



National Institute  
on Drug Abuse

# DrugFacts

[www.drugabuse.gov](http://www.drugabuse.gov)

## Synthetic Cathinones ("Bath Salts")

### What are synthetic cathinones?

Synthetic cathinones, more commonly known as "bath salts," are synthetic (human-made) drugs chemically related to cathinone, a stimulant found in the khat plant. Khat is a shrub grown in East Africa and southern Arabia, and people sometimes chew its leaves for their mild stimulant effects. Synthetic variants of cathinone can be much stronger than the natural product and, in some cases, very dangerous (Baumann, 2014).

Synthetic cathinones are included in a group of drugs that concern public health officials called "new psychoactive substances" (NPS). NPS are unregulated psychoactive (mind-altering) substances that have become newly available on the market and are intended to copy the effects of illegal drugs. Some of these substances may have been around for years but have reentered the market in altered chemical forms or due to renewed popularity.

### In Name Only

Synthetic cathinone products marketed as "bath salts" should not be confused with products such as Epsom salts that people use during bathing. These bathing products have no mind-altering ingredients.



Photo by DEA/ [www.dea.gov/pr/multimedia-library/image-gallery/bath-salts/bath-salts04.jpg](http://www.dea.gov/pr/multimedia-library/image-gallery/bath-salts/bath-salts04.jpg)

Synthetic cathinones are marketed as cheap substitutes for other stimulants such as methamphetamine and cocaine, and products sold as Molly (MDMA) often contain synthetic cathinones instead (see "Synthetic Cathinones and Molly" on page 3).

Synthetic cathinones usually take the form of a white or brown crystal-like powder and are sold in small plastic or foil packages labeled "not for human consumption." Also sometimes labeled as "plant food," "jewelry cleaner," or

"phone screen cleaner," people can buy them online and in drug paraphernalia stores under a variety of brand names, which include:

- Flakka
- Bloom
- Cloud Nine
- Lunar Wave
- Vanilla Sky
- White Lightning
- Scarface

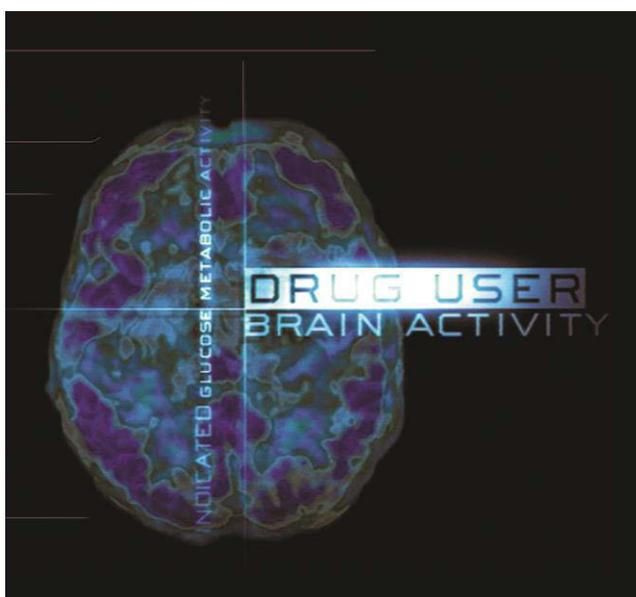
### How do people use synthetic cathinones?

People typically swallow, snort, smoke, or inject synthetic cathinones.

### How do synthetic cathinones affect the brain?

Much is still unknown about how synthetic cathinones affect the human brain. Researchers do know that synthetic cathinones are chemically similar to amphetamines, cocaine, and MDMA. These drugs can cause a range of effects including lowered inhibition, anxiety, and depression. Read more about amphetamines, cocaine, and MDMA:

- *DrugFacts: Stimulant ADHD Medications – Methylphenidate and Amphetamines*  
[www.drugabuse.gov/publications/drugfacts/stimulant-adhd-medications-methylphenidate-amphetamines](http://www.drugabuse.gov/publications/drugfacts/stimulant-adhd-medications-methylphenidate-amphetamines)
- *DrugFacts: Cocaine*  
[www.drugabuse.gov/publications/drugfacts/cocaine](http://www.drugabuse.gov/publications/drugfacts/cocaine)
- *DrugFacts: MDMA*  
[www.drugabuse.gov/publications/drugfacts/mdma-ecstasy-or-molly](http://www.drugabuse.gov/publications/drugfacts/mdma-ecstasy-or-molly)



Synthetic cathinones are chemically similar to amphetamines, cocaine, and MDMA and may produce similar effects on the brain.

Photo by NIDA

People who have taken synthetic cathinones have reported energizing and often agitating effects. Synthetic cathinones can also raise heart rate and blood pressure. A recent study found that *3,4-methylenedioxypyrovalerone* (MDPV), a common synthetic cathinone, affects the brain in a manner similar to cocaine but is at least 10 times more powerful. MDPV is the most common synthetic cathinone found in the blood and urine of patients admitted to emergency departments after taking “bath salts” (Baumann et al., 2013).

Synthetic cathinones can produce effects that include:

- *paranoia*—extreme and unreasonable distrust of others
- *hallucinations*—experiencing sensations and images that seem real though they are not
- increased sociability
- increased sex drive
- panic attacks
- *excited delirium*—extreme agitation and violent behavior

### Synthetic Cathinones and Molly

Molly—slang for "molecular," refers to the pure crystal powder form of *3,4-methylenedioxy-metamphetamine* (MDMA). Usually purchased in capsules, Molly has become more popular in the past few years. Users may be seeking out Molly to avoid the additives commonly found in MDMA pills sold as Ecstasy, such as caffeine, methamphetamine, and other harmful drugs. But those who take what they think is "pure" Molly may be exposing themselves to the same risks. News stories have reported Molly capsules containing harmful substances that include synthetic cathinones. For example, hundreds of Molly capsules tested in two South Florida crime labs in 2012 contained methylone, a dangerous synthetic cathinone.

### What are other health effects of synthetic cathinones?

Nosebleeds, sweating, and nausea are some other health effects of synthetic cathinones. People who experience excited delirium often suffer from dehydration, breakdown of skeletal muscle tissue, and kidney failure.

Intoxication from synthetic cathinones has resulted in death. The worst outcomes are associated with snorting or needle injection.

### Are synthetic cathinones addictive?

Yes, synthetic cathinones can be addictive. Animal studies show that rats will compulsively self-administer synthetic cathinones. Human users have reported that the drugs trigger intense cravings—uncontrollable urges to use the drug again. Taking synthetic cathinones often may cause strong withdrawal symptoms that include:

- depression
- anxiety
- tremors
- problems sleeping
- paranoia

### How can people get treatment for addiction to synthetic cathinones?

Behavioral therapy may be used to treat addiction to synthetic cathinones. Examples include:

- cognitive-behavioral therapy
- contingency management, or motivational incentives—providing rewards to patients who remain substance free
- motivational enhancement therapy

- behavioral treatments geared to teens

No medications are currently available to treat addiction to synthetic cathinones.

### Points to Remember

- Synthetic cathinones, more commonly known as "bath salts," are drugs that contain one or more synthetic (human-made) chemicals related to cathinone. Cathinone is a stimulant found in the khat plant.
- Synthetic cathinones are marketed as cheap substitutes for other stimulants such as methamphetamine and cocaine, and products sold as Molly (MDMA) often contain synthetic cathinones instead.
- People typically swallow, snort, smoke, or inject synthetic cathinones.
- Much is still unknown about how all of the chemicals in synthetic cathinones affect the human brain.
- Synthetic cathinones can cause:
  - nosebleeds
  - paranoia
  - increased sociability
  - increased sex drive
  - hallucinations
  - panic attacks
- Intoxication from synthetic cathinones has resulted in death.
- Synthetic cathinones can be addictive.
- Behavioral therapy may be used to treat addiction to synthetic cathinones.
- No medications are currently available to treat addiction to synthetic cathinones.

### Learn More

For more information about synthetic cathinones, visit:

[www.drugabuse.gov/drugs-abuse/commonly-abused-drugs-charts](http://www.drugabuse.gov/drugs-abuse/commonly-abused-drugs-charts)

[www.emcdda.europa.eu/publications/drug-profiles/synthetic-cathinones](http://www.emcdda.europa.eu/publications/drug-profiles/synthetic-cathinones)

[www.justice.gov/archive/ndic/pubs44/44571/44571p.pdf](http://www.justice.gov/archive/ndic/pubs44/44571/44571p.pdf)

For more information about treatment, visit:

[www.drugabuse.gov/publications/drugfacts/treatment-approaches-drug-addiction](http://www.drugabuse.gov/publications/drugfacts/treatment-approaches-drug-addiction)

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### References

Baumann MH. Awash in a sea of 'bath salts': implications for biomedical research and public health. *Addiction*. 2014;109(10):1577-1579.

Baumann MH, Partilla JS, Lehner KR, et al. Powerful cocaine-like actions of 3,4-methylenedioxypyrovalerone (MDPV), a principal constituent of psychoactive 'bath salts' products. *Neuropsychopharmacology*. 2013;38(4):552-562.