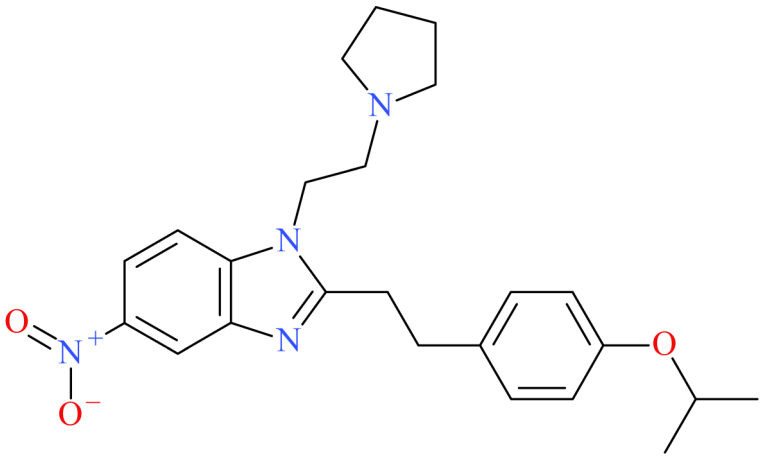
N-Pyrrolidino Ethylene Isotonitazene



NPS SUBCLASS
Opioid
REPORT DATE
October 7, 2025
SAMPLE RECEIVED
March 12, 2025
SAMPLE TYPE
Drug Material

Preferred Name	*N*-Pyrrolidino Ethylene Isotonitazene
Synonyms	Ethylene Isotonitazepyne, Ethylene *N*-Pyrrolidino Isotonitazene
Formal Name	2-[2-(4-isopropoxyphenyl)ethyl]-5-nitro-1-(2-pyrrolidin-1-ylethyl)benzimidazole
InChI Key	BCRJRRWYLQWRPJ-UHFFFAOYSA-N
CAS Number	N/A
Chemical Formula	$C_{24}H_{30}N_4O_3$
Molecular Weight	422.5
Molecular Ion [M⁺]	422
Exact Mass [M+H]⁺	423.2391

Characterization & Intelligence

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

Description: *N*-Pyrrolidino ethylene isotonitazene is a synthetic opioid bearing structural resemblance to other nitazene analogues (e.g., *N*-pyrrolidino isotonitazene, isotonitazene, ethylene etonitazene). *N*-Pyrrolidino ethylene isotonitazene differs from currently known nitazene analogues with a lengthened linker between the benzyl and benzimidazole groups.[1] *N*-Pyrrolidino ethylene isotonitazene was first identified by our laboratory in March 2025 and confirmed after acquiring standard reference material.

Sample Source: Public Health & Harm Reduction Collaborators

Sample Appearance: Tan solid material, blue solid material, white solid material

Pharmacology: *N*-Pyrrolidino ethylene isotonitazene has not be explicitly studied; however, available data suggest that some substitutions and lengthening of the linker group may lower affinity and potency compared to their non-substituted counterparts.[1]

Toxicology: *N*-Pyrrolidino ethylene isotonitazene has not been detected in toxicology cases to date.

Drug Materials: *N*-Pyrrolidino ethylene isotonitazene has been detected in eight drug materials to date.

Demographics / Geographics: The drug materials originated from California, Rhode Island, Illinois, etc. *N*-Pyrrolidino ethylene isotonitazene was identified without other drugs present and with traditional drugs (e.g., fentanyl, methamphetamine, ketamine) and NPS (e.g., metonitazene, clonazolam, spirochlorphine).

Legal Status: *N*-Pyrrolidino ethylene isotonitazene is not currently scheduled in the United States.

References:

- Cayman Chemical: N-Pyrrolidino Ethylene Isotonitazene
- [1]Kozell et al. (2025) Pharmacology of newly identified nitazene variants reveals structural determinants...

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.

Acknowledgements: This report was prepared by Sara E. Walton, Max T. Denn, Alexis D. Quinter, Angel McDowell, Joshua S. DeBord, Barry K. Logan, and Alex J. Krotulski at the Center for Forensic Science Research and Education (CFSRE) at the Fredric Rieders Family Foundation. The authors acknowledge scientists at the CFSRE for their involvements and contributions. For more information, contact npsdiscovery@cfsre.org or visit www.npsdiscovery.org.

Funding: CFSRE's NPS Discovery is supported by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice (Award Number 15PNIJ-24-GK-00981-COAP, "Novel Psychoactive Substance Discovery, Education, and Reporting Institute"). The opinions, findings, conclusions and/or recommendations expressed in this publication are those of the author(s) and do not necessarily represent the official position or policies of the U.S. Department of Justice.

Suggested Citation: Walton, SE; Denn, MT; Quinter, AD; McDowell, A; DeBord, JS; Logan, BK; Krotulski, AJ. (2025) *N-Pyrrolidino Ethylene Isotonitazene — NPS Discovery New Drug Monograph*, Center for Forensic Science Research and Education, United States.

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 N-pyrrolidino ethylene isotonitazene (Batch: 0809056-2) was purchased from Cayman Chemical (Ann Arbor, MI, USA). The analyte was confirmed to be N-pyrrolidino ethylene isotonitazene based on retention time (sample: 9.61 min vs. standard: 9.68 min) and mass spectral data comparisons.*

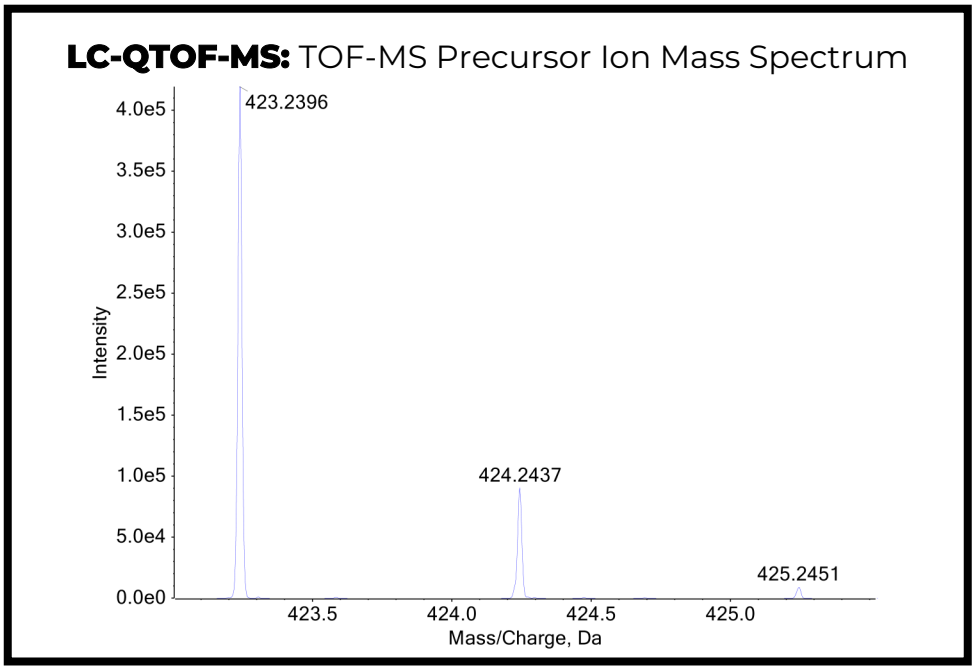
Liquid Chromatography Quadrupole Time-of-Flight Mass Spectrometry (LC-QTOF-MS)

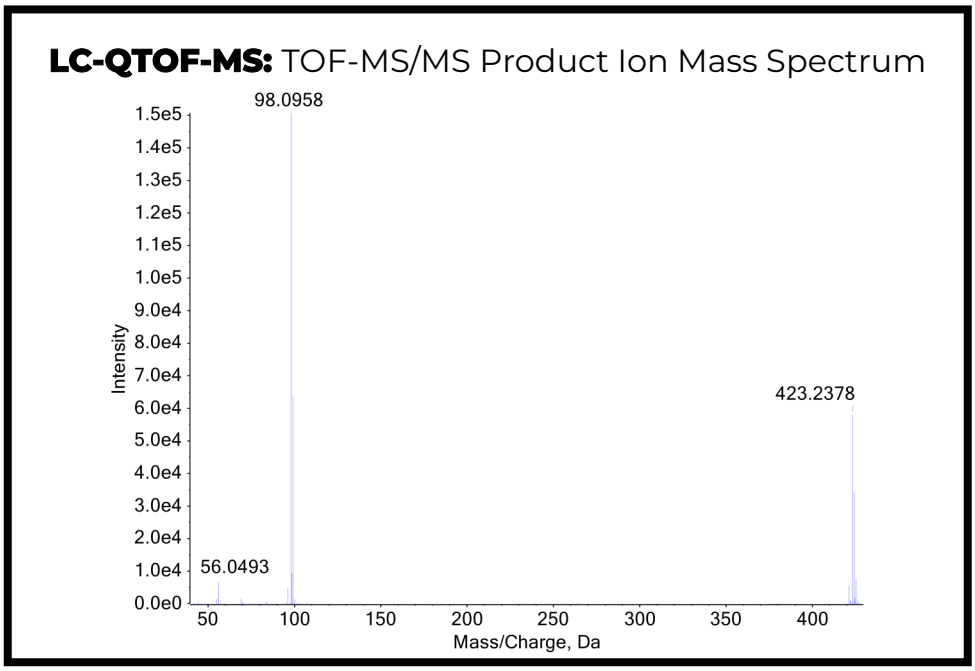
Laboratory: Center for Forensic Science Research and Education (CFSRE, Horsham, PA, USA)

Sample Preparation: Dilution in mobile phase

Instrument: Sciex 5600+ LC-QTOF-MS

Methods: LC-QTOF-MS Method Details & Monographs





Confirmation Using Drug Standard: *Reference material for N-pyrrolidino ethylene isotonitazene (Batch: 0809056-2) was purchased from Cayman Chemical (Ann Arbor, MI, USA). The analyte was confirmed to be N-pyrrolidino ethylene isotonitazene based on retention time (sample: 6.97 min vs. standard: 7.03 min) and mass spectral data comparisons.*