

# Stimulant Analytical Standards

Stimulants belong to a diverse group of psychoactive drugs whose function exerts a constant contribution to hyperactivity and impulse control. Illegal stimulant derivatives including amphetamines, arylcyclohexylamines, cathinones, cocaine/tropanes, phenethylamines, and piperazines are among the most widely abused across the US and Europe. However, the popularity of each substance, particularly in party culture settings, is frequently changing. Cayman offers more than 800 analytical standards for the identification of stimulants and is dedicated to working with the forensic community to quickly make reference standards available for new psychoactive substances (NPS). A library of mass spectral data containing many of Cayman's emerging stimulant standards is freely available for download at [www.caymanchem.com/CSL](http://www.caymanchem.com/CSL).



ACCREDITED  
ISO/IEC 17025 #AT-1773  
ISO 17034 #AR-1774

## More than 800 Stimulant Standards Available for

- Amphetamines
- Arylcyclohexylamines
- Cathinones
- Cocaine & Tropanes
- Indanes
- Phenethylamines
- Piperazines
- And More

## Tools to Rapidly Screen for Major Controlled Stimulants

### Cocaine/Heroin/Methamphetamine Mixture (CRM)

Item No. 9002662

A CRM mixture of cocaine, heroin, and methamphetamine (1 mg/ml of each)

### GC-MS Drug Standard Mixture 4

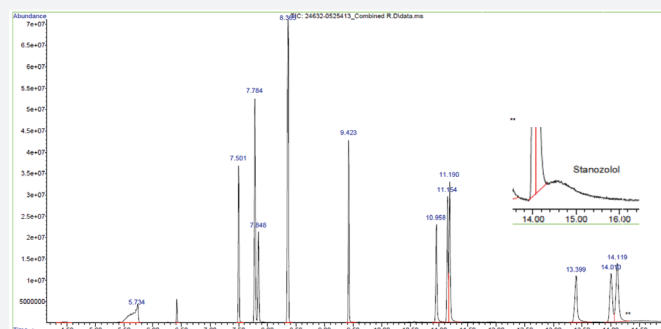
Item No. 24632

A mixture of common stimulants, opioids, and steroids as well as a synthetic cannabinoid and a benzodiazepine (250 µg/ml of each)

### Chloropseudoephedrine (hydrochloride)/ Chloroephedrine (hydrochloride) Mixture

Item No. 9002346

A mixture of two diastereomer contaminants produced during the illicit manufacture of (+)-methamphetamine from pseudoephedrine or ephedrine



Representative chromatogram of the compounds included in the GC-MS Drug Standard Mixture 4

Peak order from left to right:  $\alpha$ -Pyrrolidinobutylphenone,  $\alpha$ -Pyrrolidinopentylphenone, bk-MDEA, Butylone, Tenocyclidine, PCP, Cocaine, Nandrolone, (S)-5-fluoro ADB, Heroin, Alprazolam, Furanyl fentanyl, Furanyl fentanyl 3-furancarboxamide isomer, Stanozolol

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# Amphetamines

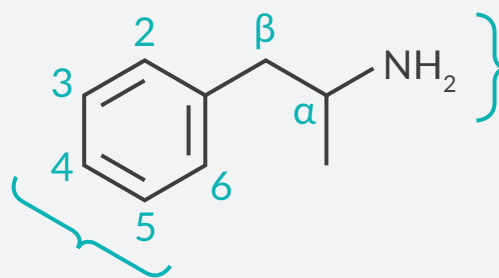
Amphetamine is a synthetic derivative of phenylethylamine, a naturally occurring substance found in chocolate, cheeses, and some wines that looks similar in structure to dopamine. The addition of a methyl group attached to the  $\alpha$ -carbon of the phenylethylamine side chain protects amphetamine from degradation by monoamine oxidases, which enables the effects of amphetamine to persist. While variations of the amphetamine scaffold have been developed by pharmaceutical companies for treatment of ADHD, appetite suppression, or to slow the progression of Parkinson's disease (e.g., Adderall, phentermine, and selegiline), designer drug chemists attempting to skirt DEA regulations have also made modifications to the basic amphetamine structure.

## Parent Compounds

Item No.	Product Name
27889	N-Acetylmethamphetamine
ISO60188	( $\pm$ )-Amphetamine (hydrochloride) (CRM) *
26204	D-Amphetamine (hemisulfate)
26596	$\alpha$ -ethyl 2C-D (hydrochloride)
27184	N-benzyl-3,4-DMA (hydrochloride)
29844	N-(1,4-dimethylpentyl)-3,4-DMA (hydrochloride)
29859	N-(1-methylpentyl)-3,4-DMA (hydrochloride)
13885	DOI (hydrochloride)
31868	Ethiopropamine (hydrochloride)
25266	2-Fluoroethamphetamine (hydrochloride)
25811	4-Fluoroethamphetamine (hydrochloride)
27044	Lisdexamfetamine (mesylate) (CRM) *
14109	5-MAPB (hydrochloride)
ISO60189	( $\pm$ )-MDA (hydrochloride) (CRM) *
ISO60190	3,4-MDMA (hydrochloride) (CRM) *
ISO60168	( $\pm$ )-Methamphetamine (hydrochloride) (CRM) *
26615	(+)-Methamphetamine (hydrochloride) (CRM) *
26616	(-)-Methamphetamine (hydrochloride) (CRM) *
29857	N-(1,4-dimethylpentyl)-4-Methoxyamphetamine (hydrochloride)
31292	5-MMPA (hydrochloride)
14205	N-Propylamphetamine (hydrochloride)
25396	2,3,5-Trimethoxyamphetamine (hydrochloride)

\* Compound also available as a neat solid

## Common Modifications of the Amphetamine Core



### Amino group can be:

- Mono-alkylated (with methyl, ethyl, etc.) to form a secondary amine
- Di-alkylated (symmetrically or asymmetrically) with alkyl groups to form a tertiary amine

### Phenyl ring can be:

- Mono-substituted or multi-substituted with alkyl groups, alkoxy groups, halogens, etc.
- Fused with another ring system such as methylenedioxymethamphetamine, furan, pyrrole, etc.

## Metabolites

Item No.	Product Name
9001830	4-hydroxy Amphetamine (hydrochloride)
9002853	4-hydroxy Amphetamine Glucuronide (trifluoroacetate salt)
13868	Cathine
30531	3,4-Dihydroxyamphetamine (hydrochloride)
19208	N-Formylamphetamine (CRM)
14195	HMMA (hydrochloride)
9002128	4-Hydroxymethamphetamine (hydrochloride)
14196	4-hydroxy-3-Methoxyamphetamine (hydrochloride)
9001345	4-Methylmethamphetamine (hydrochloride)
15915	Ritalinic Acid
22604	3-Trifluoromethylamphetamine (hydrochloride)

Discover Our Article Series: Stimulant Use and Abuse: From Past to Present  
[www.caymanchem.com/amphetamines](http://www.caymanchem.com/amphetamines)

# Cathinones

## Parent Compounds

Item No.	Product Name
27728	$\alpha$ -Butylaminohexanophenone (hydrochloride)
33687	3-Chlorocathinone (hydrochloride)
33703	$\alpha$ -Dimethylaminohexanophenone (hydrochloride)
34019	3-fluoro- $\alpha$ -Ethylaminobutiophenone (hydrochloride)
30598	$\alpha$ -Ethylaminohexanophenone (hydrochloride) (CRM) *
34911	4-fluoro- $\alpha$ -Ethylaminoisohexanophenone (hydrochloride)
29160	4-methyl- $\alpha$ -Ethylaminopentiophenone (hydrochloride) (CRM) *
29672	Eutylone (hydrochloride) (CRM) *
27327	N-ethyl Heptedrone (hydrochloride)
27240	bk-MDEA (hydrochloride) (CRM) *
35165	3,4-Methylenedioxy- $\alpha$ -Cyclohexylaminopropiophenone (hydrochloride)
16361	3,4-Methylenedioxy- $\alpha$ -Pyrrolidinohexanophenone (hydrochloride)
20891	Methylone (hydrochloride) (CRM) *
26701	N-butyl Pentylone (hydrochloride)
24337	N-ethyl Pentylone (hydrochloride) (CRM) *
25670	4-methyl Pentedrone (hydrochloride) (CRM) *
30241	$\alpha$ -Pyrrolidincyclohexanophenone (hydrochloride)
34397	2-methyl- $\alpha$ -Pyrrolidinovalerophenone (hydrochloride)
31050	4-fluoro-3-methyl- $\alpha$ -Pyrrolidinovalerophenone (hydrochloride)
21682	$\alpha$ -Pyrrolidinoisohexanophenone (hydrochloride)
22808	$\alpha$ -Pyrrolidinopentiophenone (hydrochloride) (CRM) *

\* Compound also available as a neat solid

## High-Throughput Cathinone Screening & Cataloging

### Cathinone Analytical Standards Panel

Item No. 31616

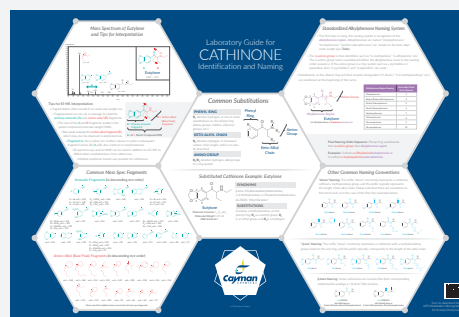
- Contains 239 analytical reference materials and standards categorized as cathinones and cathinone metabolites
- 100  $\mu$ g/well in a 96-well plate format for rapid screening or cataloging



## Cathinone Lab Guide Wall Poster

In this laboratory guide for drug identification and naming, we cover:

- Common Substitutions
- Mass Spectrum of Eutylone and Tips for Interpretation
- Common Mass Spec Fragments
- A Standardized Alkylphenone Naming System
- Other Common Naming Conventions



Request a physical copy of this wall poster at [www.caymanchem.com/posters](http://www.caymanchem.com/posters)

## Metabolites

Item No.	Product Name
14756	Mephedrone metabolite (hydrochloride) (( $\pm$ )-Ephedrine stereochemistry)
9001434	Mephedrone metabolite (hydrochloride) (( $\pm$ )-Pseudoephedrine stereochemistry)
10518	3,4-Methylenedioxy Pyrovalerone metabolite 1 (hydrochloride)
14758	4-Methylethcathinone metabolite (hydrochloride) (( $\pm$ )-Ephedrine stereochemistry)
31346	$\alpha$ -Pyrrolidinohexanophenone metabolite (hydrochloride)
14093	$\alpha$ -Pyrrolidinopentiophenone metabolite 1 (trifluoroacetate salt)

## Isotopically Labeled Standards

Item No.	Product Name
28819	Butylone- $d_3$ (hydrochloride) (CRM) *
31629	Eutylone- $d_5$ (hydrochloride)
10679	3,4-Methylenedioxy Pyrovalerone- $d_8$ (hydrochloride)
18732	Methylone- $d_3$ (hydrochloride) (CRM)
30506	N-ethyl Pentylone- $d_5$ (hydrochloride)
19204	$\alpha$ -Pyrrolidinopentiophenone- $d_8$ (hydrochloride) (CRM) *

\* Compound also available as a neat solid

# Arylcyclohexylamines, Phenethylamines, & More

## Arylcyclohexylamines

Item No.	Product Name
33962	Deoxymethoxetamine (hydrochloride)
19786	2-fluoro Deschloroketamine (hydrochloride)
29755	4-fluoro Deschloroketamine (hydrochloride)
35118	Fluorexetamine (hydrochloride)
33774	Hydroxetamine
11139	Methoxetamine (hydrochloride)
31545	Methoxisopropamine (hydrochloride)
30248	Methoxpropamine (hydrochloride)
26877	3-hydroxy PCE (hydrochloride)
31475	3-chloro PCP (hydrochloride)
31007	4-methyl PCP (hydrochloride)
34638	3-methoxy Rolicyclidine (hydrochloride)

## Phenethylamines

Item No.	Product Name
11734	2C-B (hydrochloride)
30520	$\beta$ -hydroxy 2C-B (hydrochloride)
30233	$\beta$ -methoxy 2C-D (hydrochloride)
11473	2C-B-FLY (hydrochloride)
31132	2C-I-FLY (hydrochloride)
18328	25B-NBOH (hydrochloride)
14815	25C-NBOH (hydrochloride)
22033	25H-NBOH (hydrochloride)
14909	25I-NBOH (hydrochloride)
11950	Mescaline (hydrochloride)
30541	N-methyl Mescaline (hydrochloride)
19926	Proscaline (hydrochloride)

## High-Throughput Phenethylamine Screening & Cataloging

### Phenethylamine Analytical Standards Panel

Item No. 31617

- Contains 71 analytical reference materials and standards categorized as phenethylamines
- 100  $\mu$ g/well in a 96-well plate format for rapid screening or cataloging



## Piperazines

Item No.	Product Name
30229	1-(4-Bromophenyl)piperazine (hydrochloride)
25523	BZP (hydrochloride) (CRM) *
14793	2C-B-BZP (hydrochloride)
30230	1-(3-Chloro-4-fluorophenyl)piperazine (hydrochloride)
14296	2,3-Dichlorophenylpiperazine (hydrochloride)
21954	1-(2-Fluorophenyl)piperazine (hydrochloride)
11204	1-(4-Fluorophenyl)piperazine (hydrochloride)
11205	1-(3-Trifluoromethylphenyl)piperazine (hydrochloride)
18165	Trimetazidine (hydrochloride)

\* Compound also available as a neat solid

## Cocaine, Tropanes, & Metabolites

Item No.	Product Name
ISO60186	Benzoylcegonine (CRM) *
20860	Benzoylcegonine-d <sub>3</sub> (CRM)
28820	Cocaethylene (CRM)
ISO60176	Cocaine (CRM) *
19423	Cocaine-d <sub>3</sub> (CRM)
20062	2'-hydroxy Cocaine
28492	Norcocaine (hydrochloride)
17977	RTI-31
18063	Tropacocaine (hydrochloride)

\* Compound also available as a neat solid

View a complete list of stimulants at [www.caymanchem.com/forensics](http://www.caymanchem.com/forensics)

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