**meta-Methoxy furanyl fentanyl**

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

1. **GENERAL INFORMATION**

**IUPAC Name:** \(N\)-(3-methoxyphenyl)-\(N\)-(1-phenethylpiperidin-4-yl)furan-2-carboxamide

**CAS#:** N/A

**Synonyms:** 3-methoxy Fu-F, m-methoxy Fu-F, meta-methoxy Fu-F, 3-methoxy Furanyl fentanyl, m-methoxy Furanyl fentanyl, \(N\)-(3-methoxyphenyl)-\(N\)-[1-(2-phenylethyl)piperidin-4-yl]furan-2-carboxamide

**Source:** DEA Reference Material Collection

**Appearance:** White powder

**UV\(_{\max}\)(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 (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>C(<em>{25}H</em>{28}N_{2}O_{3})</td>
<td>404.50</td>
<td>Not Determined</td>
</tr>
<tr>
<td>HCl</td>
<td>C(<em>{25}H</em>{28}N_{2}O_{3}) HCl</td>
<td>440.96</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>
3. QUALITATIVE DATA

3.1 NUCLEAR MAGNETIC RESONANCE

Sample Preparation: Dilute analyte to ~12 mg/mL in CDCl$_3$ 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

$^1$HNMR: *meta*-Methoxy furanyl fentanyl base; Lot #0539202-3; CDCl$_3$; 400MHz
3.2 GAS CHROMATOGRAPHY/MASS SPECTROMETRY

Sample Preparation: Dilute analyte ~6 mg/mL in CHCl₃

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  
MS 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: 250  
Tune file: stune.u  
Acquisition mode: scan
Retention Time: 22.23 min

EI Mass Spectrum: meta-Methoxy furanyl fentanyl base; Lot #0539202-3
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): *meta*-Methoxy furanyl fentanyl base; Lot #0539202-3