



4-Methylmethcathinone (Mephedrone) (Street Names: 4-MMC, meow meow, m-CAT, bounce, bubbles, mad cow)

May 2013
DEA/OD/ODE

Introduction

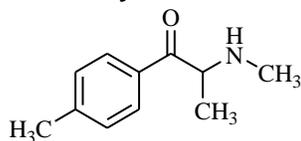
4-Methylmethcathinone (mephedrone) is a designer drug of the phenethylamine class and shares substantial structural similarities with methcathinone (Schedule I). Drugs from this class of compounds are known to produce central nervous system stimulation, psychoactivity and hallucinations.

Evidence from law enforcement indicates that the abuse of mephedrone as a recreational substance is widespread and growing. From 2009 to 2011, law enforcement agencies have documented mephedrone seizures throughout the United States. Mephedrone abuse has been associated with toxicity. Several cases of acute toxicity have been reported for the ingestion of mephedrone. Furthermore, deaths have been reported from the abuse of mephedrone.

Licit Uses

Mephedrone is not approved for medical use in the United States.

Chemistry



4-Methylmethcathinone
Molecular Formula: C₁₁H₁₅NO

The core chemical structure of mephedrone identifies it as a phenethylamine, and is related in chemical structure to methcathinone differing only by a methyl group (CH₃) on the ring. It is a solid at room temperature.

Pharmacology

Mephedrone has been shown to inhibit the function of monoamine transporters and also serve as a substrate *in vitro*. It has been reported that mephedrone increases extracellular monoamines (serotonin and dopamine) concentration in rat brain as measured by *in vivo* microdialysis technique. Mephedrone has been reported to increase locomotor activity in rats. In drug discrimination assays mephedrone fully substitutes for methamphetamine in rats trained to discriminate methamphetamine from saline. 3,4-methylenedioxymethamphetamine (MDMA) substitutes for mephedrone in rats trained to discriminate stimulus effects of mephedrone from saline. It has been reported that mephedrone is self-administered by rodents. Intracranial self-stimulation studies show that mephedrone, similar to cocaine, potentiates brain stimulation induced reward in mice. Similar to methamphetamine, mephedrone increases blood pressure and heart rate, cardiac output,

ejection fraction, and stroke volume in rats. In a clinical study mephedrone produced stimulant-like subjective effects, impaired working memory and is associated with binge use.

Individuals have presented at emergency departments following exposures to mephedrone. The adverse health effects reported for mephedrone are similar to those seen with other stimulant drugs. Adverse effects reported by abusers of mephedrone include increased heart rate, increased blood pressure, chest pain, agitation, irritability, dizziness, delusions, nose bleeding, dilated pupils, seizures, nausea and vomiting. There have been reports of deaths in which mephedrone was either implicated or ruled as the cause of death.

According to self-reported drug users, the amounts for snorting mephedrone ranged from 25 to 75 milligrams but for oral administration it ranged from 150 to 250 milligrams. Following oral or nasal ingestions of mephedrone, users report that desired effects occur 15 to 45 minutes after administration.

User Population

Mephedrone is popular with youths in urban environments with males appearing to use synthetic cathinones more than females. Information also suggests that mephedrone is used by several population groups such as young adults, mid-to-late adolescents, and older adults.

Illicit Distribution

Mephedrone is sold over the Internet and at local retail shops where it is promoted as “a research chemical”, “bath salts” or “plant food.” The National Forensic Laboratory Information System (NFLIS) is a DEA database that collects scientifically verified data on drug items and cases submitted to and analyzed by state and local forensic laboratories. The System to Retrieve Information from Drug Evidence (STRIDE) provides information on drug seizures reported to and analyzed by DEA laboratories. Substances identified by forensic laboratories as mephedrone increased from 10 reports in 2009 to 336 reports in 2011 and then decreased to 60 reports in 2012. Law enforcement officials have encountered mephedrone in 36 states since 2009.

Control Status

On October 21, 2011, mephedrone, its salts, isomers, and salts of isomers were temporarily controlled in Schedule I of the Controlled Substances Act. Control of these compounds became permanent on July 9, 2012, via passage of the Synthetic Drug Abuse Prevention Act of 2012 (Public Law 112-144, Title XI, Subtitle D).

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section, Fax 202-353-1263, Telephone 202-307-7183, or E-mail ODE@usdoj.gov.