

Methamphetamines

Generic name: methamphetamine

Brand name: Desoxyn^{®1}

Street name(s): meth, ice, crank, speed, poor man's cocaine

Miscellaneous:

- The two most common ingredients currently utilized for synthesis are ephedrine and/or pseudoephedrine.
- Phenylpropanolamine (PPA), structurally similar to pseudoephedrine and methamphetamines, also used to be commonly included as a main ingredient of methamphetamine manufacture. PPA, however, was recently banned from being included in OTC products due to its implications in causing hemorrhagic stroke.
- A “meth house” or any environment in which the drug is produced is generally uninhabitable after the lab has been discontinued. The toxic fumes and liquids bind to fibers in the carpet, wood and plastic in the house and are not able to be completely extracted/removed. Not only are the remnants of a discarded lab dangerous to people in the area, but the remaining toxins often destroy a plethora of natural flora and fauna.

Pharmaceutical Properties:

Most commonly found as a white or yellowish-white crystalline powder that may or may not be compressed into tablet form. If the final step regarding the physical transformation of methamphetamine is skipped, it is possible that the drug could be used in an oil form.

Uses:

CNS stimulation. Users may experience the short-term psychoactive effects that are also seen with cocaine. Cocaine's anesthetic effects, however, are not evident with methamphetamines.

Administration:

Oral ingestion, smoking/inhalation, IV injection (rare). “Ice” is the smokeable form of methamphetamine and, analogous to the “crack” form of cocaine, has an extremely rapid onset.² Smoking “ice” actually provides for a faster peak than would be attained through injection, and is quickly becoming the method of choice among users.

Mechanism/Pharmacology:

As stated by the United States Health Department Report on Drug Abuse Research, “the mechanism of action involves the release and blocked reuptake of dopamine and epinephrine, as well as a blockage of monoamine oxidase (MAO).”

Side effects:

Short-term: Acute cardiac failure, anorexia, circulatory collapse, dizziness, delirium, arrhythmias, pyresis, palpitations, seizures and subarachnoid bleeding.³

Long-term: Destruction of dopamine neurons and interrupted serotonin pathways.⁴⁻⁶

Testing:

Current testing is performed through hair, urine, or blood analysis. Methamphetamines can be detected in the urine for 2-4 days.¹

Treatment:

No specific antidote is available. Predominantly supportive/symptomatic. Haloperidol (2-5 mg IM) may be used in cases of extreme agitation, while diazepam administered IVP should be sufficient in handling seizures.¹ Due to the large incidence of depression among stimulant addicts, antidepressants may be helpful.

Synthesis:

Iodine is used in the initial heating process of pseudoephedrine or ephedrine.⁷ The obvious use for liquid iodine in the healthcare setting is as a topical antiseptic for flesh wounds or as a preoperative disinfectant. Less obvious, however, is the common use of iodine by horse owners to treat thrush that often appears on the animal's hooves. This is important to note because ranchers may keep large amounts of iodine for this purpose in a fairly easy-access environment. Though it is useful in small doses, iodine can be extremely toxic in large amounts. Namely, the thyroid gland and the gastrointestinal system may be severely damaged if an individual is exposed to high amounts of iodine.

Red phosphorus is a highly flammable chemical that is also used in the heating step of methamphetamine synthesis.⁷ Red phosphorus is a primary constituent of flares and composes the substance found at the end of matchsticks that enables their easy ignition. During this "cooking" stage of methamphetamines, iodine and red phosphorus may combine to form phosphene, a colorless, odorless and potentially lethal gas.⁷ Production of phosphene occurs if the heated iodine and red phosphorus are vented improperly and allowed to interact.

Hydriotic acid is used as the reducing agent in the synthesis of methamphetamines.⁷ Normally, hydriotic acid is only found in large amounts in oil refineries and research laboratories. Labs use this chemical for various purposes, while refineries often test crude oil for its sulfur content by using hydriotic acid.

The three-step summation generally includes heating a mixture of red phosphorus, ephedrine and hydriotic acid for approximately twelve hours. The resulting solution is strained to remove the non-water soluble red phosphorus. Sodium hydroxide (NaOH) is added in the second stage to convert the acidic mixture into a base.⁷ Methamphetamine is then extracted by adding Freon (refrigerant that can also act as an organic solvent) to the basic mixture. Hydrogen chloride gas is utilized in the final drying/salting process to physically transform the substance from an oil into a crystalline powder.⁷

User Identification:

Physical: Mydriasis, red/inflamed eyes, anxious/nervous, anorexia.²⁻³

Attention should be paid to the consistent/excessive purchase of the aforementioned products used in the synthesis of methamphetamine, as they are potential precursors to the illegal production of the drug and may aid in identification of suspected users or distributors.

Citation References:

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3. Comer SD, Hart CL, Ward AS, Haney M, Foltin RW, Fischman MW. Effects of repeated oral methamphetamine administration in humans. *Psychopharmacology (Berlin)* 2001;155(4):397-404.
4. Salo R, Nordahl TE, Possin K, Leamon M, Gibson DR, Galloway GP, Flynn NM, Henik A, Pfefferbaum A, Sullivan EV. Preliminary evidence of reduced cognitive inhibition in methamphetamine-dependent individuals. *Psychiatry Res* 2002;111(1):65-74.
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6. Sekine Y, Iyo M, Ouchi Y, Matsunaga T, Tsukada H, Okada H, Yoshikawa E, Futatsubashi M, Takei N, Mori N. Methamphetamine-related psychiatric symptoms and reduced brain dopamine transporters studied with PET. *Am J Psychiatry* 2001;158(8):1206-14.
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