Emerging Designer Drug Monograph

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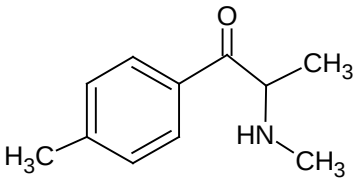
Drug Name: **Mephedrone**

Synonyms: 4-Methylmethcathinone, 4-MeMC, 4-Methylephedrone, 4-MMC, 2-aminomethyl-1-tolyl-propan- 1-one

Structure:



Formula: $C_{11}H_{15}NO$

Molecular Weight: 177.2

Pharmacological Drug Class: CNS Stimulant that initiates catecholamine release and inhibits monoamine oxidase, increasing concentrations of serotonin, norepinephrine, and dopamine in the synaptic cleft (1).

Metabolism: Mephedrone is N-demethylated to a primary amine metabolite. Ketone groups are reduced to alcohols (1).

Blood Concentrations: Case studies outlined by Maskell et al (2011) report plasma mephedrone concentrations of 0.15mg/L in a non-fatal intoxication. In a case involving multiple drug toxicity mephedrone blood concentration was 0.5mg/L (2,3). Adamowicz (2013) reports fatal mephedrone concentrations range of 5.5 µg/mL in the blood and 7.1 µg/mL in the vitreous humor (4).

Effects and Toxicity: Mephedrone is a synthetic cathinone derivative that has stimulant effects similar to methamphetamine, ecstasy, and cocaine (3). Effects include increased alertness, tachycardia, sweating, and insomnia (5). Additionally, users describe feelings of empathy and euphoria (see www.erowid.org).

Analysis: Mephedrone is a small, basic drug that chromatographs well through GC-MS. See SWGDRUG Monograph for GC-MS method and sample chromatographs. Dickson et al (2010) collected data at a mass range if 42-550, using a SIM method targeting m/z 204, 160, 119. Extractions and GC-MS method parameters are outlined (3).

References:

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3. Dickson, A. J., Vorce, S. P., Levine, B., Past, M. R. (2010) Multiple-drug toxicity caused by the coadministration of 4-methylmethcathinone (mephedrone) and heroin. *Journal of Analytical Toxicology*, 34(3), 162 - 168.
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4. Adamowicz, P., Tokarczyk, B., Stanaszek, R., Slopianka, M. (2013) Fatal mephedrone intoxication--a case report. *Journal of Analytical Toxicology*, 37(1), 37 - 42.
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5. Gibbons, S., Zloh, M. An analysis of the ‘legal high’ mephedrone (2010). *Bioorganic* & *Medicinal Chemistry Letters*, 20(14), 4135 - 4139. doi:10.1016/j.bmcl.2010.05.065.
http://www.ncbi.nlm.nih.gov/pubmed/20542690

Cayman Chemical
https://www.caymanchem.com/app/template/Product.vm/catalog/10801

SWGDRUG Monograph
http://www.swgdrug.org/Monographs/4-methylmethcathinone.pdf

Forendex
http://forendex.southernforensic.org/index.php/detail/index/1092

Mephedrone Erowid
http://www.erowid.org/chemicals/4_methylmethcathinone/4_methylmethcathinone.shtml