

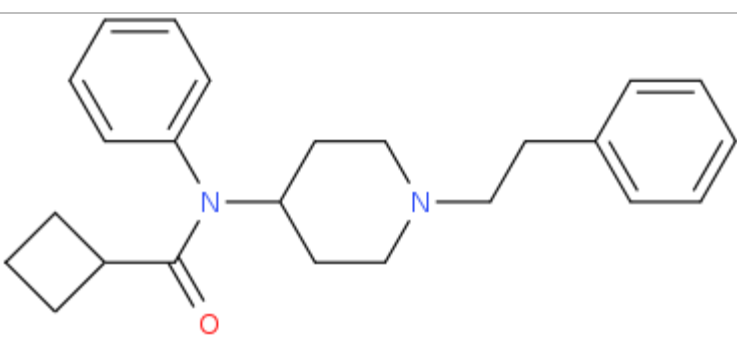
## ANALYTICAL REPORT

Cyclobutyl fentanyl (C<sub>24</sub>H<sub>30</sub>N<sub>2</sub>O)

## N-phenyl-N-[1-(2-phenylethyl)piperidin-4-yl]cyclobutanecarboxamide

Remark – other active cpd. detected: none

Sample ID:	1840-17
Sample description:	powder - white
Sample type:	RM-reference material
Comments:	CAY Lot#0507126-5,
Date of entry (DD/MM/YYYY):	18/08/2017

Substance identified-structure <sup>1</sup> (base form)	
Systematic name:	N-phenyl-N-[1-(2-phenylethyl)piperidin-4-yl]cyclobutanecarboxamide
Other names:	N-(1-phenethylpiperidin-4-yl)-N-phenylcyclobutanecarboxamide
Formula (per base form)	C <sub>24</sub> H <sub>30</sub> N <sub>2</sub> O
M <sub>w</sub> (g/mol)	362,52
Salt form:	HCl
StdInChIKey (per base form)	XHRDMQWXMFOAIX-UHFFFAOYSA-N
Other active cpd. detected	none
Add.info (purity..)	100,0%

<sup>1</sup> Created by OPSIN free tool: <http://opsin.ch.cam.ac.uk/> DOI: 10.1021/ci100384d



## Report updates

date	comments (explanation)

## Supporting information

Analytical technique:	applied	remarks
GC-MS (EI ionization)	+	NFL GC-RT (min): 12,94 BP(1): 271; BP(2): 55,BP(3) :146,
FTIR-ATR	+	direct measurement
GC-IR (condensed phase)	+	always as base form

**1. GC-MS** (Agilent): GC-method is RT locked to tetracosane (9.258 min). Injection volume 1 ml and split mode (1:50). Injector temperature: 280 °C. Chromatographic separation: on column HP1-MS (100% dimethylpolysiloxane), length 30 m, internal diameter 0.25 mm, film thickness 0.25 µm. Carrier gas He: flow-rate 1.2 ml/min. GC oven program: 170 °C for 1 min, followed by heating up to 190 °C at rate 8 °C/min, then heating up to 293 °C at a rate of 18 °C/min, hold for 7.1 min, then heating at 50 °C/min up to 325 °C and finally 6.1 min isothermal. MSD source EI = 70 eV. GC-MS transfer line T= 235 °C, source and quadrupole temperatures 280 °C and 180 °C, respectively. Scan range m/z scan range: from 50 (30 until 6 min.) to 550 (300 until 6 min) amu.

**2. FTIR-ATR** (Perkin Elmer): scan range 4000-400 cm<sup>-1</sup>; resolution 4cm<sup>-1</sup>

**3. GC- (MS)-IR** condensed phase (GC-MS (Agilent) & IR (Spectra analyses-Danny)

GC-method: Injection volume 1 ml and split mode (1:5). Injector temperature 280 °C. Chromatographic separation as above **(1)**. Split MS : IR = 1 : 9.

MSD source EI = 70 eV. GC-MS transfer line T= 235 °C, source and quadrupole temperatures 280 °C and 180 °C, respectively. Scan range m/z scan range: from 50 (30 until 6 min.) to 550 (300) amu.

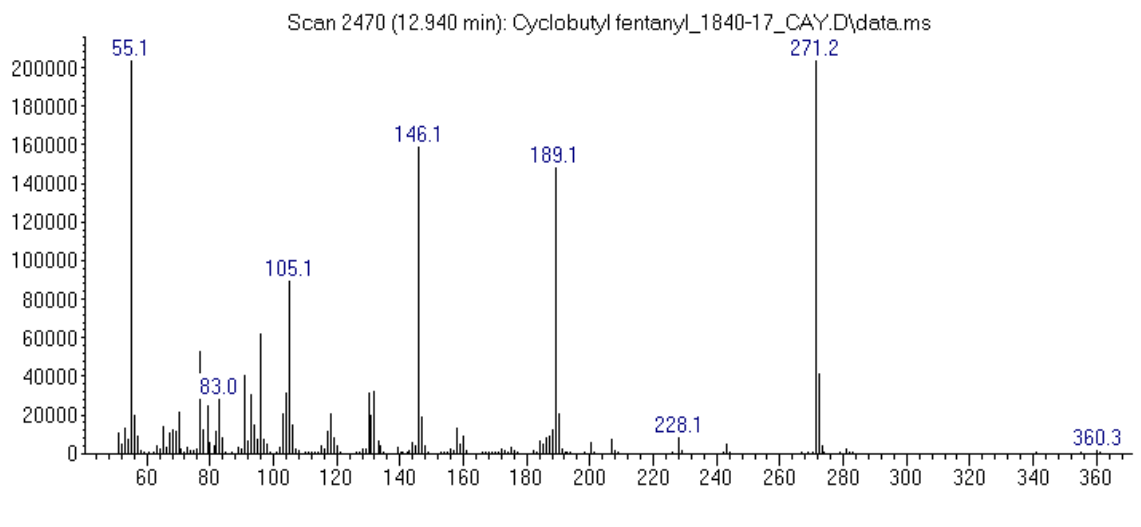
IR (condensed (solid) phase): IR scan range 4000 to 650, resolution 4 cm<sup>-1</sup>.

4. HPLC-TOF for exact monoisotopic mass and empirical formula control - results are not shown in the report.

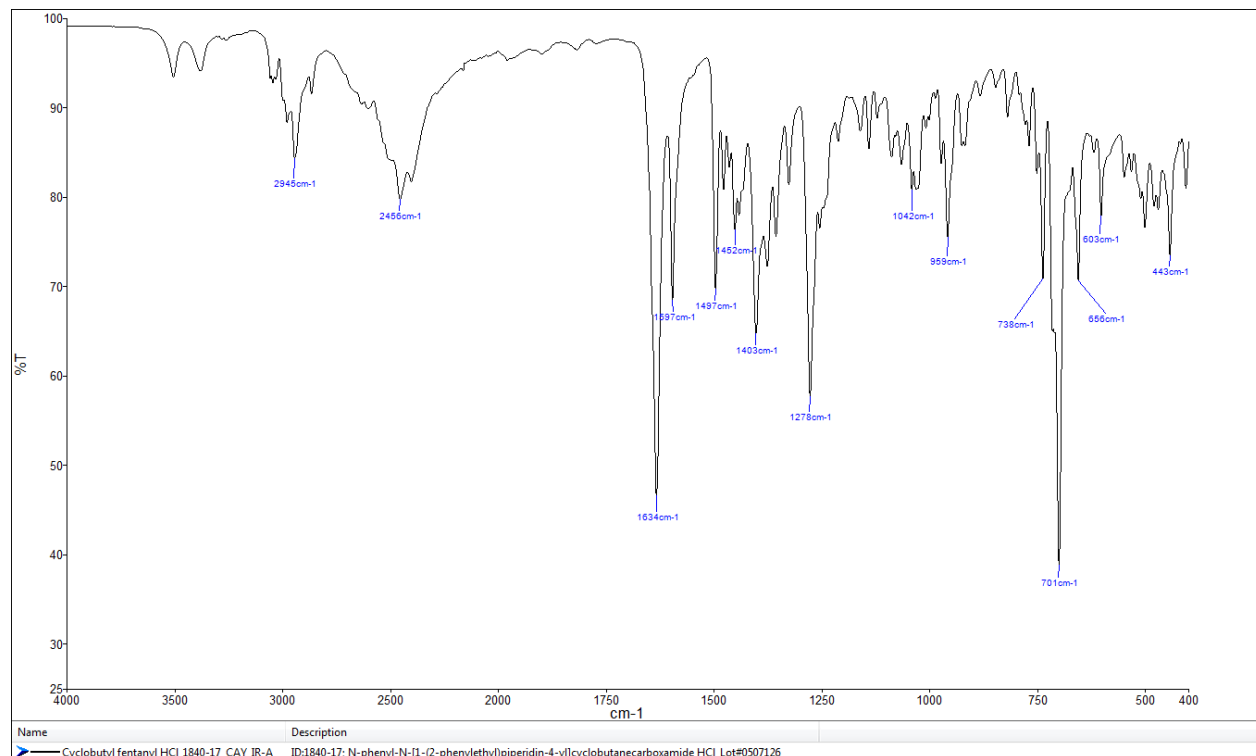
# ANALYTICAL RESULTS

MS (EI)

Abundance



## FTIR-ATR - sample as received



## IR (condensed phase – after chromatographic separation)

