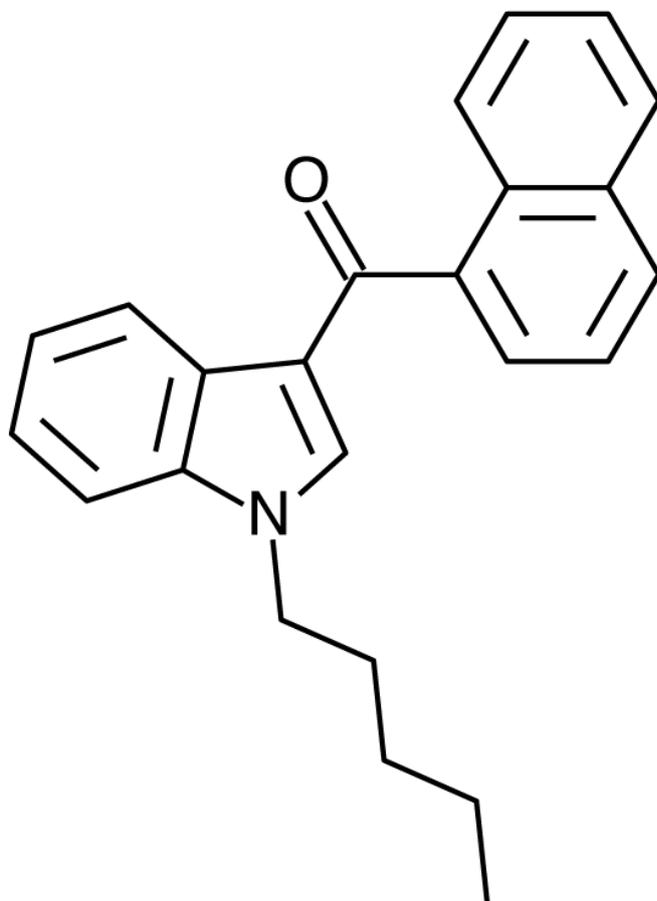
3-MeO-PCP has been used recreationally recently. Thus seven of the miscellaneous compounds are given below:

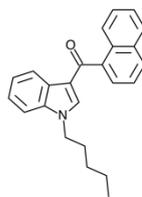
- IV.I            1-pentyl-3-(1-naphthoyl) indole (JWH-018)
- IV.II           naphthalen-1-yl-(1-butyldol-3-yl) methanone (JWH-073)
- IV.III          4-ethylnaphthalen-1-yl-(1-pentylindol-3-yl) methanone (JWH-210)
- IV.IV          1, 1-dimethylheptyl-11-hydroxytetrahydrocannabinol (HU-210)
- IV.V            2-[(1R, 3S)-3-hydroxycyclohexyl]- 5-(2-methyloctan-2-yl) phenol  
(CP-47,497)
- IV.VI          (1-pentylindol-3-yl)-(2,2,3,3-tetramethylcyclopropyl)methanone  
(UR-144)
- IV.VII         3-Methoxy Phencyclidine (3-MeO-PCP)

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# JWH-018 Report

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# JWH-018 or AM-678

## OVERVIEW

Chemical name: 1-pentyl-3-(1-naphthoyl) indole

Synonyms: Fake marijuana, K2, Spice, Red Magic, Smoke XXXX, Diesel, Serenity, and Blueberry Medication,

Active constituents: 1-pentyl-3-(1-naphthoyl) indole

Type: Research chemical – synthetic cannabinoid compound

Origin: JWH-018 was first synthesised by John W. Huffman, Professor at Clemson University. The name is given by the initials of J W Huffman.

Status: Novel

Chronology: Professor J W Huffman began his research into synthetic cannabinoid in 1984. Over two decades of research has produced more than 450 analogues and metabolites of delta-9-tetrahydrocannabinol (THC) which is one of the main ingredients of cannabis.

[1] [2] [3] [4] [a]

## KEY POINTS

JWH-018 or AM-678 is popularly thought to belong to the cannabis group but it is not. Structurally it belongs to the family of amino alkyl indole (naphtholyindole) and not related to THC. It acts on CB1 and CB2 receptors and produces effects similar to that of cannabis. It had been one of the ingredients of the 'Spice' or 'herbal incense' before its ban. Interestingly, following its ban, JWH-018 was replaced by JWH-073 in many such products. [b]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: naphthalen-1-yl-(1-pentylindol-3-yl) methanone

Molecular weight: 341.45 g/mol

Molecular formula: C<sub>24</sub>H<sub>23</sub>NO

CAS Number: 209414-07-3 [5] [6] [7]

## APPEARANCE OF COMMERCIAL PRODUCTS

## Product Description

### **Tiger Food**

We have recently invested in developing a manufacturing establishment in China and are now able to provide, interested buyers, bulk products at low prices with free worldwide shipping. All goods are shipped via courier straight from our lab in China. Minimum order quantity is 20g.

Most of the products are jwh, am series and other research chemicals that are well known worldwide. [8]

### **Canna Zine**

JWH-018 is the laboratory-synthesized substance which has been designed 'from the ground up', just to get people high. At least that was the explanation JW Huffman gave it. He's the fella who invented this stuff as well as the man who put the JWH in JWH-018. [9]

### **Kogged**

With the research chemical JWH-018 increasing in popularity, it becomes important for independent researchers to have access to JWH-018 and chemicals alike. I have dealt with my fair share of JWH-018 distributors and the majority of the companies seem "flaky" and unreliable; however, I have finally found a solid and reliable company that delivers at a fair price.[10]

## AVAILABLE INFORMATION ON PURCHASE PRICE

Only few websites actively promote the sale of these compounds. The price given in one website is as follows: 20 g for £ 320; 50 g for £ 550; 100 g for £ 850; 200 g for £ 1300; 500 g for £ 2200; 1000 g for £ 3500.

Some other websites display catalogue of compounds available, but buyers need to contact them about the price information. Yet few more websites just advertise and request the buyer to leave a comment. So the buyers leave their email address and through this possibly the vendors contact them for the price and delivery information. [11]

## MODALITIES OF INTAKE

JWH-018 can be smoked or the vapour from the aluminium foil is inhaled.

Rarely, it can be cooked to make brownies and eaten along with food.

Forum users' advised to start at very low dose of 0.5 mgs to 1milligram. The usual dose is between 2 to 4 milligrams.

Forum users discuss about accurate measurement of the JWH-018 powder. Some users approximately measure minute quantity (visually) and do not use

measuring scales. This is known as “eye balling” the sample. The popular belief is that eye balling method does not result in overdoses. This assumption is not true, as the amount eye balled depends on the density of the material used and not the volume of the measured mass.

[12] [13] [14]

## LEGAL STATUS

‘Spice’ (which contains a mixture of cannabinoid substances including JWH-018, JWH-073 and HU-210) was classified under Class B in 2009 in the UK.

It is claimed to be uncontrolled in Canada. JWH-018 was scheduled as Class 1 drug in the USA on 1<sup>st</sup> March 2012.

Although JWH-018 is not explicitly listed, ‘Spice-type’ of products are controlled in many countries such as Austria, Argentina, Belarus, Brazil, Channel islands, Chile, Estonia, France, Netherlands, New Zealand, Germany, Italy, Ireland, Latvia, Luxembourg, Romania, Poland, Russia, Sweden, South Korea etc.

[15] [16] [17] [18] [d]

## CURRENT USE / MEDICINAL USE

The intention of Huffman and his team is to explore the properties of these synthetic cannabinoid compounds and the cannabinoid brain and peripheral receptors. They have been studied for its treatment in nausea, glaucoma and as appetite suppressant. [19]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

- Sexual stimulation
- Euphoria

[20]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With 5Meo-DMT (it caused extreme nausea, anxiety and respiratory depression)
- With 2C-E, MDPV and Mephedrone
- With JWH-073
- With alprazolam

[21] [22]

## PHARMACOLOGICAL CHARACTERISTICS

JWH-018 acts as a full agonist at CB1 (Cannabinoid) receptors and CB2 receptors. The binding affinity which is represented by  $K_i$  for CB1 and CB2 receptors are  $9.00 \pm 5.00$  and  $2.94 \pm 2.65$  nM, respectively. This shows the greater affinity for CB2 receptors than CB1 receptors (the lower the  $K_i$  value, the greater the affinity).

[23] [24]

## TOXICOLOGICAL EFFECTS

A user claimed to have received an email from Professor John W. Huffman. In that email Professor JWH affirmed that there are no data on the long term effects of this compound on animals (apart from anecdotal data from Der Spiegel) and certainly there are no data regarding its effects in humans.

Anecdotal reports suggest that it is likely to produce seizures in higher doses.

[24a] [24b] [c]

## DESIRED PSYCHOACTIVE EFFECTS

- Sexual stimulation
- Euphoria

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- Headaches
- Tachycardia
- High blood pressure
- Dizziness
- Vomiting
- Increased muscle tone
- Dysphoria
- Dry mouth
- Itchy skin
- Photophobia

[25] [26]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

Marijuana like side effects

- Intense paranoia and recurring psychotic episodes requiring admission to emergency departments
- Severe anxiety and fear lasting for a month on regular use
- Panic attacks
- Auditory hallucinations
- Visual hallucinations
- Distortion of time (e.g, 2 hours seem like 2 days)
- Visual distortions (colour/ objects)
- Numbness of whole body
- Insomnia
- Heavy body load

[27] [28] [29] [30] [31]

## CLINICAL ADVICE

The dose of JWH-018 is very low and it is frequent for users to overdose on it as they do not use sophisticated balance to weigh them accurately. Hence it is advised to measure them accurately and use low doses (as small as 0.5 to 1 milligram).

It is not detected by conventional urine drug testing. Red Wood Toxicology offer urine drug testing and this substance can be detected up to 72 hours in the urine and up to 48 hours in the saliva. [32]

## RELATED FATALITIES

- L J, a 19 year old University student died of ‘multi organ failure’ after ingesting synthetic cannabinoid. It was reported that he had consumed ‘Tease – a herbal incense’. It is alleged that one of the ingredients was JWH-018.
- L K, died on 8<sup>th</sup> Jan 2012. It was reported in the autopsy report that the blood samples contained JWH-018 and JWH 2201. It showed the levels of JWH-018 as 0.53 ng/ml and AM-2201 as 9.0 ng/ml.

[33] [34] [35]

## YOU TUBE VIDEOS

There are numerous videos in English and other languages. Few examples are given below:

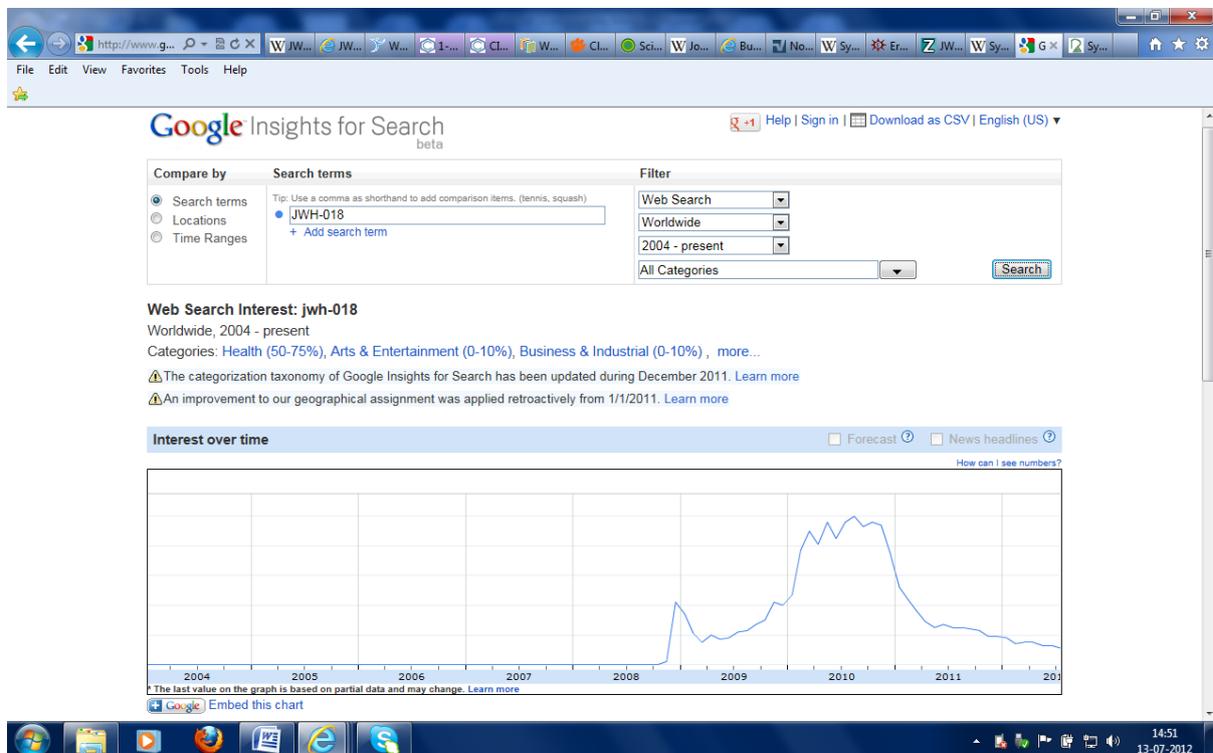
1. Neurosoup
2. JWH-018 synthesis

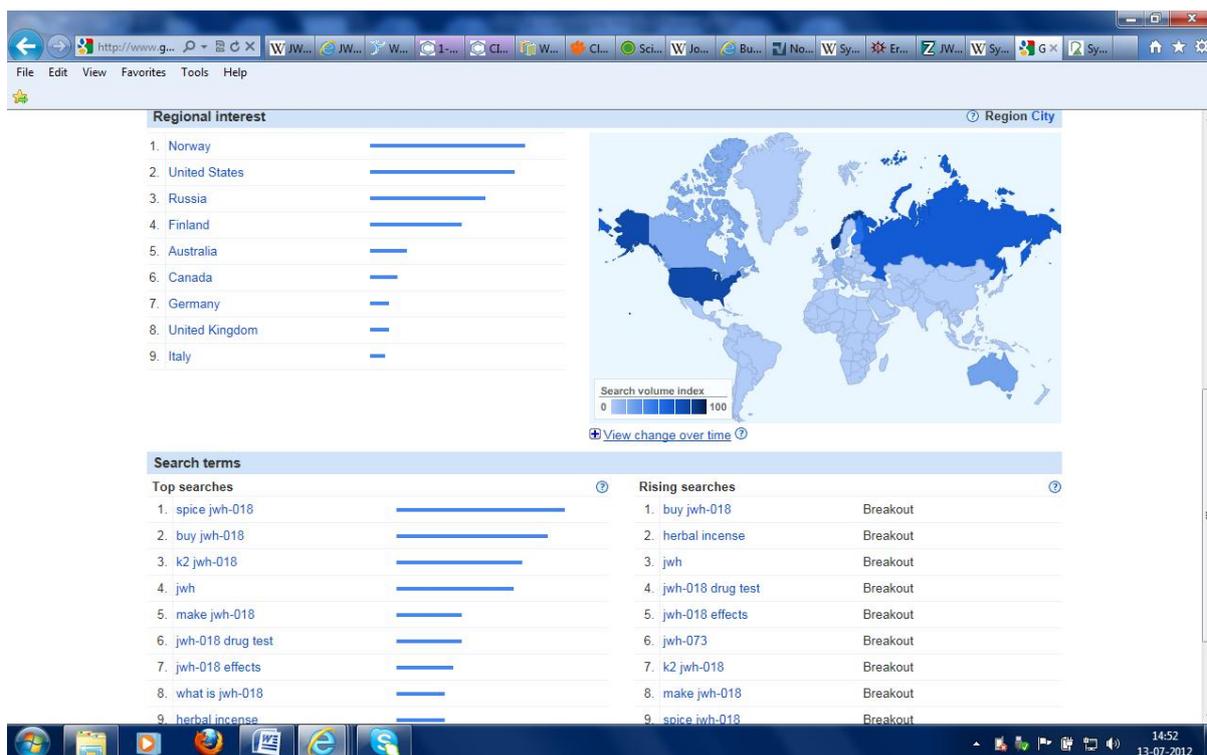
3. You tube trip
4. Buy JWH-018 online

[36] [37] [38] [39]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for JWH-018, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.





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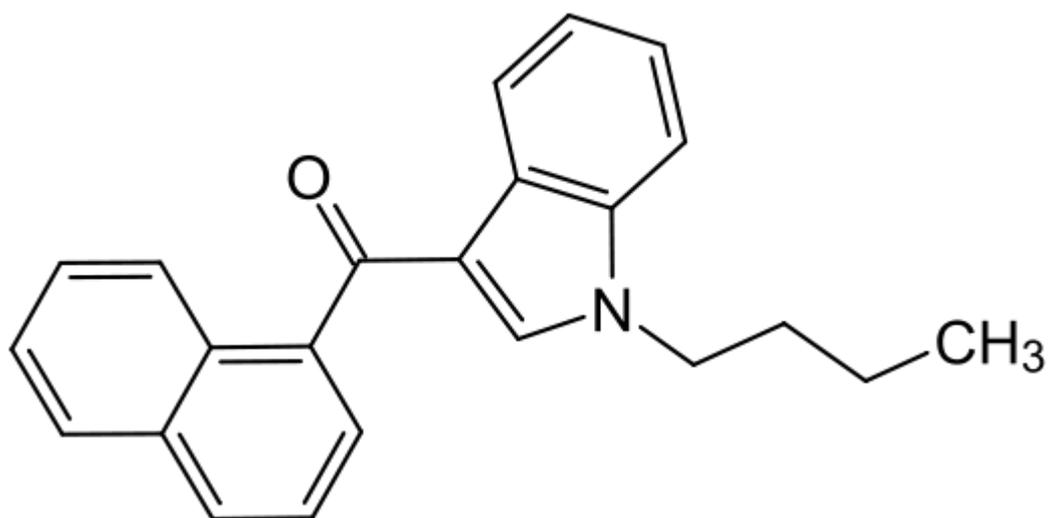
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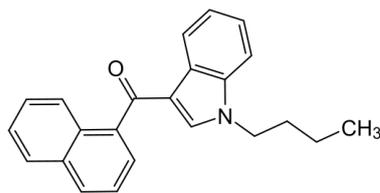
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# JWH-073 Report

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# JWH-073



## OVERVIEW

Chemical name: naphthalen-1-yl-(1-butylindol-3-yl) methanone

Synonyms: Numerous street names are available and sold as ‘herbal incense’. Spice, K2, Yucatan Fire and Genie, Banana Cream Nuke (combination of JWH-073 and JWH-018) are few of such examples.

Active constituents: naphthalen-1-yl-(1-butylindol-3-yl) methanone

Type: Research chemical – synthetic cannabinoid compound

Origin: JWH-073 was first synthesised by John W. Huffman, Professor at Clemson University. The name is given by the initials of J W Huffman. It is considered 3 to 5 times as potent as cannabis.

Status: Novel

Chronology: Professor J W Huffman began his research into synthetic cannabinoid in 1984. Over two decades of research has produced more than 450 analogues and metabolites of delta-9-tetrahydrocannabinol (THC) which is one of the main ingredients of cannabis. JWH-073 is one of those compounds he synthesised.

[1] [2] [3] [4] [a]

## KEY POINTS

JWH-073 is popularly thought to belong to the cannabis group but it is a synthetic cannabinoid and structurally it belongs to the family of amino alkylindole (naphtholyindole). It acts on CB1 and CB2 receptors and produces effects similar to that of cannabis. It is generally regarded a 3-5 times more potent than cannabis.

‘Spice’ or ‘herbal incense’ contained JW-018 and JWH-073 and subsequent to the ban on JWH-018, this compound was replaced by JWH-073.

[5] [6] [b]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: naphthalen-1-yl-(1-butylindol-3-yl) methanone

Molecular weight: 327.42 g/mol

Molecular formula: C<sub>23</sub>H<sub>21</sub>NO

CAS Number: 208987-48-8

[7] [8] [9]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product Description
<p><b>Tiger Food</b></p> <p>We have recently invested in developing a manufacturing establishment in China and are now able to provide, interested buyers, bulk products at low prices with free worldwide shipping. All goods are shipped via courier straight from our lab in China. Minimum order quantity is 20g.</p> <p>Most of the products are jwh, am series and other research chemicals that are well known worldwide. [10]</p>
<p><b>Tradevv</b></p> <p>JWH-073: 1-Butyl-3-(1-naphthoyl)indole</p> <p>naphthalen-1-yl-(1-butylindol-3-yl)methanone</p> <p>CAS 208987-48-8 Formula C<sub>23</sub>H<sub>21</sub>NO</p> <p>Mol. mass 327.42 g/mol Purity: 99%min [11]</p>
<p><b>Bridgat</b></p> <p>Contact now.</p> <p>[12]</p>
<p><b>Research Chemical:</b></p> <p>JWH-073 Sample</p> <p>Price: €20.00</p> <p>[13]</p>

## AVAILABLE INFORMATION ON PURCHASE PRICE

Only few websites actively promote the sale of this compound. The price given in one website is as follows:

50 g - €700; 100 g - €1000; 500 g - € 4000; 1Kg - € 7000; 3 Kg - € 19,500;

5 Kg – € 30,000; 10 Kg - € 50,000; 20 Kg - € 80,000

Some other websites display catalogue of compounds available, but buyers need to contact them about the price information. Yet few more websites just advertise and request the buyer to leave a comment. So the buyers leave their email address and through this possibly the vendors contact them for the price and delivery information. [14] [15]

## MODALITIES OF INTAKE

The popular method of using JWH-073 seems to be inhaling the vapour from the aluminium foil.

Oral ingestion is another common method. The powder is placed in a gel cap and swallowed.

Rarely, users make their own blend of ‘Spice’. For examples, JWH-073 is dissolved in acetone and smoked with tobacco; or it is dissolved in alcohol and mixed with mint.

The usual dose for first time user is between 4 to 6 milligrams. It has cross tolerance with cannabis and so for a regular cannabis user a dose of 10-20 milligrams is suggested by the users.

Forum users discuss about accurate measurement of the JWH-073 powder. Some users approximately measure minute quantity (visually) and do not use measuring scales. This is known as “eye balling” the sample. The popular belief is that eye balling method does not result in overdoses. This assumption is not true, as the amount eye balled depends on the density of the material used and not the volume of the measured mass.

[16] [17] [18] [19] [20]

## LEGAL STATUS

‘Spice’ (which contains a mixture of cannabinoid substances including JWH-018 and JWH-073) was classified under Class B in 2009 in the UK. JWH-073 was scheduled as Class 1 drug in the USA on 1<sup>st</sup> March 2012.

Although JWH-073 is not explicitly listed, ‘Spice-type’ of products are controlled in many countries such as Austria, Argentina, Belarus, Brazil,

Channel islands, Chile, Estonia, France, Netherlands, New Zealand, Germany, Italy, Ireland, Latvia, Luxembourg, Romania, Poland, Russia, Sweden, South Korea etc.

It is claimed to be uncontrolled in Canada.

[21] [22] [23] [24] [25] [f]

## CURRENT USE / MEDICINAL USE

The intention of Huffman and his team is to explore the properties of these synthetic cannabinoid compounds and the cannabinoid brain and peripheral receptors. They have been studied for its treatment in nausea, glaucoma and as appetite suppressant.

[26]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

- Sexual stimulation
- Euphoria
- Thought provoking

Come up: few minutes

Peak: 1 hour

Come down: 3 hours

[27] [28]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- JWH-073 is usually combined with JWH-018 in a ration of 2:1
- The forum users take vote for the best ratio for combining the following:  
JWH-018 + JWH-073 + JWH-081 + JWH-250 ratios:

JWH-018	JWH-073	JWH-081	JWH-250	JWH-018	JWH-073	JWH-081	JWH-250	Total
1	1	2	2	10mgs	10mgs	20mgs	20mgs	60mgs
1	2	1	2	10	20	10	20	60
1	2	2	1	10	20	20	10	60
2	2	1	1	20	20	10	10	60
2	1	2	1	20	10	20	10	60
2	1	1	2	20	10	10	20	60
1	1	1	1	15	15	15	15	60
2	1	1	1	24	12	12	12	60
1	2	1	1	12	24	12	12	60
1	1	2	1	12	12	12	12	60
1	1	1	2	12	12	24	24	60

[29] [30] [31]

## PHARMACOLOGICAL CHARACTERISTICS

JWH-073 has a  $K_i$  value of 8.9 for CB1 receptors and 28 for the CB2 receptors. This shows greater affinity for CB1 receptors than CB2 receptors (the lower the  $K_i$  value, the greater the affinity). Hence it has intermediate to high affinity for CB1 receptors in brain which accounts for most of its adverse effects.

[32] [c] [d]

## TOXICOLOGICAL EFFECTS

It possesses cross tolerance with other THC compounds. Hence those who smoke cannabis regularly (for at least 2 years), the first time use of JWH-073 is reported to be well tolerated, where as for those who have not been used to cannabis, it could be toxic even on the first use. Hence the forum users warn the first time user to be cautious.

It is also suggested by the forum users that it could possess carcinogenic properties.

When naphthalene undergoes metabolism, epoxides are produced which are carcinogenic. These products could interact with DNA molecule. During the metabolism, (see figure below), cytochrome 450 breaks down C=C into a simple bond, C-C, which then joins the Oxygen molecule to produce epoxide. Some of these epoxides are metabolised into non toxic products. However, some still remain unmetabolised and could, theoretically, interact with DNA and proteins causing carcinogenesis.

[33] [34] [35] [36]

## DESIRED PSYCHOACTIVE EFFECTS

- Sexual stimulation
- Extreme Euphoria

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

The most commonly occurring side effects, as discussed by the forum users, are given below:

- Headaches
- Tachycardia
- Normal pupil size, but lateral gaze nystagmus
- Tremor
- High blood pressure
- Dizziness
- Vomiting

- Increased muscle tone
- Dysphoria
- Dry mouth
- Itchy skin
- Photophobia
- It causes or aggravates pre-existing lung condition

[37] [38] [39] [40] [e]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

### Marijuana like side effects

- Intense paranoia and recurring psychotic episodes requiring admission to emergency departments
- Anxiety and fear (but less than JWH-018)
- Intense panic attacks
- Auditory hallucinations
- Visual hallucinations
- Distortion of time
- Visual distortions (colour/ objects)
- Numbness of whole body
- Insomnia
- Heavy body load

[41] [42] [43] [44] [45] [46] [47] [48]

## CLINICAL ADVICE

JWH-073 is not detected by conventional urine drug testing. Red Wood Toxicology offer urine drug testing and this substance can be detected up to 72 hours in the urine and up to 48 hours in the saliva.

[49] [50]

## RELATED FATALITIES

L J, a 19 year old University student died of ‘multi organ failure’ after ingesting synthetic cannabinoid. It was reported that he had consumed ‘Tease – a herbal incense’ which was alleged to contain ingredients such as JWH-018, JWH-073.

[51]

## YOU TUBE VIDEOS

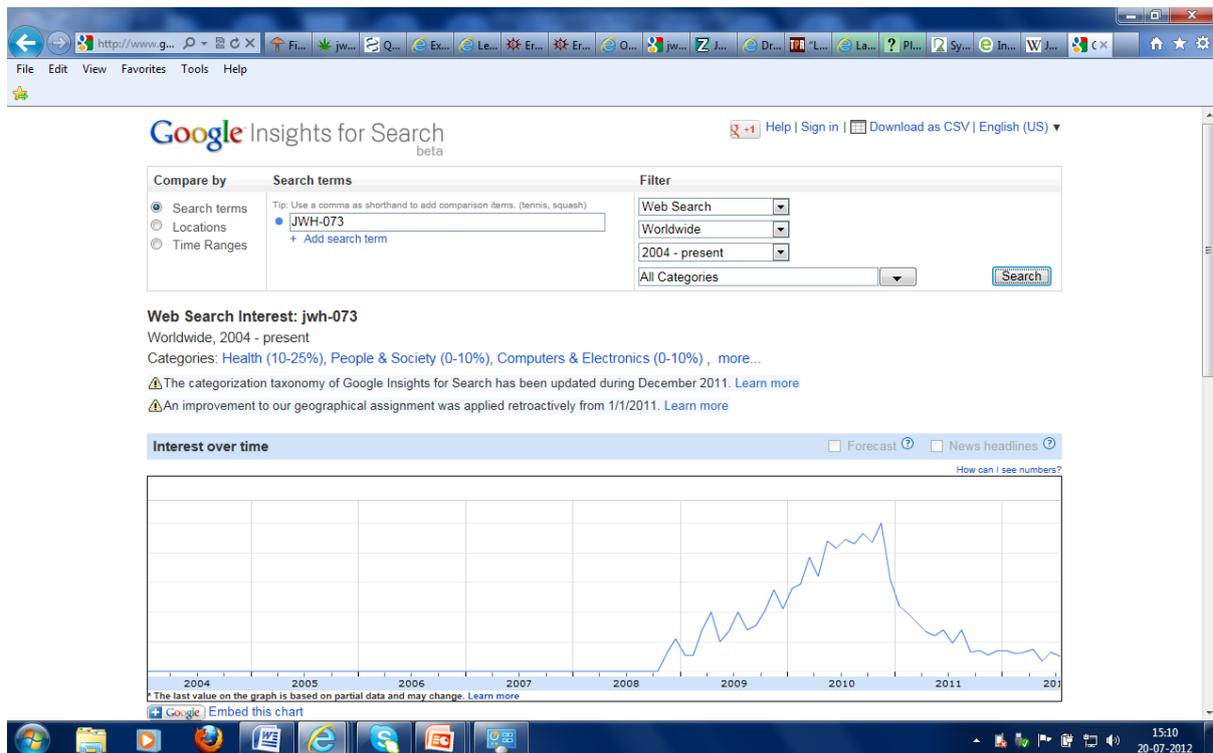
There are numerous videos in English and other languages. Few examples are given below:

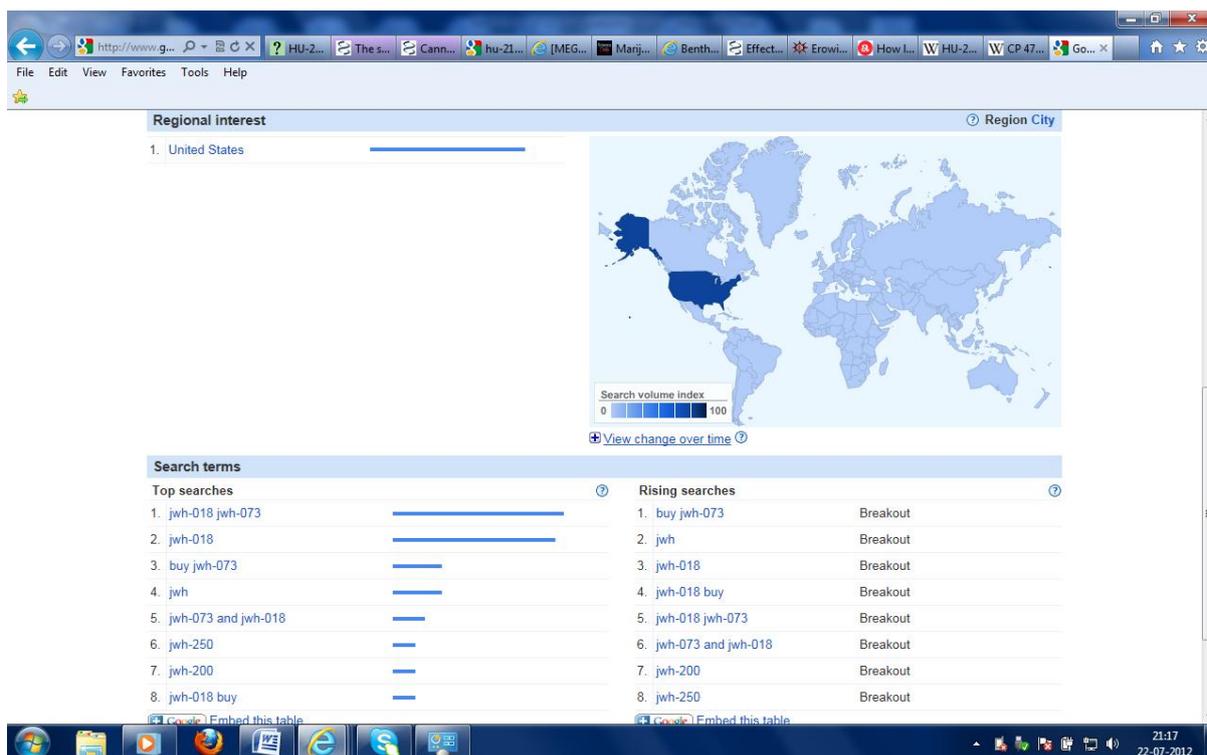
1. Neurosoup
2. JWH-073
3. Buy JWH
4. Citizens Against Banning Legal Substances

[52] [53] [54] [55]

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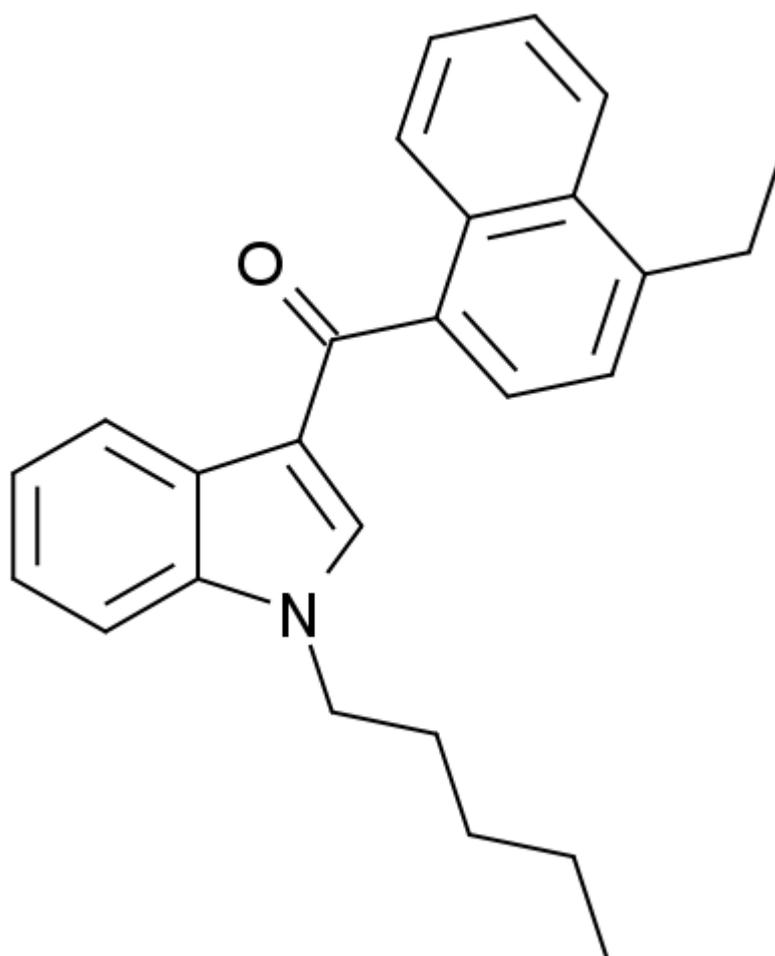
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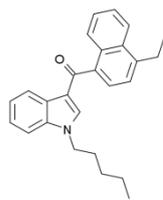
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- [55] You tube video 4: <http://www.youtube.com/watch?v=BXWb6nLlnS8> (Accessed May 12, 2012)

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# JWH-210 Report

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# JWH-210

## OVERVIEW

Chemical name: 4-ethylnaphthalen-1-yl-(1-pentylindol-3-yl) methanone

Synonyms: Numerous street names are available for these synthetic cannabinoids. Ace of spades, atomic bomb, baby J are few examples.

Active constituents: 4-ethylnaphthalen-1-yl-(1-pentylindol-3-yl) methanone

Type: Research chemical – synthetic cannabinoid compound

Origin: JWH-210 was first synthesised by John W. Huffman, Professor at Clemson University. The name is given by the initials of J W Huffman.

Status: Novel

Chronology: Professor J W Huffman began his research into synthetic cannabinoid in 1984. Over two decades of research has produced more than 450 analogues and metabolites of delta-9-tetrahydrocannabinol (THC) which is one of the main ingredients of cannabis. JWH-210 is one of those compounds he synthesised.

[1] [2] [3] [4] [a]

## KEY POINTS

JWH-210 is popularly thought to belong to the natural cannabis group but it is a synthetic cannabinoid and structurally it belongs to the family of amino alkylindole (naphtholyindole). It acts on CB1 and CB2 receptors as a potent agonist and produces effects similar to that of cannabis but more potent.

‘Spice’ or ‘herbal incense’ contains various synthetic compounds such as JW-018, JWH-073, JWH-210, HU-210 etc.

[5] [6] [7] [8] [b] [c]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 4-ethylnaphthalen-1-yl-(1-pentylindol-3-yl) methanone

Molecular weight: 369.498 g/mol

Molecular formula: C<sub>26</sub>H<sub>27</sub>NO

CAS Number: 824959-81-1 [7] [9]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Details / description</b>
<b>Nanjing KaiKai Technology Co.,LTD</b> China Tel :86-25-8630xxxx Fax : 86-25-6866xxxx Attn : Mr. Kevin Peng Mobile :86-1391389xxxx Email :xxxx aitech@gmail.com [10]
<b>Kangshuo Biochem</b> Address: China Contact us [11]
<b>Research Chemicals Direct</b> JWH-210 50g Price: €700.00 [12]

## AVAILABLE INFORMATION ON PURCHASE PRICE

Only few websites actively promote the sale of this compound. The price given in one website is as follows:

50 g - €700; 100 g - €1000; 500 g - € 4000; 1Kg - € 7000; 3 Kg - € 19,500;

5 Kg – € 30,000; 10 Kg - € 50,000; 20 Kg - € 80,000

The price of JWH-210 is the same as that of JWH-073.

Few other websites display catalogue of compounds available, but buyers need to contact them about the price information. Yet few more websites just advertise and request the buyer to leave a comment. So the buyers leave their email address and through this possibly the vendors contact them for the price and delivery information. [12] [13]

## MODALITIES OF INTAKE

JWH-210 is a very white crystalline non-sticky powder. The popular method of using it seems to be inhaling the vapour from the aluminium foil preferably through a small pipe.

Oral ingestion is another common method. The powder is placed in a gel cap and swallowed.

Rarely, users make their own blend of ‘Spice’. For examples, JWH-210 is dissolved in acetone and smoked with tobacco; or it is dissolved in alcohol and mixed with mint.

The usual dose for first time user is between 4 to 6 milligrams. It has cross tolerance with cannabis and so for a regular cannabis user a dose of 10-20 milligrams is suggested by the users.

Forum users discuss about accurate measurement of the powder. Some users approximately measure minute quantity (visually) and do not use measuring scales. This is known as “eye balling” the sample. The popular belief is that eye balling method does not result in overdoses. This assumption is not true, as the amount eye balled depends on the density of the material used and not the volume of the measured mass.

[13] [14] [15] [16] [17]

## LEGAL STATUS

Although JWH-210 is not explicitly listed, ‘Spice-type’ of products are controlled in many countries such as Austria, Argentina, Belarus, Brazil, Channel islands, Chile, Estonia, France, Netherlands, New Zealand, Germany, Italy, Ireland, Latvia, Luxembourg, Romania, Poland, Russia, Sweden, South Korea etc.

‘Spice’ (which contains a mixture of cannabinoid substances including JWH-018, JWH-073, JWH-210 and HU-210) was classified under Class B in 2009 in the UK. It was banned on 1<sup>st</sup> Oct 2010 in Sweden. JWH-210, as a compound, is unscheduled in the USA.

[18] [19] [20] [21] [d]

## CURRENT USE / MEDICINAL USE

The intention of Huffman and his team is to explore the properties of these synthetic cannabinoid compounds and the cannabinoid brain and peripheral receptors. They have been studied for its treatment in nausea, glaucoma and as appetite suppressant. [22]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

- Sexual stimulation
- Euphoria
- Thought provoking
- Sensory distortions

Come up: few minutes

Peak: 1 hour

Come down: 2-3 hours

A users experience is given below:

**T 0:00** Smoked through small wooden pipe (about 100-120 mg of herbs containing 5-6 mg of JWH-210)

**T 0:10** effects comparable to cannabis.

**T 0:15** great high, euphoria, tranquility, heightened sensory perception (music and taste), slight body buzz with pleasant muscle relaxation.

**T 0:40-1:20** strong plateau.

**T 1:30-2:00** Effects are fading out.

**T 2:00-3:00** Baseline reached.

[23]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With Phenazepam (4mgs) and MXE (30mgs) and suffered a psychotic episode
- With AM-2201 – suffered side effect from this combination such as unstable gait, dizziness, extreme dry mouth, and palpitations.

[24] [25]

## PHARMACOLOGICAL CHARACTERISTICS

JWH-210 has a  $K_i$  value of 0.46nM for CB1 receptors and 0.69nM for the CB2 receptors. This shows a potent affinity for both CB1 and CB2 receptors (the lower the  $K_i$  value, the greater the affinity). [d] [26]

## TOXICOLOGICAL EFFECTS

It possesses cross tolerance with other THC compounds. Hence the forum users warn the first time users.

It is also suggested by the forum users that it could possess carcinogenic properties.

When naphthalene undergoes metabolism, epoxides are produced which are carcinogenic. These products could interact with DNA molecule. During the metabolism, (see figure below), cytochrome 450 breaks down C=C into a simple bond, C-C, which then joins the Oxygen molecule to produce epoxide. Some of these epoxides are metabolised into non toxic products. However, some still remain un metabolised and could, theoretically, interact with DNA and proteins causing carcinogenesis. [27]

## DESIRED PSYCHOACTIVE EFFECTS

- Sexual stimulation
- Extreme Euphoria

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

JWH-210 is a research chemical and is not intended to human consumption, as there are not enough data to support safe use in people.

- Headaches
- Tachycardia
- Normal pupil size, but lateral gaze nystagmus
- Tremor
- High blood pressure
- Dizziness
- Vomiting
- Increased muscle tone
- Dysphoria
- Dry mouth
- Itchy skin
- Photophobia
- It causes or aggravates pre-existing lung condition

[28] [29]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

Marijuana like side effects including the following:

- Intense paranoia and recurring psychotic episodes requiring admission to emergency departments
- Less anxiety and fear than JWH-018
- Auditory hallucinations
- Visual hallucinations
- Distortion of time

- Visual distortions (colour/ objects)
- Numbness of whole body
- Insomnia
- Heavy body load

[30] [31] [32] [33]

## CLINICAL ADVICE

JWH-210 is not detected by conventional urine drug testing. Red Wood Toxicology offer urine drug testing and this substance can be detected up to 72 hours in the urine and up to 48 hours in the saliva. [34] [35]

## RELATED FATALITIES

- Lamar Jack, a 19 year old University student died of ‘multi organ failure’ after ingesting synthetic cannabinoid. It was reported that he had consumed ‘Tease – a herbal incense’ which was alleged to contain ingredients such as JWH-018, JWH-073, JWH-210 etc. [36]

## YOU TUBE VIDEOS

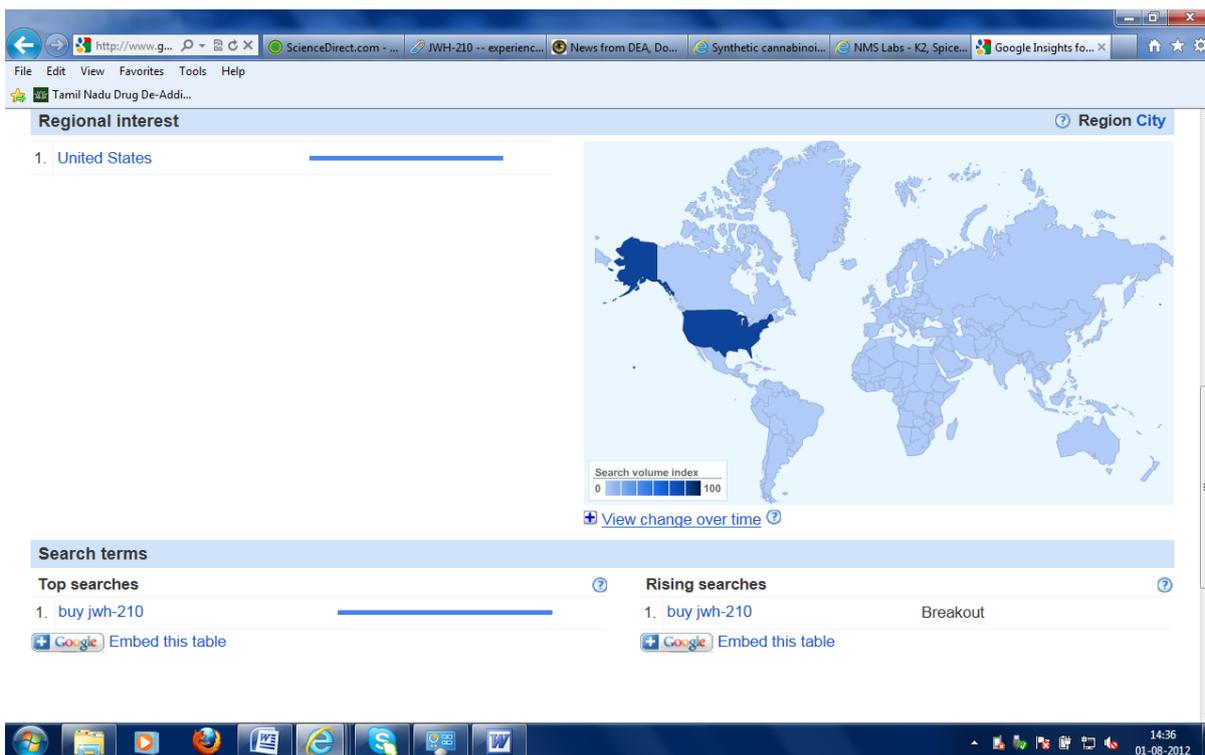
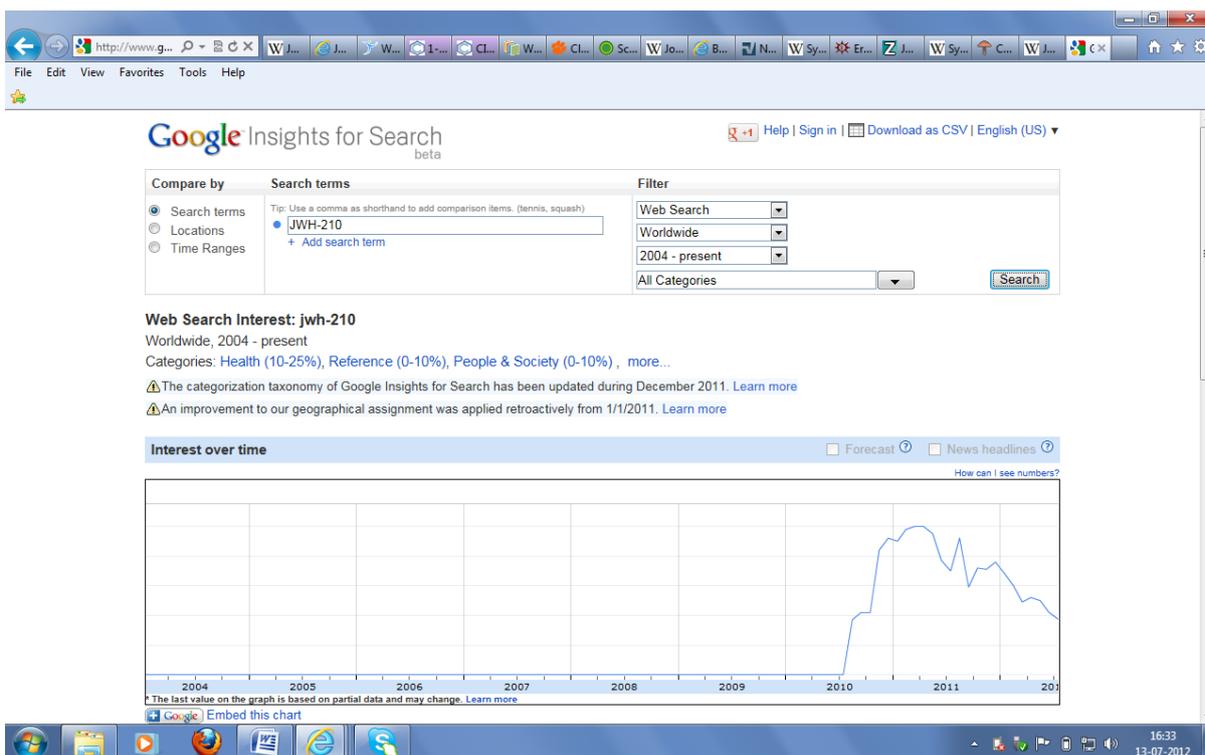
There are a number of videos in English for the sale. Few examples are given below:

1. Where to buy JWH-210?
2. Buy JWH-210

[37] [38]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for JWH-210, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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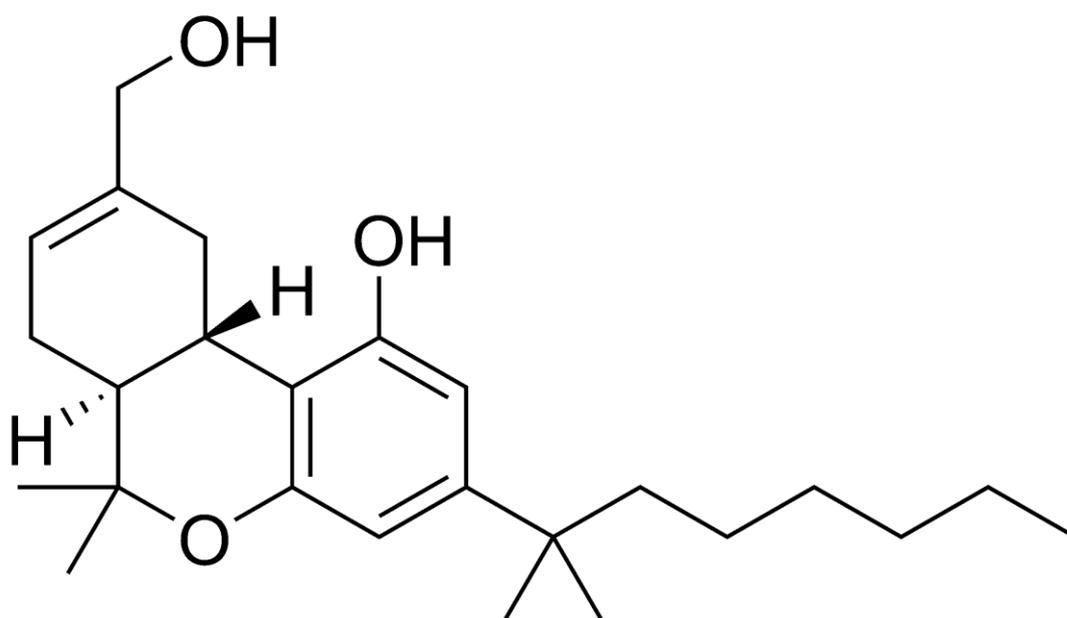
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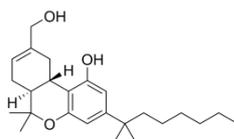
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# HU-210 Report

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# HU-210



## OVERVIEW

Chemical name: 1, 1-dimethylheptyl-11-hydroxytetrahydrocannabinol

Synonyms: HU210, H7909\_sigma, Chembi: 213285 and also all other street names of 'Spice' as HU-210 is considered to be one of its ingredients.

Active constituents: 1, 1-dimethylheptyl-11-hydroxytetrahydrocannabinol

Type: Research chemical – synthetic cannabinoid

Origin: HU-210 was first synthesised from a compound (1R, 5S-Myrtenol) by Professor Raphael Mechoulam and his team who worked at the Hebrew University in 1998. The name 'HU' is the abbreviation of Hebrew University.

Status: Novel

Chronology: This compound was originally used in basic scientific research to identify cannabinoid receptors in the brain and its application in the medical field (e.g, treatment of nausea, treatment of dementia). However, it was illegally sold as a recreational compound. The first confirmed seizure was in 2008 at Wilmington, Ohio by the U.S. Customs and Border Protection. The individual pouches (see below) were names as 'Spice Diamond'; 'Spice Artic Energy'; 'Spice Gold'; 'Genie' and 'Yucatan Fire'. The laboratory investigation confirmed the presence of HU-210 in them. [a] [1]

## KEY POINTS

HU-210 is reported to be about 100 to 800 times more potent than Tetra Hydro Cannabinol (THC) from natural cannabis and has longer duration of action. HU-210 is the 1, 1-dimethylheptyl homologue of 7-hydroxy- Δ6-tetrahydrocannabinol. It is considered to be the most potent cannabinoids ever known.

[b] [2]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 6aR,10aR)- 9-(Hydroxymethyl)- 6,6-dimethyl- 3-(2-methyloctan-2-yl)- 6a,7,10,10a-tetrahydrobenzo [c]chromen- 1-ol

Molecular weight: 386.567 g/mol

Molecular formula: C<sub>25</sub>H<sub>38</sub>O<sub>3</sub>  
CAS Number: 112830-95-2 [3] [4]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product Description</b>
<b>Cayman Chem</b>  To ask for assistance with one of our products please contact a Technical Support Scientist.  <b>This product requires special processing and/or additional information before it can be shipped. A Customer Service representative will contact you within 24 hours of receipt of your order.</b>  <b>Warning</b> This product is <b>not</b> for human or veterinary use. [5]
<b>Tocris</b>  This product is a <u>Home Office controlled substance</u> and is not available for purchase online in your territory (UK). Please <u>contact us</u> to place your order. Orders for Home Office controlled substances will incur a £28 / €33 administrative fee to cover licence expenses. [6]
<b>Pseudoephedrine Inc.</b>  HU-210, Buy HU-210, HU-210 For Sale, High Quality HU-210  Phone: +44-703-592-XXXX [7]

## AVAILABLE INFORMATION ON PURCHASE PRICE

Most websites display catalogue of compounds available, but buyers need to contact them about the price information. Yet few more websites just advertise and request the buyer to leave a comment. So the buyers leave their email address and through this possibly the vendors contact them for the price and delivery information. The one above has given a mobile number to call and get further information. In one (rare) website the price was given:

UK: 5 mg for £105 (In stock) and 25 mg for £435 (In stock) [7] [8]

## MODALITIES OF INTAKE

HU-210 can be smoked or orally ingested. It is not water soluble, but dissolves well in pure acetone or alcohol. The vapour can be inhaled from a foil. [9]

## LEGAL STATUS

‘Spice’ (which contains a mixture of cannabinoid substances including JWH-018, JWH-073 and HU-210) was classified under Class B in 2009 in the UK.

It is claimed to be uncontrolled in Canada. HU-210 was scheduled as Class 1 drug in the USA.

Although HU-210 is not explicitly listed, 'Spice-type' of products are controlled in many countries such as Austria, Argentina, Belarus, Brazil, Channel islands, Chile, Estonia, France, Netherlands, New Zealand, Germany, Italy, Ireland, Latvia, Luxembourg, Romania, Poland, Russia, Sweden, South Korea etc.

[10] [11] [12] [13] [14]

## CURRENT USE / MEDICINAL USE

It is hypothesised that HU-210 and various other synthetic cannabinoids could be used for the treatment of Alzheimer's disease. Numerous scientific studies have been conducted on this subject for many years. Recently, Chen and his team concluded that HU210 had no beneficial effects on neuropathology and behavioural deficits of Alzheimer's disease. It also cautioned on using HU-210 as a treatment because it could potentially cause 'some detrimental effects'.  
[c] [15]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

It is reported to be one of the ingredients of 'Spice' and hence it is difficult to assess its individual effects. However, it has a slower onset of action but longer duration of action when compared with JWH-018.

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With JWH-018
- 'Spice' is popularly known to contain JWH-018, JWH-073, HU-210 and CP-47497

[16] [17]

## PHARMACOLOGICAL CHARACTERISTICS

As described in the introduction, HU-210 is reported to be about 100 to 800 times more potent than THC from natural cannabis and has longer duration of action.

## TOXICOLOGICAL EFFECTS

It is a hypothesis that marijuana intake causes modifications in various mental functions including memory deficits in memory formation. A strong finding in terms of the memory is the deficit in working and short term memory. For memory formation there must be intact pre frontal cortex and hippocampus

which contain abundant CB1 receptors. It was postulated that administration of exogenous cannabinoid agonists impairs memory formation by affecting its coding process.

A recent animal experiment was conducted to find out the effect of cannabinoid on memory and hippocampal activity. HU-210 was used as an exogenous synthetic cannabinoid agonist. The finding confirmed that the deficits in memory as well as effects on anxiety, motor activity and spatial learning. The presence of cannabinoid antagonists (SR141716A or AM281) did not reverse the memory deficits. The mechanism for spatial memory deficit was due to the abnormality in hippocampal cell firing.

[d][e]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

Tolerance develops on regular use and forum users also reported withdrawal symptoms on stopping after prolonged use. The various side effects are listed below:

- Migraine / headaches – very severe and long lasting, even for weeks
- Tachycardia
- Normal pupil size, but lateral gaze nystagmus
- Tremor
- High blood pressure
- Dizziness
- Vomiting
- Increased muscle tone
- Dysphoria
- Dry mouth
- Itchy skin
- Photophobia
- It causes or aggravates pre-existing lung condition

[18] [19] [20] [21] [22] [f]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

HU-210 is a synthetic cannabinoid and several times more potent than THC. Its action is similar to that of cannabis and hence it produces Marijuana like side effects:

- Intense paranoia and recurring psychotic episodes requiring admission to emergency departments
- Anxiety and fear
- Intense panic attacks
- Auditory hallucinations
- Visual hallucinations
- Distortion of time
- Visual distortions (colour/ objects)
- Numbness of whole body
- Insomnia
- Heavy body load

[23] [24] [25] [26] [27] [28] [29] [30]

## CLINICAL ADVICE

HU-210 is a research chemical and is not intended to human consumption, as there are not enough data to support safe use in people.

## RELATED FATALITIES

Lamar Jack, a 19 year old University student died of ‘multi organ failure’ after ingesting synthetic cannabinoid. It was reported that he had consumed ‘Tease – a herbal incense’. It is alleged that one of the ingredients was HU-210. [31]

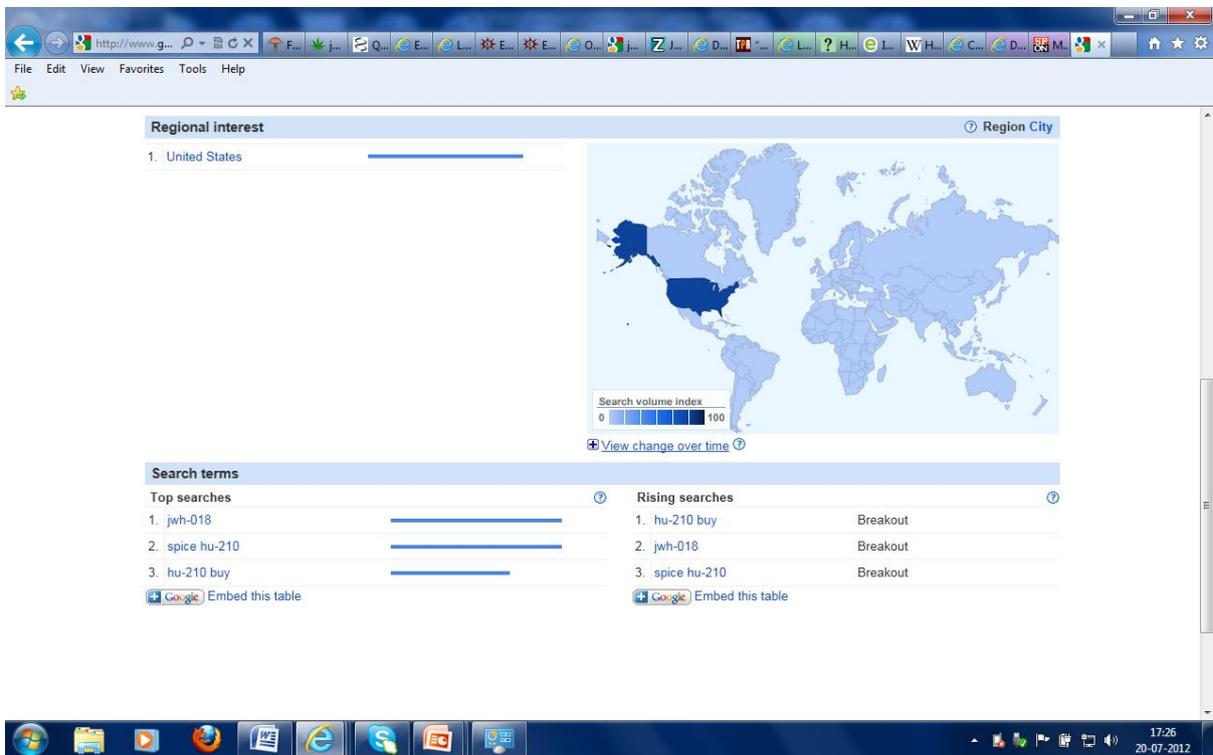
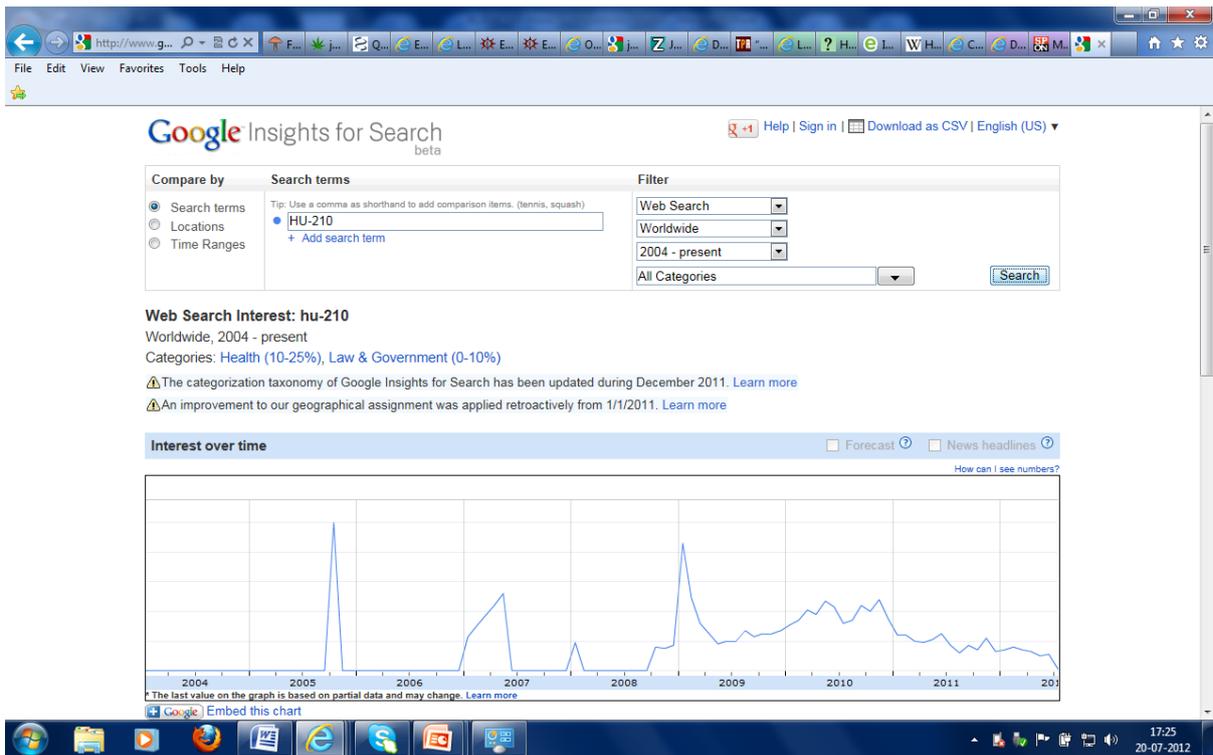
## YOU TUBE VIDEOS

1. HU-210
2. 2011 BEST HERBAL INCENSE REVIEW
3. Spice Products and Synthetic Cannabinoids
4. The K2 Diaries (Intro) Pt. 1

[32] [33] [34] [35]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for HU-210, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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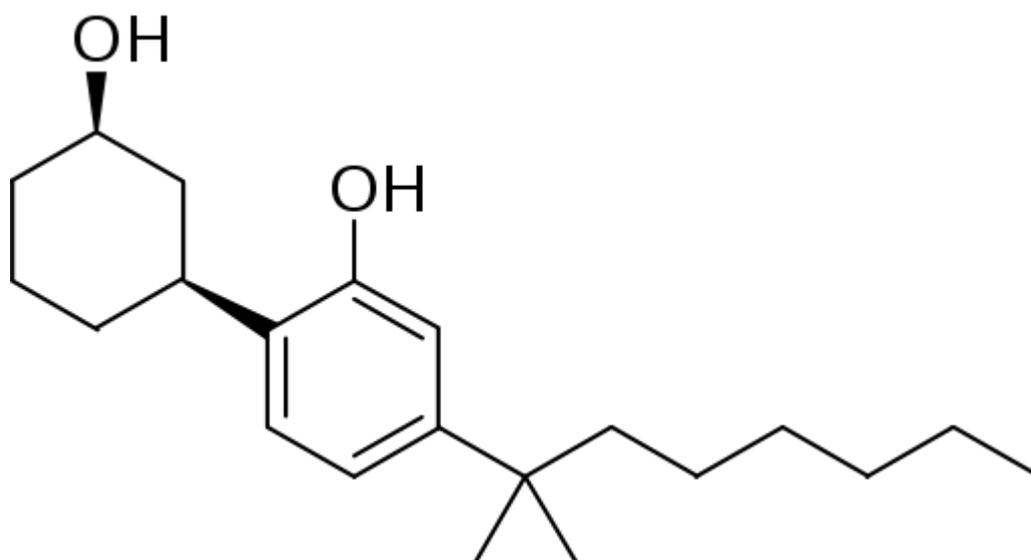
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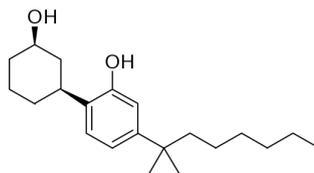
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# CP-47497 Report

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# CP-47497



## OVERVIEW

Chemical name: 2-[(1R, 3S)-3-hydroxycyclohexyl]- 5-(2-methyloctan-2-yl) phenol

Synonyms: CHEBI: 369647; CP-4497; (+/-)-CP 47497

Active constituents: 2-[(1R, 3S)-3-hydroxycyclohexyl]- 5-(2-methyloctan-2-yl) phenol

Type: Research chemical – synthetic cannabinoid

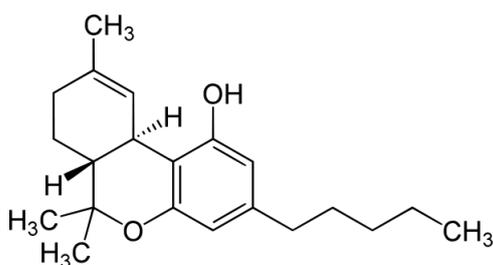
Origin: Since the identification of the structure of delta 9-tetra hydro cannabinol ( $\Delta^9$ -THC) in 1964, numerous synthetic analogues have been developed. In 1980s a team at Pfizer Company explored the synthesis of analgesics using (-)-9-nor- $\beta$ -hydroxyhexahydrocannabinol (HHC) as template and synthesised CP-47497.

Status: Novel

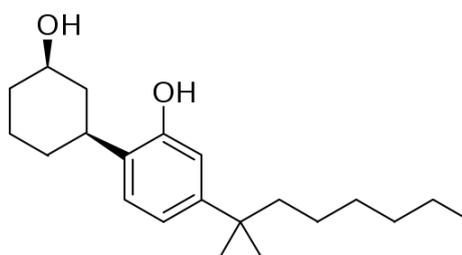
Chronology: It has been used for research in the medical field. However, recently it has appeared as a drug of misuse due to its more potent action on cannabinoid receptors. There are numerous products available online as ‘herbal incense’ which seem to contain a mixture of various chemicals predominantly synthetic cannabinoids. A recent report analysed various samples of these ‘herbal’ products and have confirmed the presence of at least 19 cannabinoids in those preparations. CP-47497 is one among them which was first identified in 2008. However some forum users report that CP-47497 was available from 2004.

[a] [b] [c] [d] [1]

## KEY POINTS



*$\Delta^9$ -THC*



*CP-47497*

CP-47497 is a non-classical cannabinoid belonging to the family of cyclohexylphenols and synthesised by removing the oxygen containing the pyran ring in the  $\Delta^9$ -THC molecule and keeping the phenolic hydroxyl group of the THC and 9-hydroxyl group of HHC. It is about 3 to 28 times more potent than  $\Delta^9$ -THC. [2]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 2-[(1R, 3S)-3-hydroxycyclohexyl]- 5-(2-methyloctan-2-yl) phenol

Molecular weight: 318.49346 g/mol

Molecular formula: C<sub>21</sub>H<sub>34</sub>O<sub>2</sub>

CAS Number: 70434-82-1 and 70434-92-3 (C8 homologue)

[3] [4] [5]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product description</b>
This product is a Home Office controlled substance and is not available for purchase online in your territory. Please contact us to place your order. Orders for Home Office controlled substances will incur a £28 / €33 administrative fee to cover licence expenses. [6]
<b>Cayman Chem</b> Cambridge Bioscience Ltd.  See a distributor in your region for pricing  <i>United Kingdom</i>  Voice: 01223 316 xxx  Fax: +44 (0)1954 781 xxx  sales@bioscience.co.ukxxx [7]
Groups Gmail advertisement  Research_Work At Safe-mail dot Netravent  Please read everything before placing an order! [8]

## AVAILABLE INFORMATION ON PURCHASE PRICE

In couple of (rare) website the price was given as follows:

UK: 10 mg for £79 (in stock) and 50 mg for £329 (in stock)

USA: 100mg for \$55 and 500mg for \$110

Some other websites display catalogue of compounds available, but buyers need to contact them about the price information. Yet few more websites just advertise and request the buyer to leave a comment. So the buyers leave their email address and through this possibly the vendors contact them for the price and delivery information. [8] [9]

## MODALITIES OF INTAKE

CP-47497 as one of the ingredient of various ‘herbal incense’ can be smoked as a joint or in a water pipe, according to a survey carried out in Germany. Another popular method is inhalation of the vapour which has the quickest mode of action. [10] [e]

## LEGAL STATUS

‘Spice’ (which contains a mixture of cannabinoid substances including JWH-018, JWH-073, CP-47497, HU-210 etc.) was classified under Class B in 2009 in the UK.

It is claimed to be uncontrolled in Canada. CP-47497 was scheduled as Class 1 drug in the USA as on 1<sup>st</sup> March 2012.

Although CP-47497 is not explicitly listed, ‘Spice-type’ of products are controlled in many countries such as Austria, Argentina, Belarus, Brazil, Channel islands, Chile, Estonia, France, Netherlands, New Zealand, Germany, Italy, Ireland, Latvia, Luxembourg, Romania, Poland, Russia, Sweden, South Korea etc. [11] [12] [13] [14] [f]

## CURRENT USE / MEDICINAL USE

The intention of Huffman and his team was to explore the properties of these synthetic cannabinoid compounds and the cannabinoid brain and peripheral receptors. They have been studied for its treatment in nausea, glaucoma and as appetite suppressant. [15]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

CP-47497 produces less euphoria than cannabis but the effects lasts longer.

Come up: 1/2 to 1 hour      Peak: about 4hours      Come down: 6-8 hours

An experienced cannabis user reported to have used between 10mgs to 25mgs. However caution was given for a new user and the usual starting dose was 5mgs.

[16] [17]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- It is one of the main ingredients of spice products.
- It is not very popular for combined use.

## PHARMACOLOGICAL CHARACTERISTICS

CP-47497 has a  $K_i$  value of 2.1nM for CB1 receptors. This shows strong agonistic action at CB1 receptors (the lower the  $K_i$  value, the greater the affinity).

[f] [g] [h]

## TOXICOLOGICAL EFFECTS

A user claimed to have received an email from Professor John W. Huffman. In that email Professor JWH affirmed that there are no data on the long term effects of this compound on animals (apart from anecdotal data from Der Spiegel) and certainly there are absolutely no data regarding its effects in humans.

[18] [19]

## DESIRED PSYCHOACTIVE EFFECTS

It is weaker than JWH-018, but produces similar effects and the effects last longer (4-6 hours).

[20] [21]

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

CP-47497 is a research chemical and is not intended to human consumption, as there are not enough data to support safe use in people.

- Headaches
- Tachycardia
- Normal pupil size, but lateral gaze nystagmus
- Tremor
- High blood pressure
- Dizziness
- Vomiting
- Increased muscle tone
- Dysphoria
- Dry mouth
- Itchy skin

- Photophobia
- It causes or aggravates pre-existing lung condition

[22] [23]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

Marijuana like side effects including the following:

- Intense paranoia and recurring psychotic episodes requiring admission to emergency departments
- Less anxiety and fear than JWH-018
- Auditory hallucinations
- Visual hallucinations
- Distortion of time
- Visual distortions (colour/ objects)
- Numbness of whole body
- Insomnia
- Heavy body load

[24] [25] [26]

## CLINICAL ADVICE

The presence of CP-47497 is difficult to establish from specimen of urine or saliva. It is not detected routinely by conventional urine drug testing. It is also not detected by Red Wood Toxicology or NMS labs.

[27] [28]

## RELATED FATALITIES

Sixteen-year-old Chase Burnett drowned after smoking the synthetic marijuana, spice. THCParm which is one of the companies in Germany producing spice included two compounds JWH-018 and CP 47,497 as the main ingredient in spice. [29]

## YOU TUBE VIDEOS

There were no You Tube videos specific to CP-47497. However there are numerous videos on spice and related products.

## GOOGLE INSIGHTS

There was not enough volume to show graphs on CP-47497.

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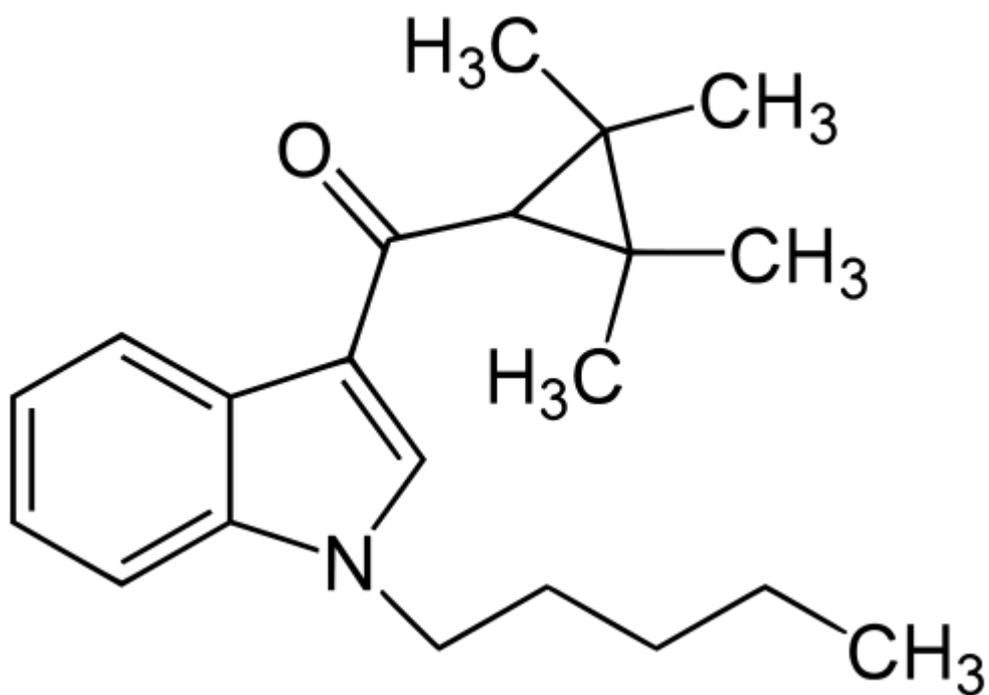
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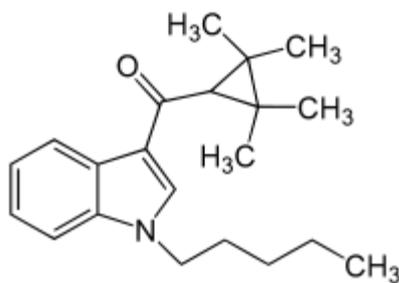
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# UR-144 Report

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# UR-144



## OVERVIEW

Chemical name: (1-pentylindol-3-yl)-(2,2,3,3-tetramethylcyclopropyl) methanone

Synonyms: UR144, KM-X1, ChEMBL571773, CHEBI:679643, S10-0058,

Active constituents: (1-pentylindol-3-yl)-(2,2,3,3-tetramethylcyclopropyl) methanone

Type: Research chemical - synthetic cannabinoid compound

Origin: It was supposed to be first synthesised at Abbott laboratories in the USA while carrying out research on neurological diseases.

Status: Novel

Chronology: It has become a popular compound recently and available online for sale from the 'Smart shops' since 2011.

[a] [1]

## KEY POINTS

UR-144 is a synthetic cannabinoid having stronger agonistic action on CB2 receptors than CB1 receptors. It has gained popularity recently, as 'Spice' herbal blends were made controlled in many countries.

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: (1-pentylindol-3-yl)-(2,2,3,3-tetramethylcyclopropyl) methanone

Molecular weight: 311.46106 g/mol

Molecular formula: C<sub>21</sub>H<sub>29</sub>NO

CAS Number: 1199943-44-6

[1] [2]

## APPEARANCE OF COMMERCIAL PRODUCTS

<b>Product description</b>
<b>Buy Research Chemicals UK</b> 500mg UR-144 for £12.00 Availability: Out of stock 500mg of high purity UR-144 - a UK legal, synthetic cannabinoid that is perfect for novel laboratory research. [3]
<b>Buy Any Chem</b> The research chemical UR-144, also known as KM X-1 and has the IUPAC name (1-pentyl-1H-indol-3-yl) (2,2,3,3-tetramethylcyclopropyl) methanone can now be ordered here at Buyanychem one of UK & Europe's most trusted and leading research chemical suppliers.[4]
<b>VIP Legals</b> UR-144 is a new synthetic cannabinoid ideal for laboratory research in the UK. Our UR-144 is a very slightly off white crystalline powder with a purity of over 99%. Buy UR-144 today to ensure you get the highest quality chemicals at the most competitive prices. UR-144 is strictly not for human consumption.[5]

## AVAILABLE INFORMATION ON PURCHASE PRICE

UR-144 is available for purchase online from several websites. The price from most of these websites remains the same as follows: 500mgs for £12; 1g for £20; 2g for £35; 5g for £70; 10g for £125; 25g for £250; 100g for £750; 500g for £2,750; 1Kg for £4,950. [3] [4] [5]

## MODALITIES OF INTAKE

UR-144 can be smoked either alone or in combination (with JWH or AM series of compounds as herbal incense). The inhalation of vapours from UR-144 is also a common method of use.

Oral consumption is rare as it is not active when taken orally.

[6] [7] [8] [9]

## LEGAL STATUS

It is a legal compound in the UK. It is not a controlled substance in the USA, through it could be covered by the Federal Analog Act. It has been temporarily controlled in New Zealand from 6<sup>th</sup> April 2012.

[10] [11] [12]

## CURRENT USE / MEDICINAL USE

UR-144 is a research chemical and is not intended for human consumption. It has been primarily been synthesised for potential use in neurological and pain disorders. [a]

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

The popularity of UR-144 is mainly due to its availability as a legal replacement after the ban on ‘Spice’ type of herbal incense containing JWH and HU series of compounds in the UK and the USA.

UR-144 is described as a ‘dirty white’ grainy powder which is odourless and tasteless. It is not water soluble and is dissolved in 100% acetone. The usual starting dose is between 0.5 to 1mg. It has shorter duration of action compared with JWH or AM series of compounds.

Users report that UR-144 and its related compound, 5F-UR-144 exhibit similar effects.

Come up: 1-2 minutes      Peak: few minutes      Come down: 1-3 hours

A typical users’ experience is described below:

T 0.00: Smoked 8mg of UR-144

T 0.01: Euphoria, appreciation of colour, palpitation

T 0.05: Euphoria

T 0.20: Blurred vision.

T 0.25: Taste appreciation.

T 1.50: The effects start to fade.

T 2.00: returned to baseline.

[13] [14] [15] [16] [17]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With Mary Joy herbal incense (in 70:30 ratio)
- With 5F-UR-144

[18]

## PHARMACOLOGICAL CHARACTERISTICS

The major actions of cannabinoids are mediated through two types of receptors: cannabinoid receptor 1 (CB1) and cannabinoid receptor 2 (CB2). The CB1 receptor mediated analgesic effects are well documented, but their therapeutic use is limited by their motor, cognitive and psychotropic side effects. UR-144 has been investigated for its potential use as an analgesic in the field of medicine. UR-144 contains potent agonistic effect on CB2 receptors. A study investigated the receptor affinities of UR-144. The  $K_i$  value for CB2 receptor is 1.8nM where as the  $K_i$  value for CB1 receptor is 150nM. Thus it exhibits a potent agonistic effect on CB2 receptors and its affinity for CB2 receptors is about 80 times more than for CB1 receptors.

The online users contest the old hypothesis that CB2 receptors are located mainly on peripheral sites and argue that CB2 exert its effects on the central nervous system as well which are currently being investigated by the research scientists.

[19] [b] [c] [d]

## TOXICOLOGICAL EFFECTS

A case of generalised seizure was reported by the online user (with 5F-UR-144). The long term toxicity of this compound is not available.

[20] [21]

## DESIRED PSYCHOACTIVE EFFECTS

- Euphoria
- Music appreciation

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

Seizure (wit 5F-UR-144)

[20] [21]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Paranoia

- Anxiety

[22] [23]

## CLINICAL ADVICE

None.

## RELATED FATALITIES

None reported.

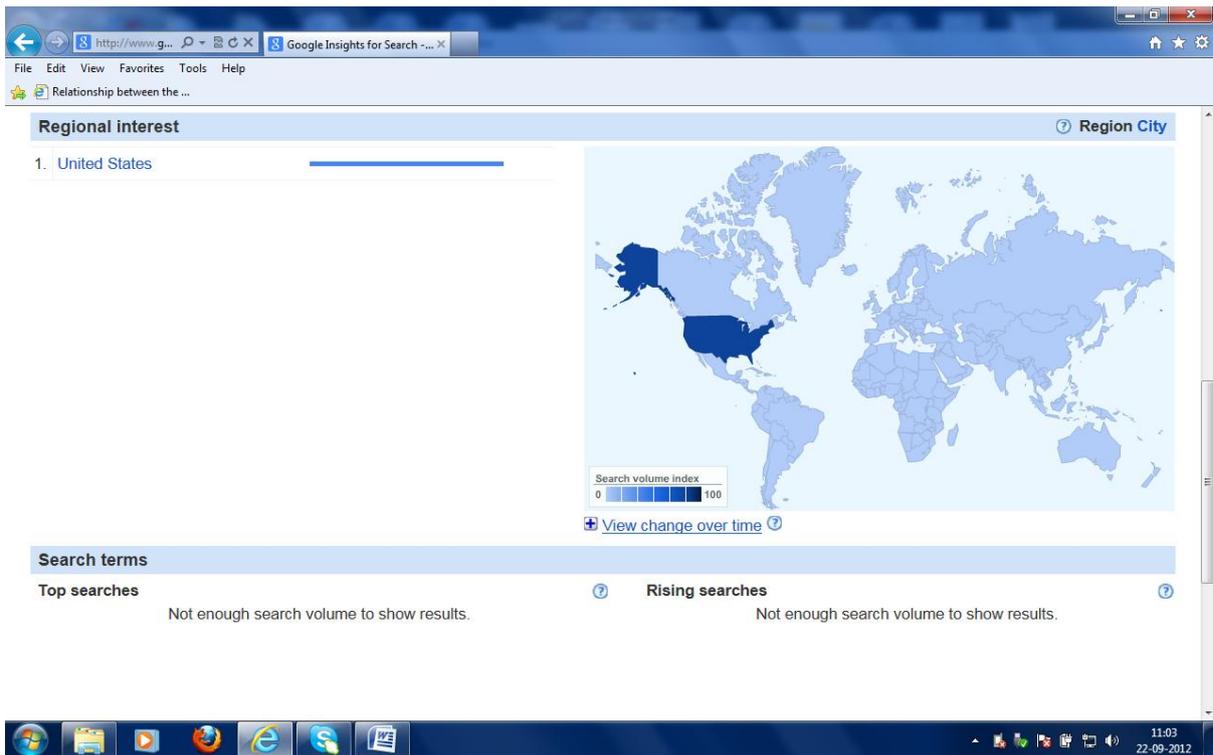
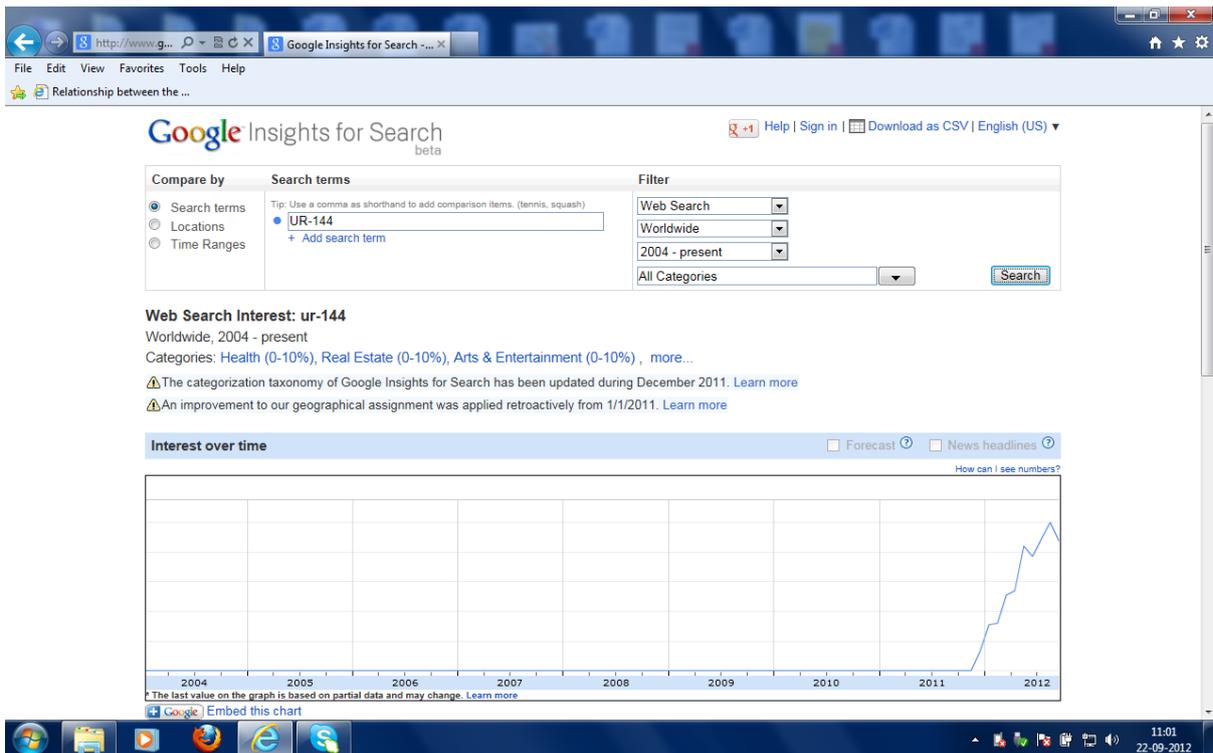
## YOU TUBE VIDEOS

1. How to make herbal potpourri incense with brand new (UR-144)
2. Herbal Incense UR-144 (for sale)
3. New for 2013 Ur-144 wax honey oil
4. Buy ur-144
5. UR-144 (for sale)

[24] [25] [26] [27] [28]

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for UR-144, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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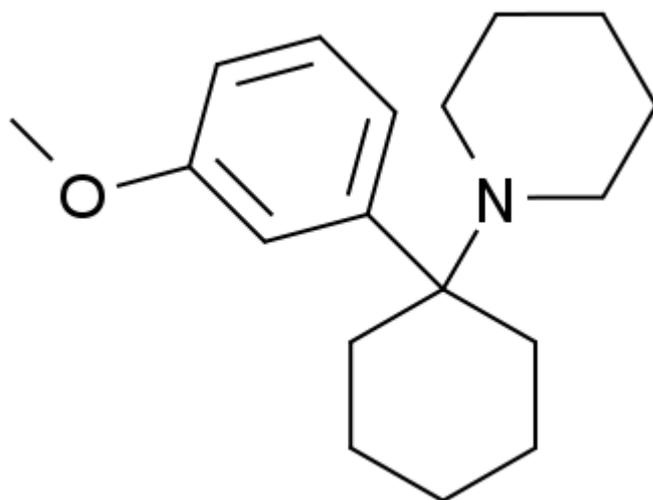
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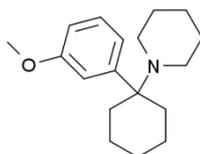
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# 3-MeO-PCP Report

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## 3-MeO-PCP

### OVERVIEW

Chemical name: 3-Methoxy Phencyclidine

Synonyms: 3-MeO-PCP

Active constituents: 3-Methoxy Phencyclidine

Type: Research chemical – Psychostimulant (Dissociative)

Origin: Although popularly thought to be synthesised by Shulgin, it was not the case.

Status: Novel

Chronology: Phencyclidine was synthesised in 1926 and patented in 1952 by Parke-Davies pharmaceutical company, but the synthesis of its analogue, 3-MeO-PCP remains unknown. [1]

### KEY POINTS

3-Methoxyphencyclidine (3-MeO-PCP) belongs to a heterogeneous group of compounds known as ‘Dissociatives’. They act as antagonist at the NMDA (N-Methyl D- Aspartate) receptor of the excitatory neurotransmitter, glutamic acid in the brain. They belong to ‘Arylcyclohexylamines’ – the best known examples in this class are Phencyclidine, Ketamine and Nitrous oxide. Historically they were used and some are still used as anaesthetic agents.

These compounds have been used for ‘recreational’ purposes when used in sub anaesthetic concentration. At this dose they induce a psychotomimetic state resembling some of the symptoms of Schizophrenia. Typically, dissociatives produce more of impaired reality testing but less of visual hallucinations which make them a separate class from the Hallucinogens.

Phencyclidine (PCP) was used as intravenous anaesthetic agent but due to its various complications (prolonged delirium) it was abandoned as an anaesthetic. The symptoms produced by PCP resemble both the positive (delusions and hallucinations) and the negative (apathy, flat affect etc) symptoms of the schizophrenia, so it could work as a good pharmacological model for schizophrenia.

3-MeO-PCP, a derivative of PCP, is less potent (by weight) than PCP. It is more potent as an NMDA antagonist but presents with the same potency as a dopamine reuptake inhibitor. [a] [b] [2]

## CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

IUPAC name: 1-[1-(3-methoxyphenyl) cyclohexyl]-piperidine  
Molecular weight: 273.412 g/mol  
Molecular formula: C<sub>18</sub>H<sub>27</sub>NO  
CAS Number: 72242-03-6 and 91164-58-8 (hydrochloride)  
[3] [4] [5]

## APPEARANCE OF COMMERCIAL PRODUCTS

Product Description
<p><b>Joyschem</b></p> <p>3-meo-pcp: This chemical is meant for research purposes only; with placing an order you declare that you are using these products for research purposes only.</p> <p>Please send your message to us. [6]</p>
<p><b>Promos-Chem</b></p> <p>3-Methoxyphencyclidine</p> <p>CAS: 91164-58-8</p> <p>This product can be delivered only via courier service.</p> <p>This product is NOT for human consumption!</p> <p>Can be used for laboratory purposes only![7]</p>
<p><b>Benzo-Fury</b></p> <p>3-Methoxyphencyclidine (3-MeO-PCP) is a dissociative anaesthetic drug with hallucinogenic and sedative effects. It is around the same potency as phencyclidine, but has slightly different effects due to its altered binding profile at various targets, particularly being somewhat more potent as an NMDA antagonist while having around the same potency as a dopamine reuptake inhibitor.[8]</p>

## AVAILABLE INFORMATION ON PURCHASE PRICE

The price varies considerably depending on the websites and the location. Promos website sells 2grams for €140 and 5gram for €300; benzofury website sells 1gram for £225 and 500mgs for £117 (which includes a 10% off from

£130). Some websites do not offer a price, but information can be obtained by contacting them through email. [9] [10]

## MODALITIES OF INTAKE

- Oral ingestion.
- Intravenous route, experimented by many reported that 6mgs of 3-MeO-PCP (IV) is roughly equivalent to 20 to 30mgs of Ketamine (IM).

[11] [12] [13]

## LEGAL STATUS

It is legal to sell and possess 3-MeO-PCP in the United Kingdom and rest of the Europe. [14]

## CURRENT USE / MEDICINAL USE

None.

## INFORMATION ON RECREATIONAL USE/ MISUSE IN THE E.U. (OR ELSEWHERE)

Users describe a dose of 6mgs to 10mgs to get good effect. As with the characteristics of 'dissociatives', this compound produces introspection, self reflection, empathy etc.

Come up: 30minutes                      Peak: 1- 2 hours                      Come down: 3 hours

A rough equivalence is given as:

~15mg of 3-MeO-PCP = ~100mg of 4-MeO-PCP = ~50mg of Methoxetamine

Users suggest keeping the dose below 15 mgs to avoid psychopathological disturbances (psychotic episode).

[15] [16]

## USE IN COMBINATION WITH OTHER COMPOUNDS

- With LSD and Methoxetamine – loss of emotions and disorientation in time.
- With LSD and Ketamine: It increases the strength of Ketamine and this combination could be very dangerous.
- With Ketamine alone.

[17] [18]

## PHARMACOLOGICAL CHARACTERISTICS

No information available.

## TOXICOLOGICAL EFFECTS

- Hypertension in acute phase: It was noted (169/111mmHg) for a user who tried at 17.5mgs
- Another user was found to have high blood pressure (230/150mmHg)

[19] [20]

## DESIRED PSYCHOACTIVE EFFECTS

- Introspection
- Self reflection
- Empathy

## PHYSICAL/ MEDICAL UNTOWARD EFFECTS

- High blood pressure

[19] [20]

## PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

- Acute psychotic episode: At a higher dose (50mgs IM) it causes signs and symptoms similar to Schizophrenia. The user presented with florid psychotic symptoms and physically his blood pressure was very high during the acute phase (230/150mmHg). He was then admitted to a psychiatric ward under relevant section for 4 weeks.
- Few more patients presented with acute psychotic episode requiring admission in a psychiatric inpatient unit.

[20]

## CLINICAL ADVICE

These are extremely dangerous compounds whose sub therapeutic doses are used by the drug misuse community as a 'dissociative', but when the high doses are administered, it can lead to serious physical complications (seizures, coma and death). The overdoses can be treated along the lines of treating a PCP overdose. Benzodiazepines are the good drug of choice in such cases. [c]

## RELATED FATALITIES

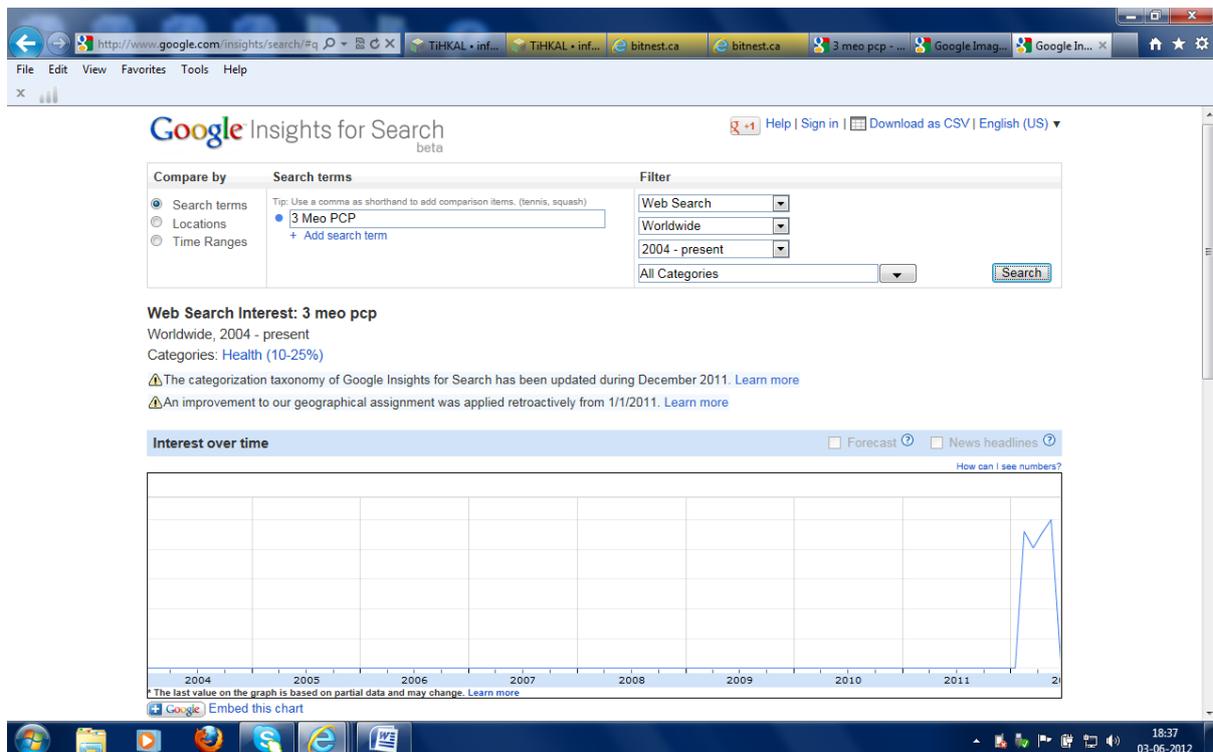
None.

## YOU TUBE VIDEOS

None.

## GOOGLE INSIGHTS

Google Insight for Search shows search volume patterns for specific key words across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for 3-MeO-PCP, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search term, a break down of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



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## **Review paper and case report**

### **Proof of submission (Appendix D)**

**Title: Recreational use of 1-(2-naphthyl)-2-(1-pyrrolidinyl)-1-pentanone hydrochloride (NRG-1), 6-(2-aminopropyl) benzofuran (Benzofury/ 6-APB) and NRG-2 with review of available evidence based literature**

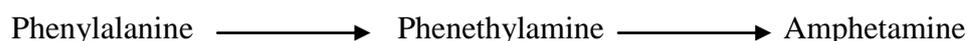
**J Jebadurai, Schifano F, Deluca P**

**Human Psychopharmacology: Clinical & Experimental; article in press  
March 2013**

Alcohol and recreational substances has been an inseparable part of human society for centuries across the globe. The widespread availability of evidence based literature for such commonly used substances such as cannabis, opioids, cocaine etc. provides information on their toxicities and guides in their management. However, a collection of novel psychoactive substances (NPS) produced by clandestine laboratories have appeared on the market (Henderson, 1988). In the mid-1980s', enormous quantities of ecstasy or MDMA, were sold in the USA (Collin and Godfrey, 1997). Even though MDMA was permanently banned in 1988, there was a great demand for chemicals that were similar to ecstasy, but were not legally banned. Alexander Shulgin published his books, PiHKAL (Shulgin and Shulgin, 1991) and TiHKAL (Shulgin and Shulgin, 1997) in the 1990s which described about 230 compounds (phenethylamines and tryptamines) synthesised in his laboratory. Since then, such newer psychoactive substances have gained enormous popularity and have appeared in the drug market over the last few years (e.g., 2C-T7; 2C-I; DOB etc).

These substances could be analogues of the controlled substances but are not usually controlled in many countries. They generate biological responses not only similar to but are also enhanced as compared to the parental compounds (Cooper, 1988). It is intriguing to understand how the molecules are modified to form a new molecule which may become a legal substance with altered function. Phenethylamine, a derivative of the amino acid phenylalanine, forms the basic skeletal structure from which hundreds of compounds could be derived by

simple alteration of the molecules. N- $\alpha$ -methyl substitution in the terminal amine group of phenethylamine results in the formation of amphetamine ( $\alpha$ -methylphenethylamine). The stimulant property of amphetamine requires the presence of unmodified aromatic ring,  $\alpha$ -carbon with methyl group (-CH<sub>3</sub>) and the terminal amino group (-NH<sub>2</sub>) and results in the release of catecholamines, mainly dopamine (Nichols, 1994).



The 'novel' substitution could occur in a number of possible ways either in phenethylamine or amphetamine leading to altered or enhanced psychoactive properties (Cooper, 1988; Nichols, 1994; Hill and Thomas, 2011). For example, substitution of the aromatic ring of phenethylamine leads to 2C- series of compounds (2C-B, 2C-I etc) where as substitution of the aromatic ring of amphetamine leads to the formation of D- series of compounds (DOB, DOC, DOI etc). This D-series compounds, also known as 'hallucinogenic amphetamines', act via 5HT<sub>2A</sub> agonism (5-hydroxytryptamine) (Nichols, 1994; Acuna-Castillo *et al.*, 2002) and possess several folds of hallucinogenic properties compared to the 'parent' amphetamine molecule.



A naturally occurring shrub, Khat contains an alkaloid, cathinone which possesses amphetamine-like stimulant properties (Brenneisen *et al.*, 1990). Cathinone can be synthesised by the addition of ketone group to the  $\beta$ -carbon of amphetamine molecule. Further alteration would result in a number of compounds such as mephedrone (4-methylmethcathinone), flephedrone (4-fluoromethcathinone) etc. The presence of  $\beta$ -ketone group increases the polarity of the molecule and there by reduces entry into CNS (Hill and Thomas, 2011; Gibbons and Zloh, 2010). Hence re-dosing or use of high doses are common to gain entry into central nervous system for 'psychedelic effects', but with toxic peripheral effects and higher mortality (Hill and Thomas, 2011). Thus a countless novel psychoactive compounds have been emerging which are available for sale through the online market.

This study forms a part of the Recreational Drugs European Network (ReDNet project, 2012), a multi-site research project which uses the existing Psychonaut [Early Warning System] project database together with information from available literature and online searches to develop accurate information on new recreational drugs and to inform harm reduction strategies in research. This project has identified several hundreds of psychoactive compounds and aims to disseminate the information to professionals and young people about such novel psychoactive compounds.

In this paper, the symptomatology displayed by a user who experimented with mephedrone, NRG-1, NRG-2, NRG-4, Benzofury etc. is discussed with the review of available evidence based literature as well as information obtained from web forums.

## **Method**

The methodology was adopted from the literature (Deluca and Schifano, 2007). Internet searches were carried out using Google and Yahoo using key words: “Phenethylamine misuse forum” “Piperazines misuse forum” “Tryptamines misuse forum” and “Synthetic herbs/ plants forum”. For each set of key words, the first 100 websites identified by Google and Yahoo were fully assessed, together with a further 5% of random samples selected by the website (Research randomizer, 2012) of the remaining websites. Thus a list of unique websites/web forums was identified. Qualitative information was extracted from various web forums discussing about naphyrone (NRG-1), benzofury (6-APB/ 6-APDB) and NRG-2.

### **1.1 Naphyrone (NRG-1)**

Naphyrone (IUPAC name: (RS)-1-naphthalen-2-yl-2-pyrrolidin-1-ylpentan-1-one) is the pyrrolidine derivative of cathinones and it structurally resembles compounds such as pyrovalerone and mephedrone. Thus, a minor structural alteration produces significant changes in the neurobiological response and behavioural effects.

### **1.2 Availability of NRG-1**

The identity of products sold as NRG-1 remains dubious. Following the ban of mephedrone in April 2010, a replacement product (known as NRG-1) was sold online. However, only few products sold as NRG-1 contained naphyrone as advertised and many others contained cathinone derivatives such as mephedrone (4-methylmethcathinone), butylone, 4-methyl-N-ethylcathinone (4-MEC), flephedrone and MDPV (3,4-methylenedioxypropylvalerone) (Brandt et al., 2010; Wood et al., 2011). Furthermore, there have been two structural isomers (alpha and beta-naphthyl isomers) sold online and it is usually the beta-naphthyl isomer which is well known and published but descriptions on the alpha-naphthyl isomer is very limited (Brandt et al., 2010).

### **1.3 Legal status of NRG-1**

In the UK, several cathinones such as mephedrone and MDPV were placed as Class B under the Misuse of Drugs Act 1971 on 16<sup>th</sup> April 2010 (Home Office, 2010). However, Naphyrone was not included under this ban. Hence a number of websites reported the sale of Naphyrone as a mephedrone replacement. Subsequently, on 12<sup>th</sup> July 2010, Naphyrone was made a class B drug in the UK. In the USA, The Drug Enforcement Administration requested for medicinal information on naphyrone on April 2011 but had not been controlled until early 2012 (U.S. Department of Justice, 2011). It is also not a controlled substance in other EU countries (Drugs forum<sup>1</sup>, 2012).

### **1.4 Route of administration of NRG-1**

Nasal insufflation appears to be the common mode of intake. It can also be ingested orally. Users report that NRG-1 was inactive when smoked (Bluelight<sup>1</sup>, 2012). Rarely it was taken intra venously which produced the same effects as nasal insufflation.

### **1.5 Pharmacology of NRG-1**

The synthesis of naphyrone and other pyrovalerone analogues were illustrated in a study (Meltzer et al., 2006) which compared the ability of these compounds to affect the reuptake of the monoamine neurotransmitters such as serotonin, dopamine and norepinephrine by interacting with the serotonin transporter (SERT), dopamine transporter (DAT), and norepinephrine transporter (NET).

This study concluded that naphyrone was the only compound which had the ability to inhibit the reuptake of all the three neurotransmitters ('triple reuptake inhibitor') at very low concentrations.

A similar study showed (Simmler et al., 2012) that naphyrone acts as a non-selective monoamine reuptake inhibitor similar to cocaine. It was also found that the permeability of the blood-brain was high in an in vitro model.

Recently, it has been shown that naphyrone is one of the most potent inhibitors of DAT with a  $K_i$  value of 53nM. This study quantitatively measured the  $K_i$  value of NET and SERT at 200nM and 235nM respectively (Iversen et al, 2013). Moreover, the micromolar affinities for 5-HT<sub>2B</sub> could explain the risk of cardio toxicity with long term use of naphyrone (Setola et al, 2003; Roth, 2007; Droogmans et al, 2007; Iversen et al, 2013).

### **1.6 Effects of NRG-1**

The web forum members buy NRG-1 online and personally experience its euphoric effects. The dose, any combinations, mode of intake, its effects and toxicity are discussed in the web forums. It takes several minutes to come up with a peak about 3 to 4 hours and come down to base line in about 7 to 10 hours or even longer. NRG-1 is reported to be potent at a very low dose (25mgs) which is at least 10 times lower than the usual dose of mephedrone. Hence web forum users warn not to consume NRG-1 at the same dose as mephedrone since NRG-1 was sold as 'mephedrone replacement' following its ban (April 2010). Hence the chances of potential overdose and toxicity are high.

The physical side effects could last more than 24 hours (Drugs-forum<sup>2</sup>, 2012) and include sweating, tachycardia (>145/ minute) (on doses above 200mgs), hypertension, increased body temperature, cold blue/ purple arms, knees and extremities, pins and needle sensation over extremities, loss of appetite and jaw stiffness. Paranoia, visual hallucinations (lasting for 48 hours), intense anxiety, depression, obsessive symptoms, disorganised thoughts, short term memory loss, lack of motivation, low self esteem, poor concentration, insomnia (> 5 days) were the psychopathological disturbances observed after its use (Bluelight<sup>2</sup>, 2012; Bluelight<sup>3</sup>, 2012; Erowid, 2012). A web forum user suffered

with depression and anxiety for 6 months following regular use of NRG-1 for a year and was treated with anti depressant medication (Bluelight<sup>4</sup>, 2012).

### **1.7 Toxicity of NRG-1**

There are no human toxicological data. However, there are several reports patients experiencing toxic effects and attending Emergency Departments (News release, 2010). This could be due to the effects of NRG-1 at a very low dose compared with mephedrone. A patient presented with acute sympathomimetic toxicity following ingestion of 100 mgs of NRG-1 (Derungs et al., 2011). He displayed restlessness, insomnia, anxiety, and hallucinations lasting for two days. A blood sample analysed by Gas Chromatography with Mass Spectrometry (GC/MS) showed a concentration of 0.03mg/L and 0.02 mg/L, 40 h and 60 h after drug intake, respectively.

Another major concern among online users was the carcinogenicity of naphyrone. Since naphyrone has not yet been studied on human or animal models, the closest match would be pronethalol which was investigated on animal model. The epoxidized naphyrone, which formed due to the oxidation of naphthalene ring, was reported to be a carcinogen. Since naphyrone possesses similar naphthalene ring, it is speculated that it could trigger carcinogenesis on long term (Drugs-forum<sup>3</sup>, 2012; Bluelight<sup>5</sup>, 2012).

### **1.8 Fatalities of NRG-1**

There are several reports of toxicity and few death reports linked to the consumption of NRG-1(News release, 2010). However there has not been any coroner's report to confirm deaths linked to NRG-1 (ACMD, 2010).

### **2.1 Benzofury (6-APB)**

David Nichols with team synthesized 6-APB (IUPAC Name: 6-(2-aminopropyl) Benzofuran) in 1993 whilst investigating non-neurotoxic MDMA analogues. 6-APDB (IUPAC name: 1-(2, 3-dihydro-1-benzofuran-6-yl) propan-2-amine hydrochloride) is often confused with 6-APB which is a derivative of 6-APDB (Monte et al., 1993).

It is an analogue of MDA where the heterocyclic 4-position oxygen from the 3,4-methylenedioxy ring has been replaced with a methylene group (Drugs-forum<sup>4</sup>, 2012).

## **2.2 Availability of 6-APB**

It's a tan grainy type of powder which is supposed to be pure. The pellet form contains varying doses of 6-APB mixed with caffeine and potentially another trivial stimulant (from analysis) or mixed with magnesium stearate as a cutting agent. The prices have fallen almost to half (£72 to £32 for 1gram) in 2012.

## **2.3 Legal status of 6-APB**

6-APB is currently legal in the UK and rest of Europe except Sweden (Sweden Parliament, 1999). It is also uncontrolled in the USA.

## **2.4 Route of administration of 6-APB**

Usual mode of use is oral ingestion. Few users have tried nasal route which was reported to be a very painful experience (Bluelight<sup>6</sup>, 2012).

## **2.5 Pharmacology of 6-APB**

6-APB inhibited norepinephrine transporter (NET) and dopamine transporter (DAT) at Ki value of 117nM and 150nM respectively (Iversen et al, 2013). Such powerful inhibitions of norepinephrine uptake could account for the sympathomimetic effects on the cardiovascular system (Wood et al, 2011).

It is reported that the activation of 5-HT<sub>2B</sub> receptors in MDMA users and the consequential proliferation of cardiac valvular interstitial cells was linked to increased prevalence of valvular heart disease among MDMA users (Setola et al, 2003; Roth, 2007; Droogmans et al, 2007). 6-APB exhibited strong (<100nM) affinities and full agonistic function for 5-HT<sub>2B</sub> receptors. Therefore it is reasonable to expect cardio toxicity with long term use of such compounds (Iversen et al, 2013).

## **2.6 Effects of 6-APB**

The side-effects are similar to that of MDA but much more prominent than that of ecstasy or MDA. They occur as a result of sympathetic stimulation. These include: tachycardia, agitation, high blood pressure (could lead to hypertensive crisis characterised by high temperature, severe sweating, severe headaches not responding to analgesics and persistent (resting) tachycardia). Many users warn about neurotoxicity and brain damage. Severe nausea and sickness occur commonly possibly due to serotonin release. The psychopathological disturbance (Bluelight<sup>7</sup>, 2012; Bluelight<sup>8</sup>, 2012; Bluelight<sup>9</sup>, 2012; Bluelight<sup>10</sup>, 2012) included depression, anxiety, panic attacks, insomnia, severe paranoid symptoms (lasting longer than that due to mephedrone). Forum users reported (Bluelight<sup>10</sup>, 2012; Bluelight<sup>11</sup>, 2012) other side effects such as jaw and teeth clenching, deep midline tongue ulcer, ulcers in the buccal mucosa possibly due to biting and clenching teeth, dry mouth, extreme dry eyes, insomnia, loin pain, prolonged diarrhoea, sensitivity to light, drowsiness, hang over the next few days, clonus of hand and feet.

## **2.7 Toxicity of 6-APB**

There is no sound evidence but web forum users' debate that it could potentially cause neurotoxicity similar to ecstasy.

Forum users warn about the possibility of serotonin syndrome (Bluelight<sup>12</sup>, 2012; Bluelight<sup>13</sup>, 2012) especially if combined with other serotonergic compounds and the outcome can be poor. The compounds include psychoactive compounds such as MDAT, MDAI, 5-IAI etc as well as medications such as MAOIs, SSRIs etc.

The cardiovascular toxicities possibly result from sympathetic stimulation and possible activation of 5-HT<sub>2B</sub> receptors which include tachycardia, supra ventricular tachycardia, high blood pressure, effect on liver (due to the presence of furans), Jaw or whole head shaking, sometimes involve the whole body (Bluelight<sup>12</sup>, 2012; Bluelight<sup>13</sup>, 2012; Bluelight<sup>14</sup>, 2012; Iversen, 2013).

## **2.8 Fatalities of 6-APB**

The news (Sky news, 2012) reported that A H, 19, from Edinburgh, collapsed and died at the RockNess Festival after taking benzofury in June 2012. Two

other members in his group were treated in hospital. The results of the post-mortem for confirmation of the substance are not yet available.

### 3.1 NRG-2

NRG-2 is also known as Energy2, Eric-2, E-2 etc. It appears to be a mystery product among web forum users. The majority of vendors advertised the product as (2 $\alpha$ , 5 $\alpha$ )-epithio-11 $\alpha$ -benzyl-12 $\beta$ -one and add that it was not related to naphyrone (NRG-1) but ‘an upgrade from the original’. Web forum users acknowledge the uncertainty of the product NRG-2. Some forum users believed that 5-IAI is a synonym for NRG-2 while many others did not. It was also confirmed from a chemical analysis (Ayres and Bond, 2012) of online products that 5-IAI contained 5-iodo-2-aminoindane which was consistent with the vendors description of 5-IAI. Other websites use a different name for NRG-2 which is (2 $\alpha$ ,3 $\alpha$ )-epithio-17 $\alpha$ -methyl-17 $\beta$ -ol-N-Benzyloxycarbonyl-d-proline (Legal iii’s, 2012; Bluelight<sup>15</sup>, 2012) which appears to be a counterfeit name to evade the laws.

There were only few studies available which investigated the novel psychoactive substances sold online using standardised procedures such as gas chromatography mass spectrometry. Immediately following the ban on mephedrone (a cathinone) in April 2010, 24 products (NPS) were purchased online about 6 weeks (Brandt et al., 2010). The results showed four samples contained 4-methyl-N-ethylcathinone (4-MEC) out of the seven NRG-2 products. Two others showed the presence of mephedrone and the last sample contained only benzocaine and caffeine. Only one sample confirmed the presence of naphyrone out of 13 NRG-1 products. Rest of them showed various cathinones including mephedrone. The author suggested that the manufacturers continued to sell mephedrone mislabelling them as NRG-1 or NRG-2 to clear the stock after immediate ban on cathinones. Interestingly, another product sold as DMC (dimethocaine) contained only lidocaine and caffeine (Brandt et al., 2010). It is also worthy to note that caffeine augments the hyperthermic response to substances such as MDMA that possess seroergic and norepinephric activities. Most of the novel psychoactive substances are thought to act via serotonergic and catecholaminergic pathways. It is reported that the presence of

caffeine also increases the toxicity of psychostimulants which include changes in body temperature regulation, cardiotoxicity and lowering of the seizure threshold. Caffeine also influences the stimulatory, discriminative and reinforcing effects of psychostimulant substances. (Vanattou-Saïfoudine et al 2010; Vanattou-Saïfoudine et al 2012)

During the latter months of 2012, seven samples were analysed by Fourier Transform Infrared (FTIR) and gas chromatography-mass spectrometry (GC-MS) but six of them did not contain the specified product but enormous amounts of caffeine (Baron et al., 2011). Another study analysed samples sold as “NRG-2” using fully validated chromatographic methods and identified two mephedrone derivatives, 4-methyl-N-ethylcathinone (4-MEC) and 4-methyl-N-benzylcathinone (4-MBC) (Khreit et al., 2012). Another recent study (Ayres and Bond, 2012) also showed two products from different websites, sold as “NRG-2”, contained mephedrone and 4-MEC despite the ban of cathinone derivatives in 2010.

Thus, with the available evidence based literature, we conclude that most products do not contain the ingredients as advertised. In addition, these products contain substances that are already controlled in the UK (e.g, NRG-2 products containing mephedrone) and hence it could lead to criminal investigations.

### **Case report**

A 49 year old man worked in public sector for about 27years. He had no past psychiatric or positive family history of substance misuse or mental disorders. He purchased mephedrone (IUPAC name: 2-methylamino-1-p-tolylpropan-1-one) in 2009 by ordering from a specific vendor website (Plant feed chemicals, 2010). He described the most typical appearance of the product as having an off-white appearance and granular consistency. For several months, he snorted about 1-2 grams of mephedrone once every week. Although he was experiencing euphoria, he developed paranoid delusions accompanied by visual hallucinations on doses above 750 mgs per day. Most of these symptoms typically disappeared within 24 hours with exception of the paranoia which persisted for several weeks.

He continued to use mephedrone until it was controlled in the UK (April 2010). Within a few days after its ban, he allegedly received an e-mail from the same online vendor, and was offered with a 'legal replacement of mephedrone', popularly known as 'Energy' or 'NRG-1' (1-(2-naphthyl)-2-(1-pyrrolidinyl)-1-pentanone hydrochloride; naphthylpyrovalerone hydrochloride). He described the consistency and appearance of NRG-1 similar to that of mephedrone. He purchased and snorted two grams of NRG-1 and immediately following this, he developed paranoid delusions and hence he called the police for his own safety. He was then brought to the A&E department, where he presented with tachycardia and paranoia. The levels of CPK were very high (1,195.0 U/litre; normal values: 0- 170U/litre), whilst CRP values were mildly elevated (12.0 mg/litre; normal values: 0-5mg/litre). All other blood tests were within normal limits. The ECG confirmed presence of tachycardia and sinus rhythm. As for the routine urine drug test, it was negative for all substances such as cocaine, heroin, and cannabinoids. He was assessed to have developed paranoid delusions and hallucinations, possibly secondary to the intake of NRG-1. He was prescribed few doses of diazepam and discharged. However, he reported having insomnia and both auditory and visual hallucinations which lasted for at least a week after his discharge.

A few months later (July 2010), however, NRG-1 was made a controlled drug in the UK. The same vendors (Plant feed chemicals, 2010) started advertising the availability for sale of a larger range of novel legal highs. He randomly placed an order for £95, which allegedly contained the following: 1g of NRG-2 (IUPAC name: (2 $\alpha$ , 5 $\alpha$ )-epithio-11 $\alpha$ -benzyl-12 $\beta$ -one) (price £17); 2g of dimethocaine (DMC; IUPAC: 3-diethylamino-2,2-dimethylpropyl)-4-aminobenzoate) (price £28); 5g of NRG-4 (supposed IUPAC (Bluelight<sup>16</sup>, 2012): 2-(3-(4-Methoxybenzyl)-4-bromophenyl)-6-hydroxymethyl tetrahydro-2H-pyran-3,4,5-triol) (price £50); 1g of Benzo fury (6-APB) (IUPAC: 6-(2-aminopropyl) benzofuran) which was provided free of cost.

He reported that all these products appeared very similar to each other, so that he was unable to differentiate among them. He consumed them one after the other with few hours in between them. He experienced some euphoria, lasting for few hours. He eventually reported lethargy, loss of appetite and sleep. About 3-4

days later, he started feeling intensely paranoid whilst experiencing strong auditory and visual hallucinations very similar to those previously experienced. He presented to the A&E department showing profuse sweating and tachycardia. He was assessed by the psychiatric team and discharged with the prescription of diazepam for a few days. All his symptoms disappeared within a week.

This case report provides an application of the findings so far in a wider context. It highlights a range of clinical issues relating to legal highs and may suggest that at least some of the legal highs possess both stimulant and psychotomimetic properties, hence raising a number of legal as well as public health concerns. Vulnerable individuals and young people may buy these drugs online easily. Furthermore, it seems from this report that whenever an index legal high is being made a controlled drug, the vendors immediately start aggressively promoting the sale of other, 'legal' psychoactive substances (i.e.: NRG-1; NRG-2; NRG-4 and 6-APB).

The acute and long-term clinical effects of these novel psychoactive substances on the human body may be largely unknown. A 10-fold higher than normal concentrations of CPK, an enzyme typical of cardiac/skeletal muscles and brain tissues (Barohn, 2007), was here identified. Any damage or toxicity to these tissues would produce an elevation of CPK.

It is not surprising that the urine drug tests performed turned out to be negative for the search of misusing drugs. In fact, the laboratory kits for the identification of novel psychoactive substances are still unavailable. Moreover, one could wonder about the costs of testing for potentially hundreds (Schifano et al., 2002) of psychoactive compounds. As a consequence, it may be essential for clinicians to obtain a full clinical and toxicological history when assessing clients presenting with psychopathological symptoms (Carrus and Schifano, 2012; Schifano et al., 2011b).

Given the extreme paucity of peer reviewed material relating to both the pharmacodynamics and pharmacokinetics of these compounds, one could speculate about the best pharmacological treatment for patients presenting with levels of clinical and/or behavioural toxicity associated with the intake of unknown compounds, which are often taken in combination and as such may

present with untoward synergistic effects with classical antipsychotics and antidepressants. From this point of view, benzodiazepines were here prescribed because they may provide levels of sedation without interacting with the arguably already imbalanced dopaminergic, noradrenergic and serotonergic neurotransmitter pathways (Schifano et al., 2011a).

In addition, although the psychoactive products offered for sale allegedly contain specific ingredients, it is very difficult to confirm this, unless the product is tested in a research laboratory. He had in fact purchased over time a range of NRG products (NRG-1; 2; 4) from the same vendor, but concluded that both their appearance and taste were indistinguishable from each other. However, people purchasing these compounds do not have access to testing facilities and rely on the vendor's descriptions / instructions and discussion forums to learn how to use them. On the other hand, it is understandable that those dissident scientists who are allegedly synthesizing novel psychoactive molecules would not be keen to disclose the chemical structure of these chemicals (Power and Parry, 2010). From the recent literature (Brandt et al., 2010; Baron et al., 2011; Khreit et al., 2012), we understand that NRG-1 was marketed as a 'replacement product' immediately after the ban on mephedrone (2010) to circumvent the law, although these products contained mephedrone which could suggest that the retailers continued to sell the backlog of mephedrone stock in 2010. However, in 2012, products sold as "NRG-2" still contained cathinone derivatives which are controlled in the UK and hence potential legal consequences.

## Discussion

Huge numbers of NPS are available for sale worldwide. The users' - generally seek for substances which maximise their psychedelic or stimulant experience but devoid of any potential toxicity. They prefer NPS which are legal, cheap, easy to purchase, produce more euphoria with little or no side effects and less contamination with adulterants<sup>32</sup> (Measham et. al, 2010; Carhart-Harris et al, 2011).

The clandestine laboratories and vendors meet this demand by synthesising newer NPS and distributing them in discreet packing to several countries. The characteristics of these substances are largely unknown and are not possibly without side effects or serious toxicity.

The NPS can be easily ordered online from any part of the world. The NPS is usually packed discreetly with words such as 'Plant food' or 'Not for human consumption' to evade the law and to be conveniently delivered by post. The users need Internet access and a payment method (Debit/ credit card or Pay pal or direct bank transfer) (Legal iii's website<sup>1</sup>, Trilogy products LLC, 2013). Companies / distributors based in the UK use the Royal Mail for recorded delivery of the NPS. A next day special delivery before 9am is also available. Interestingly, for International delivery, the options include: Royal Mail Airsure, Royal Mail International signed for, Secure Trackable Post as well as DHL or FedEx courier service (Jefferyblant36, 2013; Research chemicals London, 2013). However, the user has no knowledge about the NPS received by post and so many users share their knowledge using various web fora.

The users regularly post their experience on these fora and gradually build up an online community which has a strong identity and group cohesion. They have a strong sense of shared experience (Davey et al, 2012).

Although numerous web fora exist, the number of studies on drug related web fora is limited (Davey et al, 2012). In this research, about 84 unique web fora were identified. Drugs Forum (DF) is an example of such fora. A brief description about one of such web fora is given below:

The website is hosted by Shock Media B.V., located in Almelo, OV, Netherlands. It was established on 14th June 2002. The administrator of drugs forum, ALPHA (nick named 'productive insomniac'), described himself as a 97 year old from Netherlands, has studied psychopharmacology from an University. He has contributed 26,999 posts as on 25.04.13.

He quoted in DF website that he was addicted to a chemistry forum, Hive which discussed about the chemistry of new substances, but he missed a community feeling. Hence he started DF in 2002. During the early days, there were very few members and only couple of posts were posted in one day but he would carefully post a reply. He added that respect and knowledge where the key words for Drugs-Forum (Drugs-forum<sup>5</sup>, 2013; Drugs-forum<sup>6</sup>, 2013).

Over the years the number of members have grown steadily in DF. An example is given below: There were only 55 members and 280 posts on 12.04.2003 (Drugs-forum<sup>7</sup>, 2013). It has grown massively in about a decade to having over 170,000 members with 1,030,000 posts and about 2.7 million readers every month (Drugs-forum<sup>7a</sup>, 2013).

Members belong to several geographical locations (United States of America, United Kingdom, Australia, New Zealand, Canada, Finland, Netherlands, Norway, Spain, Germany, Bermuda, Afghanistan etc) (Drugs-forum<sup>8</sup>, 2013).

They have a range of educational backgrounds and occupations such as chef, painter, home maker, university students, IT professionals, pharmacist, psychologists etc. It is useful to know there are many pharmacists and students who use these fora regularly (Drugs-forum<sup>9</sup>, 2013; Drugs-forum<sup>10</sup>, 2013).

Few example profiles of members are given below:

Profile name:~lostgurl~, Female from New Zealand, education at University level (geography), total posts = 3,948 (Drugs-forum<sup>11</sup>, 2013).

Profile name: beentheredonethatagain, Male from West Bank, contractor. technician, total posts = 2,553 (Drugs-forum<sup>12</sup>, 2013).

Profile name (New member): Cid Lysergic, Male from Canada, Pharmacology student with A grades specialising in addictions (also diagnosed with drug

induced psychosis and multiple drug dependence), total posts = 66 (on 25.04.13) (Drugs-forum<sup>13</sup>, 2013).

Profile name (Banned member): Nagognog2, Male, psychologist with 7,290 posts (Drugs-forum<sup>14</sup>, 2013).

Profile name (Platinum member): enquirewithin, male from Bermuda with 5,677 posts (Drugs-forum<sup>15</sup>, 2013).

These fora have strict rules and regulations. The user are not allowed to incriminate themselves, instead, they should use terms such as 'AFOAF - A Friend Of A Friend', 'SWIM – Someone Who Isn't Me' or 'my pet monkey tried this powder' etc. Sale or discussions about vendors of NPS on these fora are prohibited. Breaking the rules would earn infraction points and end ban on members.

Users write in detail about their experimentation with various NPS in various drug fora. For example, Erowid contains volumes of information on hundreds of NPS on topics such as preparation, first time use, adverse reactions, addiction potential etc. Greater emphasis is given to the subjective experience of a particular NPS. A discussion on any topic can be started by a member of a forum (eg, LSD and serotonin syndrome). Other members post their replies and this discussion could carry on for even years! (eg, 'The Low-Dose LSD Appreciation Thread' was started on 20.08.2006 and the last response was posted on 29.04.2013). (Erowid<sup>1</sup>, 2013; Bluelight<sup>17</sup>, 2013; Bluelight<sup>18</sup>, 2013).

Each experience post is generally written up with the following information: name of the NPS, amount, mode of intake, body weight of the user, duration of action of NPS - serial time line starting from +T 00:00 to the peak and til the end of the effect/ hang over (eg, +T 13:00 hours), euphoria, unpleasant experiences, post trip notes, side effects, toxicity, any visits to the emergency departments, treatment provided etc. It is very common to find abusive and foul language used when describing any vicious effects of the NPS (Erowid<sup>2</sup>, 2013).

Thus wealth of information is available on several web fora. It is a challenging task to go through all the information published in these sites. Information obtained from various fora provide insight into the way these online virtual

communities operate. Given the lack of evidence based literature on several NPS, the web fora supply useful, reliable information about unknown or unidentified NPS. Some of the fora include members who are well informed, trained and educated in pharmacology and related fields. However, the web fora are largely unregulated, user-led source of information. Hence there could be potentially misleading information for the new and uneducated users (Davey et al, 2012).

The forum users discuss in detail about their experiences on overdoses for each substances. The online community warn the users about the safe dose range. However, the occurrences of accidental overdoses due to the NPS is largely unpredictable due to many factors such as combination of NPS, 'mislabelling' of NPS, errors in measurement etc. (as the toxic dose of NPS vary hugely from one to another - in micrograms for some NPS eg, NBOMe series). It is vital to recognize and treat life threatening medical emergencies such as sympathomimetic toxicity and serotonin syndrome which could occur as a result of ingestion of NPS. The clinical signs, symptoms and its management are discussed below.

#### Sympathomimetic toxicity:

The use of a range of NPS (eg, mephedrone, naphyrone, TFMPP, BZP etc.) characterized by a stimulant activity can be associated with a sympathomimetic toxicity and this has been confirmed by published papers as well as the case report discussed above (Derungs et al, 2011; Wood et al, 2010; Wood et al, 2008). Sympathomimetic toxicity must be recognized early, because untreated patient could result in death. In the USA, following the ingestion of NPS (stimulants - methamphetamine type), 169 deaths occurred out of 66,540 cases (presenting with sympathomimetic effects) in 2011. These cases were reported to the American Association of Poison Control Centers (Bronstein et al, 2011).

The onset of sympathomimetic symptoms usually occurs within 2 hours after ingestion. The signs and symptoms most commonly include: mydriasis, tachycardia, diaphoresis (sweating), bruxism (teeth grinding), delirium and even psychosis/paranoia. However, users can accidentally overdose on NPS. There can be several reasons for accidental overdose such as lack of sophisticated

balance especially measuring substances which are active in micrograms (25C-NBOMe), redosing, presence of adulterants, mislabelling of NPS, combinations with other substances etc.

It is very important to identify patients with toxicity early to prevent end organ damage and death. The life threatening complications occur in about 2 to 6 hours after ingestion in most cases. Some of the toxic symptoms include hyperthermia (may be induced due to agitated behaviour, hot and humid dance clubs or seizures), extreme hypertension (severe headache, intracerebral haemorrhage, hypertensive encephalopathy as well as asymptomatic hypertension), cardiac arrhythmias (supraventricular tachycardia - atrial fibrillation / atrial flutter, ventricular tachycardia, torsades de pointes, ventricular fibrillation), myocardial ischaemia/ infarction, seizures, stroke etc (Kolecki et al, 2013).

The main treatment in the Emergency departments is given by a general supportive care for these patients, as no specific antidotes for most NPS poisoning exist. Most patients present with severe disturbances and hence provision of safe environment is the first step in the management. Extreme agitation could potentially precipitate hyperthermia, seizure and death. As a consequence, frequent use of benzodiazepines (eg, diazepam or lorazepam) in a titrated fashion may be the safest option to calm the patient (Kolecki et al, 2013). Standard cooling measures should be used for hyperthermic patients. Hypertension not responding to sedatives should be treated with anti hypertensive medication. Seizures should be controlled by the use of IV benzodiazepines. CT scan is indicated for patients presenting with severe headache and focal neurological deficit to rule out cerebral pathology. Severe life threatening complications could occur (hyperthermia, seizure, acute respiratory distress syndrome (ARDS), renal failure, rhabdomyolysis, cerebral accidents) (Kolecki et al, 2013).

Thus, benzodiazepines remain the treatment of intital choice for tachycardia, agitation, seizure, hypertension and hyperthermia in patients with toxicity of NPS (Kolecki et al, 2013).

### Serotonin syndrome:

It is well known known that the classical hallucinogens (eg, D- series of substances such as DOB) mainly act on 5HT<sub>2a</sub> serotonin receptors to produce its 'psychedelic' effects and the presence of a methyl group on the alpha carbon of substituted phenethylamines increases the effects by 210 fold due to its agonistic effects (Nichols DE, 1994 and Acuna-Castillo C, 2002).

The pharmacological characteristics of several unidentified NPS are not known yet. However, as a general finding on this research, the NPS (excluding the synthetic cannabinoids) are most likely to act via serotonergic (5HT<sub>1a/1b/1d</sub>; 5HT<sub>2a/2b/2c</sub>), noradrenergic or dopaminergic pathways. Some of them such as naphyrone act as triple reuptake inhibitor (acting on serotonin/dopamine and norepinephrine transporter) (Meltzer et al, 2006 and Simmler et al, 2012). These NPS possibly possess significant activity to inhibit MAOs in small doses leading to increased levels of monoamines such as dopamine or serotonin. Hence the chances of developing a dangerous clinical situation such as 'Serotonin Syndrome' is exceptionally high if combined with any other Serotonergic agents (eg, combination of NPS, combining with medications such as SSRI antidepressants, concomitant use of opioids etc).

The Emergency Departments have become clueless in managing their acute toxicity, as the scientific literature is scant and most of the healthcare professionals are possibly unaware of these emerging phenomena of 'novel psychoactive substances'. The mortality rate of serotonin syndrome is reported between 2% and 12%. In the USA, The Toxic Exposure Surveillance System reported 93 deaths due to serotonin syndrome in 2002 (Watson et al, 2002 and Frank, 2008).

A serotonergic syndrome should be suspected in patients presenting to Emergency departments with a history of NPS ingestion and clinical signs of clonus, hyperthermia, hypertension and hypertonia. The core management of such emergency is basically symptomatic. First, further use of the offending NPS should be discontinued and the identity of all the NPS taken should be established, if possible and the sample must be sent to laboratory for GC-MS analysis. (Boyer and Shannon, 2005). Adequate hydration should be maintained

with diuresis above 50-100mls/ hr to avoid the risk of myoglobinuria (Jaunay et al, 2001). Benzodiazepines can be used to treat neurological symptoms such as agitation, hyper excitability, hyperreflexia and psychiatric manifestations. Since benzodiazepines act through GABA receptors and do not interfere with serotonergic/ dopaminergic pathways, prescription of diazepam or lorazepam for short term use is largely beneficial.

Though agents such as propranolol, cyproheptadine and chlorpromazine can be used for treatment, they lack sound evidence base. Complicated patients need resuscitation (mechanical ventilation, antiepileptic/antihypertensive etc.) (Birmes et al, 2003; Jaunay et al, 2001; Mason et al, 2000).

## Limitations

An array of challenges await for those involved in this field of scientific research. Identifying and characterising these compounds would be the first major step towards gathering evidence based literature. This research is one of those that contribute towards this and it gives an overview of a sample of psychoactive substances.

New NPS flood the online shops everyday replacing the older ones. There are several hundreds of such compounds available for sale online around the world. Most of these NPS lack robust evidence based literature. It may be difficult to conduct large clinical trials involving human subjects. It might well raise the ethical dilemma of such intervention. Also, it would be a colossal task to accomplish such studies for each compound.

Another point to emphasise here is the relative instability of the above described 'pro drug' websites. The information contained in the webfora is not guaranteed to be stable over time. New websites appear regularly and also websites close down constantly (Davey et al, 2012). Thus monitoring of these website fora should be a regular exercise (Davey et al, 2012).

The market has developed into very flexible system and well prepared to dispatch new compounds for sale, once the older ones become controlled in a particular country. Hence, as new NPS appear day by day, the evidence based information also needs to be updated relentlessly.

It is difficult to track down a specific website which may sell NPS that are illegal in a country. In most cases, the websites could be based in a different country (eg, China, Mexico). Hence it could potentially become impossible to prosecute the website organisation based in one country using the law from another country.

Also, the genuinity of each product is questionable. There have been numerous investigations into the identity of the samples and have concluded that the majority of the products do not contain the specified ingredients or they might contain other psychoactive substances and/ or adulterants (Brandt et al., 2010;

Baron et al., 2011; Khreit et al., 2012). Hence the toxicity report pertaining to a particular compound becomes dubious and whether it reflects the characteristics of the compound or its due to the combination of compounds in the mixture.

This research has been based on the vast qualitative data supplied by the online drug misuse communities. The users discuss in depth about their experience and toxicity for a range of psychoactive compounds for which hardly any scientific literature exist. However, the information gathered from the web fora arise from online source alone. Interviewing users, their carers and analytical confirmation of the compounds bought online by standardised investigations such as Gas Chromatography and Mass Spectrometry would add more value.

Thus, a number of opportunities as well as challenges exist in this field of NPS and the virtual communities – identification of new substances, tracking websites, criminality, amendments to the existing legislations, international cooperation, management of overdoses etc. Thankfully, research projects such as this one along with the ReDNet project have started to uncover the depths of this recreational world which could potentially become a major public health concern in the future.

## Conclusions

A range of novel psychoactive substances have been made recently available across the globe. The sale is easily achieved through the Internet. New legislations are made to control some recreational substances whilst newer substances appear. Furthermore, the distributors sell the backlog of products even after controlling of the substance has occurred and hence are liable to potentiating criminal investigations. Hence it is suggested as well that the 'genuinity' of each online substance is questionable. Evidence-based literature is scant for the vast majority of these substances. This research was carried out on thirty NPS which could represent vast numbers of NPS emerging online. The summaries/technical reports on these thirty NPS has given an overview of the NPS on the worldwide market and provides useful insight into the online users perspectives/ subjective experiences, health related risks and their management.

The online communities share information about NPS to support and warn members from the potential adverse effects of these substances. Accidental overdoses are common occurrences and some of the potential life-threatening clinical situations include sympathomimetic toxidrome and serotonin syndrome. Benzodiazepines appear to help with agitation and neuropsychiatric manifestations. Prompt recognition of overdoses, access to Emergency departments, comprehensive assessment including full history are of paramount importance to prevent potential medical/psychiatric complications and even death.

Better levels of international cooperation and rapid share of available information may be needed to tackle the emerging problem of the novel psychoactive substances. Further research is required to have a broad perspective about the NPS and effective ways of managing them.

## List of appendices

### Appendix A *(List of all the unique websites identified by Google and Yahoo searches)*

1. <http://www.erowid.org> (Accessed August 25, 2012)
2. <http://www.bluelight.ru> (Accessed August 25, 2012)
3. <http://www.drugs-forum.co.uk> (Accessed August 25, 2012)
4. <http://www.entheogen.com> (Accessed August 25, 2012)
5. <http://www.hipfora.com> (Accessed August 25, 2012)
6. <http://www.waytoomany.com/> (Accessed August 25, 2012)
7. <http://www.iwfora.com> (Accessed August 25, 2012)
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## Appendix B

Ethical approval from the University of Hertfordshire - Recreational Drugs European Network [ReDNet] project:

Form PLEC3

UNIVERSITY OF HERTFORDSHIRE  
FACULTY OF HEALTH AND HUMAN SCIENCES  
ECDA, PHARMACY AND POSTGRADUATE MEDICINE

**Outcome of Application for Protocol Approval for  
Studies Involving Human Subjects**

**Title of Study:** Recreational Drugs' European Network: an ICT prevention service addressing the use of novel compounds in vulnerable individuals.

**Name of Investigator(s):** Professor F Schifano  
**Department:** Pharmacy

(i) We support the approval of the above protocol without pre-conditions.

(ii) We support the approval of the above protocol, with special conditions (as detailed overleaf)

**Your Protocol Approval Number is:** PHAEC/10-42

(iii) We consider the protocol to be approvable subject to the following:

(a) Essential pre-conditions (as detailed overleaf):

(b) General recommendations and comments (as detailed overleaf):

(iv) We do not support the approval of the above protocol: (as detailed overleaf)

**Signature:**  **Date:** 15/12/10

**Chair of the School of Pharmacy Ethics Committee**

## Appendix C

Ethical committee's advice on the Psychonaut web scanning project:

### Wandsworth Research Ethics Committee

St George's University of London  
South London REC office 1  
Room 1.14,  
1st Floor, Jenner Wing  
Tooting  
London  
SW17 0QT

Telephone: 020 8725 1558  
Facsimile: 020 8725 1980

15th May 2008

Dr. Paolo Deluca, Ph.D.  
Senior Research Fellow in Addictive Behaviour  
Section of Alcohol Research  
National Addiction Centre, PO48  
Division of Psychological Medicine and Psychiatry  
Institute of Psychiatry  
King's College London  
4 Windsor Walk  
London  
SE5 8BB

Dear Dr Deluca,

**Full title of project:** Psychonaut web scanning, alert on new recreational drugs on the web; building up a European-wide digital web scan monitoring system

**REC reference:** 0040. 08

Thank you for seeking the Committee's advice about the above project. It has been considered by the Sub-Committee.

I enclose a copy of our leaflet, "Defining Research", which explains how we differentiate research from other activities. The Sub-Committee has advised that the project is a survey and therefore not considered to be research according to this guidance. Therefore it does not require ethical review by a NHS Research Ethics Committee.

This letter should not be interpreted as giving a form of ethical approval to the project or any endorsement of the project, but it may be provided to a journal or other body as evidence that ethical approval is not required under NHS research governance arrangements.

However, if you, your sponsor/funder or any NHS organisation feels that the project should be managed as research and/or that ethical review by a NHS REC is essential, please write setting out your reasons and we will be pleased to consider further.

Where NHS organisations have clarified that a project is not to be managed as research, the Research Governance Framework states that it should not be presented as research within the NHS.

Yours sincerely

**Emma Clark**

**Committee Co-ordinator**

## Appendix D

Gmail: Status update to your article in Human Psychopharmacology: Clinical and Experimental - HUP-2302

Mar 21

### Human Psychopharmacology: Clinical & Experimental

Dear Dr Jeshoor Jebadurai,

Journal: *Human Psychopharmacology: Clinical and Experimental*

Article title: "Recreational use of 1-(2-naphthyl)-2-(1-pyrrolidiny)-1-pentanone hydrochloride (NRG-1), 6-(2-aminopropyl) benzofuran (Benzofury/ 6-APB) and NRG-2 with review of available evidence based literature"

Your article is currently at the following stage of production:

**Stage 3 (of 4): Author corrections have now been received by the publisher.** We are making your corrections and preparing to publish your article. If your journal article is published EarlyView (online ahead of being assigned an issue), please understand that there may be a short delay from when your corrections are received and when it is published online.

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***THE END***