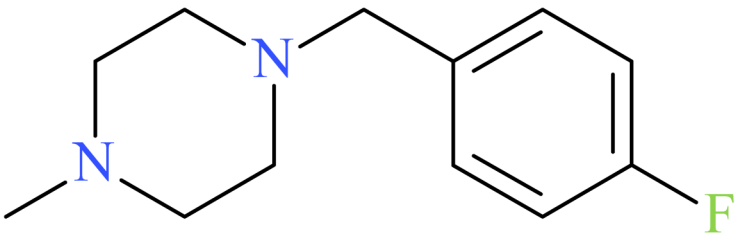
4F-MBZP



NPS SUBCLASS
Stimulant
REPORT DATE
June 18, 2025
SAMPLE RECEIVED
January 10, 2025
SAMPLE TYPE
Drug Material

Preferred Name	4F-MBZP
Synonyms	4-Fluoro-MBZP, 4-Fluoro-Methylbenzylpiperazine
Formal Name	1-[(4-fluorophenyl)methyl]-4-methyl-piperazine
InChI Key	KFMDNJJTGINMCS-UHFFFAOYSA-N
CAS Number	144734-44-1
Chemical Formula	$C_{12}H_{17}FN_2$
Molecular Weight	208.3
Molecular Ion [M⁺]	208
Exact Mass [M+H]⁺	209.1449

Characterization & Intelligence

The following information was compiled in June 2025 and is subject to change as new research is conducted and as new information becomes available:

Description: 4F-MBZP is a novel stimulant classified as a piperazine and is structurally similar to other derivatives of benzylpiperazine (BZP). Fluorinated MBZP exists in three isomeric forms (2F-, 3F-, and 4F-); however, only 4F-MBZP has been identified to date. 4F-MBZP was first identified from the Australian drug checking service CanTEST in June 2023.[1] 4F-MBZP was identified by our laboratory in January 2025 and confirmed after acquiring standard reference material.

Sample Source: StreetCheck (Massachusetts, Northeast)

Sample Appearance: Green tablet

Pharmacology: The activity and potency of 4F-MBZP have not been explicitly studied; however, due to structural similarity to other benzylpiperazines, it is assumed that 4F-MBZP stimulates the release and inhibits the reuptake of neurotransmitters to cause dopaminergic and serotonergic effects.[2,3]

Toxicology: 4F-MBZP has not been detected in toxicology cases to date at the CFSRE.

Drug Materials: 4F-MBZP has been detected in two drug materials to date at the CFSRE.

Demographics / Geographics: Drug materials originated from Massachusetts and Pennsylvania, and 4F-MBZP was found alongside designer benzodiazepines (e.g., bromazolam) and novel stimulants.

Legal Status: 4F-MBZP is not currently scheduled in the United States.

References:

- Cayman Chemical: 4F-MBZP
- [1]Algar *et al.* Identification of three unexpected new psychoactive substances at an Australian…
- [2]EUDA: BZP/Piperazines Drug Profile
- [3]Dolan *et al.* Impure but not inactive: behavioral pharmacology of dibenzylpiperazine…

About: In collaboration with medical examiner and coroner offices, crime laboratories, clinical partners, and other stakeholders, the Center for Forensic Science Research and Education (CFSRE) is documenting first confirmations of NPS through analysis of drug materials and/or toxicology samples. These reports are generated using comprehensive analytical techniques (e.g., GC-MS, LC-QTOF-MS, NMR) and include available information about the new substances identified at the time of reporting, as well as the analytical data generated during testing. Our new drug monographs are intended to assist with the rapid identification of NPS in forensic casework and related disciplines, and should not be used for confirmatory purposes alone.

Analytical Notes: All identifications were made based on evaluation of analytical data (GC-MS and LC-QTOF-MS) in comparison to analysis of acquired reference material.

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Gas Chromatography Mass Spectrometry (GC-MS)

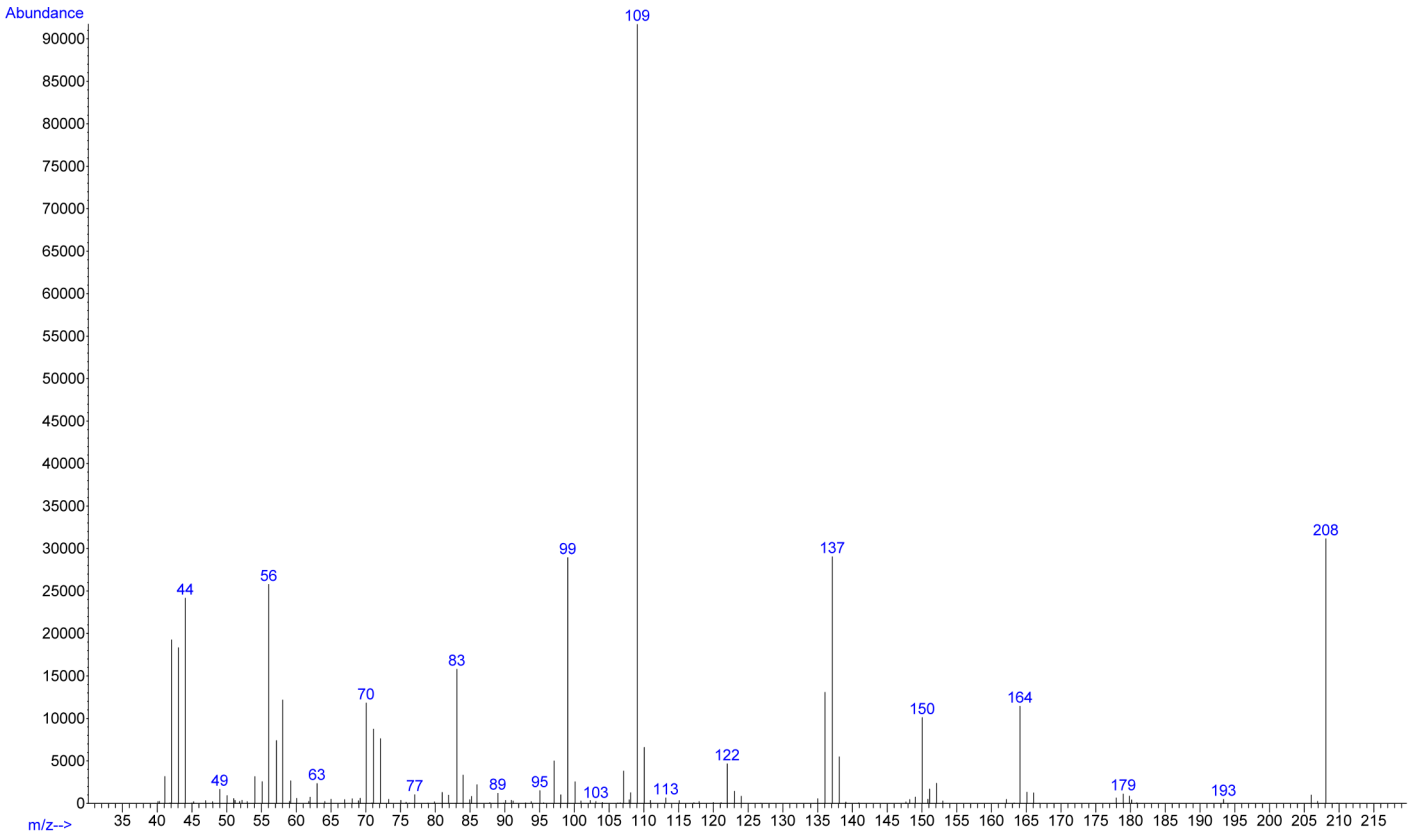
Laboratory: Center for Forensic Science Research and Education (CFSRE, Horsham PA, USA)

Sample Preparation: Acid-base extraction

Instrument: Agilent 5975 Series GC/MSD

Methods: GC-MS Method Details & Monographs

GC-MS: Mass Spectrum (EI 70 eV)



Confirmation Using Drug Standard: *Reference material for 4F-MBZP (Batch: 0725995-2) was purchased from Cayman Chemical (Ann Arbor, MI, USA). The analyte was confirmed to be 4F-MBZP based on retention time (sample: 3.76 min vs. standard: 3.78 min) and mass spectral data comparisons.*

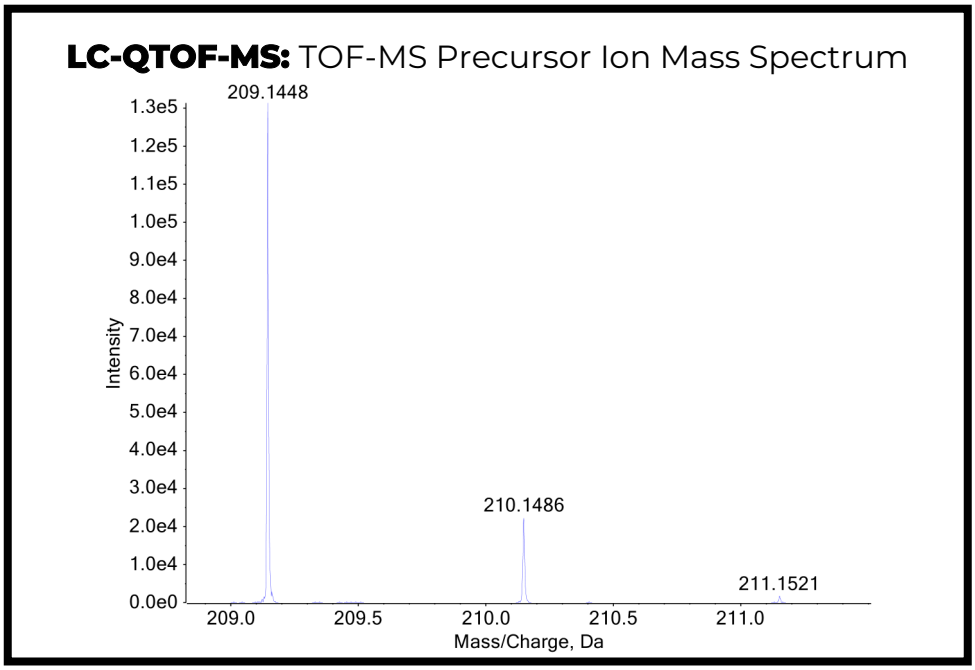
Liquid Chromatography Quadrupole Time-of-Flight Mass Spectrometry (LC-QTOF-MS)

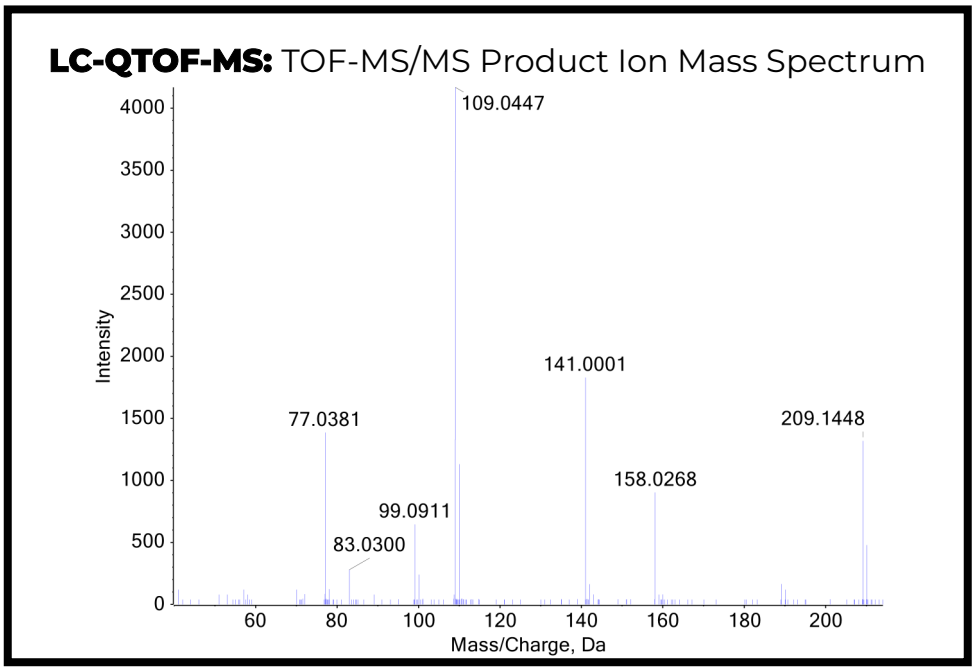
Laboratory: Center for Forensic Science Research and Education (CFSRE, Horsham, PA, USA)

Sample Preparation: Dilution in mobile phase

Instrument: Sciex X500R LC-QTOF-MS

Methods: LC-QTOF-MS Method Details & Monographs





Confirmation Using Drug Standard: *Reference material for 4F-MBZP (Batch: 0725995-2) was purchased from Cayman Chemical (Ann Arbor, MI, USA). The analyte was confirmed to be 4F-MBZP based on retention time (sample: 3.08 min vs. standard: 3.09 min) and mass spectral data comparisons.*