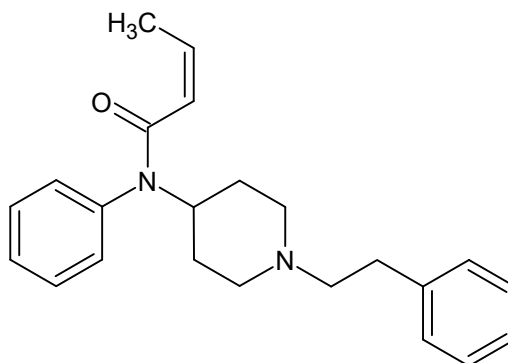




Z-Crotonyl fentanyl

The Drug Enforcement Administration's Special Testing and Research Laboratory generated this monograph using structurally confirmed reference material.



1. GENERAL INFORMATION

IUPAC Name:	(Z)-N-(1-phenethylpiperidin-4-yl)-N-phenylbut-2-enamide
CAS#:	NA
Synonyms:	(2Z)-N-phenyl-N-[1-(2-phenylethyl)piperidin-4-yl]but-2-enamide
Source:	DEA Reference Material Collection
Appearance:	Yellow powder
UV_{max}(nm):	Not determined

2. CHEMICAL AND PHYSICAL DATA

2.1 CHEMICAL DATA

Form	Chemical Formula	Molecular Weight	Melting Point (°C)
Base	C ₂₃ H ₂₈ N ₂ O	348.48	Not Determined
HCl	C ₂₃ H ₂₈ N ₂ O HCl	384.94	Not Determined



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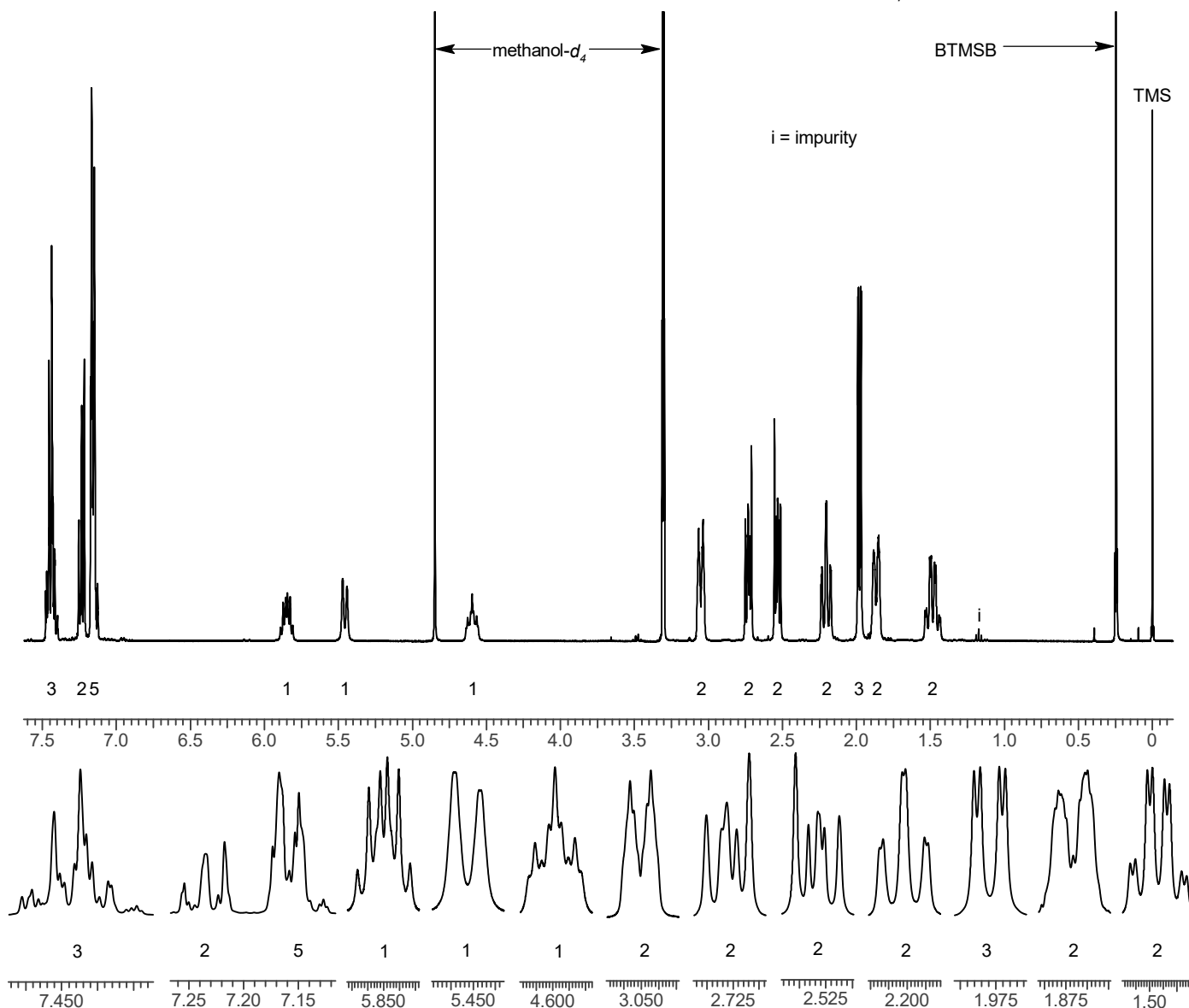
3. QUALITATIVE DATA

3.1 NUCLEAR MAGNETIC RESONANCE

Sample Preparation: Dilute analyte to ~11 mg/mL in methanol- d_4 containing TMS for 0 ppm reference and 1,4-BTMSB- d_4 as quantitative internal standard.

Instrument: 400 MHz NMR spectrometer
Parameters: Spectral width: at least containing -3 ppm through 13 ppm
Pulse angle: 90°
Delay between pulses: 45 seconds

^1H NMR: Z-Crotonyl fentanyl Base; Lot# N18-P74C; methanol- d_4 ; 400MHz





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3.2 GAS CHROMATOGRAPHY/MASS SPECTROMETRY

Sample Preparation: Dilute analyte ~4 mg/mL in MeOH

Instrument: Agilent gas chromatograph operated in split mode with MS detector

Column: HP-5 MS (or equivalent); 30m x 0.25 mm x 0.25 μ m

Carrier Gas: Helium at 1.5 mL/min

Temperatures: Injector: 280°C MSD transfer line: 280°C

MS Source: 230°C MS Quad: 150°C

Oven program:

1) 100°C initial temperature for 1.0 min

2) Ramp to 280°C at 12 °C/min

3) Hold final temperature for 9.0 min

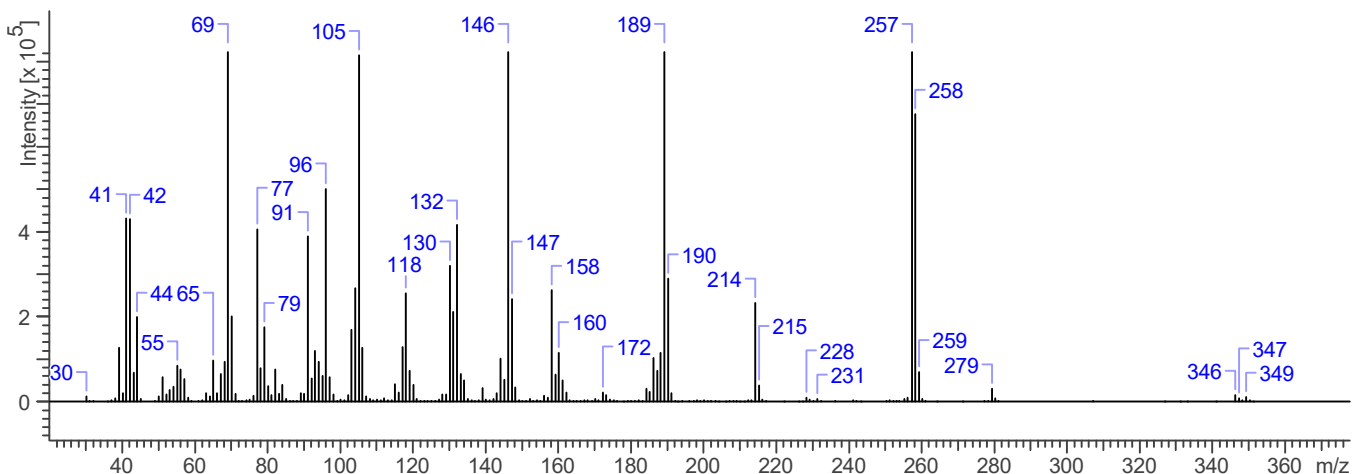
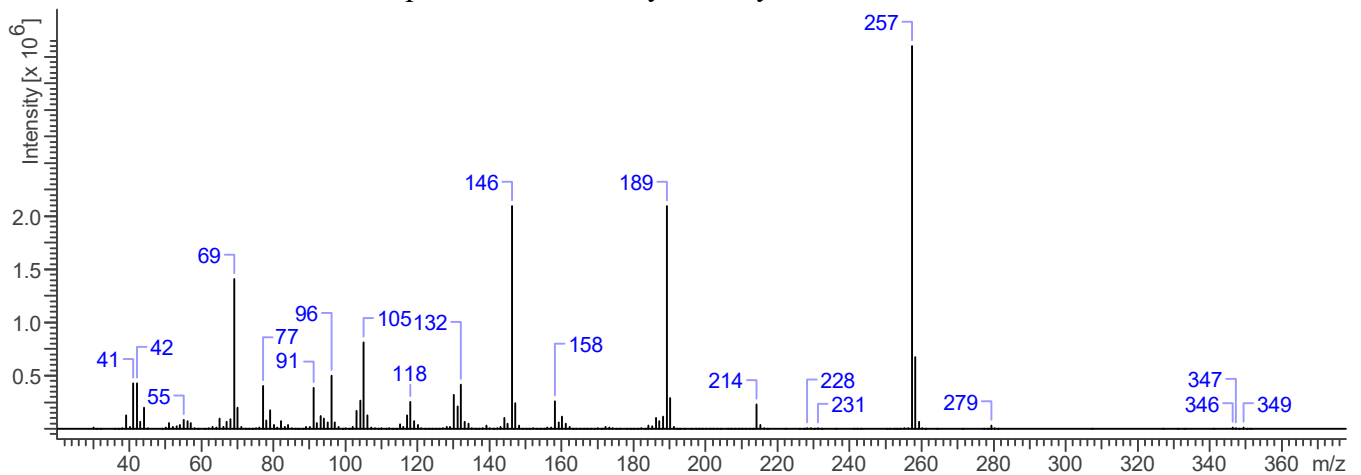
Injection Parameters: Split Ratio = 25:1, 1 μ L injected

MS Parameters: Mass scan range: 30-550 amu Threshold: 250

Tune file: stune.u Acquisition mode: scan

Retention Time: 17.16 min

EI Mass Spectrum: Z-Crotonyl fentanyl Base; Lot# N18-P74C





Z-Crotonyl fentanyl



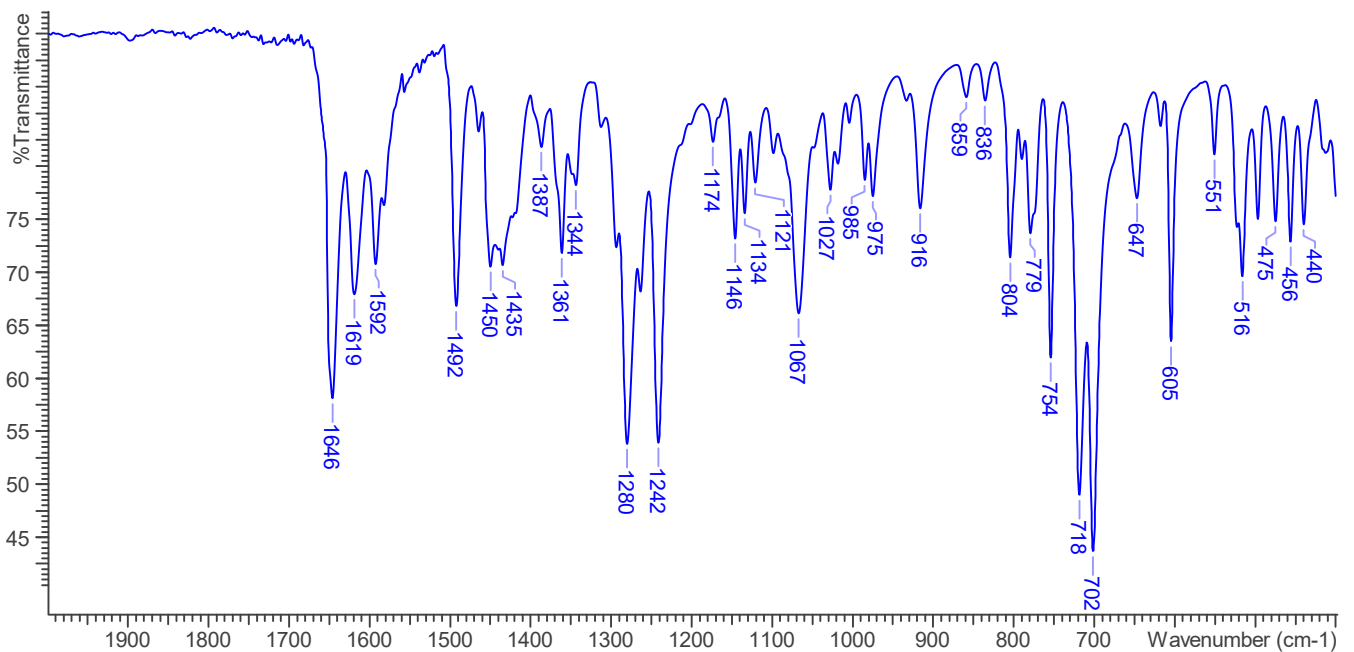
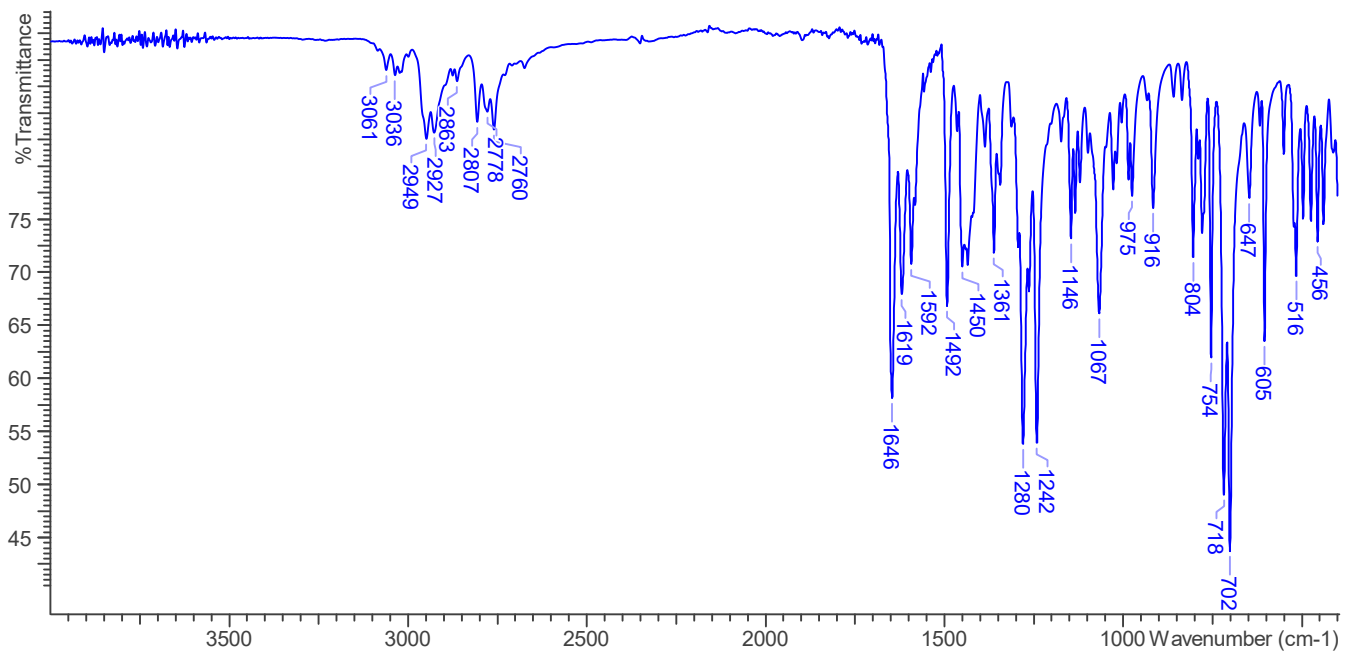
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3.3 INFRARED SPECTROSCOPY (FTIR)

Instrument: FTIR with diamond ATR attachment (1 bounce)

Scan Parameters:
Number of scans: 32
Number of background scans: 32
Resolution: 4 cm⁻¹
Sample gain: 1
Aperture: 150

FTIR ATR (Diamond 1 Bounce): Z-Crotonyl fentanyl Base; Lot# N18-P74C





Z-Crotonyl fentanyl

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4. ADDITIONAL RESOURCES

Mallette, J.R., et al. "Characterization and differentiation of cyclopropylfentanyl from E-crotonylfentanyl, Z-crotonylfentanyl, and 3-butenylfentanyl." *Science & Justice* 59 (2019) 67-74.