



Critical Review Report: 4-CMC (4-CHLOROMETHCATHIONE)

Expert Committee on Drug Dependence

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Executive Summary

Potent synthetic analogs of methcathinone continue to emerge on the illicit market and one of the more recent compounds appearing is 4-chloromethcathinone or 4-CMC. As other cathinones were being scheduled nationally and internationally, 4-CMC was first reported to the EMCDDA in September 2011. In 2015 and 2016, 4-CMC was one of the most persistent and most prevalent novel psychoactive substances seized UNODC EWA substances seized. 4-CMC appears on the illicit market for purchase as powders and similar to other synthetic cathinones, 4-CMC is typically snorted or ingested orally with potential for intravenous use as well. The doses of 4-CMC generally range from 100 to 300 mg for oral ingestion and from 50 to 150 mg for insufflation. However, depending on the tolerance of the user, up to 1 g has been consumed. The few reports that are available examining the pharmacodynamics, patterns of use, toxicology, adverse events, or abuse liability of this compound indicate that 4-CMC is a cathinone with abuse liability potentially similar to MDMA especially as 4-CMC is a substrate at the DAT, SERT and NET with potent, DAT/SERT releasing capabilities and 4-CMC substitutes for cocaine, +-methamphetamine, and MDMA in rats. The most serious adverse effects for 4-CMC are difficult to separate from the additional substances also reported to be taken in combination with 4-CMC. Nevertheless, the adverse effects resemble patterns observed for other cathinones such as toxicity of the sympathomimetic system such as hypertension, pains in the chest, tachycardia. CNS effects include fear, aggression, agitation, psychoses, hallucinations, and sleeplessness. The population likely to abuse 4-CMC, either knowingly or unknowingly (4-CMC is a frequent adulterant), intersects with the population using other cathinones and stimulants as evidenced by self-reports and toxicological case reports in both nonfatal and fatal case reports. Very few nations have scheduled 4-CMC at the present time. In summary, 4-CMC is one of the latest methcathinone derivatives to be sold and used in a similar manner as other licit and illicit stimulants. At the current time, there is evidence that 4-CMC produces a number of preclinical effects and self-report effects that indicate 4-CMC may share similar public health and safety risks as the mephedrone and MDMA.

1. Substance identification

A. International Nonproprietary Name (INN)

4-CMC (4-chloromethcathinone)

B. Chemical Abstract Service (CAS) Registry Number

1225843-86-6

C. Other Chemical Names

1-(4-chlorophenyl)-2-(methylamino)-1-propanone

1-(4-Chlorophenyl)-2-(methylamino)propan-1-one

para-Chloro-N-methyl-cathinone

4-Chloro-Methcathinone

4-Cl-Methcathinone (4-Cl-MCAT)

D. Trade Names

Not Applicable

E. Street Names

Clephedrone

Klefedron

4-CMC

F. Physical Appearance

White powder, crystalline solid

G. WHO Review History

4-chloromethcathinone has not been previously reviewed by WHO.

2. Chemistry

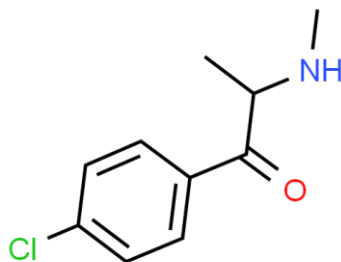
A. Chemical Name

IUPAC Name: 1-(4-chlorophenyl)-2-methylamine)propan-1-one

CA Index Name: 1-(4-chlorophenyl)-2-(methylamino)-1-propanone

B. Chemical Structure

Free base:



Molecular Formula: C₁₀H₁₂ClNO; C₁₀H₁₂ClNO • HCl

Molecular Weight: 197.66 g/mol g·mol⁻¹; 234.1 g/mol g·mol⁻¹

C. Stereoisomers

R- and S-enantiomers

D. Methods and Ease of Illicit Manufacturing

4-CMC is a methcathinone derivative with a chlorine added to the fourth position of the phenyl ring.

E. Chemical Properties

Melting point

198 °C (388 °F)

Boiling point

302.8±0.0 °C at 760 mmHg

Solubility

4-CMC is soluble in organic solvents such as DMSO to a concentration of 10 mg/ml, or in solvents such as dimethyl formamide or ethanol to a concentration of approximately 5 mg/ml. Solubility of 4-CMC hydrochloride is 5 mg/ml in PBS, pH 7.2.

F. Identification and Analysis

Although the rapid appearance and turnover of synthetic cathinones results in an initial lack of analytical reference standards and developed methods of analysis, in recent years a number of identification and analysis studies have been performed for 4-CMC. Early identification and characterization of 4-CMC was performed with GC–MS as well as NMR. In addition, this study determined whether 4-CMC was synthesized as a single pure enantiomer or an equivalent mixture of R- and S-enantiomers using GC and CE analysis. For the samples used in this study it was determined that 4-CMC was obtained as equivalent mixture of R- and S-enantiomers (Taschwer et al., 2014). Other methods of analyses included combinations of GC–MS, IR, NMR, electronic absorption spectroscopy, and single crystal X-ray diffraction method (Nycz et al., 2016; Tomczak et al., 2018). Additional analytical techniques for 4-CMC of UPLC-MS/MS were developed and compared to routine methods of analysis such as immunochemical technique, gas chromatography

with flame ionization detection and gas chromatography with electron impact mass spectrometry (Wiergowski et al., 2017).

In studies of cathinone stability in biological samples, 4-CMC was observed to be one of the least stable cathinones in blood at room temperature as the initial concentration decreased by 50% in less than 3 h. The estimated half-lives for 4-CMC were 1 day at 24°C and 5°C in blood samples; yet the estimated half-life was over 2 months at 24°C in urine samples (Adamowicz and Malczyk, 2019). This lack of stability in blood samples was supported by a more recent case study that found 4-CMC levels dropped by 65% in blood serum samples stored at 4°C after 3 days (Nowak et al., 2019). These studies emphasize the importance of analyses for 4-CMC as soon as possible after sample collection.

3. Ease of Convertibility into Controlled Substances

At the time of the report, no information was found on whether 4-CMC is converted into other controlled substances. In recent years, there have been indications of increasing interest in making synthetic cathinones in Europe, including seizures of precursors, equipment and illicit laboratories used to make mephedrone (which is now under international control), as well as 4-CMC (EMCDDA, 2019a,b).

4. General Pharmacology

A. *Routes of administration and dosage*

Routes of administration and dosages are based on user self-reports and paraphernalia found at the site of administration. Similar to other synthetic cathinones, 4-CMC is typically snorted or ingested orally with potential for intravenous use as well. The doses of 4-CMC generally range from 100 to 300 mg for oral ingestion and from 50 to 150 mg for insufflation. However, depending on the tolerance of the user, up to 1 g has been consumed. Users reported that the profile of effects of 4-CMC depends on the route of administration such that oral ingestion results in a euphoric effect, while snorting results in a speed-like effect accompanied by agitation, increased concentration, and increased self-confidence (Grifell et al., 2016; Tomczak et al. 2018).

B. *Pharmacokinetics*

At the time of this report, no published studies of pharmacokinetics have been performed. In self-reports, users claim the effects of 4-CMC can be felt more quickly after insufflation (2-3 min) than after oral ingestion (30–60 min), but duration of effect is longer with oral ingestion (Grifell et al., 2016). In a published forensic report, after a subject had ingested nonfatal concentrations of 4-CMC, the concentrations from blood samples after a 30 min time period were completely eliminated suggesting rapid metabolism of 4-CMC from this subject (Wiergowski et al., 2017).

C. *Pharmacodynamics*

In radioligand binding assays, 4-CMC had very low affinities of 9,410 nM, 28,700 nM, and 19,600 nM for the dopamine transporter (DAT), serotonin transporter (SERT), and

norepinephrine transporter (NET), respectively. In uptake potency assays, 4-CMC had low uptake potencies of 208 nM, 670 nM, and 75.5 nM for the DAT, SERT, and NET, respectively. In HEK-hDAT cells, 4-CMC (10 nM to 100 μ M) possessed full efficacy at stimulating the release of [3 H]dopamine. The maximal response elicited by 4-CMC was 83.5% of the efficacy of methamphetamine. 4-CMC was less potent (EC_{50} value = 2,890 nM) at stimulating the release of [3 H]dopamine compared to methamphetamine (EC_{50} value = 430 nM). In HEK-hSERT cells, 4-CMC (100 nM to 100 μ M) possessed full efficacy at stimulating the release of [3 H]serotonin. The maximal response elicited by 4-CMC was 124% of the maximal efficacy of methamphetamine. 4-CMC was more potent (EC_{50} value = 1,980 nM) at stimulating release of [3 H]serotonin compared to methamphetamine (27,500 nM). In HEK-hNET cells, 4-CMC (10 nM to 30 μ M) possessed full efficacy at stimulating the release of [3 H]norepinephrine. The maximal response elicited by 4-CMC was 84.9% of the maximal efficacy of methamphetamine. 4-CMC was less potent (EC_{50} value = 1,240 nM) at stimulating release of [3 H]norepinephrine compared to methamphetamine (EC_{50} value = 152 nM). In summary of this report, 4-CMC was a substrate at the DAT, SERT and NET based on its potencies at inhibiting uptake and the ability to induce [3 H]neurotransmitter release. The rank order of potency for inhibition of uptake was reported as NET > DAT > SERT and the rank order of potency for the release of neurotransmitter via the transporters was reported as NET > SERT > DAT (Janowsky, 2015).

Similarly, another study found 4-CMC to 3 times more potent at releasing dopamine than serotonin in vitro and in vivo (Bonano et al., 2015; Suyama et al., 2016) although others found more similar potency for release from SERT and DAT in vitro (Blough et al., 2018; Eshleman et al., 2017). Nevertheless, it appears 4-CMC is a substrate at the DAT, SERT and NET with potent, DAT/SERT releasing capabilities. This relationship between DAT/SERT appears especially important for para-substituted analogs of methcathinone such as 4-CMC as there appears to be a shift in preference from the DAT to the SERT with greater the steric volume of the para substituent and a concomitant decrease in abuse related behaviors in animal models (Bonano et al., 2015; Negus and Banks, 2017).

5. Toxicology

At the time of the report, there were no acute or chronic preclinical toxicology studies found.

6. Adverse Reactions in Humans

A number of forensic and case reports indicate adverse reactions in humans although 4-CMC is usually administered in combination with other substances so the specific adverse effects are difficult to separate from the other substances. Generally, in summary of observations and self-reports of users, 4-CMC produces adverse effects similar to other cathinones such as toxicity of the sympathomimetic system such as hypertension, pains in the chest, tachycardia. CNS effects include fear, aggression, agitation, psychoses, hallucinations, and sleeplessness (Grifell et al., 2016; Tomczak et al. 2018).

More specifically, 4-CMC levels were determined in 15 forensic cases related to nonfatal intoxication including driving under the influence, and fatalities including overdoses,

suicide and traffic accidents between 2015 and 2017. Subjects were between the ages of 18-35 years old and all but one subject was male. Out of these 15 cases, only one subject had 4-CMC as the only compound detected. Nine cases were non-fatal with blood concentrations ranging from 1.3 to 75.3 ng/mL and 6 cases were fatal with blood concentration ranging from 56.2–1870 ng/mL. Reports from nonfatal cases in which 4-CMC was taken in combination with other substances included dilated pupils, slow or absent pupillary light reflex, slurred speech, agitation, increased drive, tachycardia, difficulty in walking, difficulty in picking up objects from the ground, positive Romberg's sign (lack of balance), disorientation as to time, place, and surroundings, drowsiness, talkativeness, and slow behavior. For the single nonfatal case with intoxication from only 4-CMC, the following adverse effects were reported: agitation, joyful expressions, increased drive, tachycardia, dilated pupils, and difficulty in picking up objects from the ground. All fatal cases had multiple substances detected in blood and four of the six fatalities were associated with risky behavior. In one of the fatal cases, forensic pathologist indicated the action of a psychoactive substance on the body probably as the primary cause of his death suggesting it is highly probable that the death resulted from an overdose of 4-CMC. In another fatal case deemed a suicide, a woman fell from a height and a high concentration of 1870 ng/mL 4-CMC was determined from her blood. The forensic pathologist and authors suggested this subject had likely developed a degree of tolerance to the 4-CMC to be able to consume this dose of 4-CMC (Tomczak et al., 2018)

A range of other toxicological reports indicate interactions of 4-CMC with other substances as likely producing additive adverse effects. In three toxicological cases of 4-CMC combined 25B-NBOMe, the authors suggested that concentrations of 2.14ng/ml 4-CMC were not likely lethal alone, however additive with 25B-NBOMe on the inhibition of monoamine transporters may cause increased likelihood of lethality (Wierowski et al., 2017). In Slovenia, a 38 year old man attempted suicide with a mix of AB-CHMINACA, ABFUBINACA, alpha-PHP, alpha-PVP and 4-CMC identified in drug bags found at the scene. As the authors did not find 4-CMC in the stomach contents or urine, they are unsure 4-CMC was actually consumed (Klavž J et al., 2016). In Hungary between the years of 2008-2015, identification of 4-CMC peaked around 2015. In 2015, besides the compounds pentedrone, α PVP, and α PHP, 4-CMC was detected frequently (11 instances) in blood samples in Hungary with 73% of these cases involving multi-drug use. The concentrations in urine ranged from 33.4 to 67900 ng/mL (Arok et al., 2017). Finally, according to the UNODC.org/tox portal, 2 toxicology cases in Taiwan, Providence of China were reported in 2 males aged 25-44 consisting of 656 and 14 ng/mL 4-CMC in addition to 3 and 4 other cathinones or ketamine in 2018 (UNODC EWA Tox-Portal, 2019).

In anecdotal statements of users published on Internet forums, a user consuming 1 g 4-CMC administered over 24 h period in combination with other cathinones reported stimulation, empathogenic effects, with initial adverse effects of intense tremor, bruxism, and nearly blacking out. Another user administering 1 g 4-CMC, i.v. reported requiring a trip to the emergency department, treatment of beta blockers, and a week-long MDMA like hangover. Other adverse effects self-reported were extreme pain when snorted, headaches the next day, psychic and somatic anxiety, apathy, involuntary eye movements,

and jaw tension. As these descriptions are self-reported from Internet sites and anonymous surveys, there is not an opportunity to verify the substance consumed was actually 4-CMC or how much of the substance was 4-CMC (Grifell et al., 2016).

7. Dependence Potential

A. *Animal Studies*

At the time of this report, there were no studies of dependence potential in the literature for 4-CMC.

B. *Human Studies*

In anecdotal statements of users published on Internet forums such as reddit, drugs-forum, bluelight, vice, flashback, hyperreal, dopalator, drugs.tripsit.me, and Google Trends, 50% of respondents reported mixing cathinones such as 4-CMC with other drugs such as cocaine, ketamine, or GHB. Many users reported being sent a free sample of 4-CMC with a purchase of another novel psychoactive substance. Some users reported looking for a legal alternative to mephedrone playing a role on whether to ingest 4-CMC. There were reported speculations and concern on the potential of neurotoxicity of the chlorinated form of methcathinone (4-CMC) from some users since there is an increased risk of toxicity for chlorinated amphetamines in comparison to other amphetamines (Reddit, 2016 in Grifell et al., 2016). The data on trends and doses from the internet and forums suggest a potential for abuse and dependence similarly to other cathinones. For example, 50 mg 4-CMC was comparable to 75-90 mg of MDMA producing euphoria, increased energy, increased sociability, visual and auditory hallucinations, empathogenic feelings, and increased sexuality. Higher doses of 80-250 mg (insufflation) were reported to produce dizziness, light-headedness, feelings of warmth, increased body heat, nystagmus, euphoria, and extreme ecstasy. These effects of 4-CMC began after approximately 20 min and then began to diminish after 30 min. Users also reported using doses up to 1000 mg suggesting that some degree of tolerance may be achieved with repeated administration. However, as these descriptions are self-reported from Internet sites and anonymous surveys, these reports are limited to the veracity of the account and it is not possible to verify that the substance consumed was actually 4-CMC (Grifell et al., 2016).

8. Abuse Potential

A. *Animal Studies*

In mouse locomotor activity assays, treatment with 2.5 to 10 mg/kg 4-CMC i.p. resulted in time- and dose-dependent increases in locomotion. Peak locomotor effects were observed following 5 mg/kg 4-CMC. Maximal locomotor stimulant effects of 5 mg/kg 4-CMC occurred 10-40 min post injection and lasted 70-230 min. At higher doses, locomotor effects were delayed, peaking from 30 to 60 min after administration. Duration was also dose-dependent, increasing to 6 h at 10 mg/kg 4-CMC. Based on the 30-minute time period in which maximal stimulant effects occurred (10 to 40 minutes following injection), an ED₅₀ of 1.4 mg/kg was calculated for 4-CMC (Gatch, 2019). Compared to cocaine, methamphetamine, and MDMA, the maximal stimulant effects of 4-CMC were 66%, 63%

and 64%, respectively (Sumien et al., 2017; Gatch, 2019). The locomotor stimulant effects of 4-CMC revealed a time course similar to MDMA in this assay, with a slow onset and long acting effects. 4-CMC, however, did not produce the initial depressant effects on locomotion produced by low-dose MDMA (Gatch, 2019).

In drug discrimination assays (Forester et al., 2018a,b; Gatch et al., 2019), 4-CMC i.p. fully substituted (ED_{50} = 4.3 mg/kg) for the discriminative stimulus effects of 10 mg/kg, i.p. cocaine in rats. Doses of 1-10 mg/kg 4-CMC failed to alter response rates from vehicle control. 4-CMC also fully substituted (ED_{50} = 3.9 mg/kg) for the discriminative stimulus effects of 1.0 mg/kg, i.p. (+)-methamphetamine. In this group of rats, response rates were decreased 5 and 10 mg/kg 4-CMC with a dose of 10 mg/kg 4-CMC decreasing rates to 17% of the vehicle control rates. Finally, 4-CMC fully substituted (ED_{50} = 0.37 ± 0.10 mg/kg) for the discriminative stimulus effects of 1.5 mg/kg MDMA, i.p., without significant changes in response rates at the doses tested. In summary, 4-CMC was 10-fold more potent at producing MDMA-like discriminative stimulus effects than it was at producing cocaine- or methamphetamine-like discriminative stimulus effects. This observation is similar to the locomotor studies in that 4-CMC produced patterns of locomotor stimulant effects more similar to MDMA than like cocaine or methamphetamine (Gatch et al., 2019).

Abuse liability for 4-CMC was also assessed in the intracranial self-stimulation model (ICSS). In this assay, 4-CMC produced facilitation of low ICSS rates maintained by low stimulation frequencies; however, higher doses of 10 mg/kg 4-CMC i.p. significantly decreased high ICSS rates. This dose of 10 mg/kg 4-CMC produced rate-decreasing effects that peaked after 10 min and remained significant after 300 min. Rate-increasing effects were apparent only 300 min after administration of 10 mg/kg 4-CMC. In this study, the authors also correlated the in vitro selectivity of 4-CMC for DAT/SERT with its in vivo efficacy to facilitate ICSS and determined 4-CMC would be likely to be associated with higher abuse potential (Bonaro et al., 2015; Negus and Banks, 2017).

B. Human Studies

On internet forums, 4-CMC was reported by several users as addictive and these users warned the community about controlling the frequency of use (Grifell et al., 2016).

9. Therapeutic Applications and Extent of Therapeutic Use and Epidemiology of Medical Use

There are currently no therapeutic applications or recorded medical uses.

10. Listing on the WHO Model List of Essential Medicines

4-CMC is not listed on the WHO Model List of Essential Medicines.

11. Marketing Authorizations (as a Medicinal Product)

No evidence is available that 4-CMC is being pursued as a medicinal product. Furthermore, 4-CMC has not been granted a marketing authorization as a medicinal product for human use or veterinary use, has not been the subject of an application for marketing

authorization as a medicinal product for human use or veterinary, or has not had a case of suspended marketing authorization as a human or animal medicine.

12. Industrial Use

No potential industrial use was detected for 4-CMC besides as an analytical reference standard for scientific research and forensic applications. 4-CMC currently is available for purchase synthesized by various chemical companies available in wholesale amounts and in consumer amounts.

13. Non-Medical Use, Abuse and Dependence

At the time of this report, there were no formal epidemiology reports published on the prevalence, abuse, or dependence of 4-CMC. Only case reports described above and two toxicology reports from Taiwan (Wiergowski et al., 2017; Tomczak et al., 2018; UNODC EWA Tox-Portal, 2019) were available despite the fact that 4-CMC was one of the most frequently seized cathinone by the UNODC in 2015 and 2016.

14. Nature and Magnitude of Public Health Problems Related to Misuse, Abuse and Dependence

Toxicological case reports have indicated that 4-CMC is a substance involved in nonfatal intoxication including driving under the influence and in fatalities including overdoses, suicide, and traffic accidents. 4-CMC is identified with other cathinones as well as other compounds such as ketamine, cocaine, THC, and others (Klavž J et al., 2016; Wiergowski et al., 2017; Tomczak et al., 2018; UNODC EWA Tox-Portal, 2019).

15. Licit Production, Consumption and International Trade

There is currently no licit production, consumption, or trade for 4-CMC.

16. Illicit Manufacture and Traffic and Related Information

In 2015 and 2016, 4-CMC was one of the top UNODC EWA substances reported as the most persistent and most prevalent novel psychoactive substances seized (Tetty 2017). The five most commonly seized cathinones in 2015 were alpha- PVP, 3-MMC, ethylone, 4-CMC and pentedrone. Where reported, more than 60 % (1.2 tonnes) of the synthetic cathinones seized in 2015 were shipped from China (EMCDDA, 2017). The significance of these findings is reinforced by the observation that in Europe in 2016, 4-CMC was the second most frequently confiscated cathinone and the one seized in the largest amount (890 kg) (European Drug Report 2018). In seizures between 2015-2016 as provided by the Annual Report Questionnaire, a total of 470 g 4-CMC was seized, specifically 5.42 g in China, Macao SAR, 102 g in Czechia in 2016, and a total of 311 g seized in 2015, individual nations not identified. In 2017, 115.6 g of 4-CMC were seized in Indonesia (Directorate General of Customs and Excise, 2018).

4-CMC samples were collected by Energy Control, a project within the Spanish NGO "Asociacion Bienestar y Desarrollo" to provide free and anonymous drug checking, and analyzed by GC/MS. Although this is certainly not an exact reflection of the market for 4-

CMC, 4-CMC was first identified in June 2014 by this organization. In a study of 12,965 samples collected from purchasers and voluntarily submitted, 4-CMC was found in 29 samples in the form of crystal rocks or powders. In this study, only ~23% of the purchased samples actually contained what the consumer thought they were purchasing (Grifell et al., 2016).

In national reports provided by Poland, the police have observed the manufacturing process and the distribution of 4-CMC by Polish organized crime groups that establish, equip, and supply synthetic drug production labs. Because of the changing legal status of certain precursors, the police have observed shifts so that production stages take place in different locations, which change frequently. In 2017, the Polish police dismantled 18 synthetic drug labs: 12 for the production of amphetamine, five for methamphetamine production and one producing a new psychoactive substance, i.e., 4-CMC (EMCDDA, 2019b).

Other indications of illicit trafficking of 4-CMC are the number and percentage of syringes detected with traces of 4-CMC in monitored sentinel cities. In 2017, the European Syringe Collection and Analysis Project Enterprise reported identifying 4-CMC in used syringes in five of six sentinel cities: Amsterdam, Budapest, Glasgow, Helsinki, and Lausanne. Further, they indicated 14 counts or ~6% of samples collected in Budapest contained 4-CMC (EMCDDA, 2019c). 4-CMC was found as an adulterant of MDMA in Europe (EMCDDA, 2019b) and reported in Austria, Switzerland, and the United States (Ecstasy data.org 2016). In the first half of 2015, 4-CMC was the eighth psychoactive substance most frequently found in “designer drugs”, and in the second half of 2015, 4-CMC was ranked second most frequent adulterant in Europe. Taking into account the data for 2016 seizures, 4-CMC was the psychoactive substance most frequently found in these types of products during these two years (Tomczak et al., 2018).

17. Current International Controls and Their Impact

At the current time, there are no international controls for 4-CMC.

18. Current and Past National Controls

The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and Europol added 4-CMC to the list of new psychoactive substances to be monitored through the European Union Early Warning System and a profile of the substance was created on the European Database on New Drugs.

The legal status for 4-CMC is Anlage 1 controlled drug in Germany and Sweden’s public health agency classified 4-CMC as an illegal narcotic on June 2015. In Hungary, 4-CMC has been controlled as a new psychoactive substance since April 2012. As of October 2015, 4-CMC is a controlled substance in China.

19. Other Medical and Scientific Matters Relevant for a Recommendation on the Scheduling of the Substance

Because users of 4-CMC obtain this substances through unregulated sources, the identity, purity, and potency is uncertain posing a significant adverse health risks to the purchaser. Limited pharmacological and toxicological information are available for 4-CMC, increasing the risk for harmful adverse events.

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Annex 1: Report on WHO Questionnaire for Review of Psychoactive Substances

Refer to separate Annex 1: Report on WHO questionnaire for review of psychoactive substances