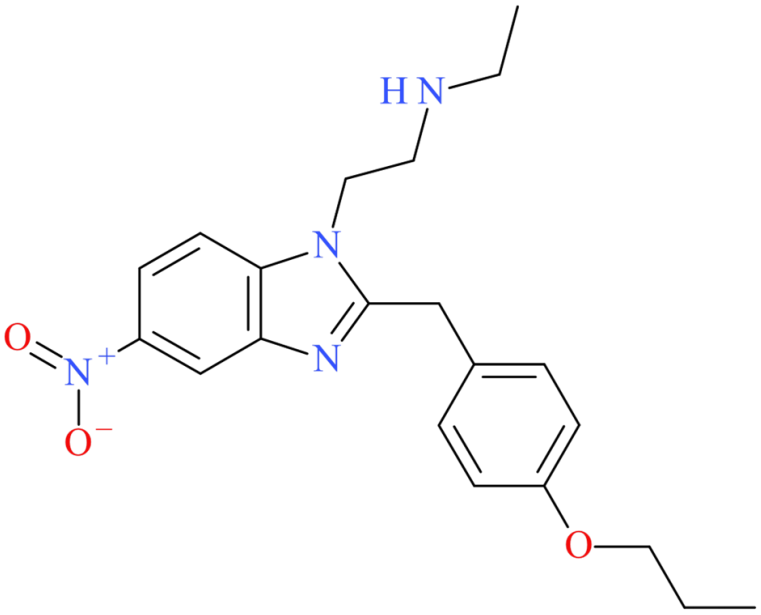
N-Desethyl Protonitazene



NPS SUBCLASS
Opioid
REPORT DATE
June 16, 2025
SAMPLE RECEIVED
November 5, 2024
SAMPLE TYPE
Drug Material

Preferred Name	*N*-Desethyl Protonitazene
Synonyms	NDP
Formal Name	N-ethyl-2-[5-nitro-2-[(4-propoxyphenyl)methyl]benzimidazol-1-yl]ethanamine
InChI Key	NPHUSRHIDKYNDO-UHFFFAOYSA-N
CAS Number	N/A
Chemical Formula	$C_{21}H_{26}N_4O_3$
Molecular Weight	382.5
Molecular Ion [M⁺]	382
Exact Mass [M+H]⁺	383.2078

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: *N*-Desethyl protonitazene is a novel synthetic opioid bearing structural similarity to other *N*-dealkylated nitazene analogues (e.g., *N*-desethyl isotonitazene, *N*-desethyl etonitazene). *N*-Desethyl protonitazene is a primary metabolite of protonitazene; however, it has been discovered as a drug in its own right similarly to the emergence of *N*-desethyl isotonitazene. *N*-Desethyl protonitazene was first identified and confirmed in November 2024 by our laboratory.

Sample Source: Chicago Recovery Alliance (Chicago, IL)

Sample Appearance: Yellow powder

Pharmacology: *N*-Desethyl protonitazene is a mu-opioid receptor agonist and demonstrated *in vitro* potency greater than fentanyl but less than that of protonitazene and *N*-desethyl isotonitazene with an EC_{50} of 10.1 nM (fentanyl: 25.7 nM, protonitazene: 1.57 nM, *N*-desethyl isotonitazene: 0.317 nM).[1]

Toxicology: *N*-Desethyl protonitazene has not been detected in the absence of protonitazene in toxicology cases to date at the CFSRE.

Drug Materials: *N*-Desethyl protonitazene has been detected in one drug material to date at the CFSRE.

Demographics / Geographics: The drug material originated from Chicago, IL, and *N*-desethyl protonitazene was found alongside fentanyl and adulterants (e.g., diphenhydramine, quinine).

Legal Status: *N*-Desethyl protonitazene is not currently scheduled in the United States.

References:

- Cayman Chemical: N-Desethyl Protonitazene
- [1]De Vrieze *et al.* In vitro structure-activity relationships and forensic case series...

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: Standard diluted in methanol

Instrument: Agilent 5975 Series GC/MSD

Methods: GC-MS Method Details & Monographs

GC-MS: Mass Spectrum (EI 70 eV)

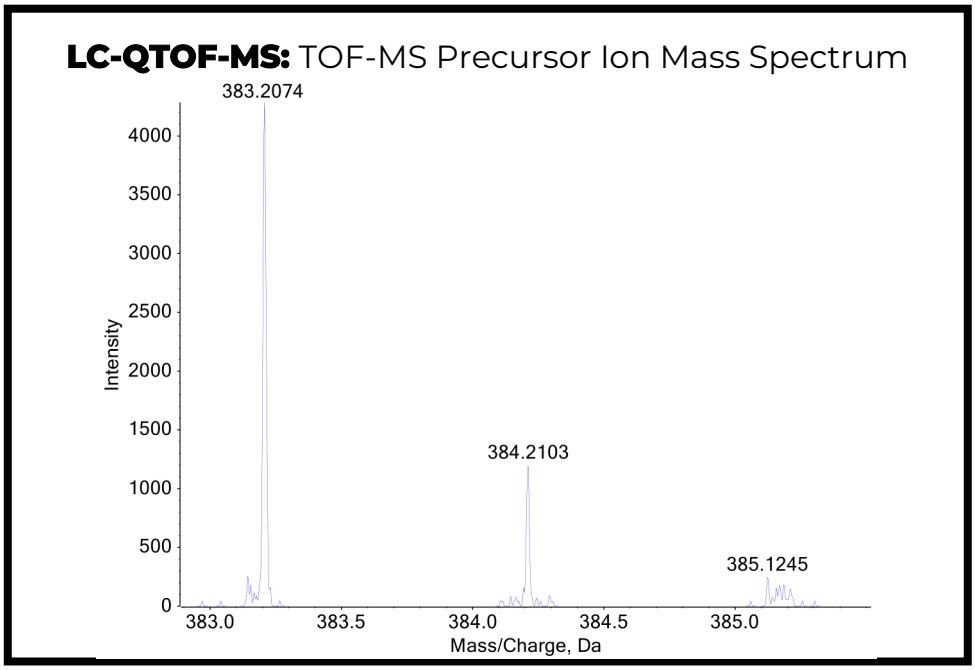
Liquid Chromatography Quadrupole Time-of-Flight Mass Spectrometry (LC-QTOF-MS)

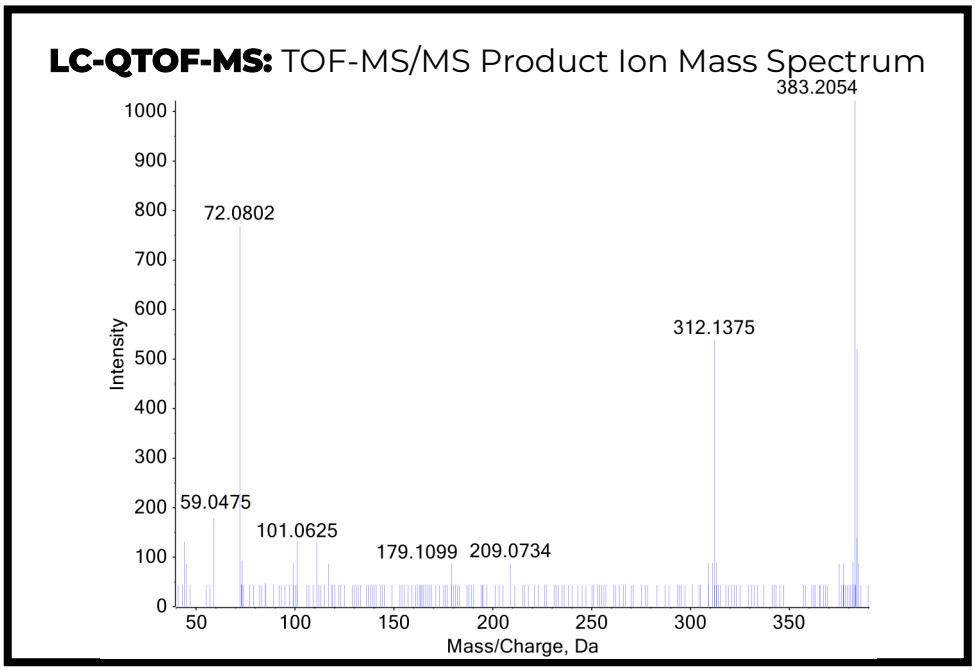
Laboratory: Center for Forensic Science Research and Education (CFSRE, Horsham, PA, USA)

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 (Batch: 0670313-1) was purchased from Cayman Chemical (Ann Arbor, MI, USA). The analyte was confirmed to be N-desethyl protonitazene based on retention time (sample: 6.96 min vs. standard: 6.96 min) and mass spectral data comparisons.*