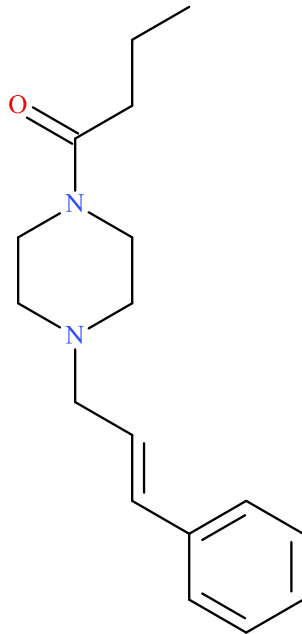


**AP-237**

Sample Type: **Seized Material**



Latest Revision: **September 16, 2019**

Date Received: **August 16, 2019**

Date of Report: **September 16, 2019**

## 1. GENERAL INFORMATION

<b>IUPAC Name:</b>	1-[4-[(E)-cinnamyl]piperazin-1-yl]butan-1-one
<b>InChI String:</b>	InChI=1S/C17H24N2O/c1-2-7-17(20)19-14-12-18(13-15-19)11-6-10-16-8-4-3-5-9-16/h3-6,8-10H,2,7,11-15H2,1H3/b10-6+
<b>CFR:</b>	Not Scheduled (09/2019)
<b>CAS#</b>	17730-82-4
<b>Synonyms:</b>	Bucinnazine, 1-butyryl-4-cinnamylpiperazine
<b>Source:</b>	Department of Homeland Security
<b>Appearance:</b>	White Solid Material

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

**Prepared By:** Alex J. Krotulski, MSFS, Melissa F. Fogarty, MSFS, D-ABFT-FT, and Barry K. Logan, PhD, F-ABFT

## 2. CHEMICAL AND PHYSICAL DATA

### 2.1 CHEMICAL DATA

Form	Chemical Formula	Molecular Weight	Molecular Ion [M <sup>+</sup> ]	Exact Mass [M+H] <sup>+</sup>
Base	C <sub>17</sub> H <sub>24</sub> N <sub>2</sub> O	272.4	272	273.1961

### 3. BRIEF DESCRIPTION

AP-237 (Bucinnazine) is classified as a synthetic opioid. AP-237 is structurally distinct from fentanyl, its analogues, and other synthetic opioids previously reported. AP-237 is an opioid used therapeutically; although not prescribed within the United States. Based on its recent emergence and potential for abuse within the United States and worldwide, AP-237 has been categorized as a Novel Psychoactive Substance (NPS). 2-Methyl AP-237, previously reported through this network, is a structurally similar analogue of AP-237; both are not scheduled substances in the United States. AP-237 was found to be active with several literature reports characterizing its pharmacological properties.<sup>1-3</sup>

### 4. ADDITIONAL RESOURCES

1. Nishimura, N.; Kiuchi, M.; Kanetake, Y.; Takahashi, T. (1970). "Clinical evaluation of a new analgesic agent Ap-237". *Masui*. 19 (6): 653–6.  
<https://www.ncbi.nlm.nih.gov/pubmed/4916908>
2. Carrano, R. A.; Kimura, K. K.; McCurdy, D. H. (1975). "Analgesic and tolerance studies with AP-237, a new analgesic". *Arch Int Pharmacodyn Ther*. 213 (1): 41–57.  
<https://www.ncbi.nlm.nih.gov/pubmed/1156018>
3. Carrano, R. A.; Kimura, K. K.; Landes, R. C.; McCurdy, D. H. (1975). "General pharmacology of a new analgesic-AP-237". *Arch Int Pharmacodyn Ther*. 213 (1): 28–40.  
<https://www.ncbi.nlm.nih.gov/pubmed/1156016>

[https://www.policija.si/apps/nfl\\_response\\_web/0\\_Analytical\\_Reports\\_final/AP-237-ID-2048-19\\_report.pdf](https://www.policija.si/apps/nfl_response_web/0_Analytical_Reports_final/AP-237-ID-2048-19_report.pdf)

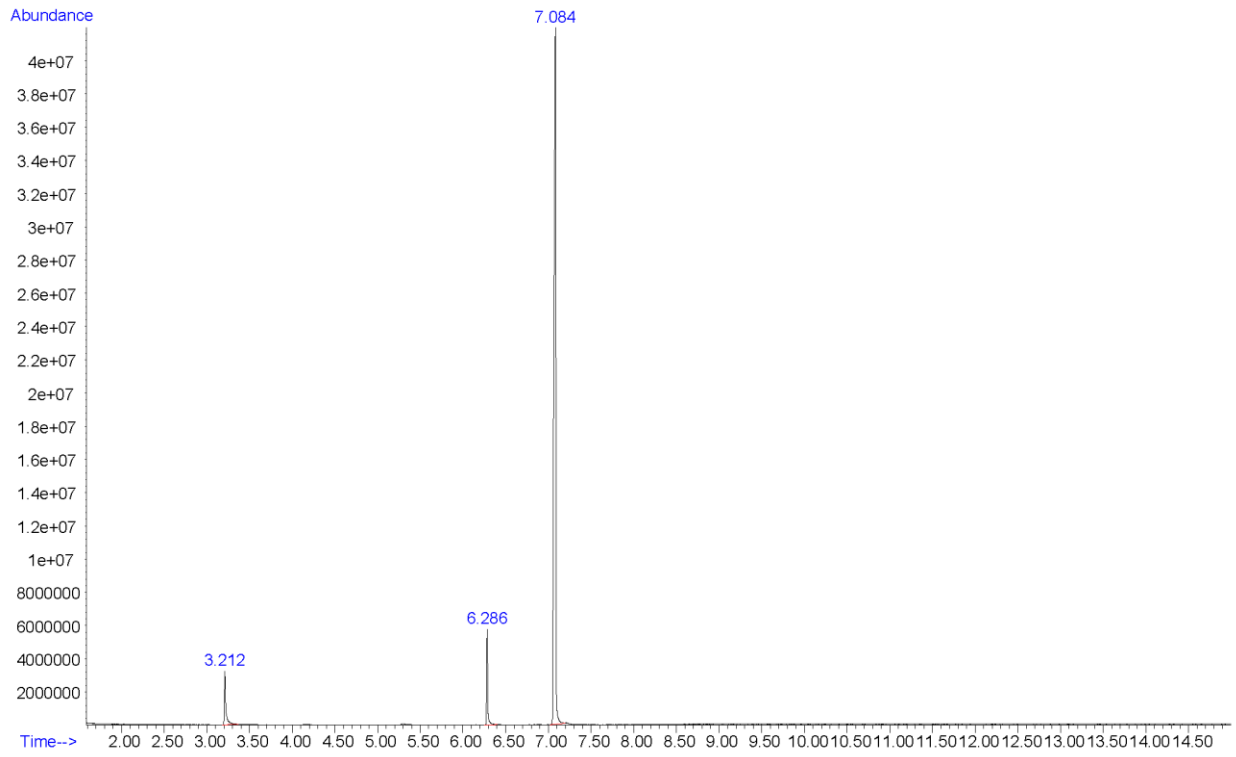
<https://www.caymanchem.com/product/26484>

## 5. QUALITATIVE DATA

### 5.1 GAS CHROMATOGRAPHY MASS SPECTROMETRY (GC-MS)

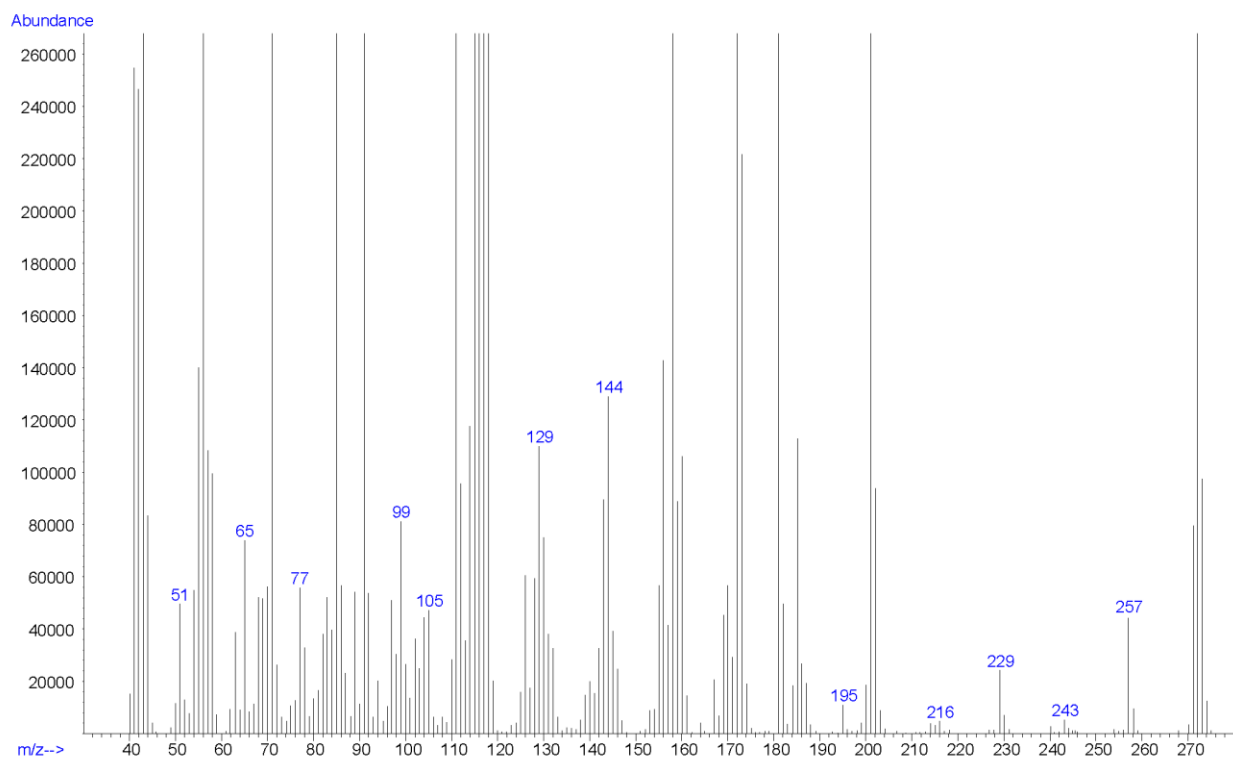
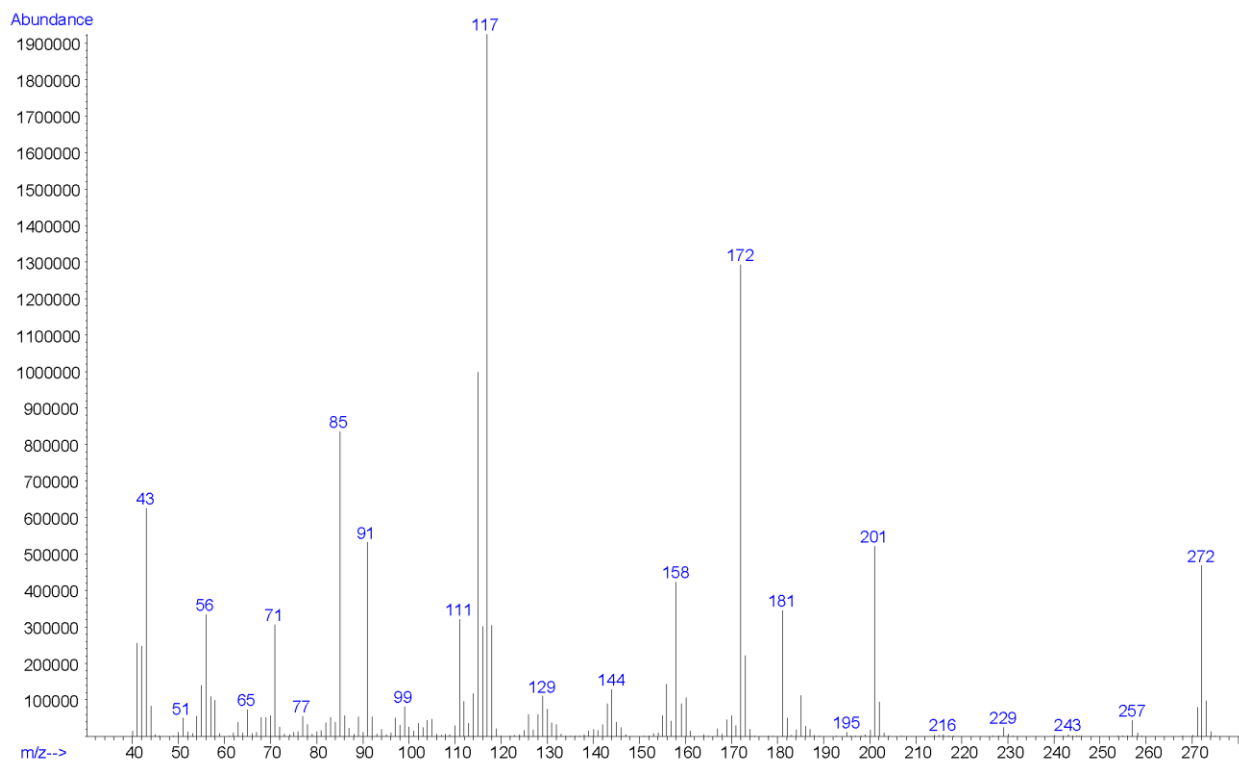
<b>Testing Performed At:</b>	NMS Labs (Willow Grove, PA)
<b>Sample Preparation:</b>	Acid/Base extraction
<b>Instrument:</b>	Agilent 5975 Series GC/MSD System
<b>Column:</b>	Zebtron™ Inferno™ ZB-35HT (15 m x 250 µm x 0.25 µm)
<b>Carrier Gas:</b>	Helium (Flow: 1 mL/min)
<b>Temperatures:</b>	Injection Port: 265 °C Transfer Line: 300 °C MS Source: 230 °C MS Quad: 150 °C Oven Program: 60 °C for 0.5 min, 35 °C/min to 340 °C for 6.5 min
<b>Injection Parameters:</b>	Injection Type: Splitless Injection Volume: 1 µL
<b>MS Parameters:</b>	Mass Scan Range: 40-550 m/z Threshold: 250
<b>Retention Time:</b>	7.084 min
<b>Standard Comparison:</b>	Reference material for AP-237 (Batch: 0545936-4) was purchased from Cayman Chemical (Ann Arbor, MI, USA). Analysis of this standard resulted in positive identification of the analyte in the exhibit as AP-237, based on retention time (7.062 min) and mass spectral data. ( <a href="https://www.caymanchem.com/product/26484">https://www.caymanchem.com/product/26484</a> )

# Chromatogram: AP-237



*Additional peaks present in chromatogram: internal standards (3.212 min and 6.286 min)*

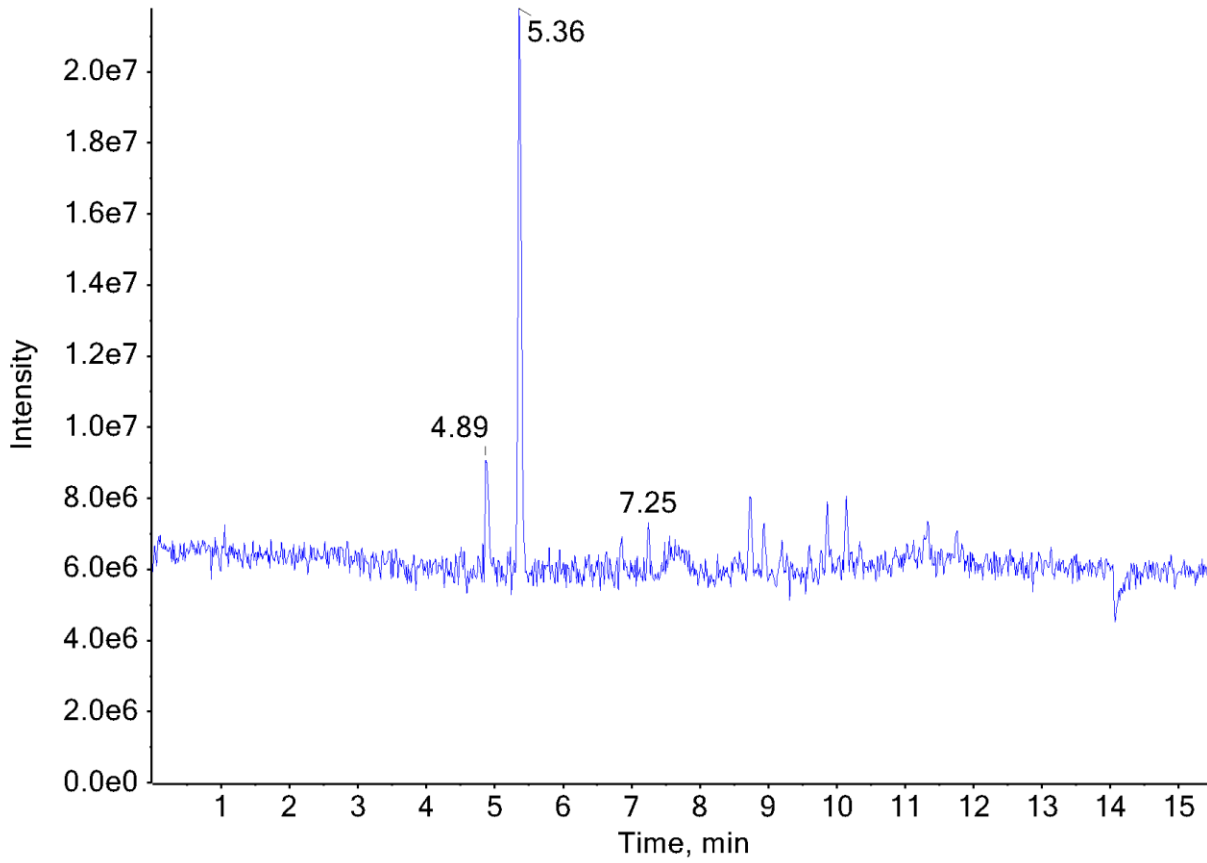
# EI (70 eV) Mass Spectrum (Top) and 10x (Bottom): AP-237



## 5.2 LIQUID CHROMATOGRAPHY QUADRUPOLE TIME OF FLIGHT MASS SPECTROMETRY (LC-QTOF)

<b>Testing Performed At:</b>	The Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation (Willow Grove, PA)
<b>Sample Preparation:</b>	1:100 dilution of acid/base extract in mobile phase
<b>Instrument:</b>	Sciex TripleTOF® 5600+, Shimadzu Nexera XR UHPLC
<b>Column:</b>	Phenomenex® Kinetex C18 (50 mm x 3.0 mm, 2.6 µm)
<b>Mobile Phase:</b>	A: Ammonium formate (10 mM, pH 3.0) B: Methanol/acetonitrile (50:50) Flow rate: 0.4 mL/min
<b>Gradient:</b>	Initial: 95A:5B; 5A:95B over 13 min; 95A:5B at 15.5 min
<b>Temperatures:</b>	Autosampler: 15 °C Column Oven: 30 °C Source Heater: 600 °C
<b>Injection Parameters:</b>	Injection Volume: 10 µL
<b>QTOF Parameters:</b>	TOF MS Scan Range: 100-510 Da Precursor Isolation: SWATH® acquisition (27 windows) Fragmentation: Collision Energy Spread (35±15 eV) MS/MS Scan Range: 50-510 Da
<b>Retention Time:</b>	5.36 min
<b>Standard Comparison:</b>	Reference material for AP-237 (Batch: 0545936-4) was purchased from Cayman Chemical (Ann Arbor, MI, USA). Analysis of this standard resulted in positive identification of the analyte in the exhibit as AP-237, based on retention time (5.38 min) and mass spectral data. ( <a href="https://www.caymanchem.com/product/26484">https://www.caymanchem.com/product/26484</a> )

**Chromatogram: AP-237**



*Additional peaks present in chromatogram: internal standards (4.89 min and 7.25 min)*

**TOF MS (Top) and MS/MS (Bottom) Spectra: AP-237**

