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**Bath salts:  
Designed for disaster**

Updated: June 2012  
**DWI/Traffic Safety  
 and DRE  
 Recertification  
 Conference**




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**Objectives**

**What are these substances?  
 What are their effects?  
 Where do they originate?  
 Are they dangerous?  
 Legal Status in Missouri**

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### What the DEA says about bath salts



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### European Monitoring Centre for Drugs and Drug Addiction



<http://www.emcdda.europa.eu/publications/drug-profiles/synthetic-cathinones>

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### Over the counter "street names"

- Psychoactive-stimulants sold under the names:
  - "Bath Salts"
  - "Jewelry cleaner"
  - "Cell phone screen cleaner"
  - "Plant food"
  - "Natural insect repellent"
- Convenience stores, truck stops, tattoo parlors, herbal shops, smoke shops and the Internet.

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**Will the real bath powder please stand up?**



"Masada": one of the highest rated bath salts/powders on the internet. An eight pound (3,628 grams) jar for \$24.00. **Which is \$3.00 per pound.**



A very popular version of "bath salts" Charley Sheene "bath salts/powder". 0.5 grams (1/2 a gram) for \$44.99. **This is \$40,850.92 per pound!**

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Alternate Names For

## BATH SALTS

ARCTIC BLAST	COTTON CLOUD	MYSTIC	WHITE GIRLS
BAYDU IVORY FLOWER	DYNAMITE DYNAMITE PLUS	OCEAN SNOW	WHITE HORSE
BLOOM	ENERGIZING AROMATHERAPY POWDER	PURE WHITE	WHITE KNIGHT
BLUE MAGIC	EUPHORIA	RED DOVE	WHITE LIGHTNING
BLUE MAGIC	GOLD RUSH	ROUTE 66	WHITE RUSH
BLUE SILK	HURRICANE CHARLIE	SCARFACE	WICKED X
BOLIVIAN BATH	IVORY FRESH	SNOW DAY	WICKED XX
BONSAI WINTER BOOST	IVORY WAVE	SNOW LEOPARD	ZOOM
C ORIGINAL	IVORY WAVE ULTRA	TRANQUILITY	
CLOUD 10	LADY BUBBLES	VANILLA SKY	
CLOUD 10 ULTRA	LUNAR WAVE	WHITE CHINA	
CLOUD 9	MR. NICE GUY	WHITE DOVE	

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**CATHINONES IDENTIFIED IN BATH SALT PRODUCTS**

- Mephedrone
- Methylone
- 4-Methoxymethcathinone (Methedrone)
- Butylone
- Ethylone
- Flephedrone (4-FMC)
- 3-Fluoromethcathinone (3-FMC)
- MDPV
- 3,4-DMMC
- Pyrovalerone
- Naphyrone
- Ethcathione
- 4-Methyl-N-ethylcathinone
- N,N-Dimethylcathinone
- Buphedrone
- Pentedrone
- Benzedrone
- Alpha-PVP
- Alpha-PPP
- MDPPP

Source: Charlene Schweitzer:  
North Dakota Crime Lab

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### Other Compounds Identified in Bath Salt Products

- Caffeine
- Benzocaine
- Lidocaine
- Procaine
- Acetaminophen
  - A few submissions adulterated with controlled drugs:
    - Cocaine, Ketamine, Amphetamine, & 1-Benzylpiperazine (BZP)
- Purity data not usually determined during routine forensic analysis
  - However, advertised as being of ‘high purity’



Source: Charlene Schweitzer: North Dakota Crime Lab

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Legal? That's the \$64,000 question.

- Does an Ordinance or Statute ban this substance?
- Does your lab possess standards to test it?
- Do you have the ability to explain what an analog is?
- Previous samples have contained pentylone and/or pentedrone.
- We have samples of “Pump-It” at NMS right now.

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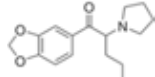
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### MDPV



- MDPV (methylene-dioxy pyrovalerone) is the methylene-dioxy analog of pyrovalerone, and is **structurally related to cathinone**, an active alkaloid stimulant found in the Khat plant. MDMA (Ecstasy) has a similar chemical structure. The DEA recently published a bulletin on MDPV to provide the chemistry, pharmacology and legal status of the drug.
- Its pharmacological effects **mimic that of methamphetamine and MDMA**.
- Source: [ToxTalk March 2011 Mephedrone.pdf](#) Pages 16-20

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### MDPV picture (Erowid)

Dosage difficult to pin down: most reports are 5 to 30 mg.




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### Advertised as “legal” cocaine

- **MDPV**
  - powerful stimulant
  - Dopamine-norepinephrine reuptake inhibitor
  - Stimulant effects on CNS lasting 6-8 hours
  - Tachycardia, hypertension, hyper-thermic, vasoconstriction, sweating.
  - Euphoric, increased alertness/wakefulness, arousal, anxiety, agitation, loss of appetite, no need for sleep.
    - “Fiending” (compulsive re-dosing)
    - Strong potential for addiction

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### MDPV Historical Timeline



<http://www.hdap.org/mdpv.html#history>

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### Poison control reports

- 2010: 303 calls about MDPV (bath salts).
- 2011: **5853 calls** about MDPV (bath salts).
- Reports of bizarre violence and suicide associated with use.
  - Chest pains, agitation, hallucinations, extreme paranoia, delusions, assaults, suicidal thoughts, homicides and suicides.

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### MO regional labs are finding...

- Johnson County (KS) crime lab has found MDPV, Methyone and Mephedrone.
- MSHP lab (Springfield) has found MDPV.
- Children's Mercy Hospital (Kansas City) has found MDPV and Methyone.
- St. Charles County Crime Lab: Pentedrone

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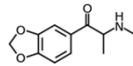
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## Methylone



- Methylone was patented in 1996 as an antidepressant, but never made the FDA's list of approved drugs.
- It was the main ingredient of the designer drug "Explosion" which was found and reported in 2005 in the Netherlands.
- Psychoactive chemical structurally & pharmacologically similar to MDMA (Ecstasy)
  - Hallucinogenic-stimulant

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## Methylone Dosage (Erowid)

Oral Methylone Dosages (tentative)	
Threshold	60 - 120 mg
Light	100 - 150 mg
Common	100 - 250 mg
Strong	160 - 270 mg
Heavy	250 + mg

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## Methylone powder: (Erowid picture)




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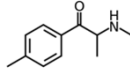
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## Mephedrone



- 4-Methylmethcathinone (mephedrone) is a designer drug of the phenethylamine class and shares substantial structural similarities with methcathinone (Schedule I in Missouri).
- Mephedrone has stimulant-like effects very similar to methamphetamine.

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## Mephedrone dosage (Erowid)

Caution : Dose information should not be taken as recommendations. [see below]

4-Methylmethcathinone Dosages Oral	
Threshold	15 - 50 mg
Light	50 - 100 mg
Common	100 - 200 mg
Strong	150 - 300+ mg

4-Methylmethcathinone Dosages Insufflated (Snorted)	
Threshold	5 - 15 mg
Light	15 - 25 mg
Common	20 - 80 mg
Strong	75 - 125 mg

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## Mephedrone: (Erowid photo)



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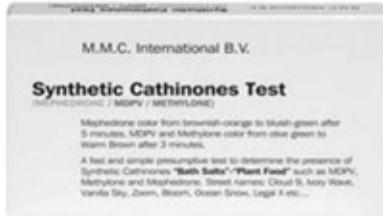
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### Field tests for some cathinones



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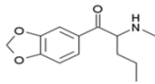
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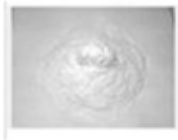
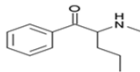
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### Other labs are reporting:

- Pentylone



- Pentedrone



I had difficulty finding dosage information.

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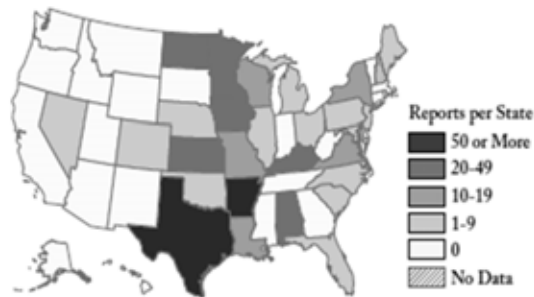
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Figure 2. Synthetic cathinone reports in NFLIS, by State, 2010



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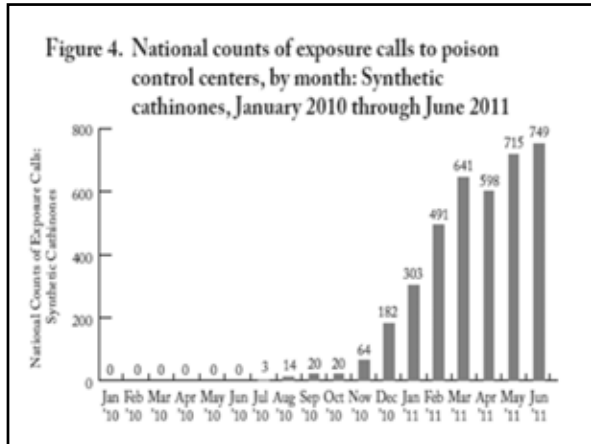
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Future problems



- How do we ban “everything”?
- How do we test for “everything”?
- How do we prosecute?
- How do we explain the term “substantially similar” when it comes to the legal definition of “analog” to a jury?
- How do we train our prosecutors to understand “analogs”?
- How do we fund our labs better?
  - Training, Calibration Standards, Court testimony

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### More on the forensics of synthetic drugs: synthetic cannabinoids and synthetic cathinones

On December 29, 2011, in Analysis, by Justin J. McChase

The forensic world continues to grapple with the forensics of identifying synthetic drugs and their pharmacological and analytical chemistry characteristics. As we have written before just because there may be laws on the books or emergency or permanent regulations outlawing certain drugs and their analogues doesn't mean that they can actually prove scientifically that the unknown substance that is seized and submitted for testing is actually the listed controlled substance and that the reported qualitative measurement (what is it?) is in fact specific (meaning it is that one substance and that one substance alone to the exclusion of every thing else). If the government cannot prove the validity of the qualitative measurement beyond a reasonable doubt, then there can be no conviction. Further in impaired driving prosecutions, if it cannot be proven that the drug actually exists in the blood because the analyst's opinion as to the qualitative measurement is not valid, then there can be no conviction. Further, in the case of an impaired driving based prosecution, we do not have information that would allow a pharmacologist to opine impairment based upon an analytical chemistry result alone.

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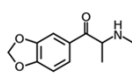
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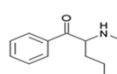
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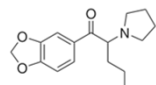
### Analogues or not???



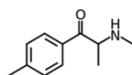
Methyldrone



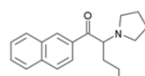
Pentedrone



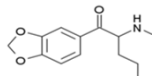
Methylene-dioxypyrovalerone



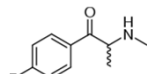
Mephedrone



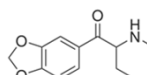
Naphyrone



Pentylone



4-Fluoromethcathinone



Butylone

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### EMCDDA Analysis advice

#### • Analysis

- Cathinone derivatives do not give a colored reaction with the Marquis field test.
- Analysis using GCMS and Infrared (IR) spectroscopy is straightforward.
- Although pure reference samples of some derivatives **may not be commercially available**, analytical profiles for most have been published.
- Immunoassay field tests for methamphetamine give false positive reactions with some cathinone derivatives.

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### US laws are in constant flux...

- Alabama: (MDPV, Mephedrone)
- Arkansas: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- Delaware: (MDPV, Mephedrone, Methylo)
- Florida: (MDPV, Mephedrone, Methylo, 3-FMC, BK-PMMA)
- Georgia: (MDPV, Mephedrone, Methylo, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- Hawaii: (MDPV, Mephedrone)
- Idaho: (MDPV, Mephedrone)
- Illinois: (MDPV)
- Kansas: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone], Butylone)
- Kentucky: (MDPV, Mephedrone, Methylo)
- Louisiana: (MDPV, Mephedrone, Methylo, 4-FMC [Flephedrone], BK-PMMA [Methedrone])

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- Maine: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone], Butylone)
- Mississippi: (MDPV, Mephedrone)
- Missouri: (MDPV, Mephedrone, Methylo, MPBP [4'-Methyl-a-pyrrolidinobutiophenone]) plus analogs.
- New Jersey: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- New Mexico: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- New York: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- North Carolina: (MDPV, Mephedrone)
- North Dakota: (Mephedrone only)
- Ohio: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone]) – Effective October 15, 2011.
- Oklahoma: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])

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- Oregon: (MDPV, Mephedrone, Methylo, 4-FMC [Flephedrone], BK-PMMA [Methedrone], Butylone)
- Pennsylvania: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- Tennessee: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- Texas: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- Utah: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone], Butylone)
- Virginia: (MDPV, Mephedrone)
- Washington: (MDPV, Mephedrone, and synthetic cannabinoids, analogues) – Effective November 3, 2011
- West Virginia: (MDPV, Mephedrone)
- Wisconsin: (MDPV, Mephedrone)
- Wyoming: (MDPV, Mephedrone, Methylo, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])

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- **Indiana law allows the board of pharmacy (board) to adopt an emergency rule to declare that a substance is a synthetic drug. Provides that the definition of synthetic drug includes a compound determined to be a synthetic drug by a rule adopted by the board.** Enhances penalties for dealing in or possessing a synthetic drug if the amount of the synthetic drug is more than two grams.
- **The Board of Pharmacy in Washington State** moved to not only permanently outlaw the substances and their active ingredients, but also a broad swath of related chemicals that, in some instances, haven't even been invented yet. Department of Health spokeswoman Julie Graham says it is the first time Washington has "taken action to ban broader, general classifications of chemicals."

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**Bath salts linked to violence.**

- A Mississippi man who took his skinning knife and slit his face and stomach repeatedly after using "Bath Salts". 
- A Louisiana man cut his throat and ended his life with a gunshot after using "Bath Salts". PDF
- A New Jersey college student with a history of bath salts use, was charged with the murder of his girlfriend.
- A Tennessee woman was arrested Monday night after police say one of her two children was found lying on the side of I-24 in Marshall County. She had beaten and dropped her 2 year old on the side of the road and was carrying the other. She had been snorting bath salts earlier that day. 

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**Bath salts linked to violence.** 

- December 2010 in Tippah County, Miss., an officer was shot and killed while trying to resolve a domestic dispute with a man who authorities said had taken bath salts.
- December 2010 in Salina, Kan., Elijah Taylor, 21, a University of Kansas student was killed after running into traffic head-on into a moving car. Bath salt packets were found in his pocket.
- Jan. 17, in Panama City, Fla., a daughter tried to attack her sleeping mother with a machete before fleeing the scene. Police said she had spent several days taking bath salts.

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### Bath salts induced psychosis



PDF

- Bath Salts have a very frightening yet very common side effect of drug psychosis. Due to the nature of the drug and the lack of accurate information about doses and safety, it is impossible to safeguard users against this phenomenon. Overdosing on MDVP is something that can happen to even the most experienced drug user due to the intense cravings the drug creates. Binging on the drug is not unusual. When a user slips into a psychosis, they may not be aware it has happened. They may exhibit signs of distress, excessive violence, incoherent rambling speaking, scattered thoughts and extreme paranoia and anxiety. They will often have a very elevated heart rate and body temperature. Users may experience severe headaches, nausea and chest pain.

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### Bath salts hits US like freight train

- <http://www.startribune.com/local/130023373.html?page=all&prepage=1&c=y#continue>



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- Demand for these kinds of drugs is not going to go away, and this demand will be satisfied by the internet and by synthesis of new compounds.
- Chemical synthesis in the Far East is available readily and cheaply and there are reports that more chemicals have been prepared in time for the banning of mephedrone.
- The ingenuity of these suppliers will ensure other chemicals enter our market.

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**Contact information**

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University of Central Missouri  
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Email: [welsh@ucmo.edu](mailto:welsh@ucmo.edu)

<http://ucmconnect.ucmo.edu/p61768739/>

Synthetic Cannabinoids: 101

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**Thank you      Danke      Merci      Mahalo**

**Domo Arigato      Grazie      Tack      Thank ye**

Contact Information:

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**University of Central Missouri**

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