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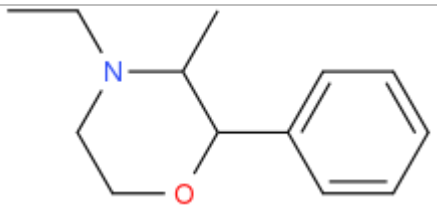
ANALYTICAL REPORT[1]

Phenmetetrazine (C13H19NO)

4-ethyl-3-methyl-2-phenylmorpholine

Remark – other NPS detected:

Sample ID:	1291-15S
Sample description:	liquid - colourless (in diethyl ether)
Sample type:	synthesized from precursor test purchased sample sold as Phenmetetrazine
Date of sample receipt (M/D/Y):	9/25/2016
Date of entry (M/D/Y) into NFL database:	3/9/2016
Report updates (if any) will be published here:	http://www.policija.si/apps/nfl_response_web/seznam.php

Substance identified - structure[2] (base form)	
Systematic name	4-ethyl-3-methyl-2-phenylmorpholine
Other names	
Formula (per base form)	C13H19NO
M_w (g/mol)	205,3
Salt form/anions detected	base
StdInChIKey	ZOMTUQAEMGCZPK-UHFFFAOYSA-N
Compound Class	Others
Other NPS detected	none by GC-MS (derivatized and underivatized sample have been analysed), by HPLC - TOF due to acidic water media precursor compound was detected as well
Add.info (purity..)	Two isomers detected by GC-MS and HPLC TOF.

[1] This report has been produced with the financial support of the Prevention of and fight against crime Programme of the European Union (grant agreement number JUST/2013/ISEC/DRUGS/AG/6413). The contents of this report are the sole responsibility of the National Forensic Laboratory and can in no way be taken to reflect the views of the European Commission.

[2] Created by OPSIN free tool: http://opsin.ch.cam.ac.uk/ **DOI:** 10.1021/ci100384d

Report updates

date	comments (explanation)

Instrumental methods (if applied) in NFL

1. GC-MS (Agilent): GC-method is RT locked to tetracosane (RT=9.53 min). Injection volume 1 ml and split mode (1:50) . Injector temperature: 280 ^{0}C. Chromatographic separation: on column HP1-MS (100% dimethylpolysiloxane), length 30 m, internal diameter 0.25 mm, film thickens 0.25 mm. Carrier gas He: flow-rate 1.2 ml/min. GC oven program: 170 ^{0}C for 1 min, followed by heating up to 293 ^{0}C at a rate of 18 ^{0}C/min, hold for 6.1 min, than heating at 50 ^{0}C/min up to 325 ^{0}C and finally 6.1 min isothermal. MSD source EI = 70 eV. GC-MS transfer line T= 235^{0}C, source and quadropole temperatures 280^{0}C and 180^{0}C, respectively. Scan range m/z scan range: from 50 (30 until 6 min.) to 550 (300) amu.

2. HPLC-TOF (Agilent): 6230B TOF with Agilent 1260 Infinity HPLC with binary pump, column: Zorbax Eclipse XDB-C18, 50 x 4.6 mm, 1.8 micron. Mobile phases (A) 0.1% formic acid and 1mM ammonium formate in water; (B) 0.1% formic acid in methanol (B). Gradient: starting at 5% B, changing to 40% B over 4 min, then to 70% over 2 min and in 5 min to 100%, hold 1 min and back to 5%, equilibration for 1.7 min. The flow rate: 1.0 ml/min; Injection volume 1 µl. MS parameters: 2GHz, Extended Dynamic range mode to a maximum of 1700 amu, acquisition rate 1.30 spectra/sec. Sample ionisation: by Agilent Jet Stream technology (Dual AJS ESI). Ion source: positive ion scan mode with mass scanning from 82 to 1000 amu. Other TOF parameters: drying gas (N2) and sheath temperature 325 °C; drying gas flow rate 6 l/min; sheath gas flow rate 8 l/min; nebulizer 25 psig; Vcap. 4000 V; nozzle 2000 V; skimmer 65 V; fragmentor 175 V and Octopole RF 750 V.

3.FTIR-ATR (Perkin Elmer): scan range 4000-400 cm-1; resolution 4cm-1

4. 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 ^{0}C. Chromatographic separation as above **(1).** Split MS : IR = 1:9.
MSD source EI = 70 eV. GC-MS transfer line T= 235^{0}C, source and quadropole temperatures 280^{0}C and 180^{0}C, respectively. Scan range m/z scan range: from 50 (30 until 6 min.) to 550 (300) amu.
IR (condesed phase): IR scan range 4000 to 650, resolution 4 cm^{-1}.

5. **IC** (anions) (Thermo Scientific, Dionex ICS 2100), Column: IonPac AS19, 2 x 250mm; Eluent: 10mM from 0 to 10 min, 10-58 mM from 10 to 40min; Flow rate: 0.25 ml/min; Temperature: 30˚C; Suppressor: AERS 500 2mm, suppressor current 13mA; Inj. Volume: 25 µl

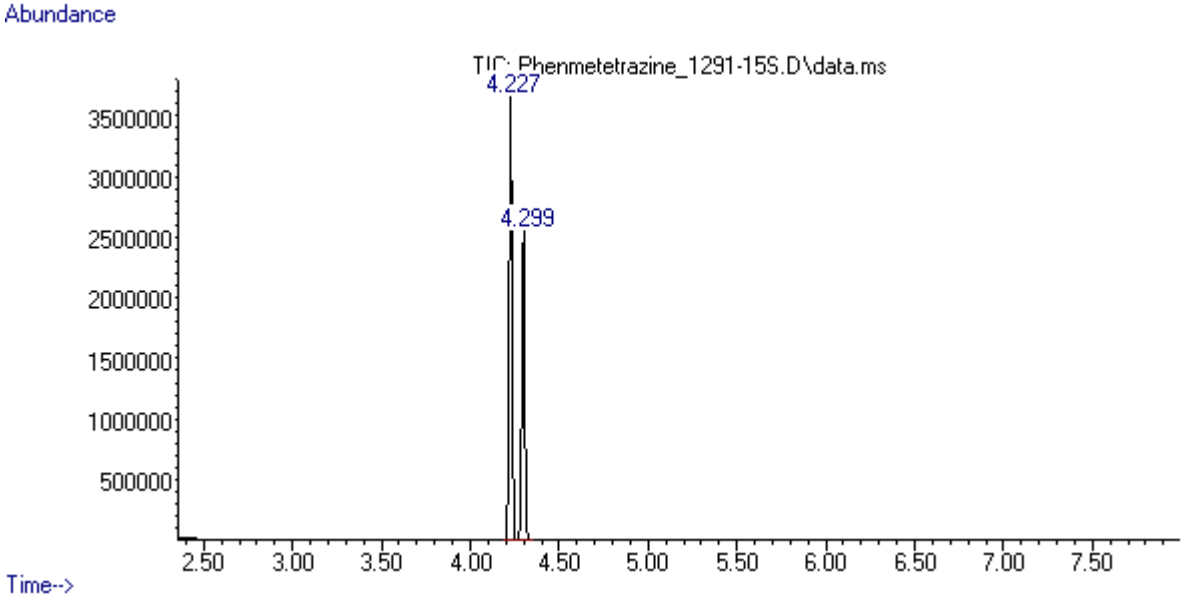
Supporting information

Solubility in	result/remark
CH_2Cl_2	/
MeOH	/
H_2O	/

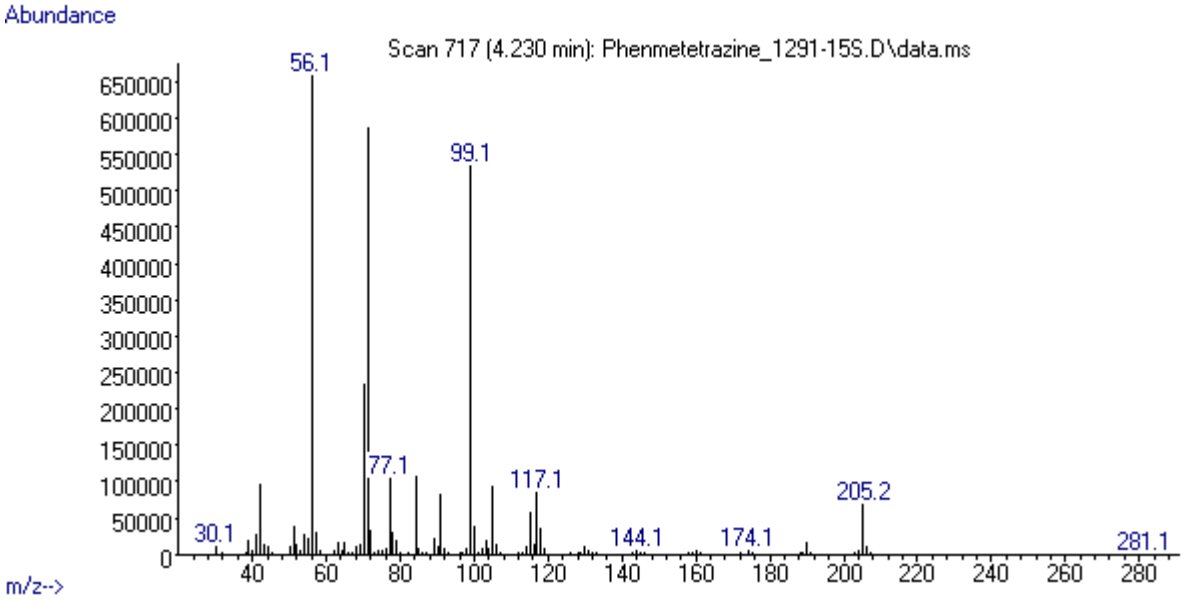
Analytical technique:	applied	remarks
GC-MS (EI ionization)	+	NFL GC-RT (min): 4,23 BP(1): 56; BP(2): 71,BP(3) :99,
HPLC-TOF	+	Exact mass (theoretical): 205.1467 measured value Δppm: -0,37 (isomer 1) formula:C13H19NO
FTIR-ATR	+	dried ether extract
FTIR (condensed phase) always as base form	+	
IC (anions)	-	
NMR (in FKKT)	-	
validation		
other		

ANALYTICAL RESULTS

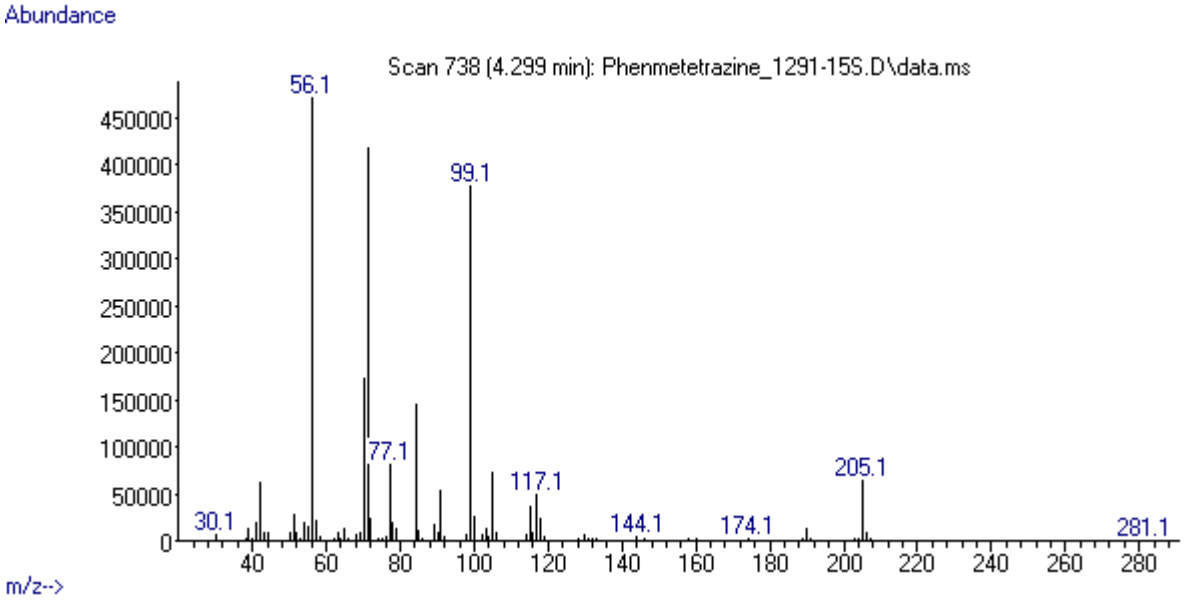
GC-MS (EI)



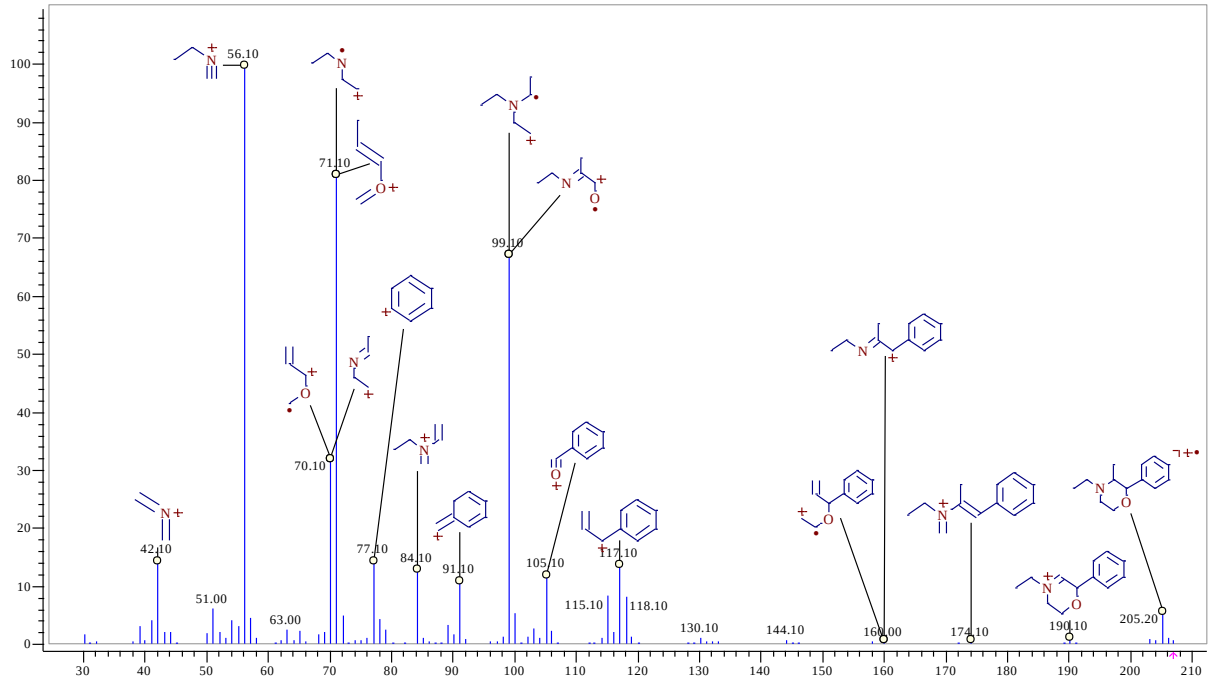
Chromatogram



MS spectrum - isomer 1

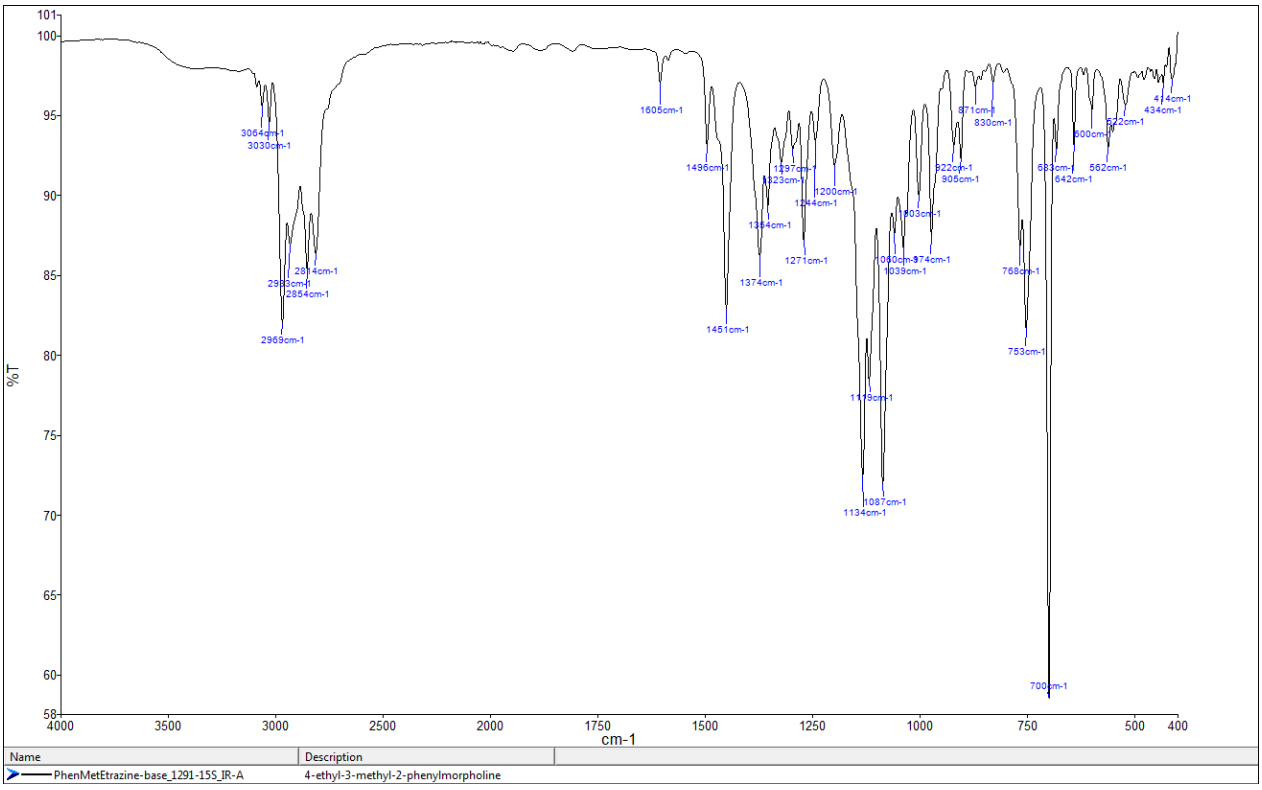


MS spectrum - isomer 2

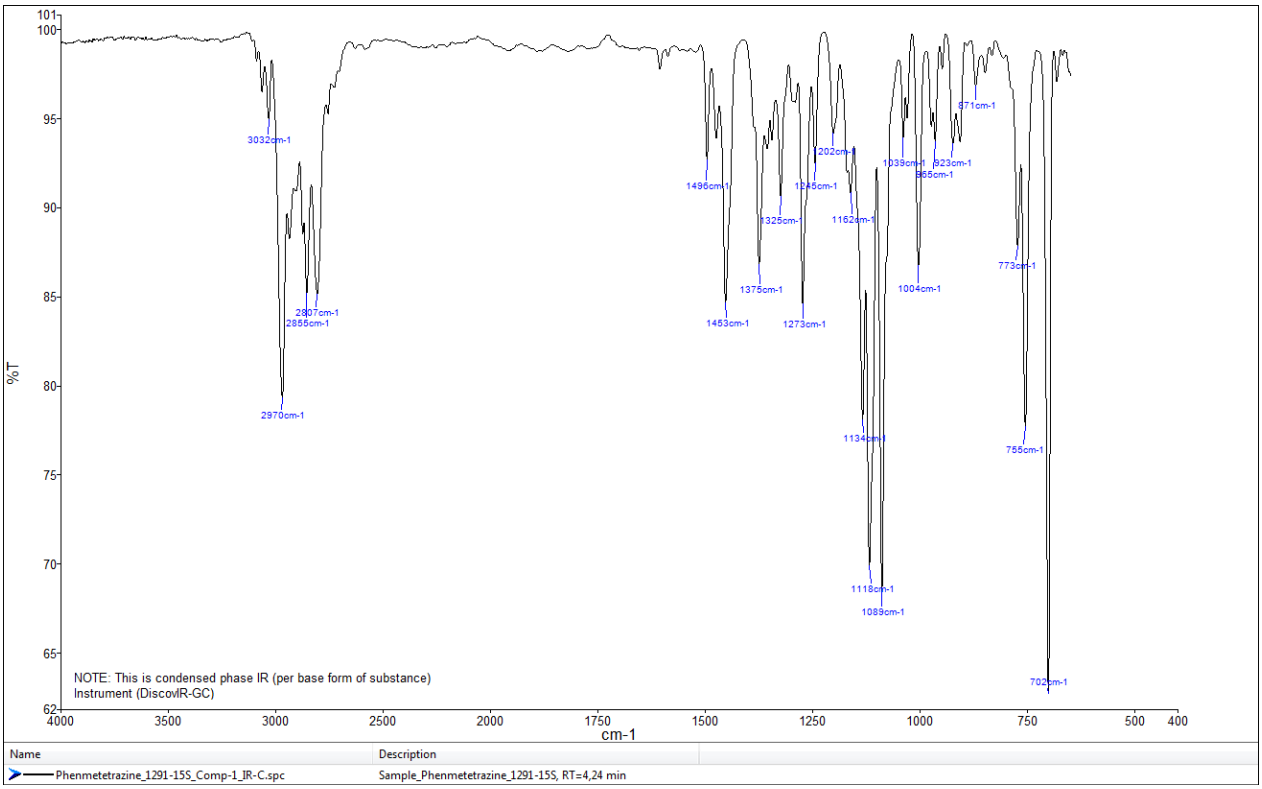


MS interpretation by Thermo Scientific Mass Frontier (7.0) software

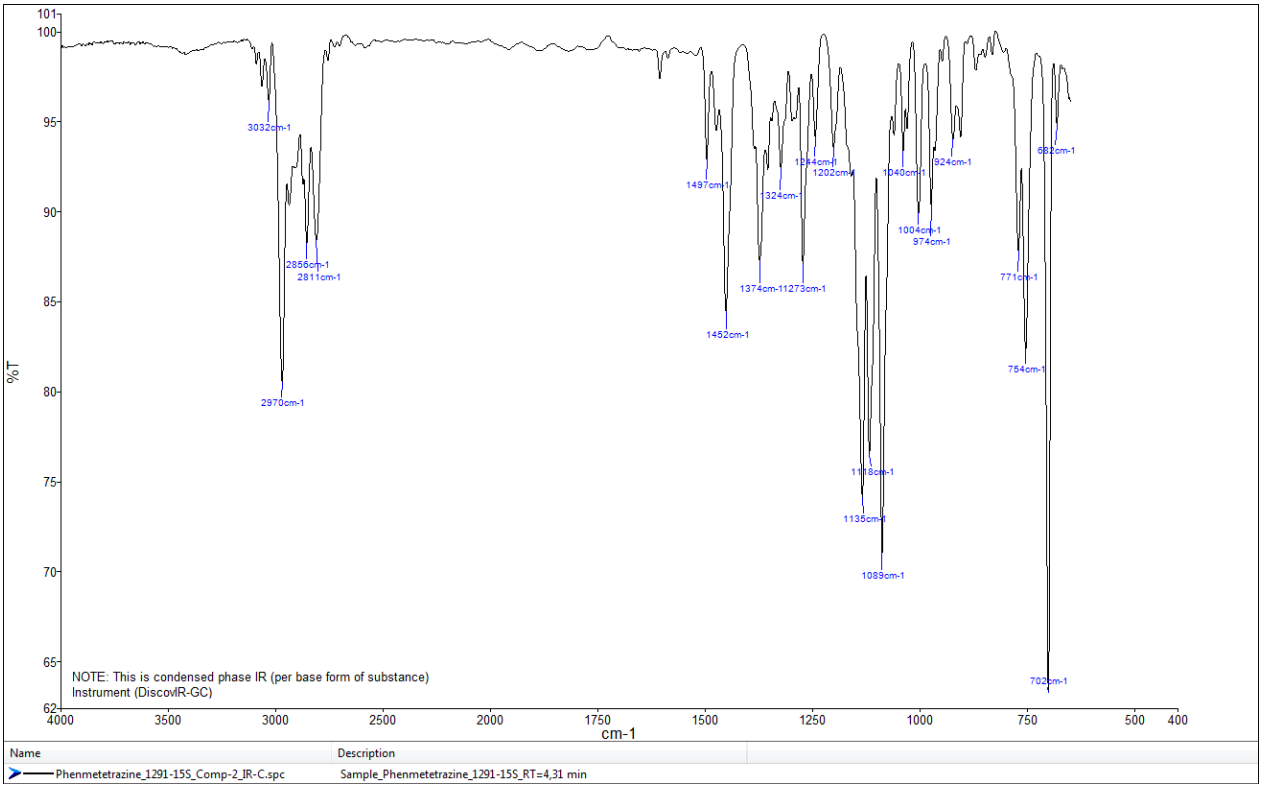
FTIR-ATR - dried ether extract



IR (condensed phase – after chromatographic separation)



Spectrum isomer 1



Spectrum-isomer 2

TOF REPORT

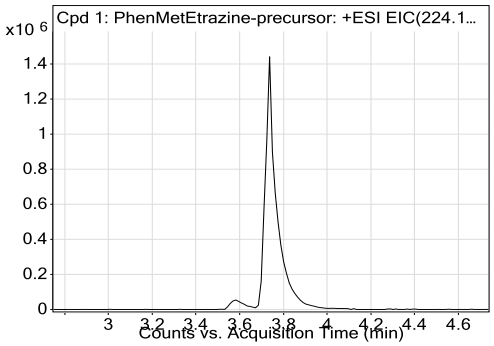
Data File	1291-15_s.d	**Sample Name**	1291-15-s-MeOH
Sample Type	Sample	**Position**	P1-F6
Instrument Name	6230B TOF LC-MS	**User Name**	TG
Acq Method	general-1512015-XDB-C18-ESI-poz.m	**Acquired Time**	3/10/2016 10:02:35 AM
IRM Calibration Status	Success	**DA Method**	Drugs_NFL.m
Comment	extract in diethylether		

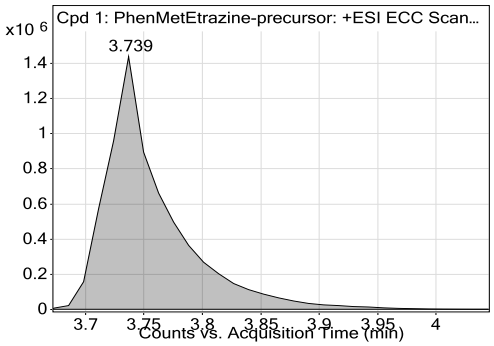
Compound Table

Label	Compound Name	Obs. RT	Obs. Mass
Cpd 1: PhenMetEtrazine-precursor	PhenMetEtrazine-precursor	3.739	223.1572
Cpd 2: PhenMetEtrazine -izomera I	PhenMetEtrazine -izomera I	4.023	205.1467
Cpd 3: PhenMetEtrazine -izomera II	PhenMetEtrazine -izomera II	4.84	205.1468

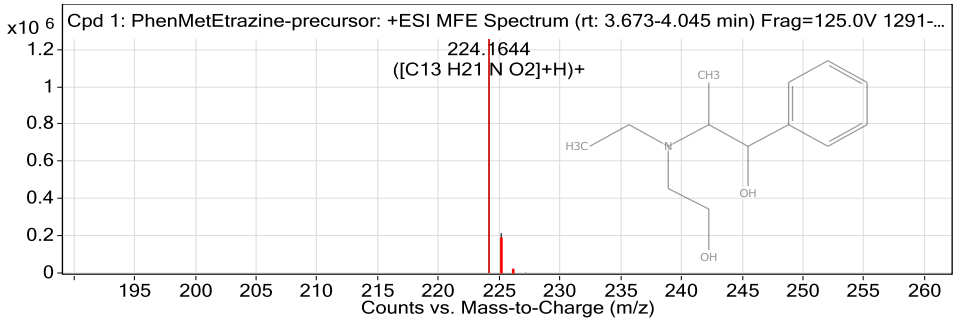
Name	*Obs. m/z*	Obs. RT	Obs. Mass	DB RT	DB Formula	DB Mass	DB Mass Error (ppm)
PhenMetEtrazine-precursor	224.1644	3.739	223.1572	3.74	C13 H21 N O2	223.1572	0.12

Compound Chromatograms

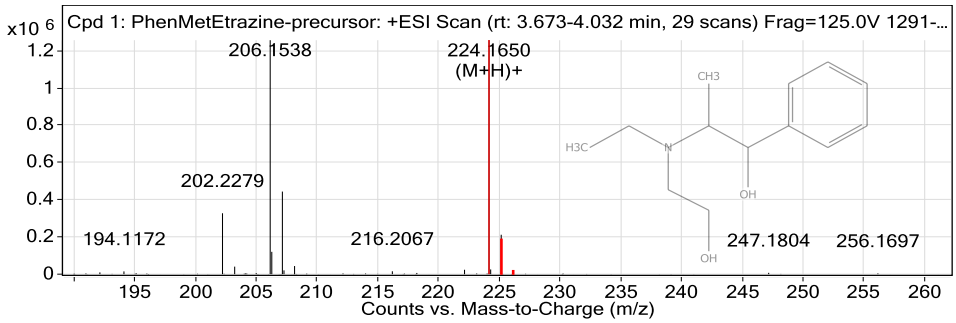




MFE MS Zoomed Spectrum



MS Zoomed Spectrum



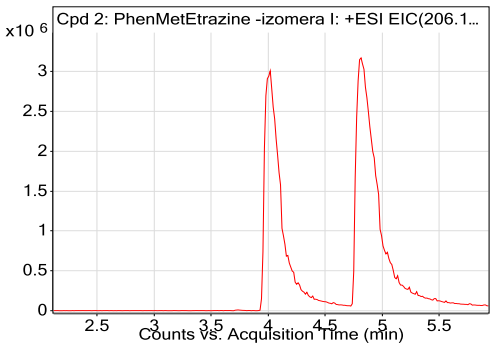
MS Spectrum Peak List

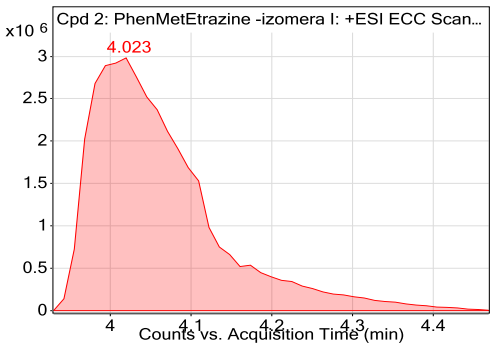
Obs. m/z	Charge	Abund	Formula	Ion/Isotope
224.1644	1	1255999.5	C13 H21 N O2	(M+H)+
225.1683	1	214324.49	C13 H21 N O2	(M+H)+
226.1704	1	22335.97	C13 H21 N O2	(M+H)+
227.1735	1	1735.38	C13 H21 N O2	(M+H)+

Name	*Obs. m/z*	Obs. RT	Obs. Mass	DB RT	DB Formula	DB Mass	DB Mass Error (ppm)
PhenMetEtrazine - izomera I	206.1539	4.023	205.1467	4.02	C13 H19 N O	205.1467	-0.37

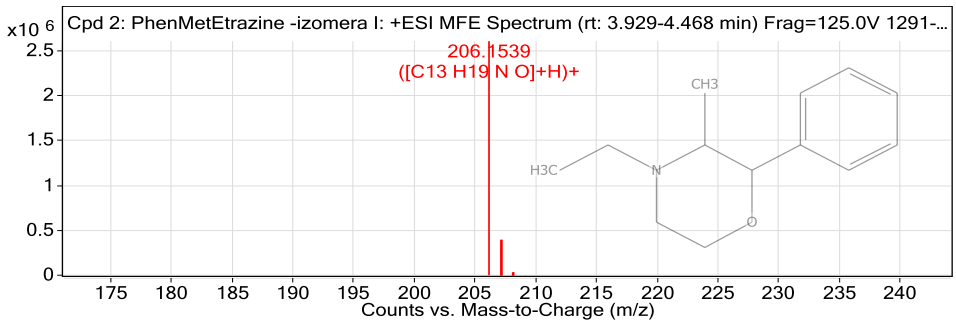
Compound Chromatograms

TOF REPORT

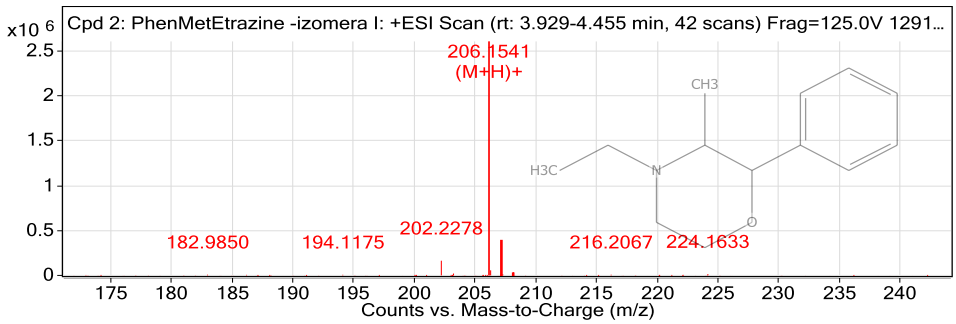




MFE MS Zoomed Spectrum



MS Zoomed Spectrum

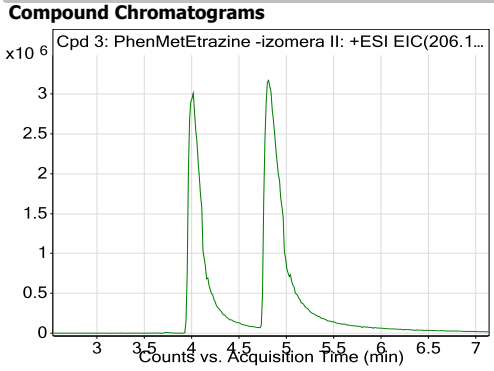


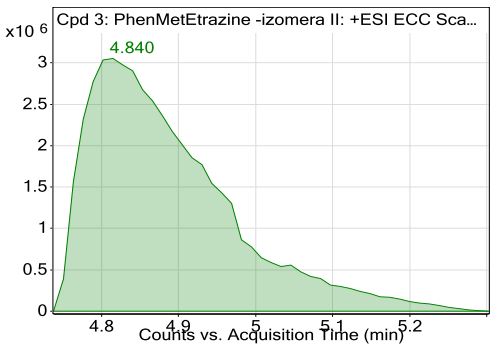
MS Spectrum Peak List

Obs. m/z	Charge	Abund	Formula	Ion/Isotope
206.1539	1	2604161.5	C13 H19 N O	(M+H)+
207.1581	1	341401.25	C13 H19 N O	(M+H)+
208.1602	1	34043.34	C13 H19 N O	(M+H)+
209.1616	1	2034.08	C13 H19 N O	(M+H)+

Name	*Obs. m/z*	Obs. RT	Obs. Mass	DB RT	DB Formula	DB Mass	DB Mass Error (ppm)
PhenMetEtrazine - izomera II	206.154	4.84	205.1468	4.84	C13 H19 N O	205.1467	-0.92

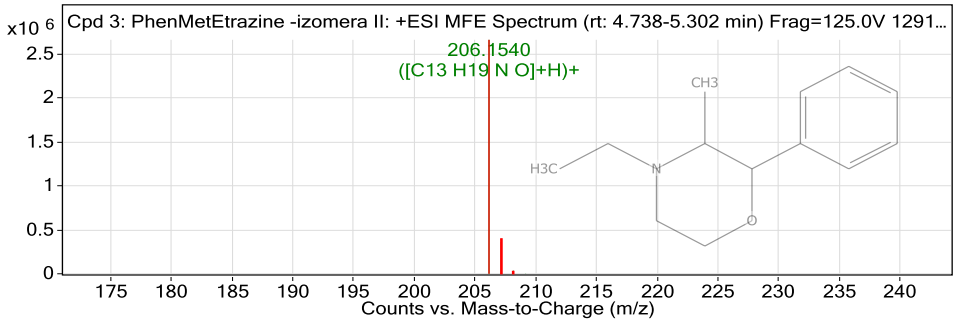
Compound Chromatograms



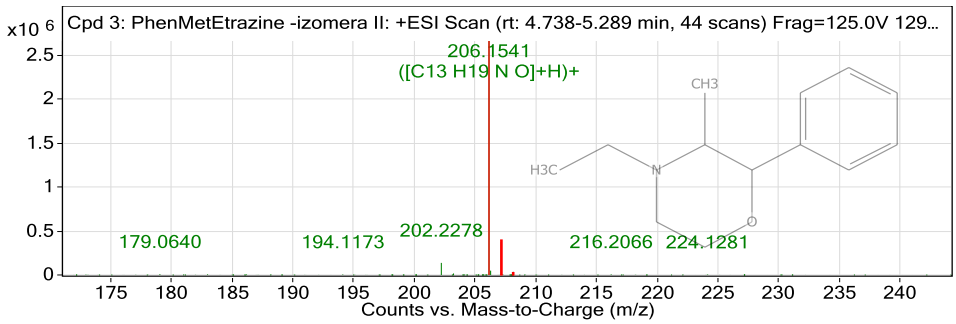


MFE MS Zoomed Spectrum

TOF REPORT



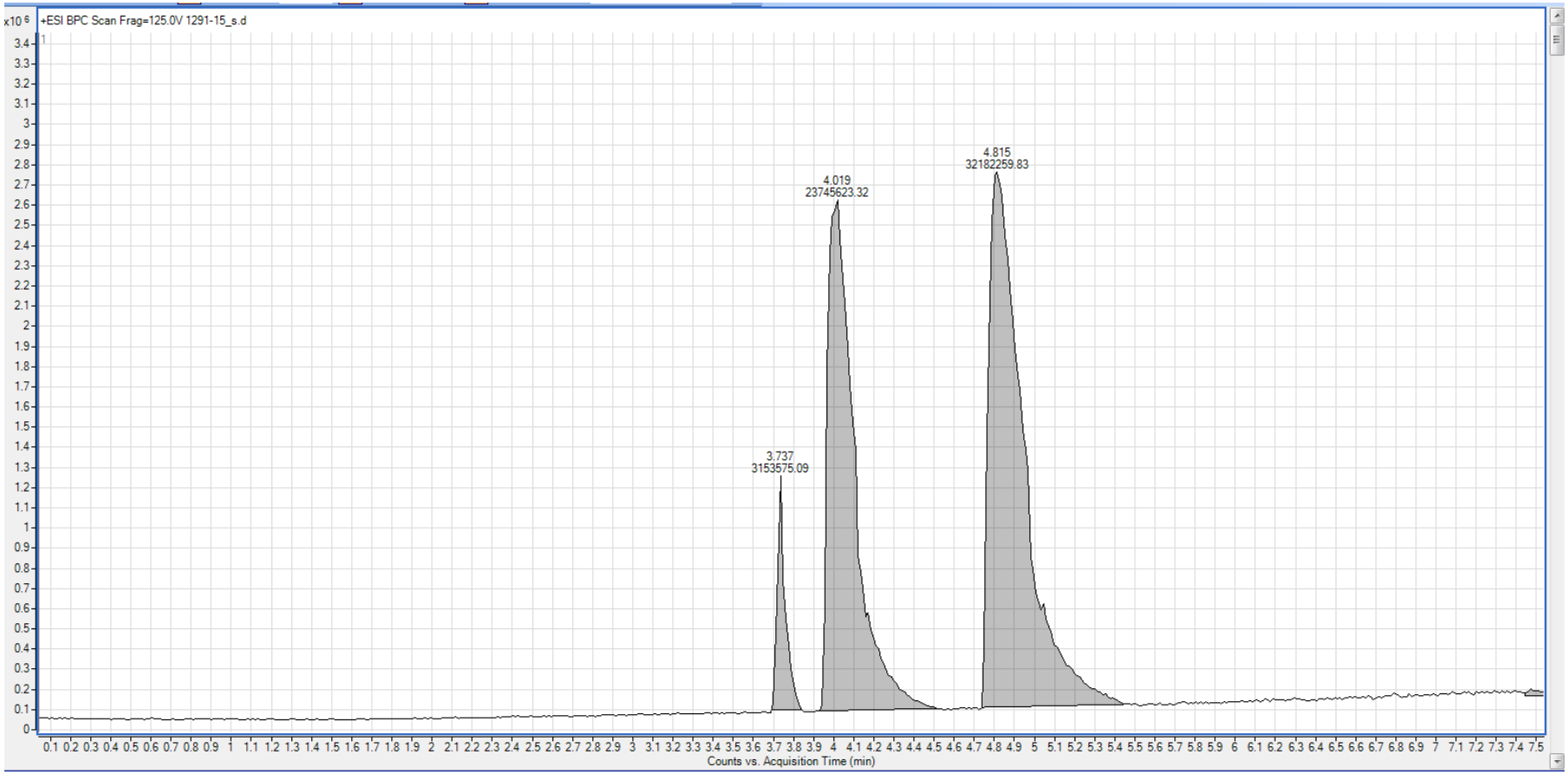
MS Zoomed Spectrum



MS Spectrum Peak List

Obs. m/z	Charge	Abund	Formula	Ion/Isotope
206.154	1	2661083	C13 H19 N O	(M+H)+
207.158	1	360313.34	C13 H19 N O	(M+H)+
208.1602	1	35449.32	C13 H19 N O	(M+H)+
209.1626	1	2143.63	C13 H19 N O	(M+H)+

--- End Of Report ---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+ESI BPC Scan Frag=125.0V 1291-15_s.d
3.737
3153575.09
4.019
23745623.32
4.815
32182259.83
Counts vs. Acquisition Time (min)