1. GENERAL INFORMATION

**IUPAC Name:** N-(1-benzylpiperidin-4-yl)-N-(4-fluorophenyl)propionamide

**CAS#:** N/A

**Synonyms:** para-fluoro benzyl fentanyl, N-benzyl para-fluoro fentanyl

**Source:** DEA Reference Material Collection

**Appearance:** White powder

**$UV_{\text{max}}(\text{nm})$:** Not determined

2. CHEMICAL AND PHYSICAL DATA

2.1 CHEMICAL DATA

<table>
<thead>
<tr>
<th>Form</th>
<th>Chemical Formula</th>
<th>Molecular Weight</th>
<th>Melting Point ($^\circ$C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>$C_{21}H_{25}FN_2O$</td>
<td>340.43</td>
<td>Not Determined</td>
</tr>
<tr>
<td>HCl</td>
<td>$C_{21}H_{25}FN_2O\text{HCl}$</td>
<td>376.90</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>
N-Benzyl para-fluoro norfentanyl

3. QUALITATIVE DATA

3.1 NUCLEAR MAGNETIC RESONANCE

Sample Preparation: Dilute analyte to ~13 mg/mL in methanol-d₄ containing TMS for 0 ppm reference and 1,4-BTMSB-d₄ 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

¹HNMR: N-Benzyl para-fluoro norfentanyl HCl; Lot# N19-P13A; methanol-d₄; 400MHz
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 μm

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 μL injected

MS Parameters:
- Mass scan range: 30-550 amu
- Threshold: 150
- Tune file: stune.u
- Acquisition mode: scan

Retention Time: 15.80 min

EI Mass Spectrum: N-Benzyl para-fluoro norfentanyl HCl; Lot # N19-P13A
3.3 INFRARED SPECTROSCOPY (FTIR)

Instrument: FTIR ATR (KRS-5 focusing)
Scan Parameters:
- Number of scans: 32
- Number of background scans: 32
- Resolution: 4 cm\(^{-1}\)
- Sample gain: 1
- Aperture: 150

FTIR ATR (KRS-5 focusing): N-Benzyl para-fluoro norfentanyl HCl; Lot# N19-P13A