

Validation Review

Procedure Method Validation Study on GC/FTIR

Check the appropriate box: New Validation ☐ Modification ☒ Performance Check ☐

Sign and Date to indicate your acceptance of the procedure/instrument:

Examiner (if applicable) Sela Jackson Date 12/6/14

Unit Supervisor Glenn B. Everett Date 12-5-14

Technical Leader (if different than Supervisor) Glenn B. Everett Date 12-5-14

Crime Laboratory Regional Supervisor W. J. [Signature] Date 12-10-14

Quality Assurance Manager [Signature] Date 12-10-14

*All information must be submitted to the Quality Assurance Manager prior to the implementation of the procedure/instrument. If all technical staff training has not been completed, please include a proposed training plan and completion schedule.

Gas Chromatograph/Fourier Transform Infrared (GC/FTIR) Method Validation

Purpose

The purpose of this study is to verify modifications of previously validated and existing methods. Three mixtures of wide ranging compounds typically seen in drug analysis were chosen to demonstrate the suitability of these methods. Please refer to the outline of methods for further information on existing methods and the newly modification of methods. Modifications include shortening the run time and lowering the ramp temperature.

Procedure

A 5 meter column has been installed on GC/FTIR #1. The shorter column can be used to identify compounds that elute slowly due to their high molecular weight i.e. JWH-081, nandrolone undecanoate, and testosterone. A 30 meter column has been installed on GC/FTIR #2. This instrument can be used to identify both small molecular weight i.e. amphetamine, phentermine, and methamphetamine while also being used to identify intermediate molecular weight compounds i.e. cocaine, hydrocone, and pethidine. Multiple instrument methods were developed for each individual GC/FTIR to give the Forensic Chemistry Unit a wide ranging capability to identify a number of compounds in any given case submitted to the FCU. Above mentioned compound mixtures were analyzed on selected GC/FTIRs with specifically selected methods. There is an outline of methods for each GC/FTIR on following pages in the method validation study. Please refer to these pages for additional information. The spectra from the standard mixtures were compared to previously analyzed reference material and found to be acceptable.

Conclusion

After each standard mixture was analyzed, it was determined that all of the methods performed as expected and adequately for the compound of interest. Some compounds did not produce results. This was due to the type of compound being analyzed in relationship to the method parameter. For example, one would not expect pethidine to elute on a short column with high temperature isothermal method such as 270°C or nandrolone undecanoate to elute on the 5S method due to the temperature ramp being cut in half from 70°C to 35°C and also the length of the run time being 20 minutes. However, there are more suitable methods for analysis of those compounds.

Training

Additional training is not necessary due to the fact that instrumental methods used for GC/FTIR are similarly configured as previously validated GC/FTIR and GC/MS methods. Analysts have been exposed to these methods through the Forensic Chemistry Unit's Controlled Substance Training Program. In most cases, the GC/FTIR is used as a supporting or secondary test meaning that the analyst already knows the identity of the compound of interest via other testing and can choose the appropriate GC/FTIR and method based on previous analyses.

Outline of Methods

GC/IR #1 (Short column)

Method	Description
1s	90-270°C @70°C/ min for 20 min
2s	200-270°C @70°C min for 20 min
3s	270°C Isothermal for 20 min
4s	270°C Isothermal for 30 min
5s	90-270°C @35°C/ min for 20 min
6s	90-270°C @35°C/ min for 30 min
7s	90-270°C @70°C/ min for 10 min
8s	200-270°C @70°C/ min for 10 min

GC/IR #2 (Long column)

Method	Description
1L	120-270°C @70°C/ min for 20 min
2L	200-270°C @70°C/ min for 20 min
3L	270°C Isothermal for 20 min
4L	270°C Isothermal for 30 min
5L	120-270°C @70°C/ min for 10 min
6L	200-270°C @70°C/ min for 10 min

Reagents

Amphetamine, Methamphetamine, Phentermine Standard (AMP)

Exp. 12/17/14

<u>Standard</u>	<u>Manufacturer</u>	<u>Lot number</u>
Amphetamine	K & K	83567
Methamphetamine	Sigma	34H0144
Phentermine	Sigma	47H0208

Pethidine, Cocaine, Hydrocodone Standard (PCH)

Exp. 1/29/15

<u>Standard</u>	<u>Manufacturer</u>	<u>Lot number</u>
Pethidine	S.B. Penick	413NMN-027
Cocaine	Sigma	50k1124
Hydrocodone	Merck	V1526

JWH 081, Nandrolone Undecanoate, Testosterone Standard (JNT)

Exp. 9/11/15

<u>Standard</u>	<u>Manufacturer</u>	<u>Lot number</u>
JWH 081	Cayman Chemical	0423966-21
Nandrolone Undecanoate	Steraloids	B0547
Testosterone	Sigma	50H0345 label A

GC/IR #1

GC/IR #1 (short column)

	Methods							
<u>Compounds</u>	1s	2s	3s	4s	5s	6s	7s	8s
Pethidine	+	+	-	/	/	/	+	+
Cocaine	+	+	+	/	/	/	+	+
Hydrocodone	+	+	+	/	/	/	+	+
Testosterone	/	/	/	+	+	+	/	/
JWH 081	/	/	/	+	+	+	/	/
Nandrolone Undecanoate	/	/	/	+	-	+	/	/

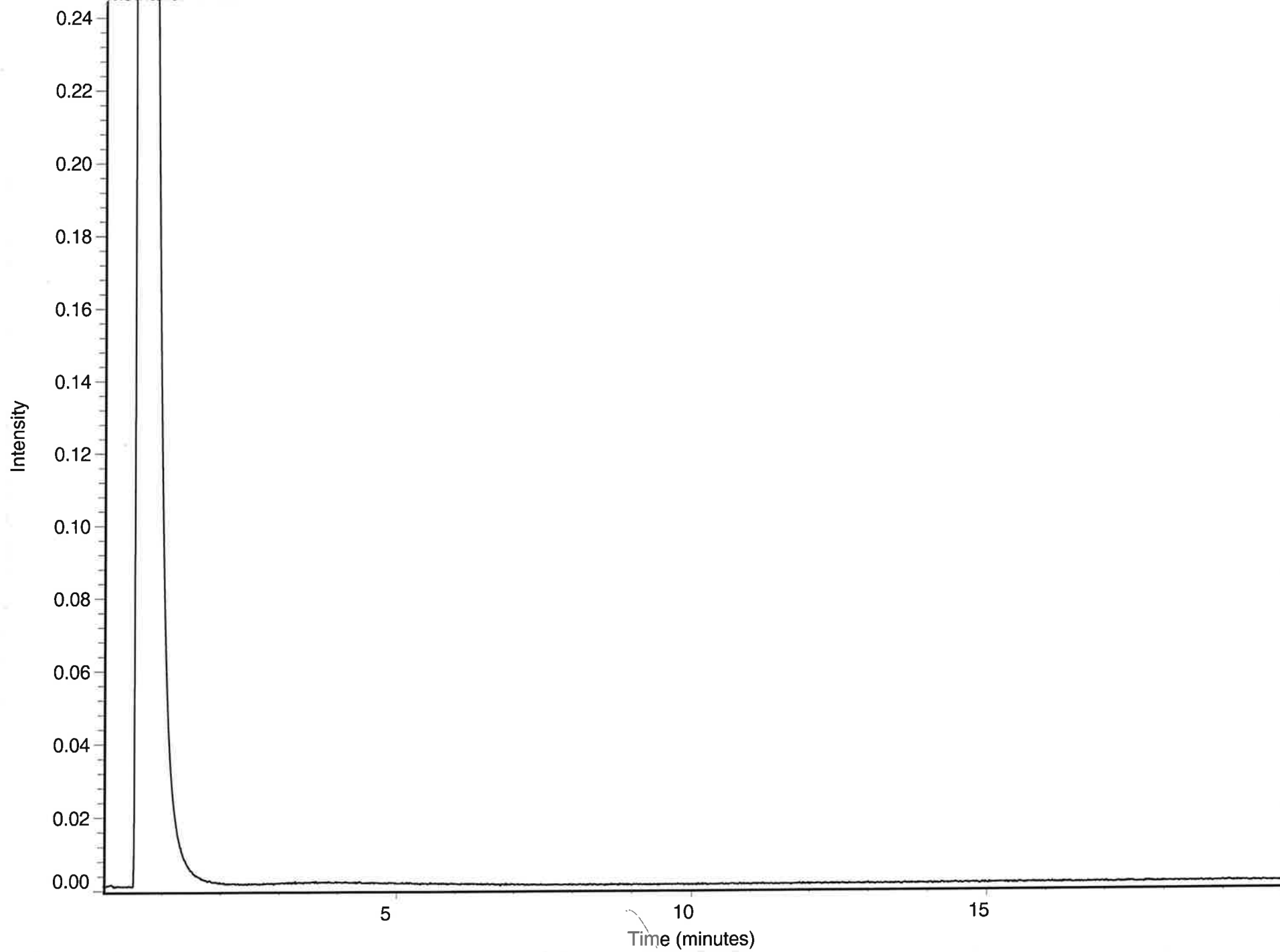
/ = Compounds not run on method

+ = Compounds present

- = Compounds absent

Methanol Blank

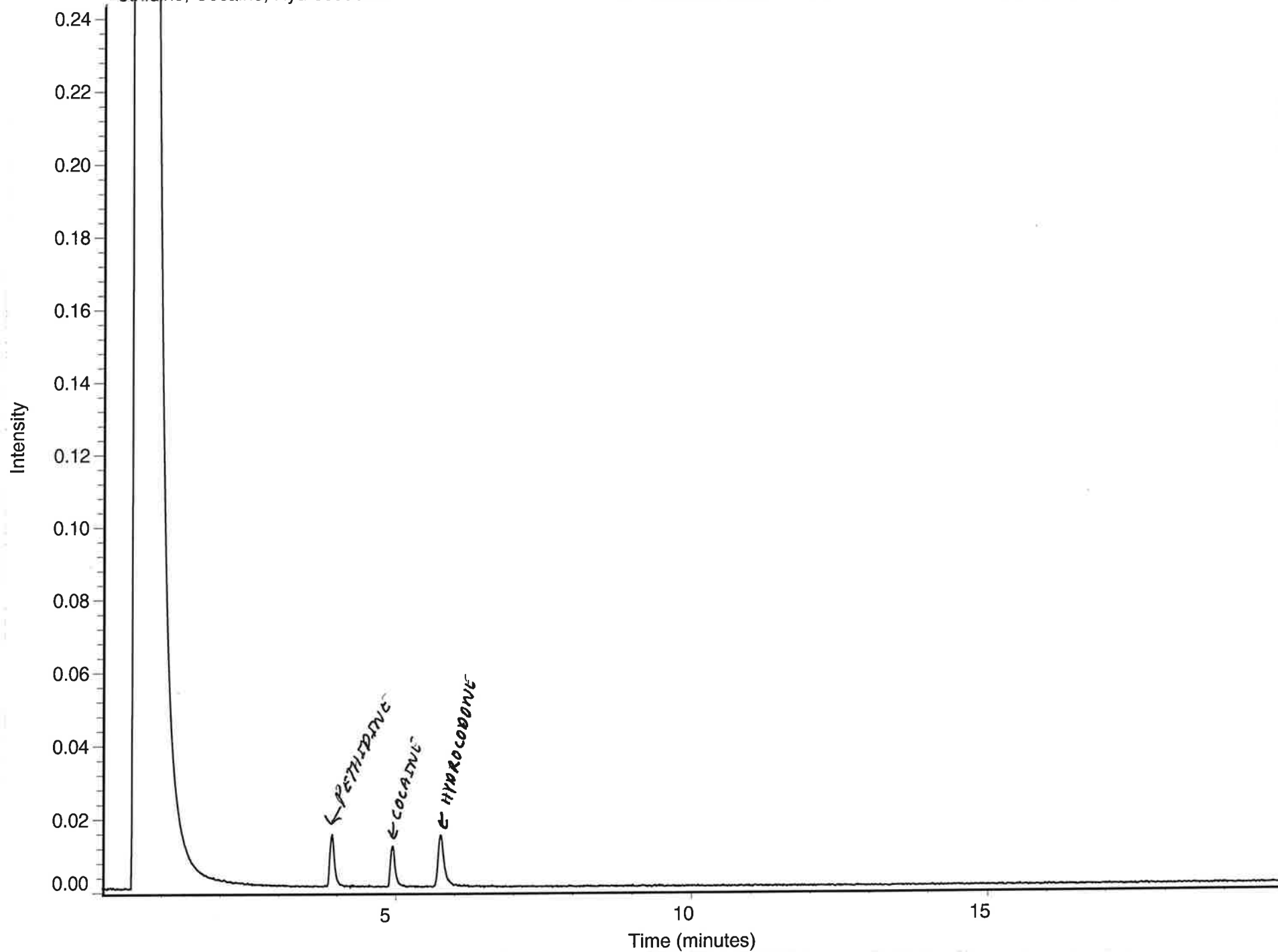
Methanol 90-27 @70c/min for 20 min GCIR #1 12/3/14 LJ

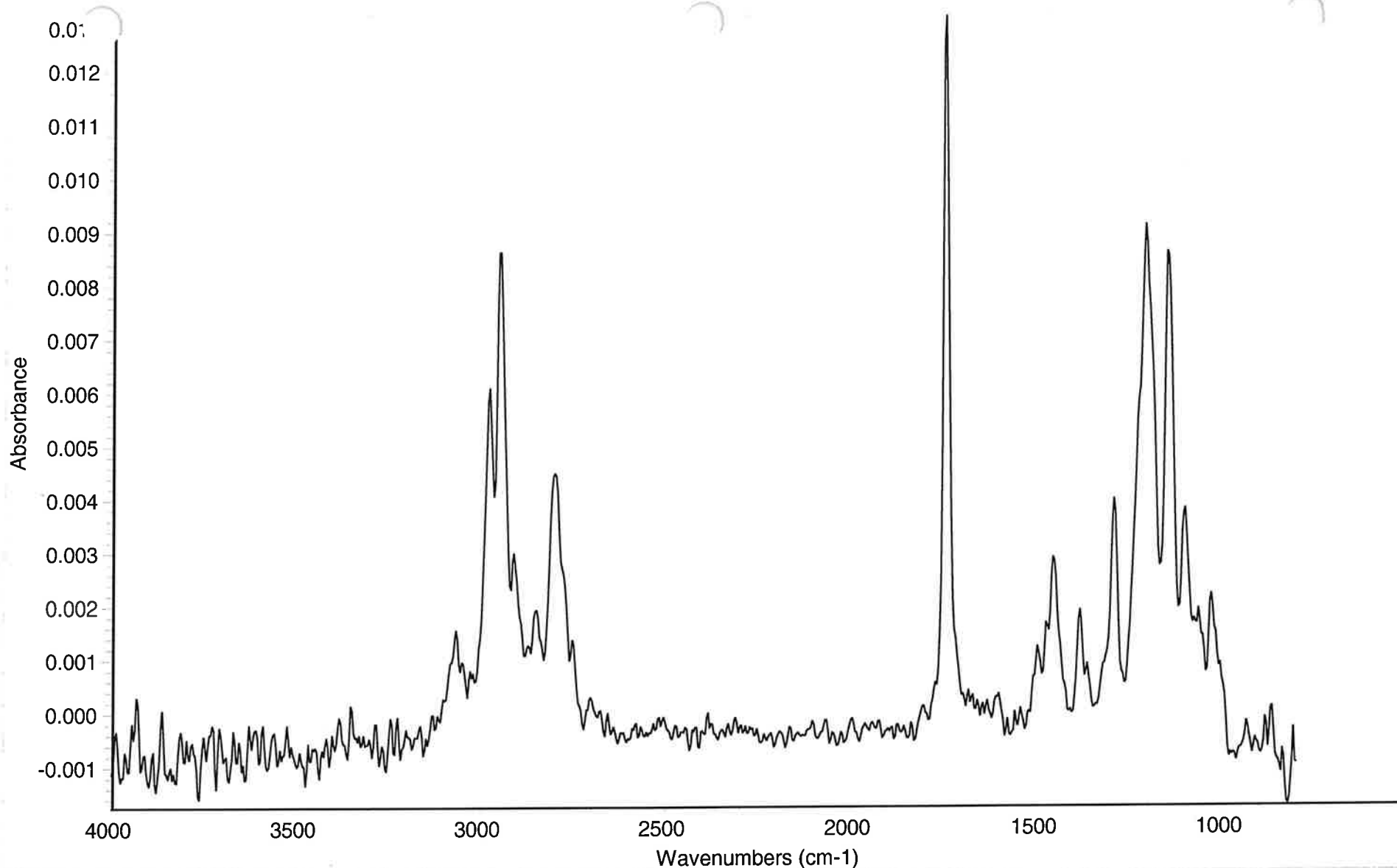


Pethidine, Cocaine, Hydrocodone

Anal 90-270c @70c/min for 20 min

GCIR #1 12/3/14 LJ





Pethidine

Methanol 90-270c @70c/min for 20 min

GCIR #1 12/3/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

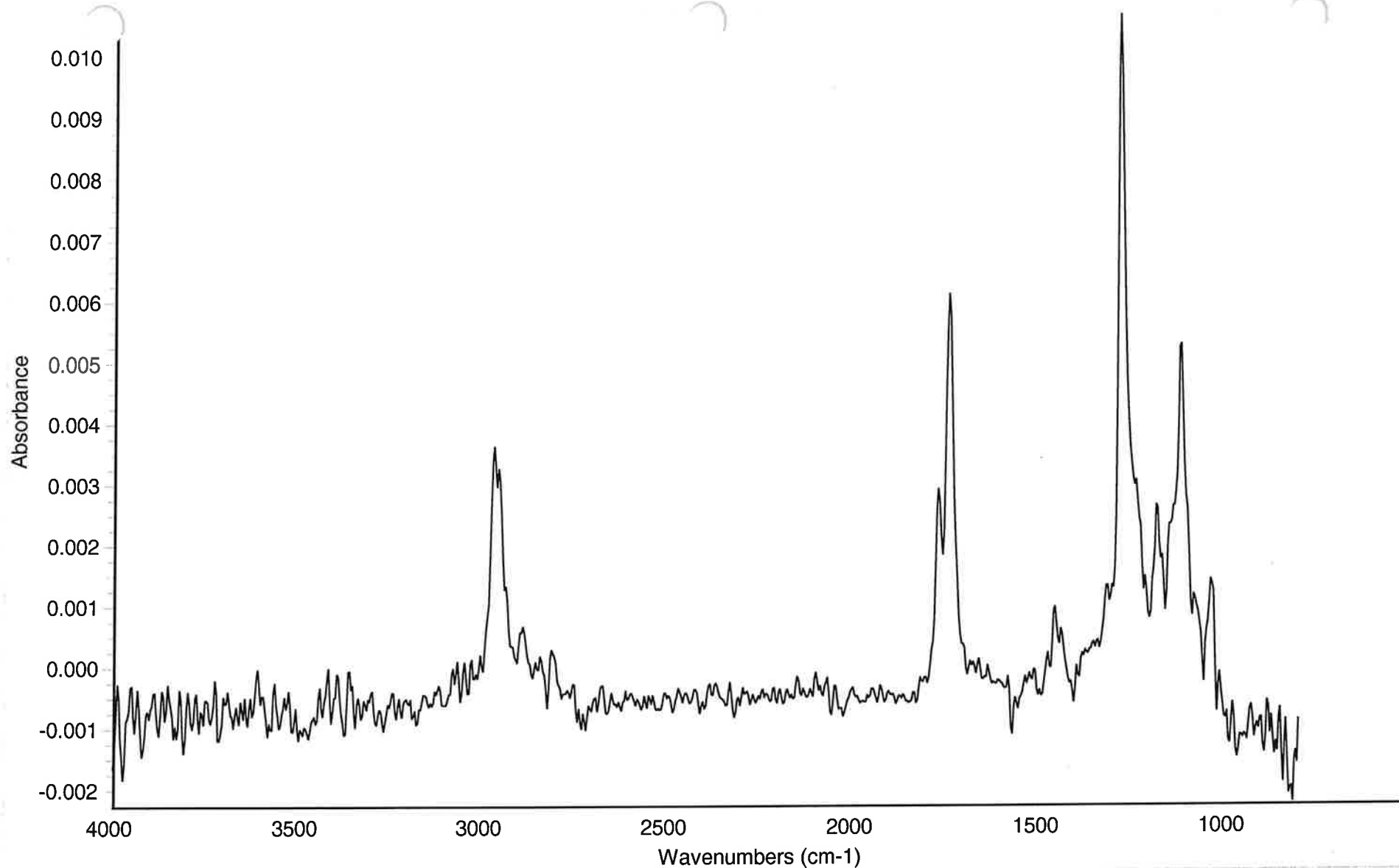
Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D*
Beamsplitter: KBr
Source: IR
Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Dec 03 14:08:59 2014 (GMT-06:00)



Cocaine

Methanol 90-270c @70c/min for 20 min

GCIR #1 12/3/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT-High D*
Beamsplitter: KBr
Source: IR
Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Dec 03 14:10:02 2014 (GMT-06:00)

Absorbance

0.012
0.011
0.010
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
-0.001

4000 3500 3000 2500 2000 1500 1000
Wavenumbers (cm-1)

Hydrocodone

Methanol 90-270c @70c/min for 20 min

GCIR #1 12/3/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

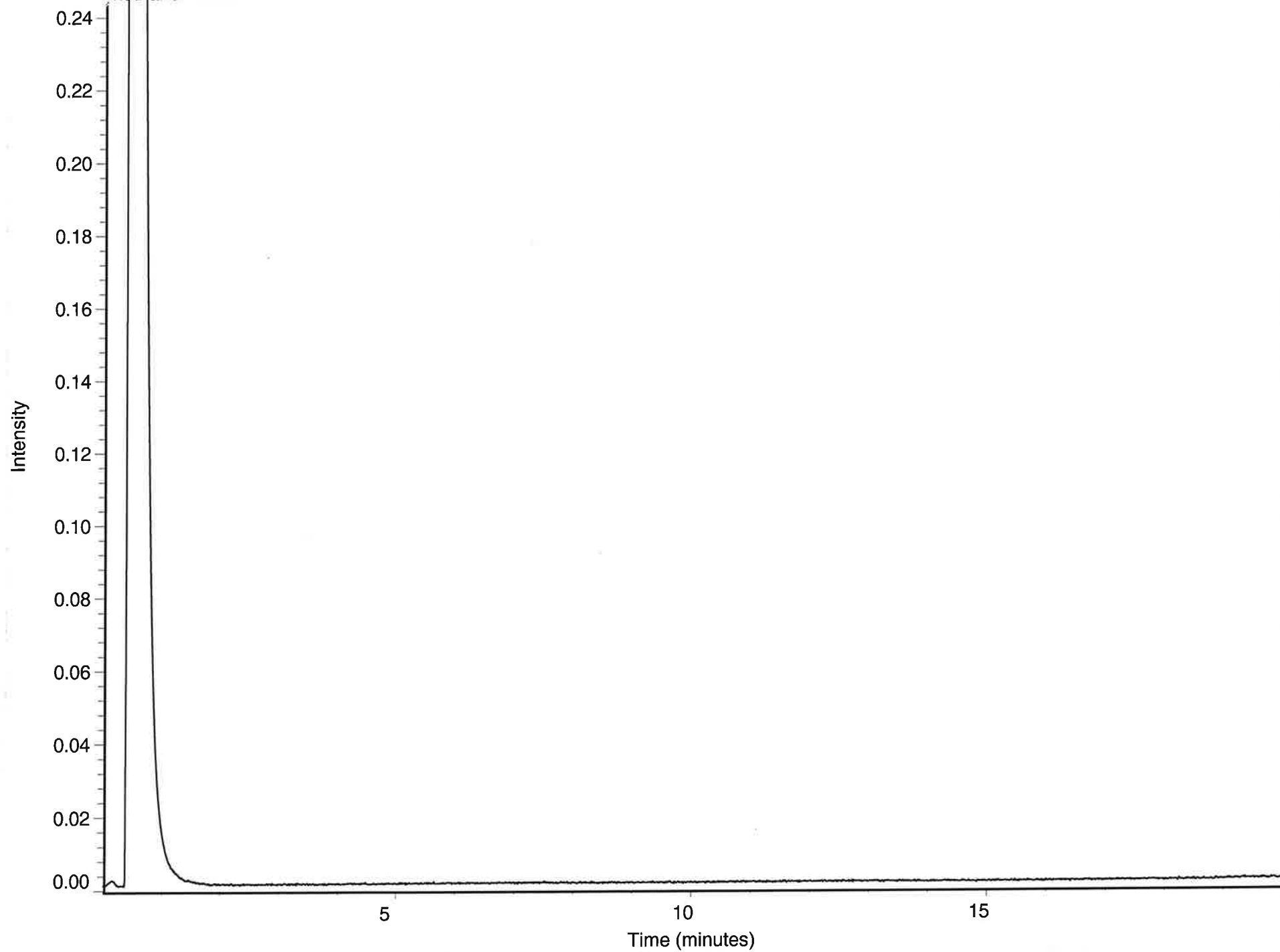
Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Dec 03 14:10:50 2014 (GMT-06:00)

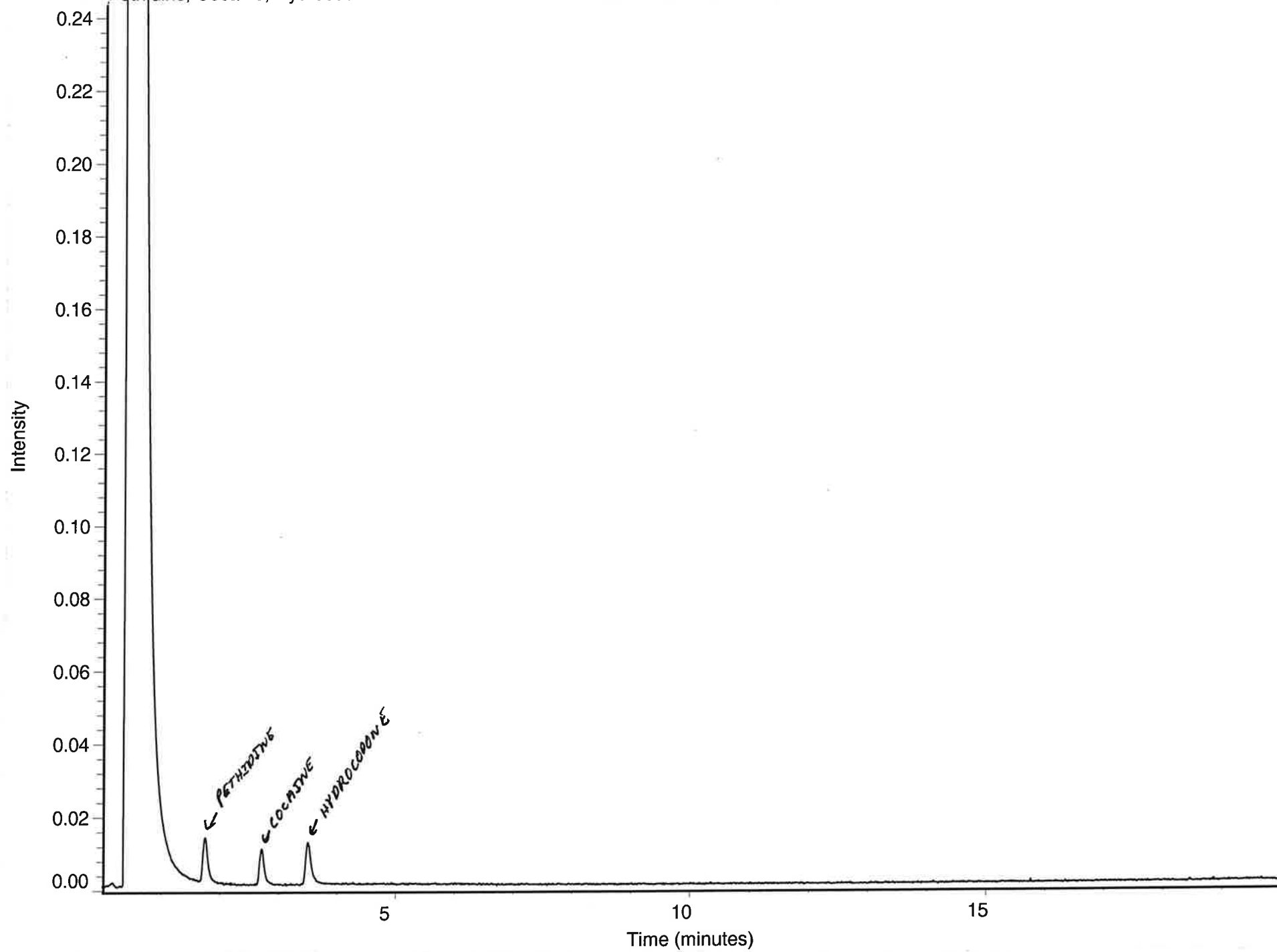
Methanol Blank

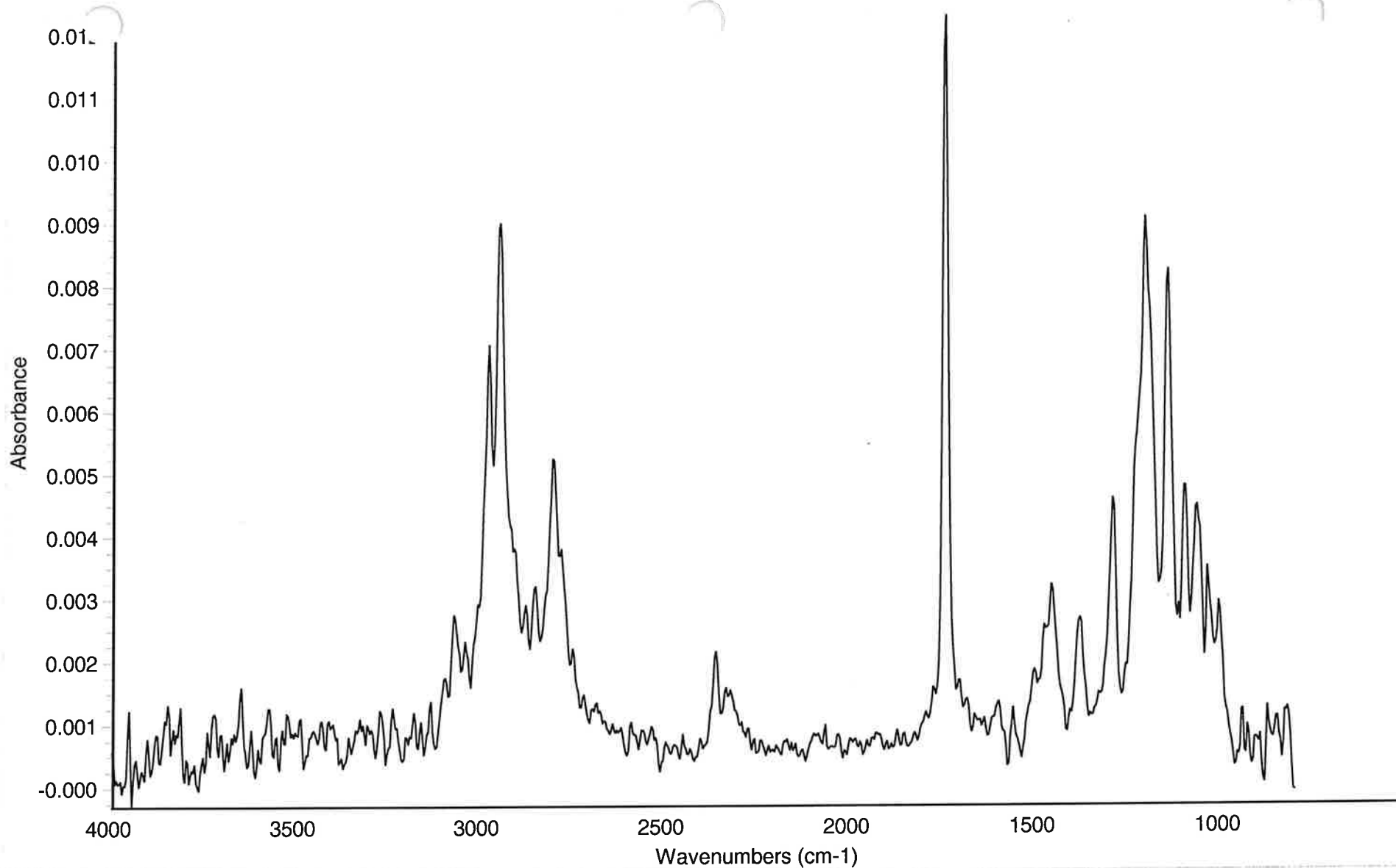
Methanol 200-270c 0c/min for 20 min GCIR #1 12/4/14 LJ



Pethidine, Cocaine, Hydrocodone

Me₂SO 200-270c @70c/min for 20 min GCIR #1 12/4/14 LJ





Pethidine

Methanol 200-270c @70c/min for 20 min GCIR #1 12/4/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

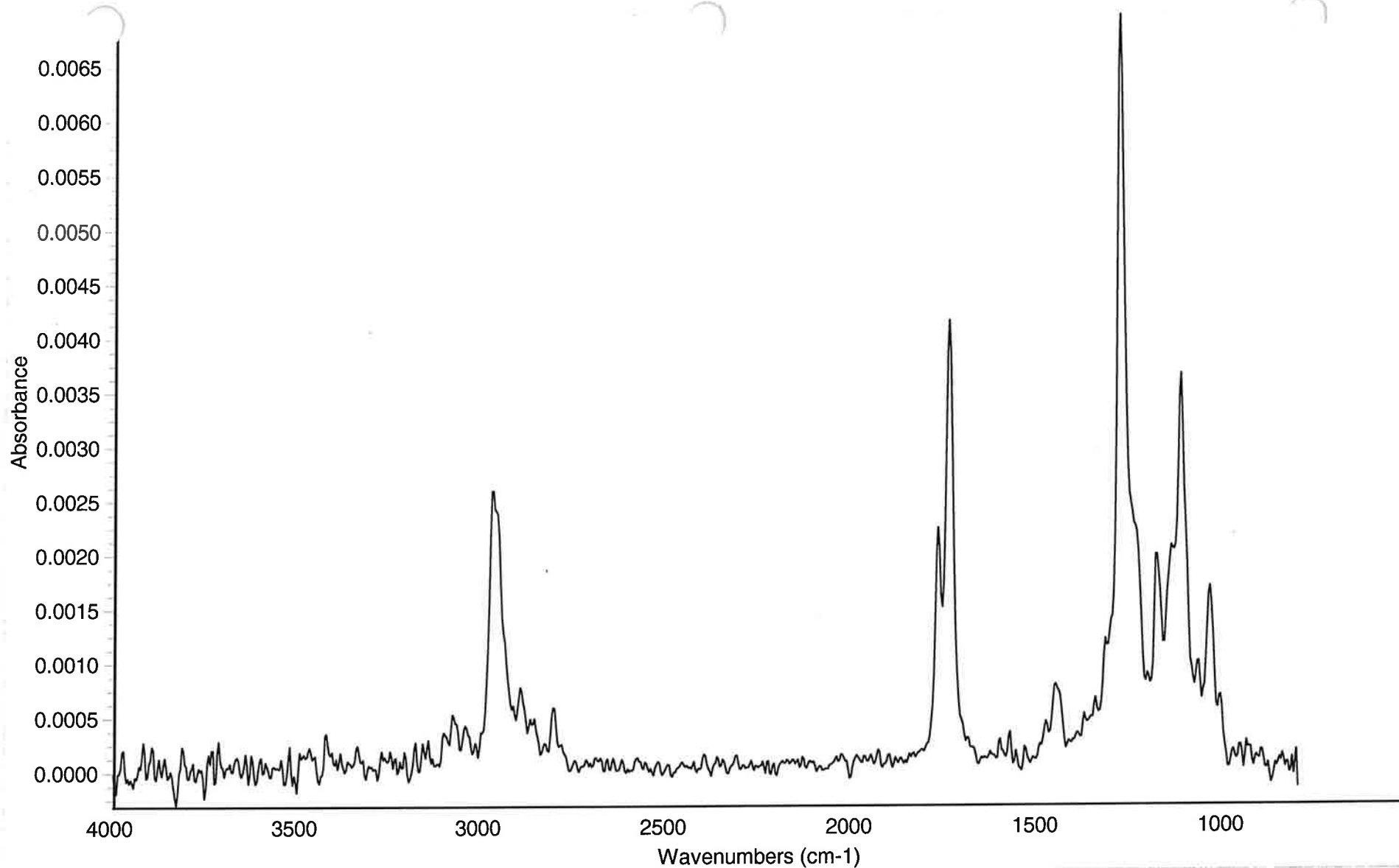
Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Thu Dec 04 08:02:43 2014 (GMT-06:00)



Cocaine

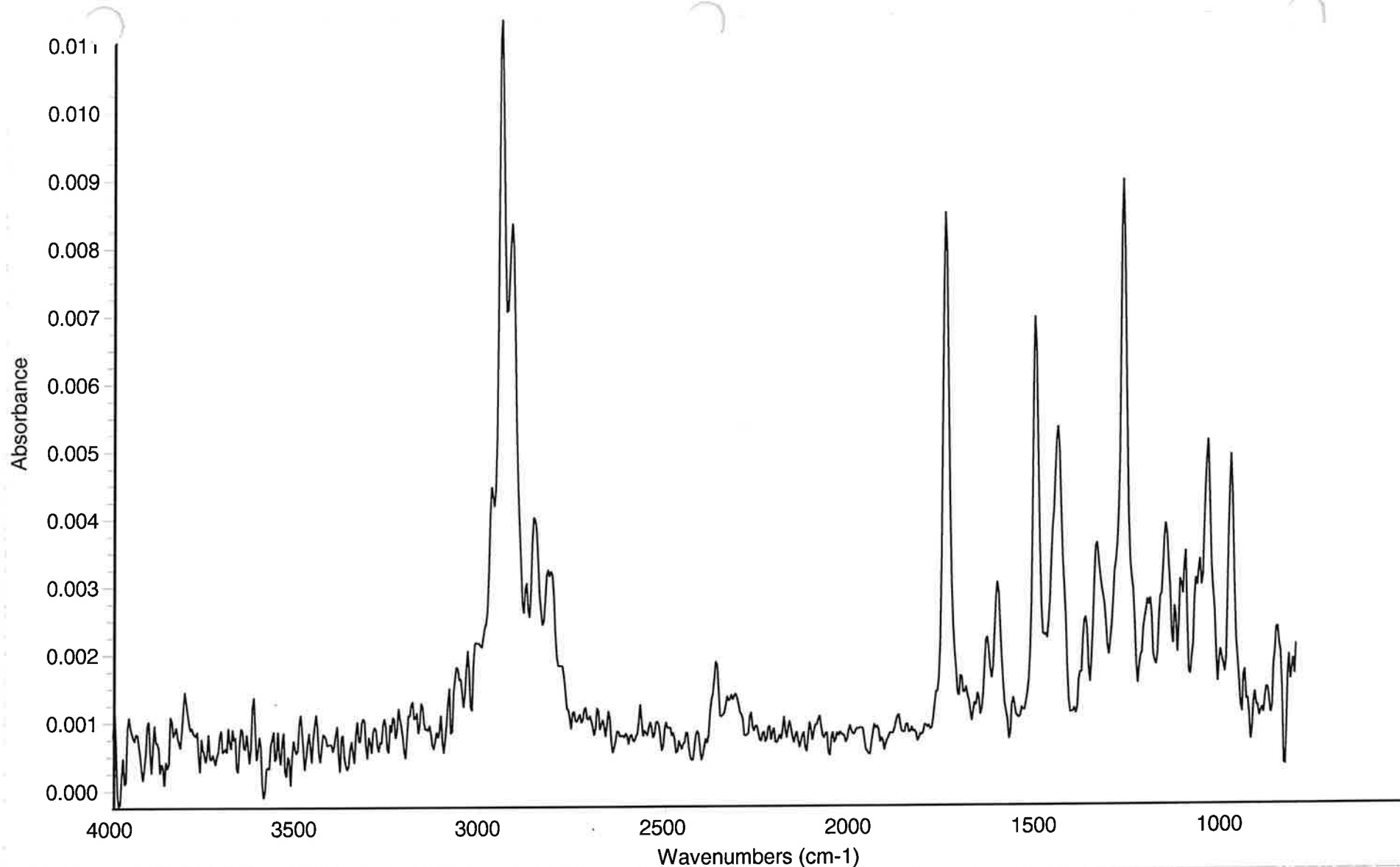
Methanol 200-270c @70c/min for 20 min GCIR #1 12/4/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

GC/FTIR 1

Collection time: Thu Dec 04 08:30:17 2014 (GMT-06:00)

Detector: MCT-High D* Number of sample scans: 44
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00



Hydrocodone

Methanol 200-270c @70c/min for 20 min GCIR #1 12/4/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

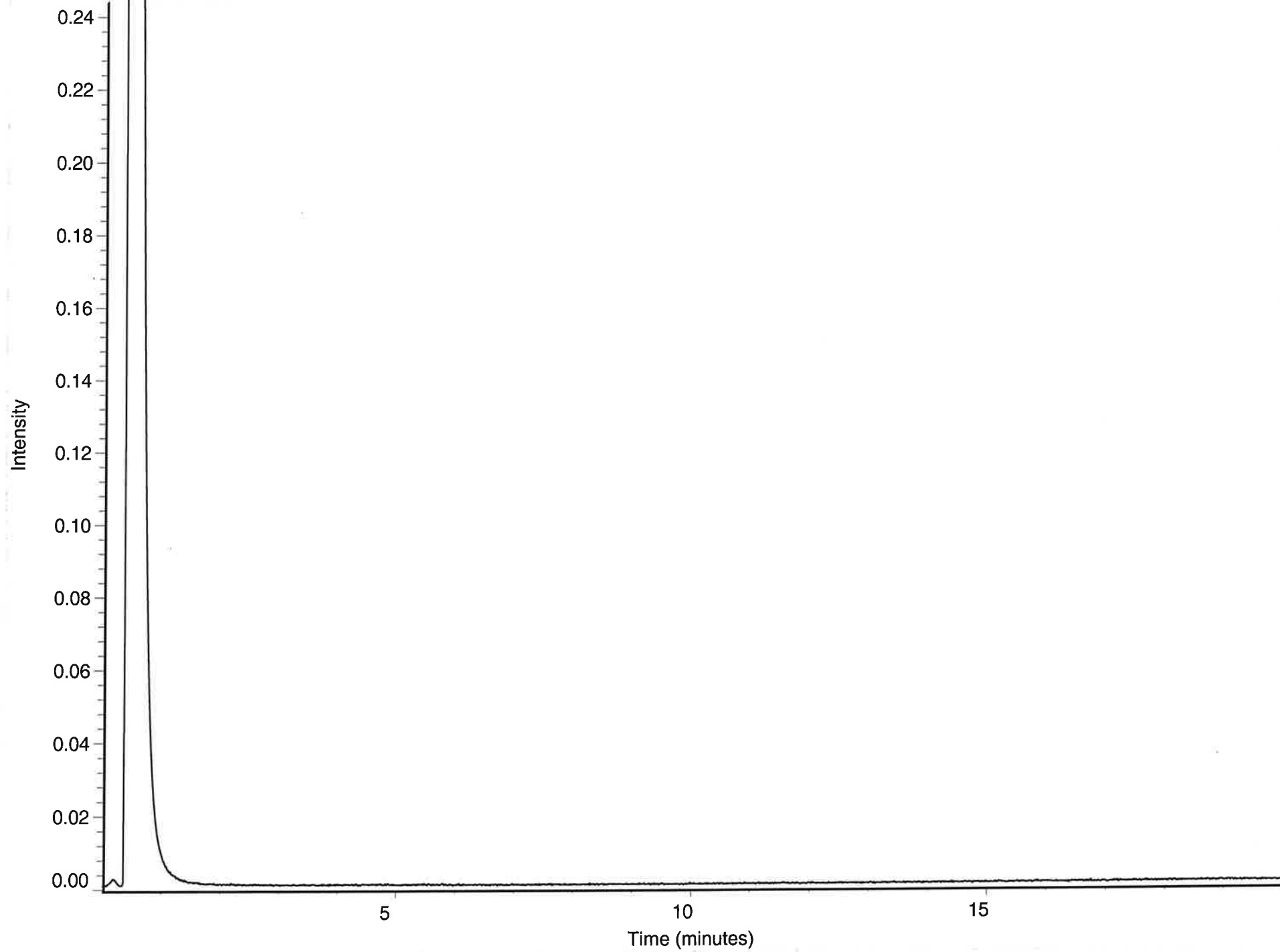
Detector: MCT-High D*
Beamsplitter: KBr
Source: IR
Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Thu Dec 04 08:04:29 2014 (GMT-06:00)

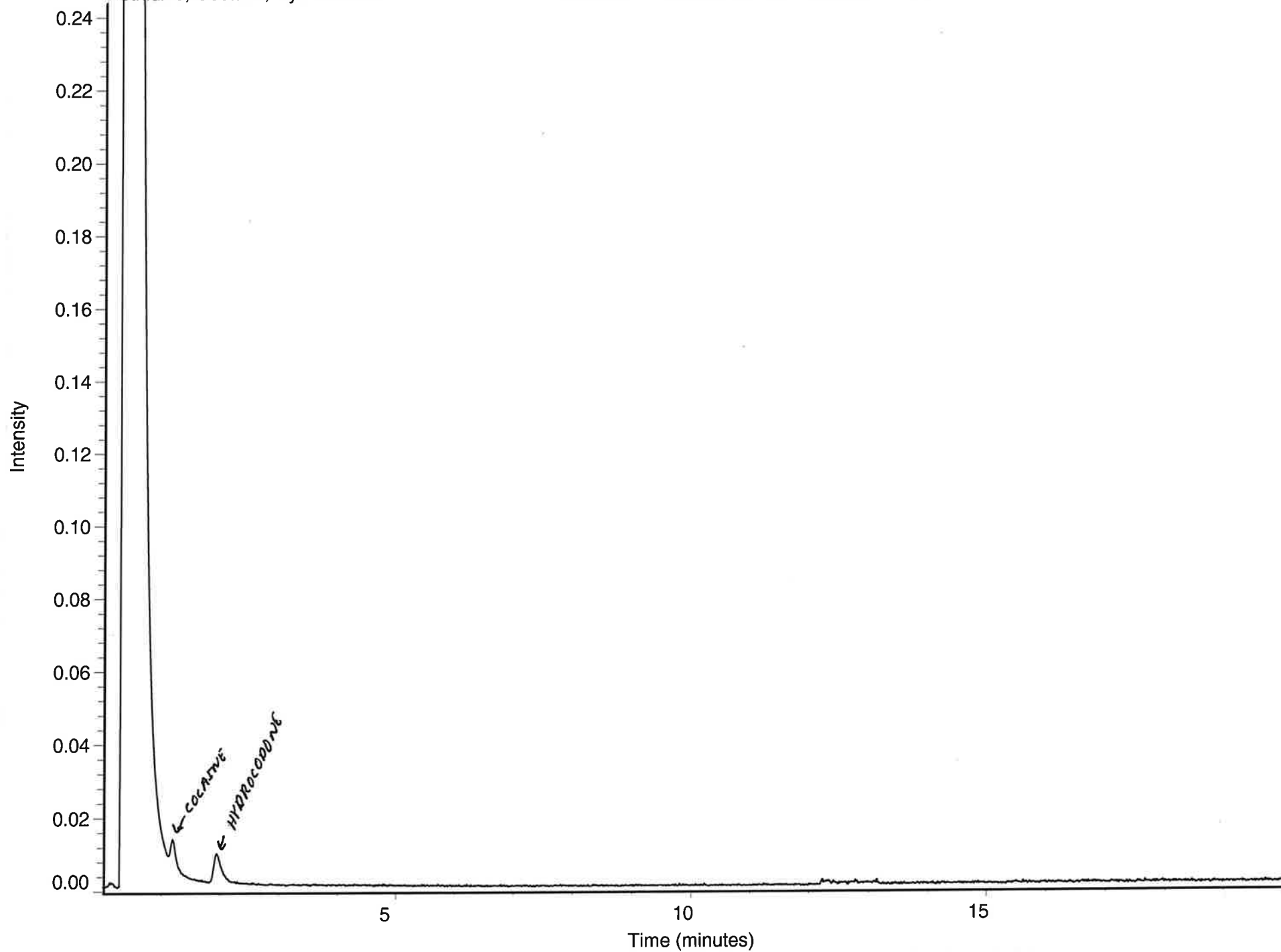
Methanol Blank

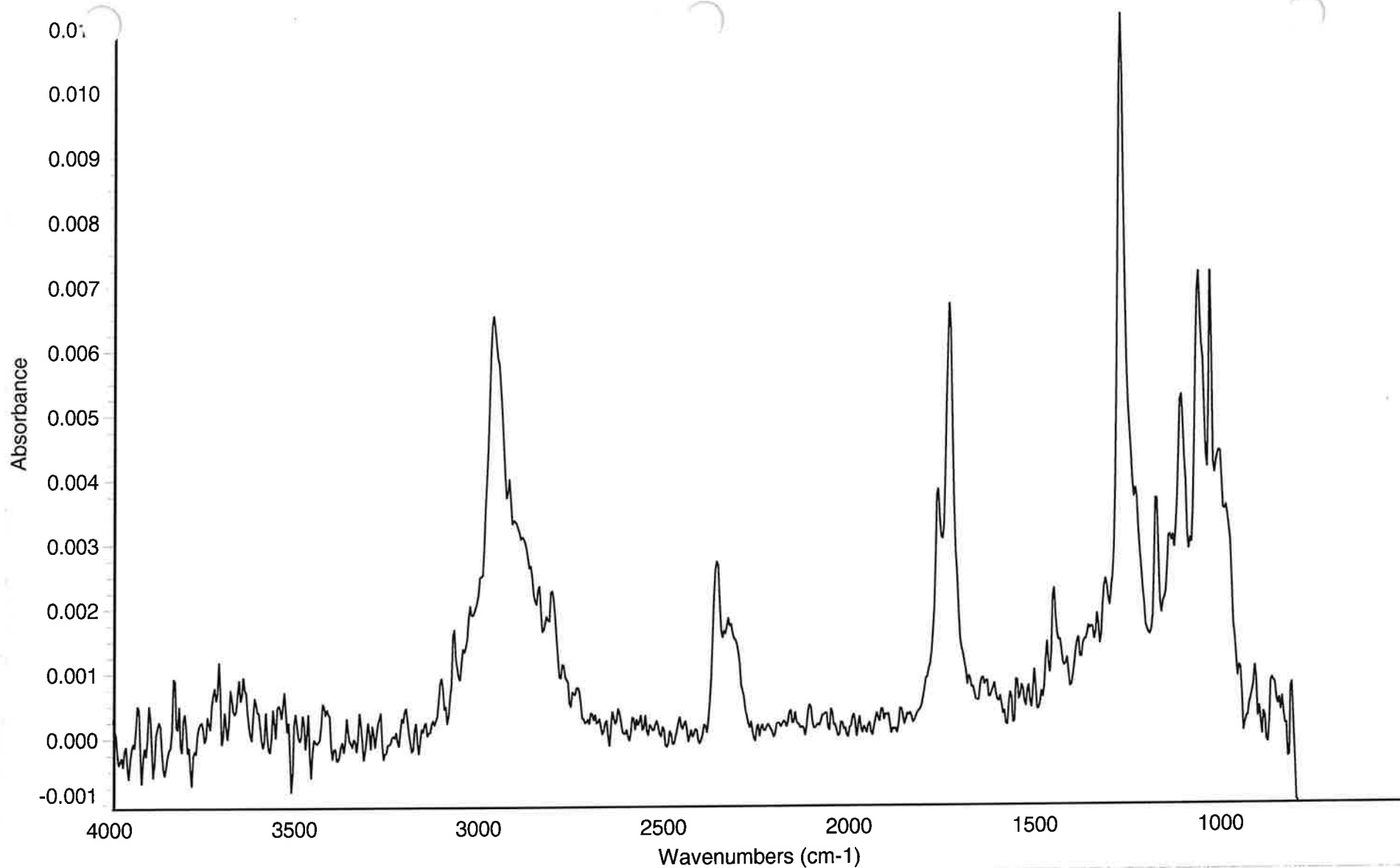
Methanol 270c for 2 min GCIR #1 12/4/14 LJ



Pethidine, Cocaine, Hydrocodone

Methar. 270c for 20 min GCIR #1 12/4/14 LJ





Weak Cocaine

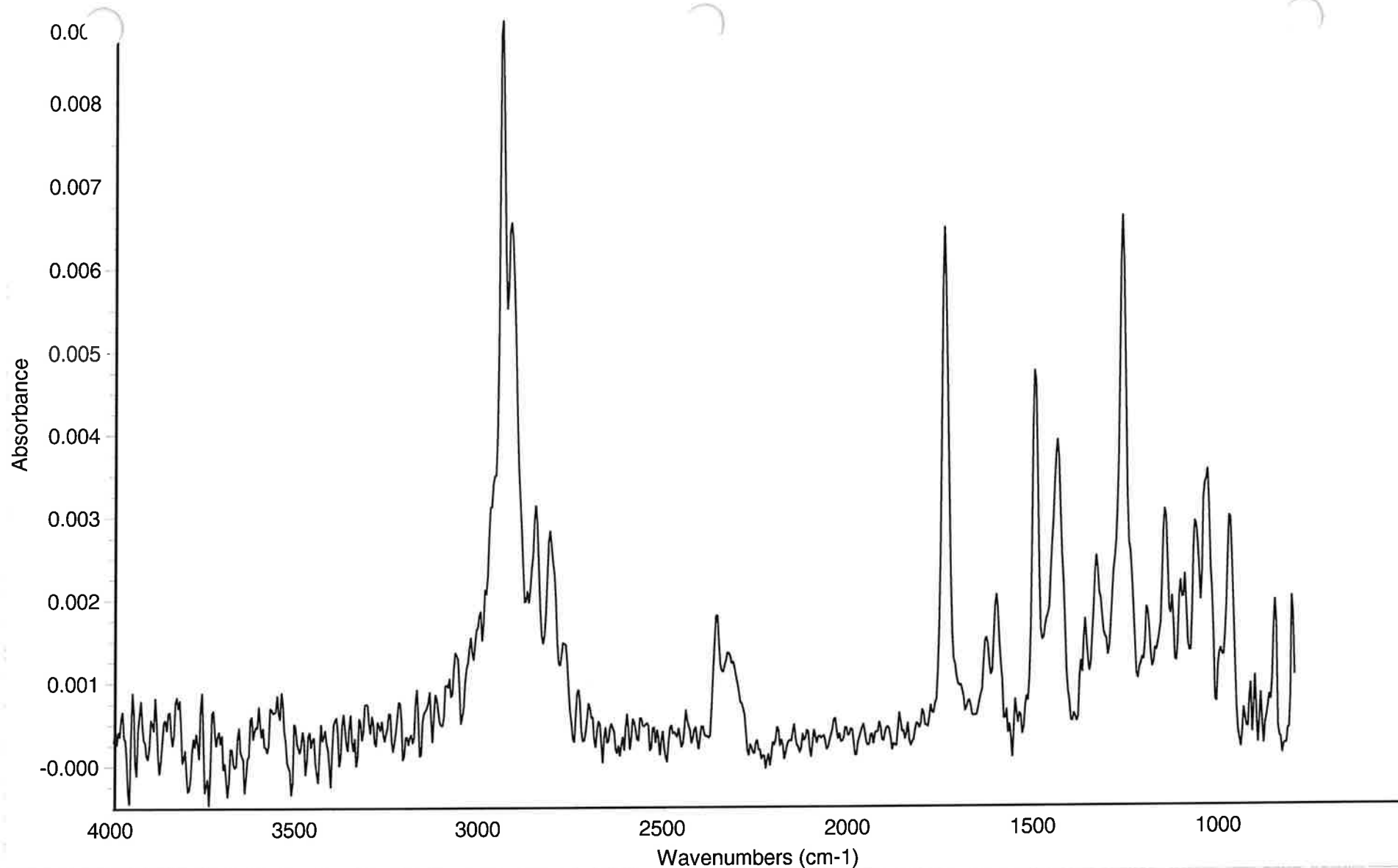
Methanol 270c for 20 min GCIR #1 12/4/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Thu Dec 04 08:47:26 2014 (GMT-06:00)



Hydrocodone

Methanol 270c for 20 min GCIR #1 12/4/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

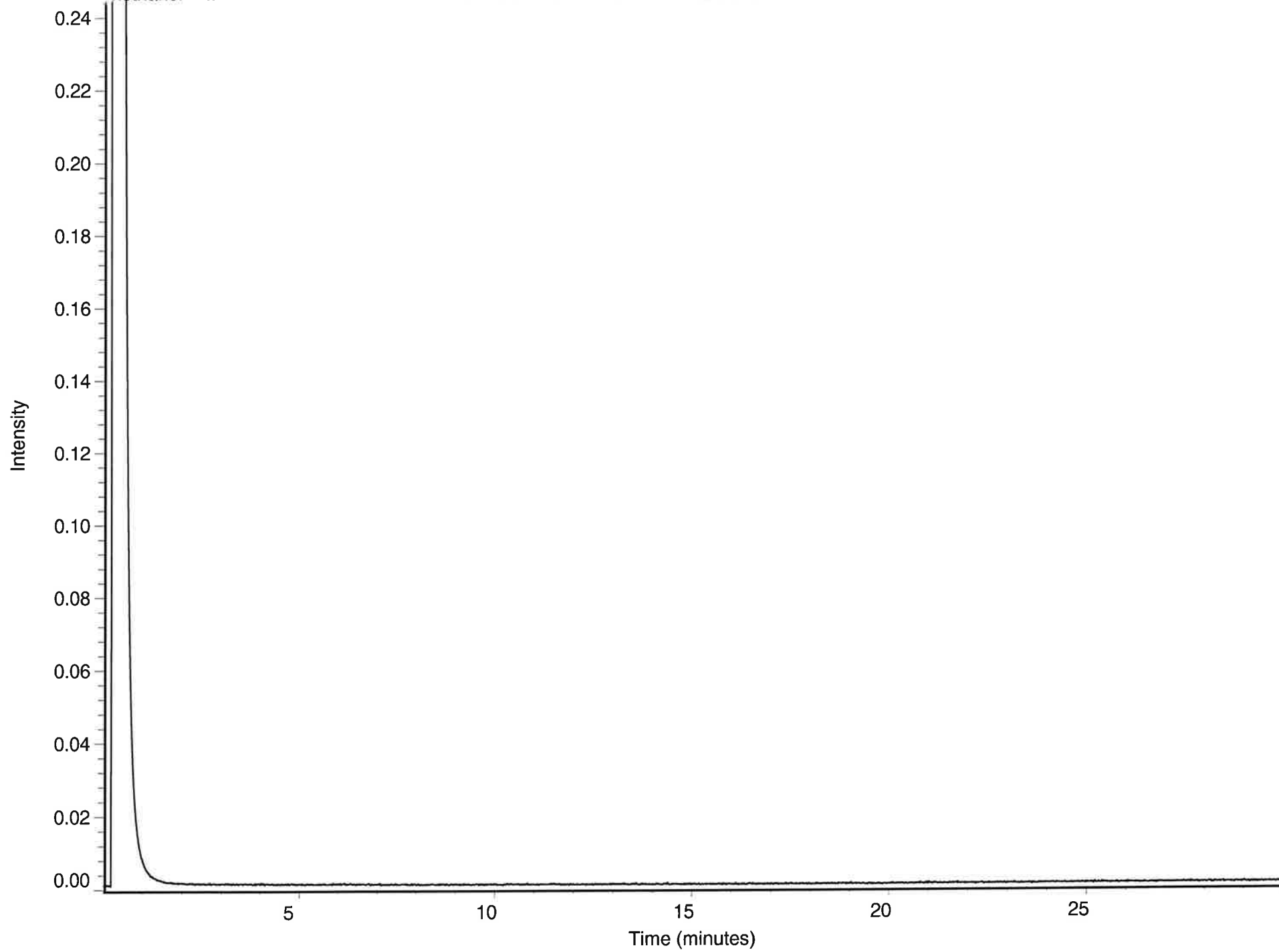
GC/FTIR 1

Collection time: Thu Dec 04 08:48:10 2014 (GMT-06:00)

Detector: MCT-High D*
Beamsplitter: KBr
Source: IR
Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

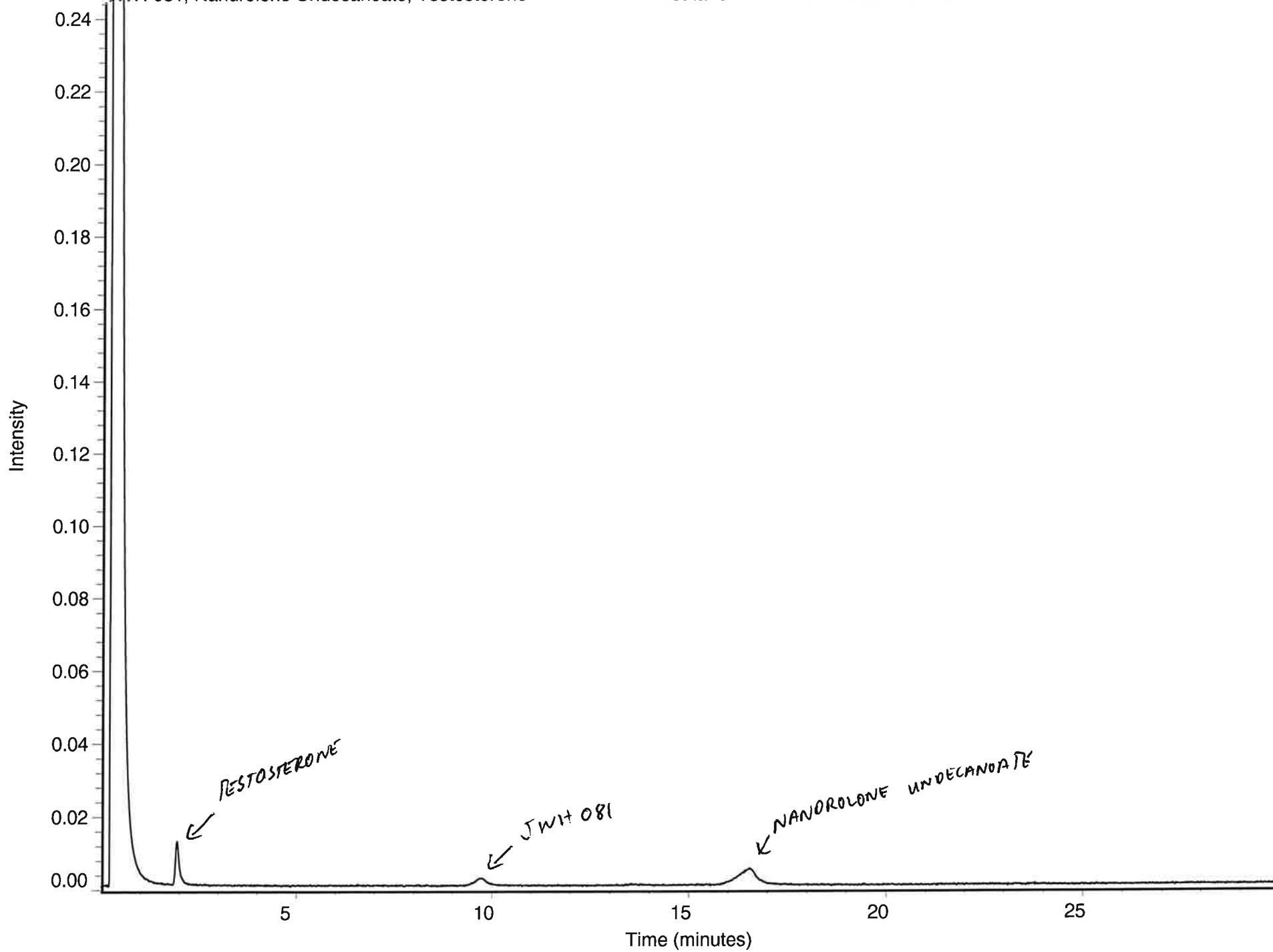
Methanol Blank

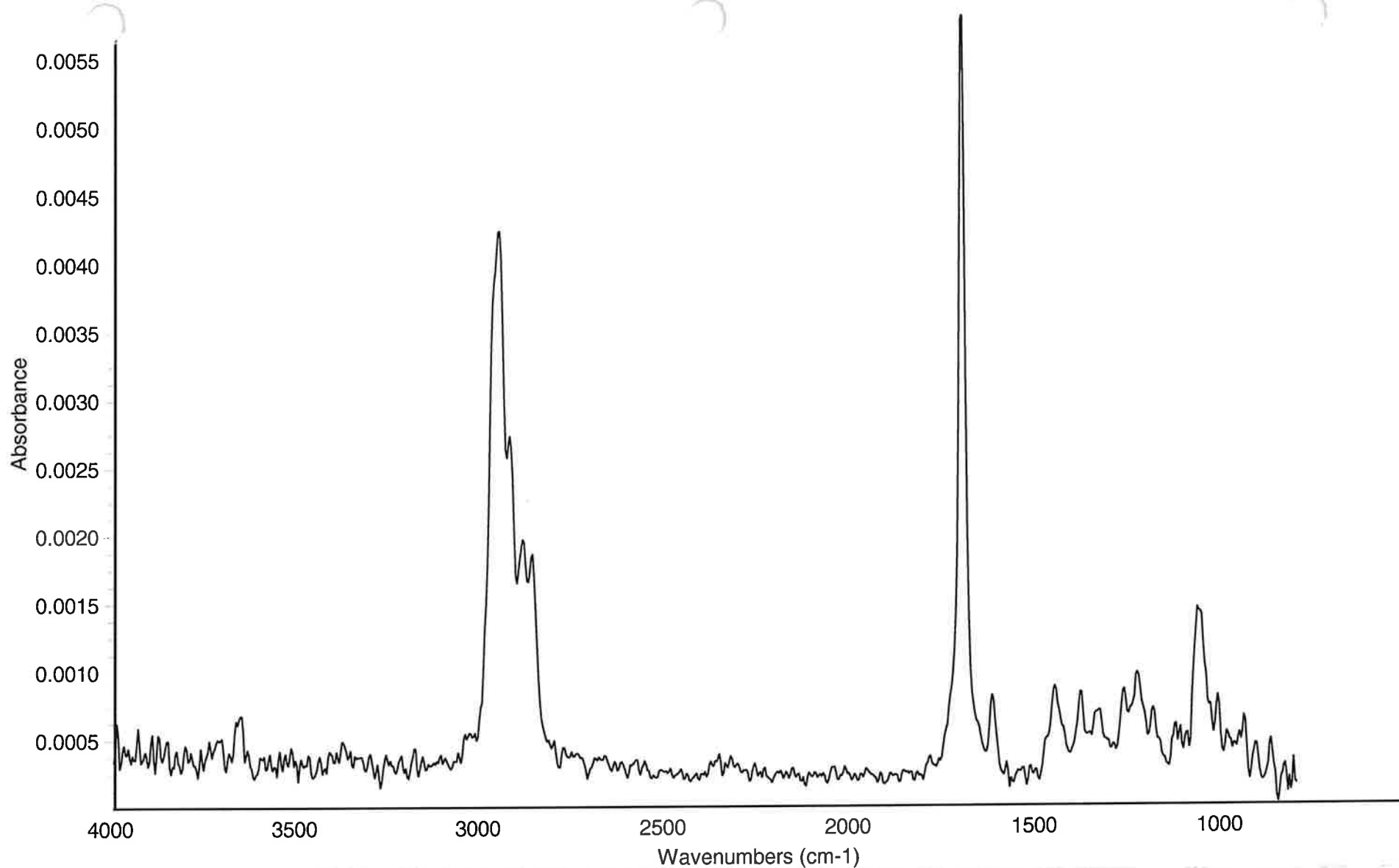
Methanol 270c for 30 min GC #1 11/12/14 LJ



WH 081, Nandrolone Undecanoate, Testosterone

Methanol 270c for 30 min GCIR #1 11/12/14 LJ





Testosterone

Methanol 270c for 30 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

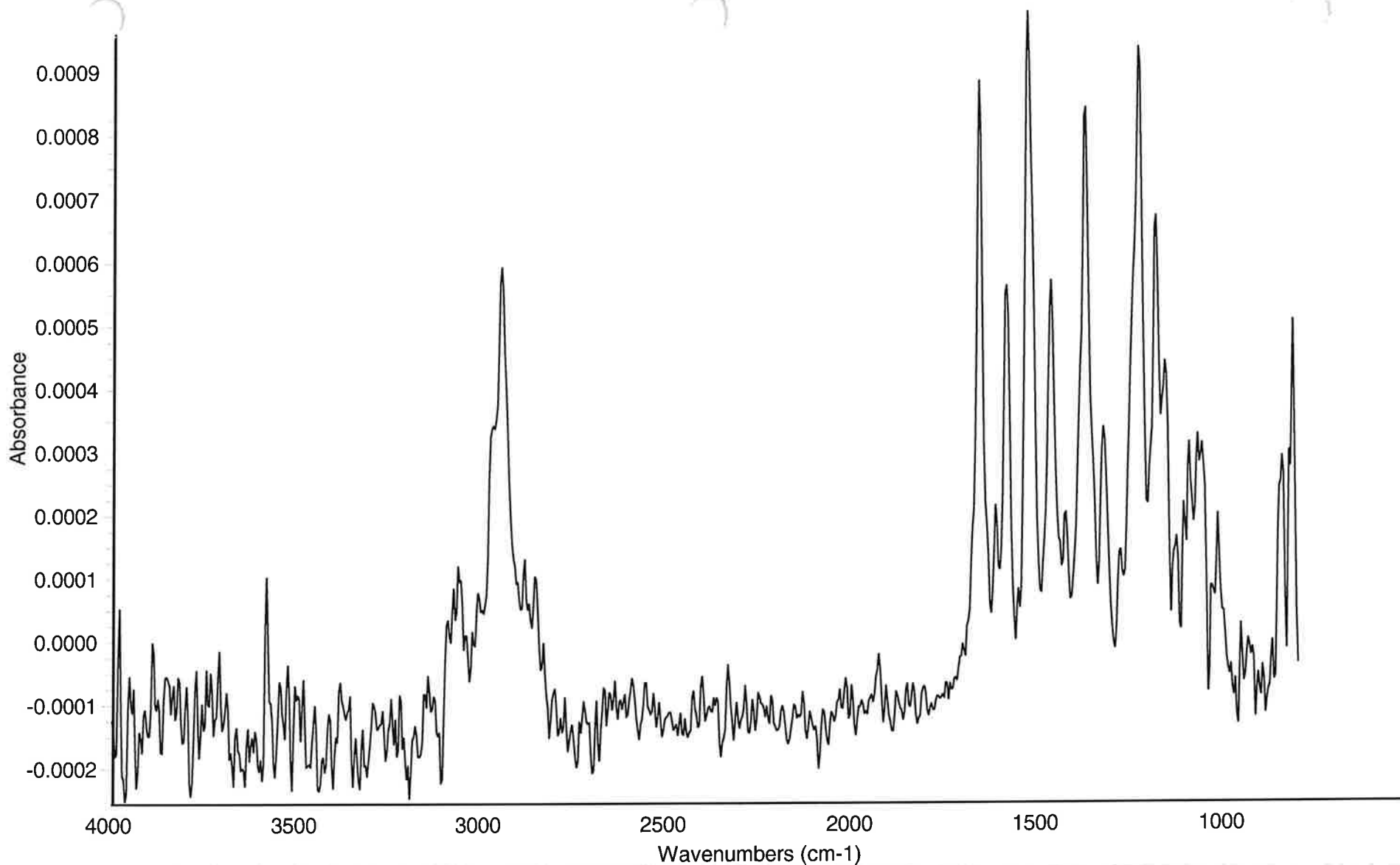
Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 76
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 12 11:50:16 2014 (GMT-06:00)



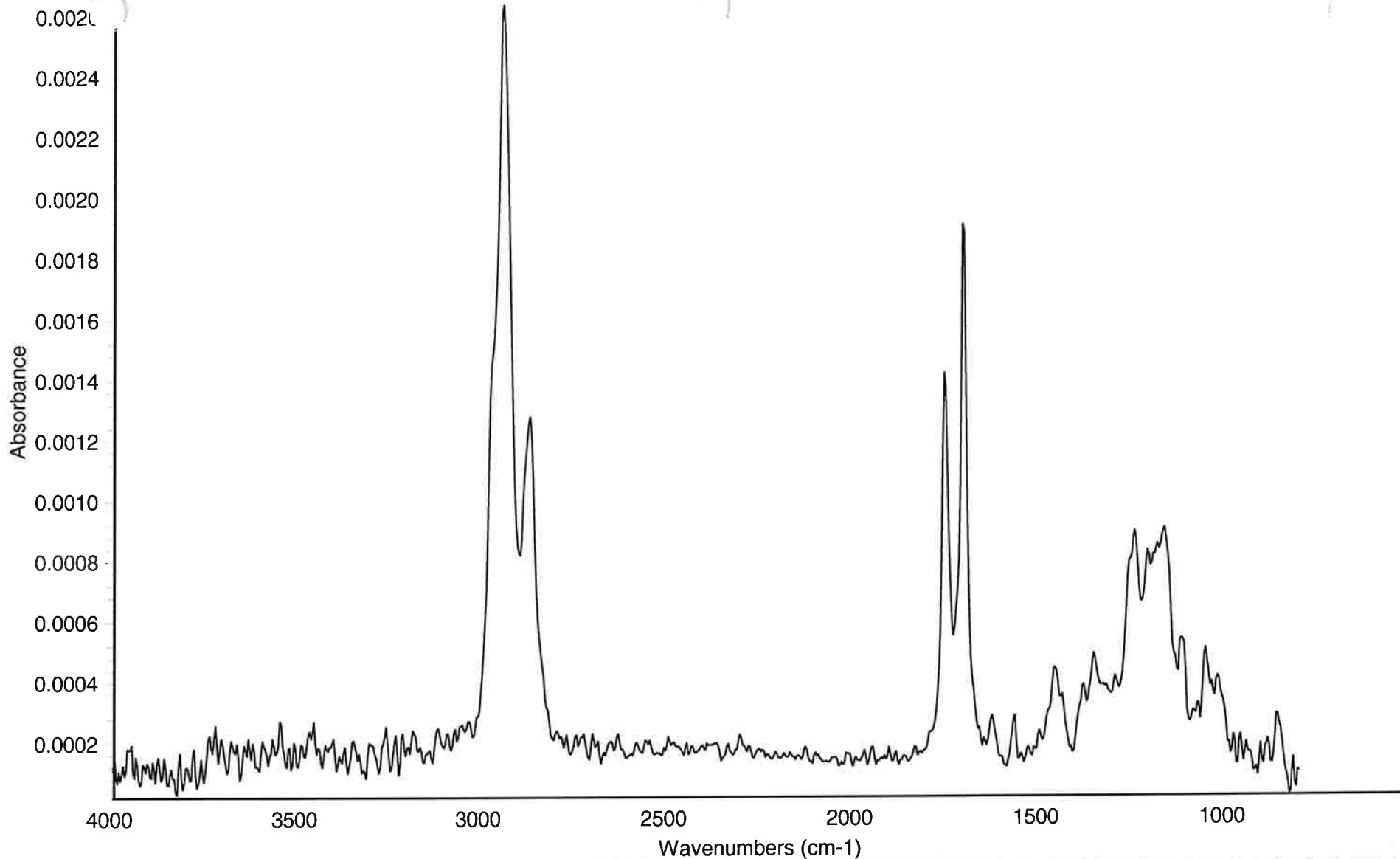
JWH 081 Methanol 270c for 30 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 168
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 12 17:54:09 2014 (GMT-06:00)



Nandrolone Undecanoate

Methanol 270c for 30 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 260
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Thu Nov 13 04:39:59 2014 (GMT-06:00)

Chloroform Blank

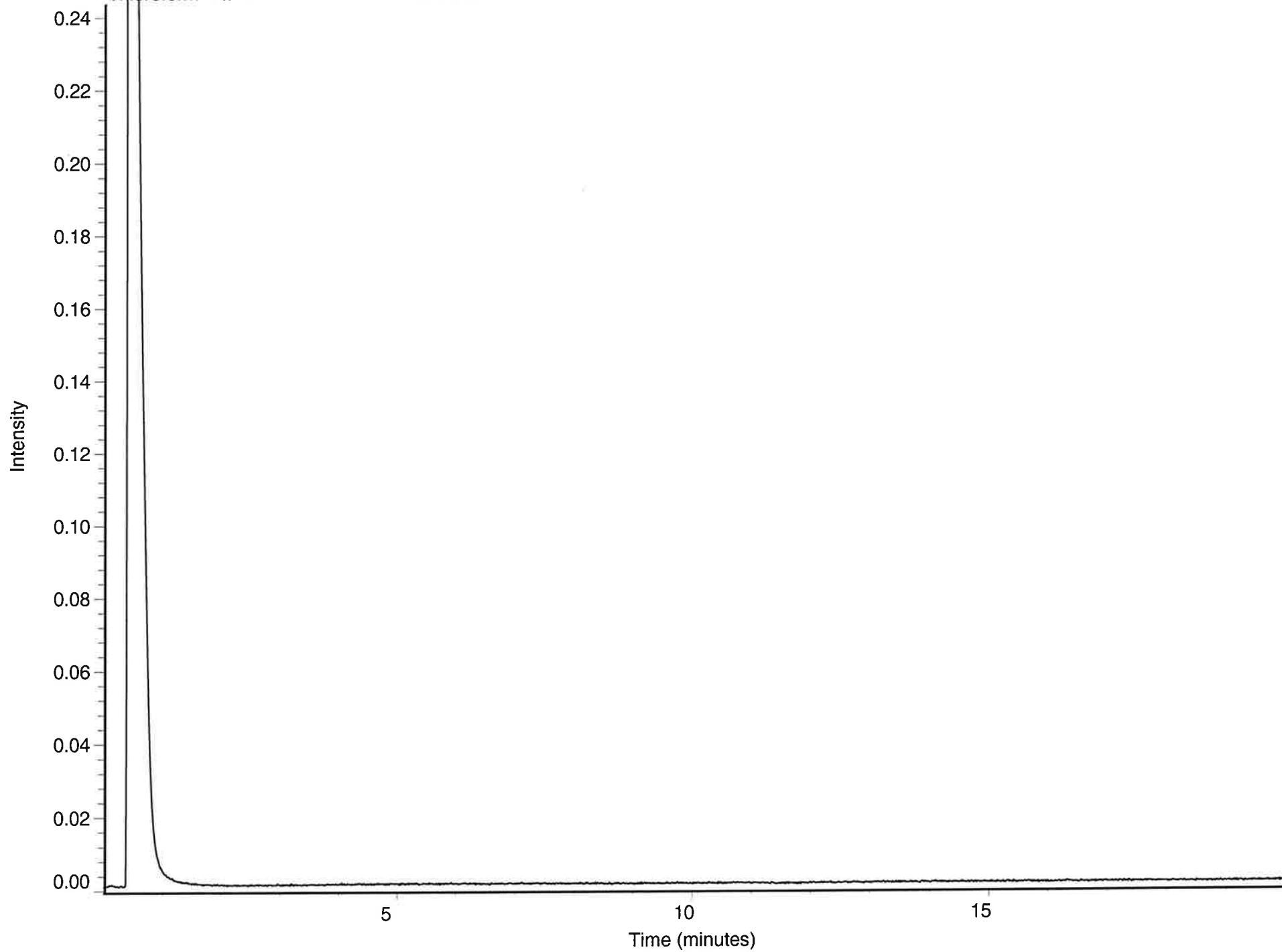
Chloroform

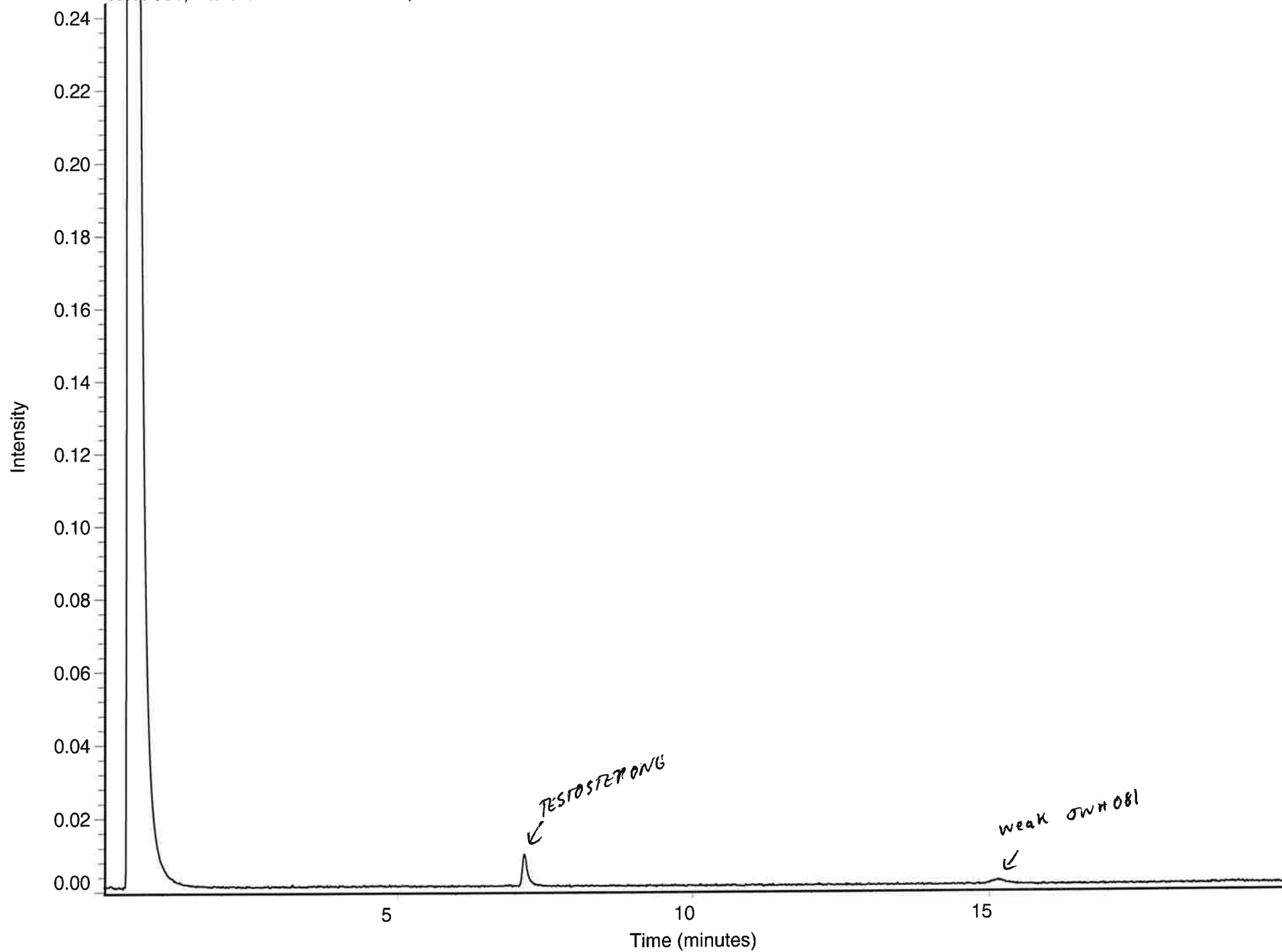
90-270c

35c/min for 20 min

GCIR #1

11/5/14 LJ





Absorbance

0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
-0.001

4000 3500 3000 2500 2000 1500 1000

Wavenumbers (cm⁻¹)

Testosterone

Chloroform

90-270c @ 35c/min for 20 min

GCIR #1

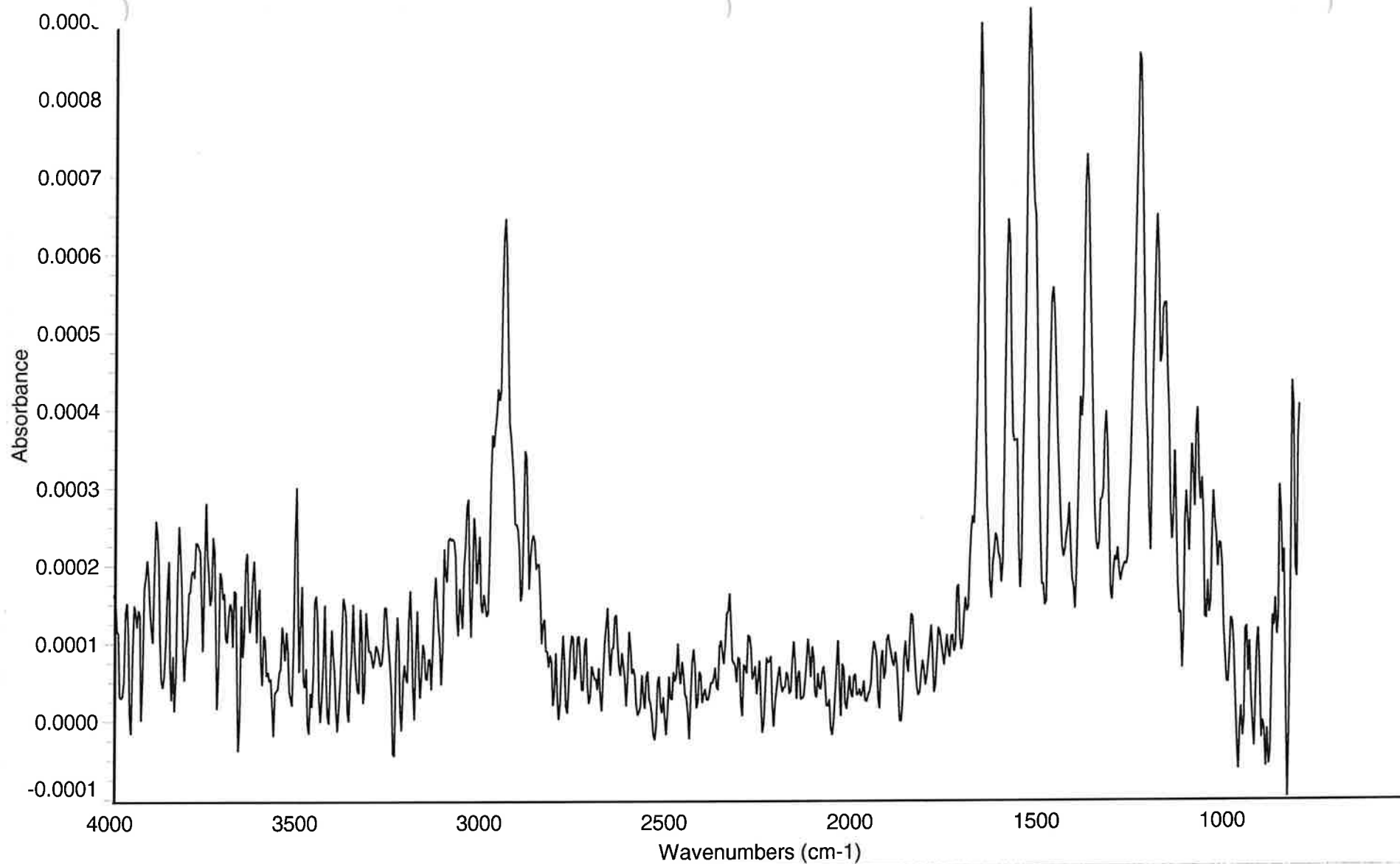
11/5/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 05 13:58:35 2014 (GMT-06:00)



JWH 081

Chloroform

90-270c @ 35c/min for 20 min

GCIR #1

11/5/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D*
Beamsplitter: KBr
Source: IR

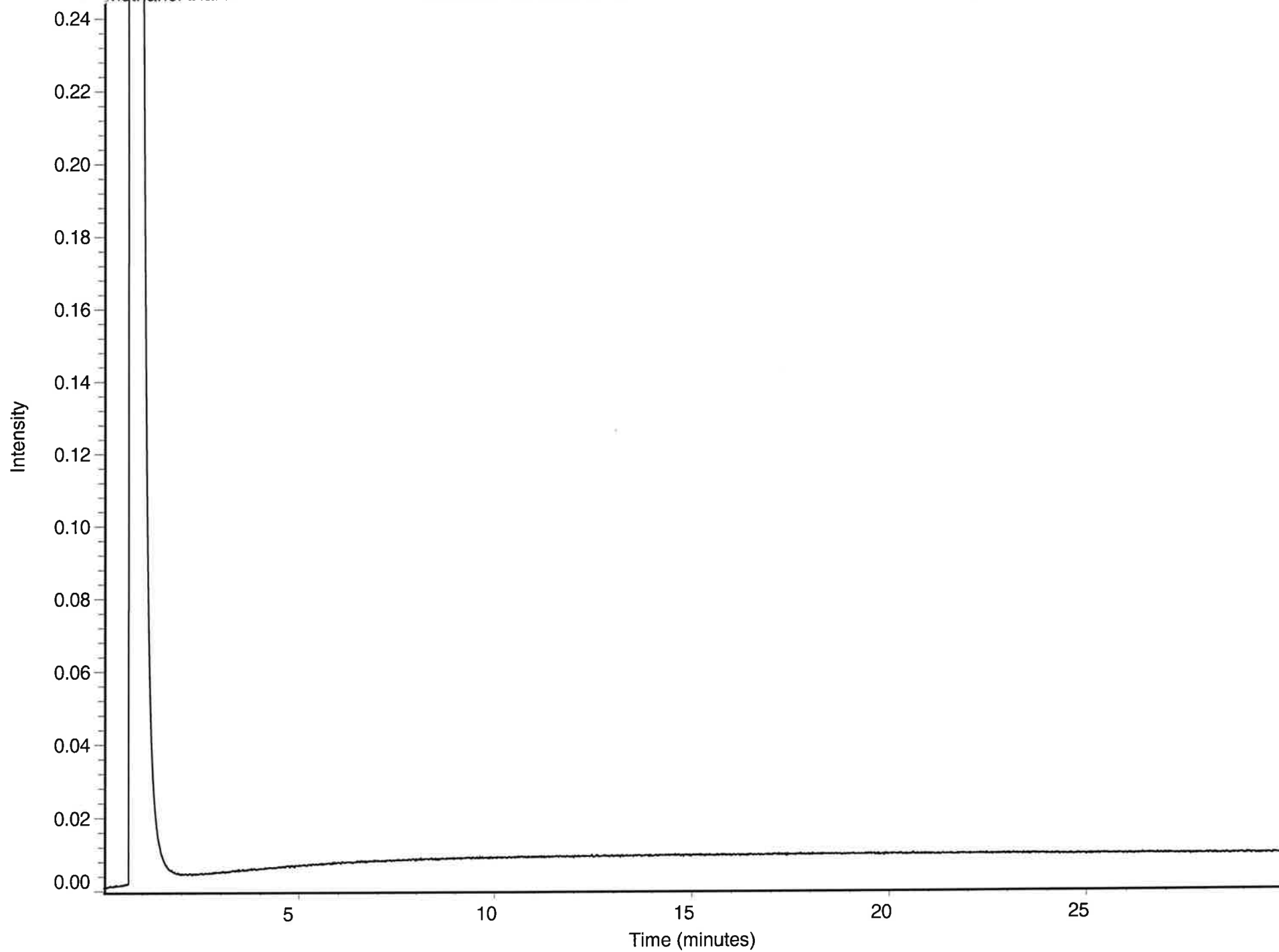
Number of sample scans: 108
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 05 20:36:46 2014 (GMT-06:00)

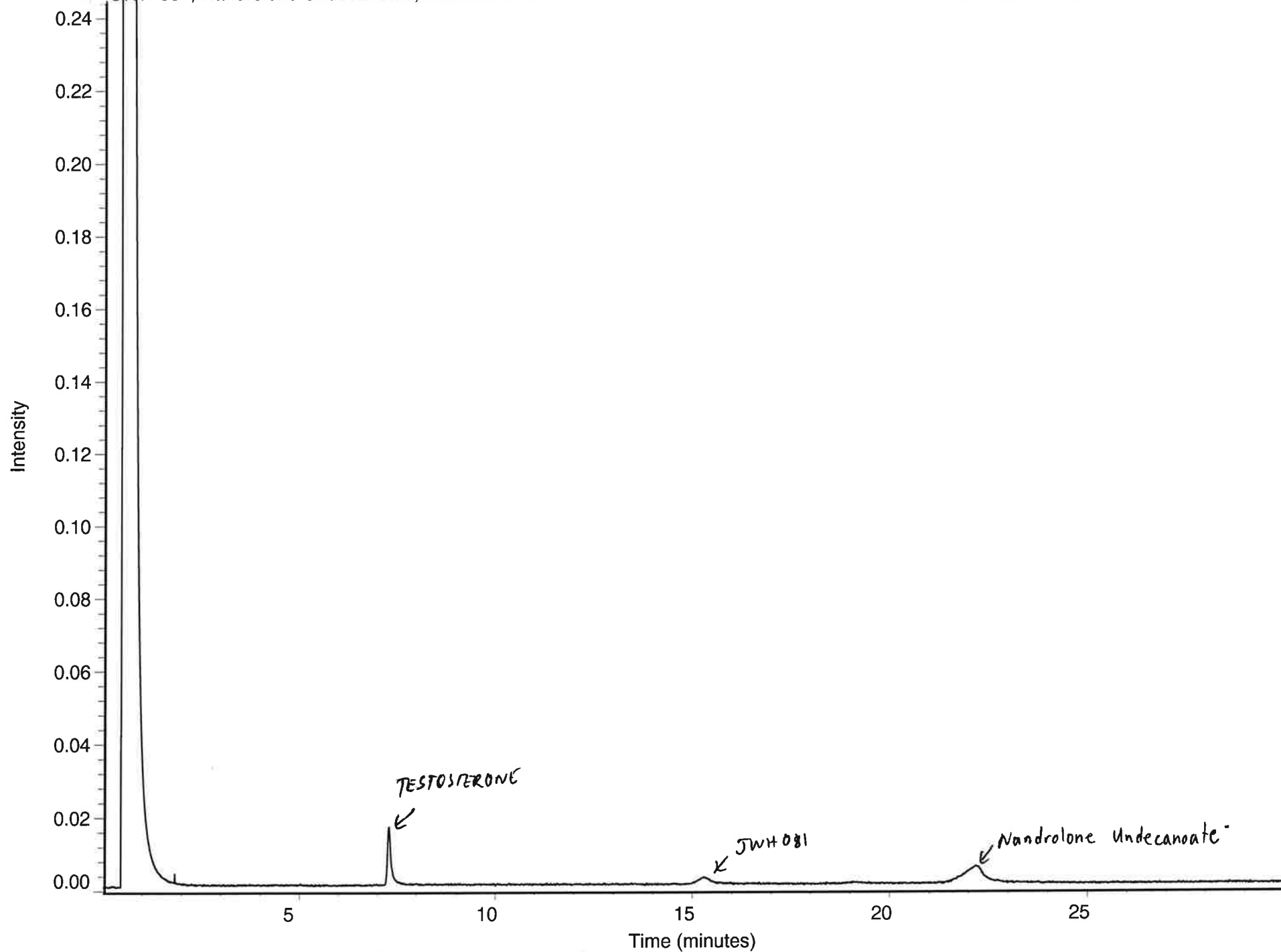
Methanol Blank

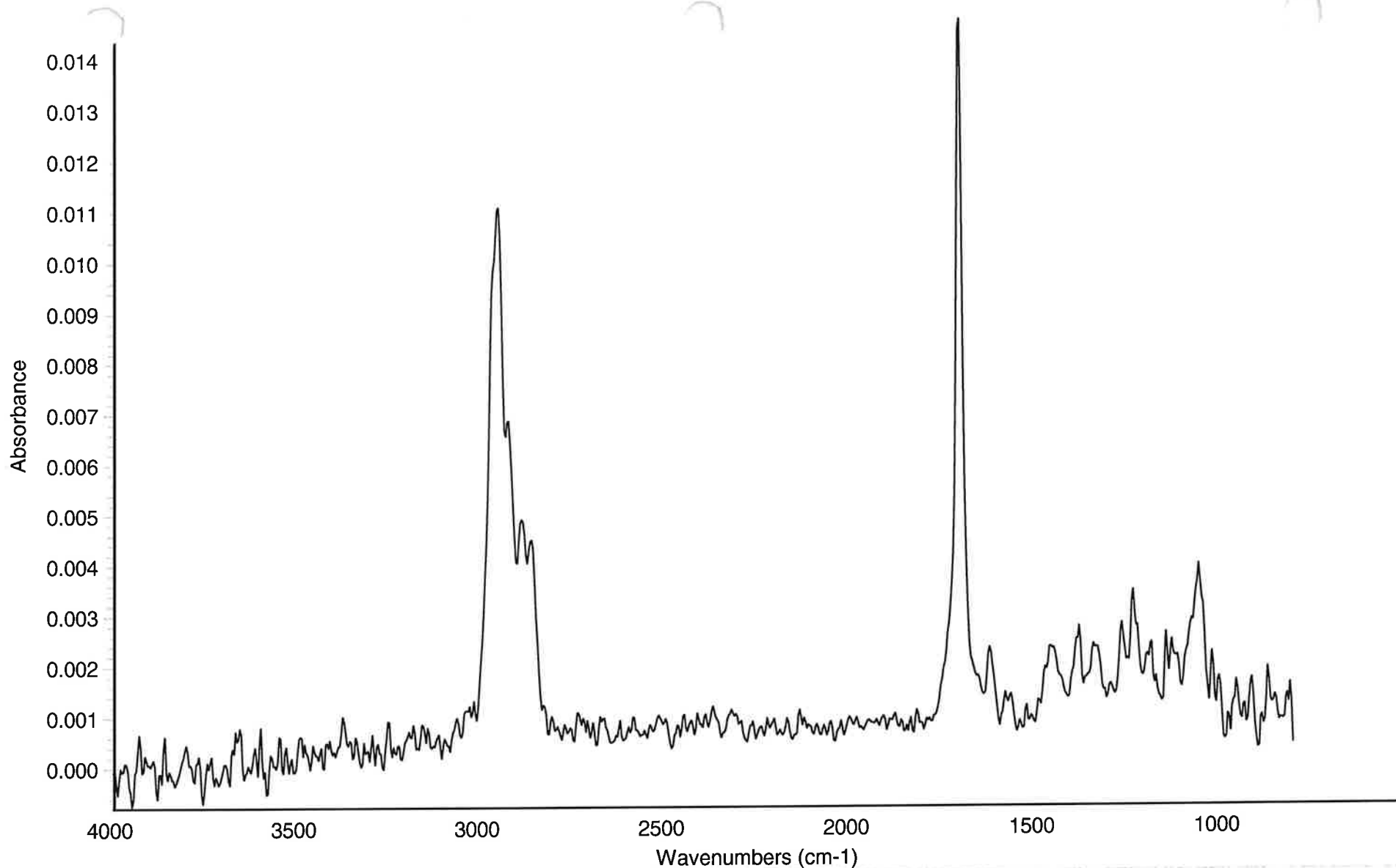
Methanol 90-270c @ 30 min for 30 min GCIR #1 11/12/14 LJ



JWH 081, Nandrolone Undecanoate, Testosterone

Methanol 90-270c @ 35c /min for 30 min GCIR #1 11/12 .4 LJ





Testosterone

Methanol 90-270c @ 35c /min for 30 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

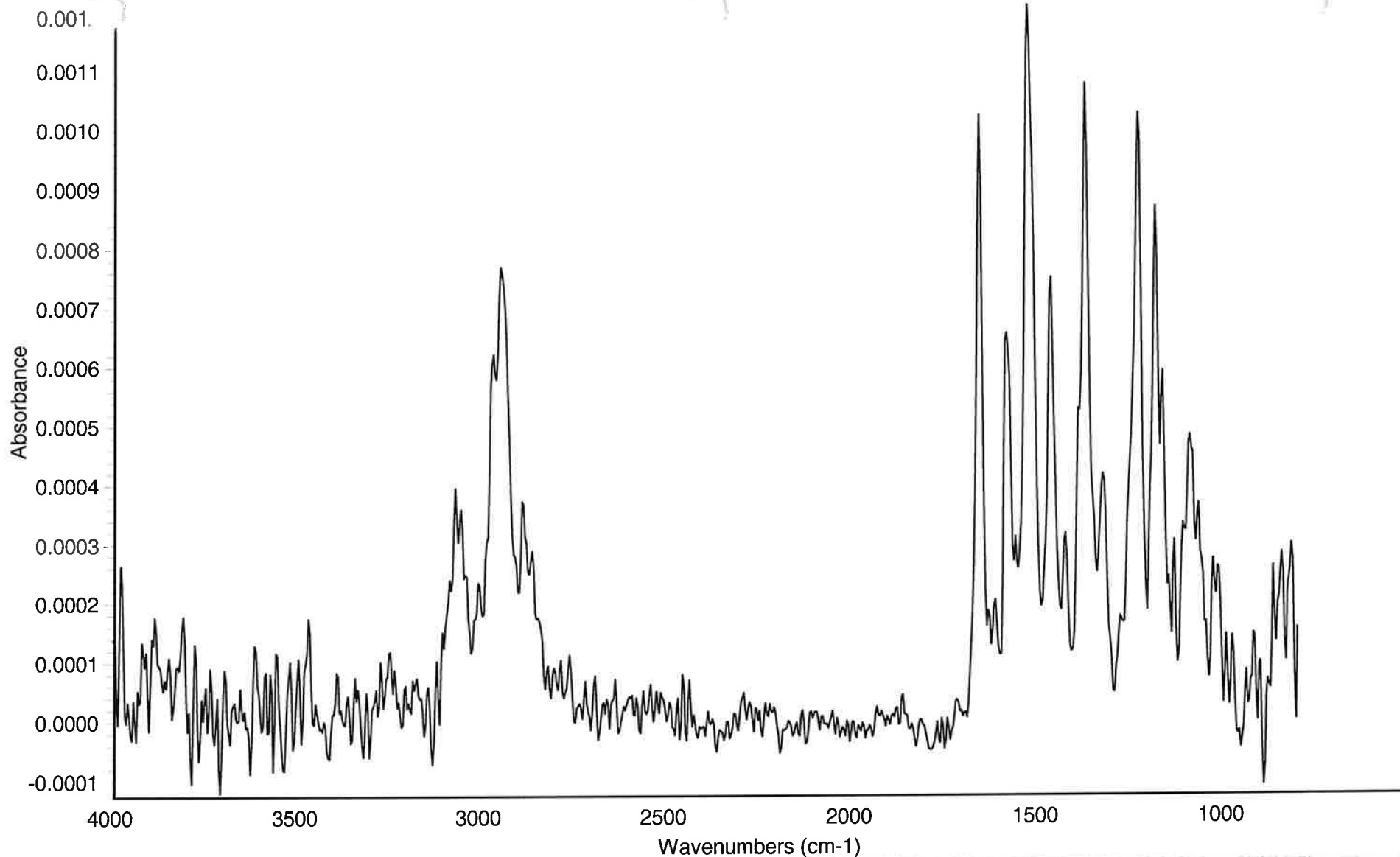
Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 12 10:05:10 2014 (GMT-06:00)



JWH 081 Methanol 90-270c @ 35c /min for 30 min GCIR #1 11/12/14 LJ

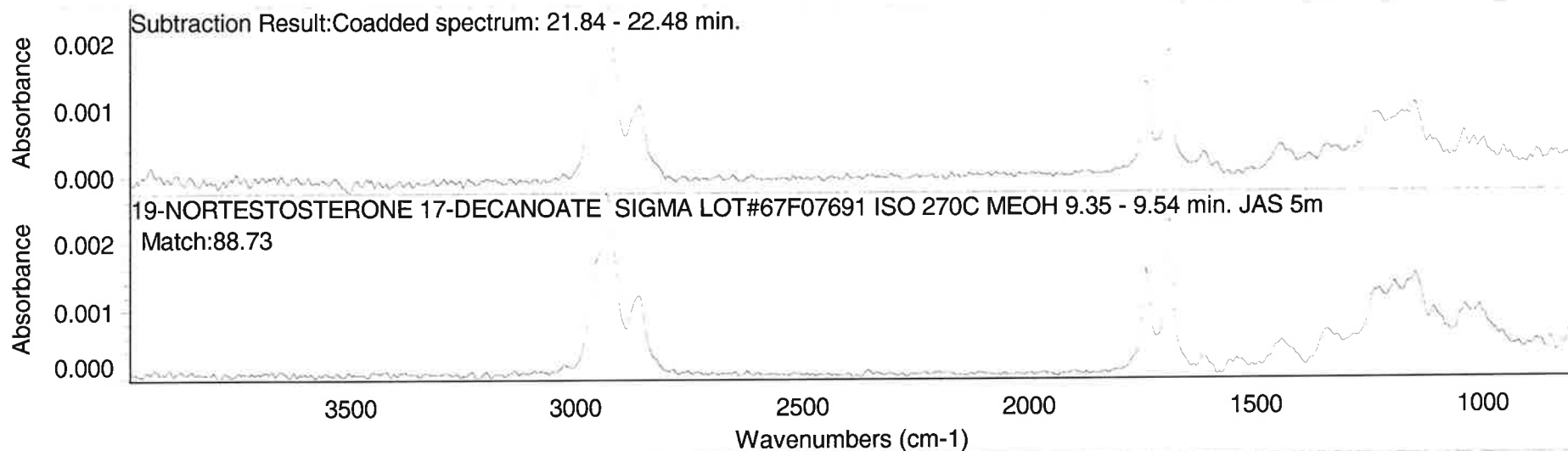
Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 136
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

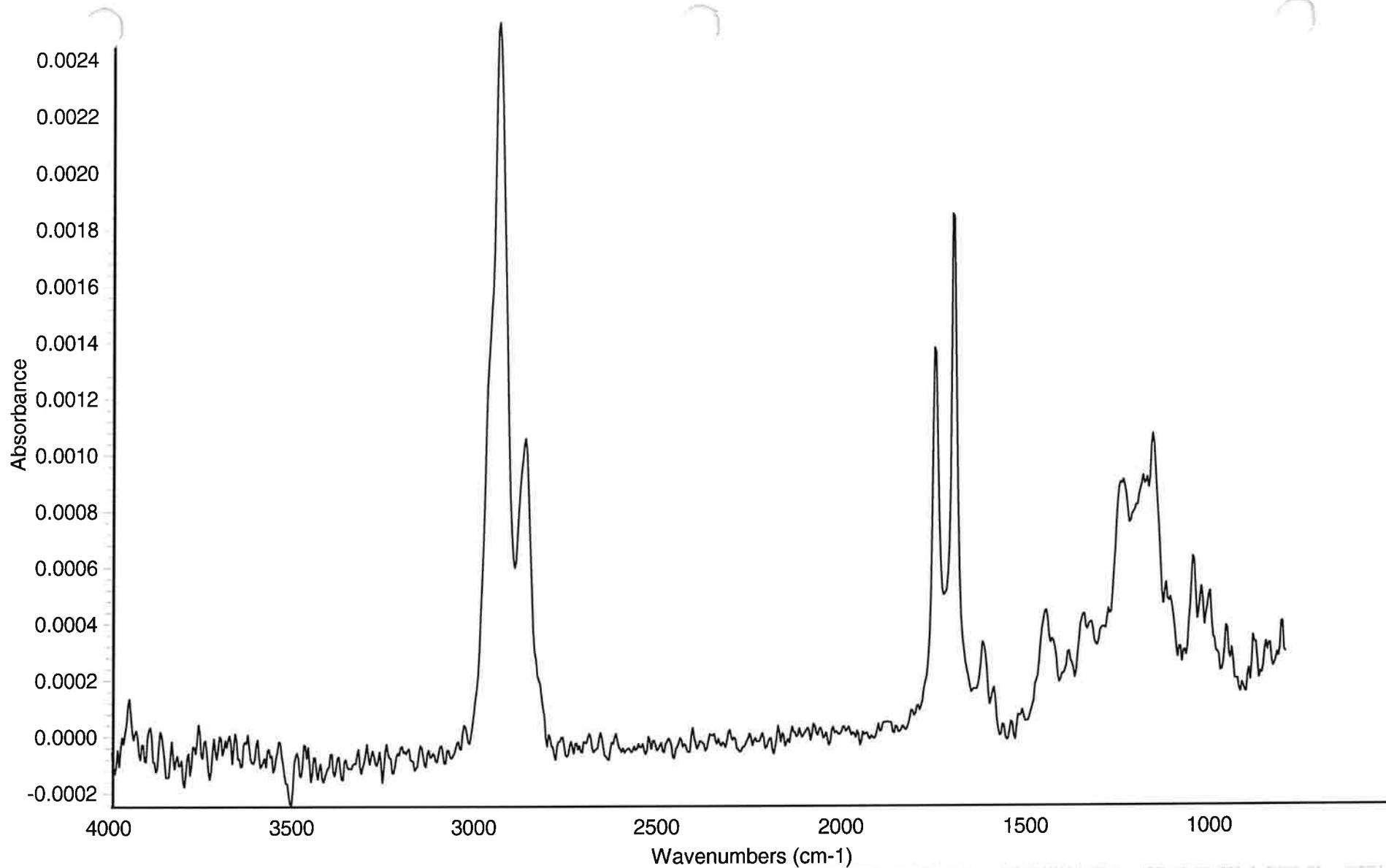
Collection time: Wed Nov 12 18:31:42 2014 (GMT-06:00)

Search results for: Subtraction Result: Coadded spectrum: 21.84 - 22.48 min.
 Date: Wed Nov 12 10:33:17 2014 (GMT-06:00)
 Search algorithm: Correlation
 Regions searched: 3995.85-798.40



Search results list of matches

	Index	Match	Compound Name	Library Name
1	215	88.73	19-NORTESTOSTERONE 17-DECANOATE SIGMA LOT#67F07691 ISO 270C	TBI GCIR Library
2	215	88.73	19-NORTESTOSTERONE 17-DECANOATE SIGMA LOT#67F07691 ISO 270C	TBI Gas Phase Library
3	239	88.69	TESTOSTERONE UNDECANOATE STERALS LOT#B0155 IN MeOH ISO 27	TBI GCIR Library
4	241	88.69	TESTOSTERONE UNDECANOATE STERALS LOT#B0155 IN MeOH ISO 27	TBI Gas Phase Library
5	222	86.68	TESTOSTERONE 17-DECANOATE SIGMA LOT#59H081 MeOH ISO 270C	TBI GCIR Library



Nandrolone Undecanoate

Methanol 90-270c @ 35c /min for 30 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 228

Beamsplitter: KBr

Source: IR

Number of background scans: 10

Resolution: 8.000

Sample gain: 2.0

Mirror velocity: 3.1647

Aperture: 100.00

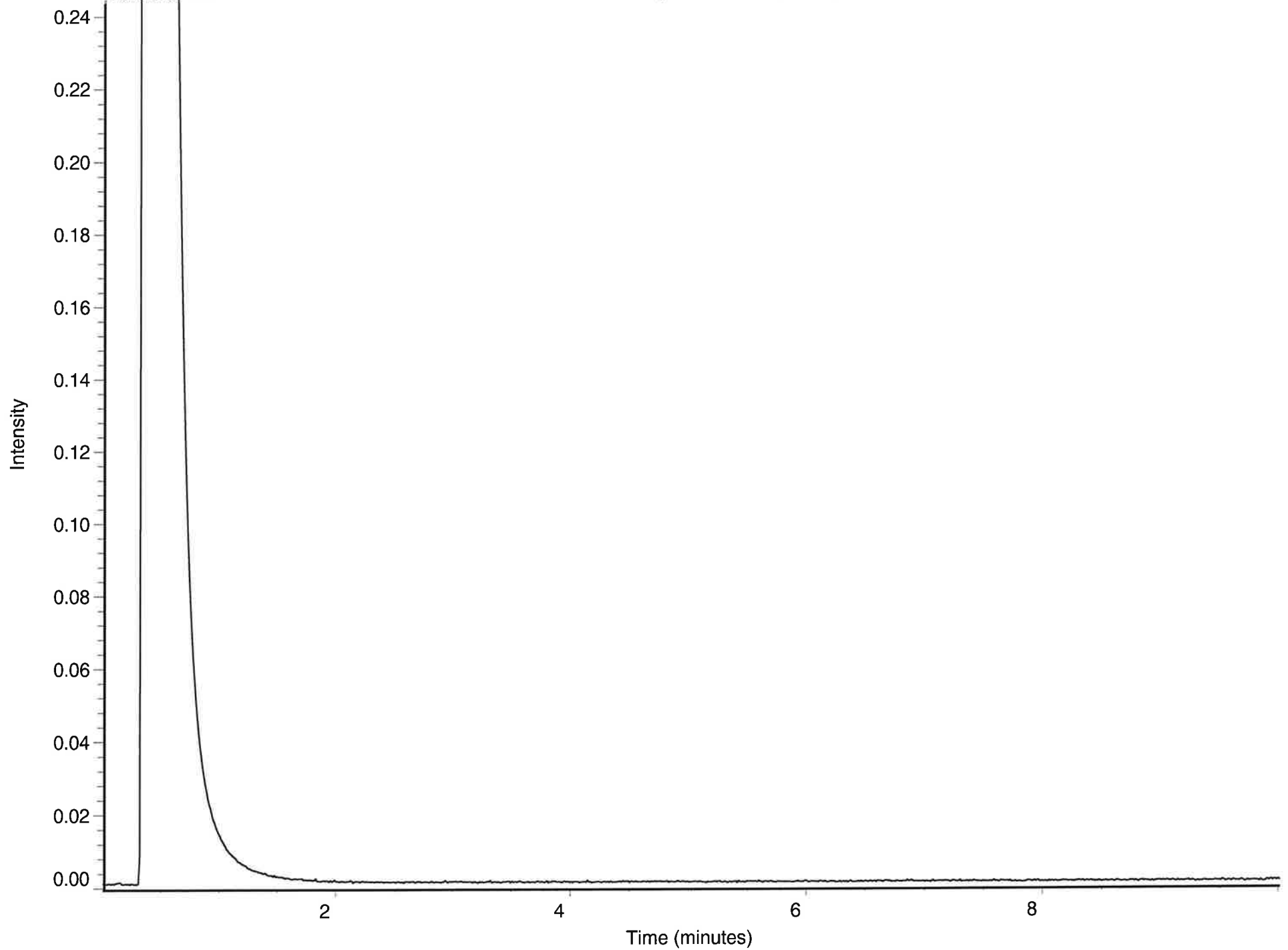
GC/FTIR 1

Collection time: Thu Nov 13 06:42:52 2014 (GMT-06:00)

Methanol Blank

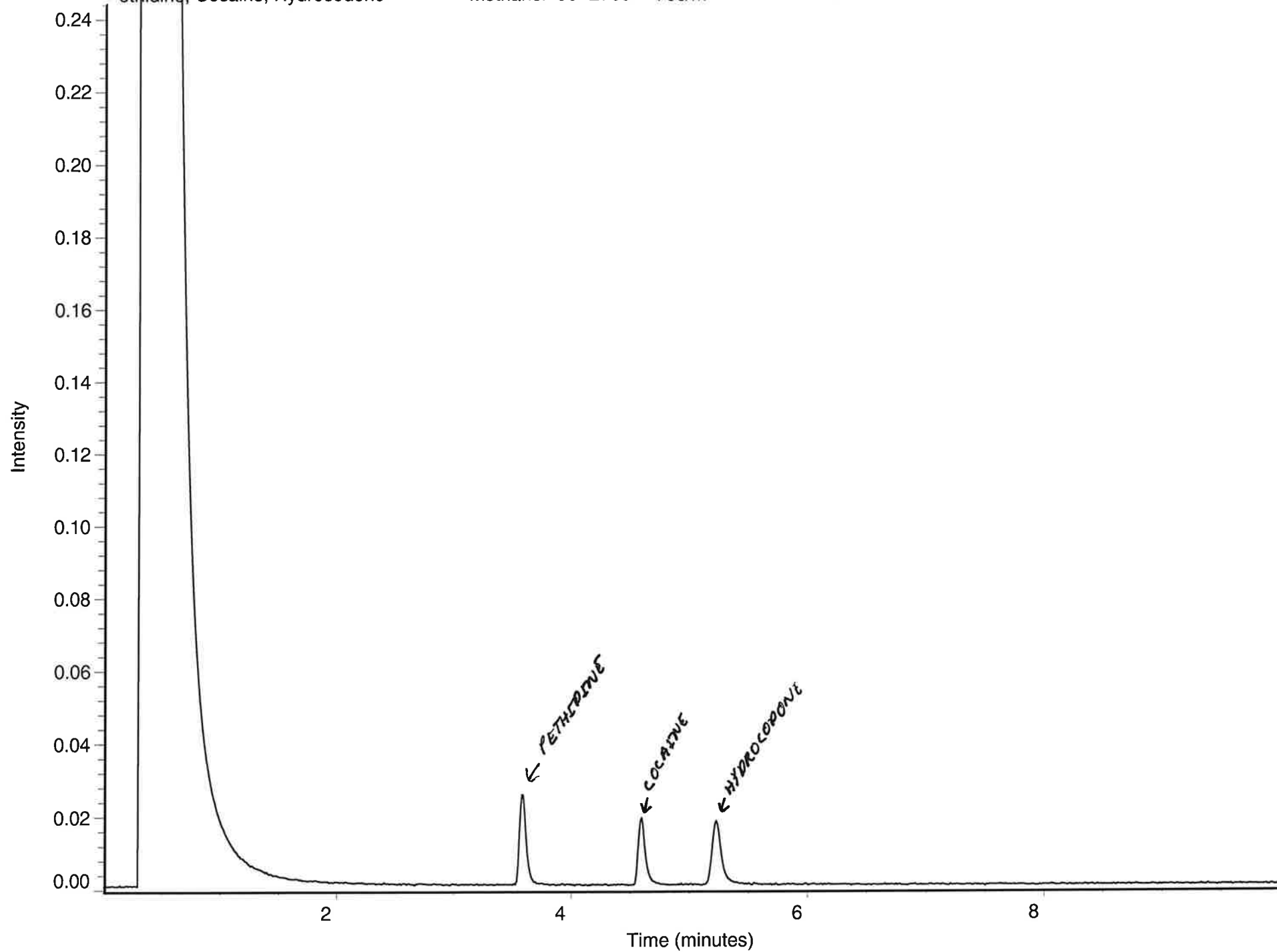
Methanol 90- 270c @70c/min for 10

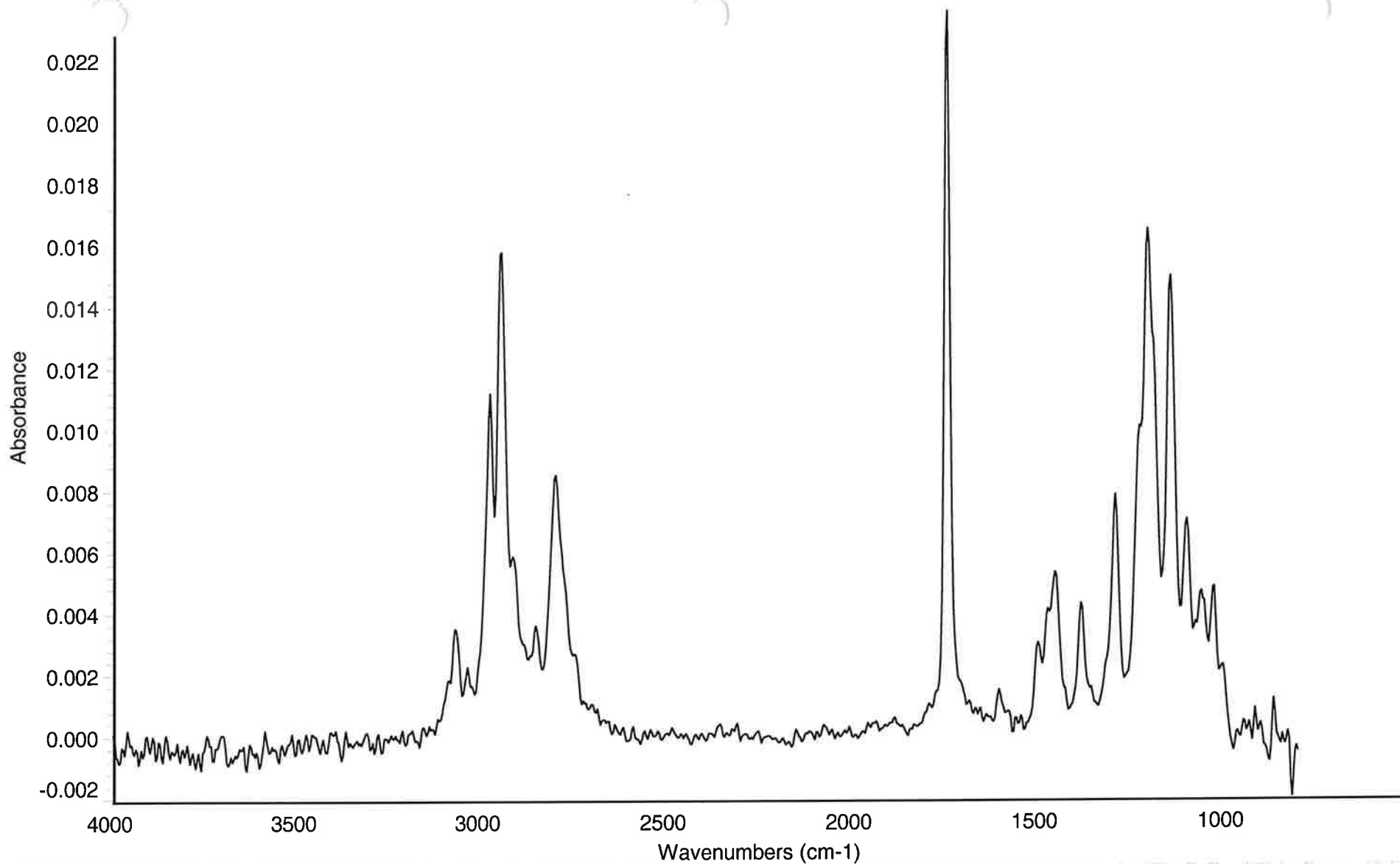
GCIR #1 11/12/14 LJ



Pethidine, Cocaine, Hydrocodone

Methanol 90- 270c 70c/min for 10 min GCIR #1 11/12/14 LJ





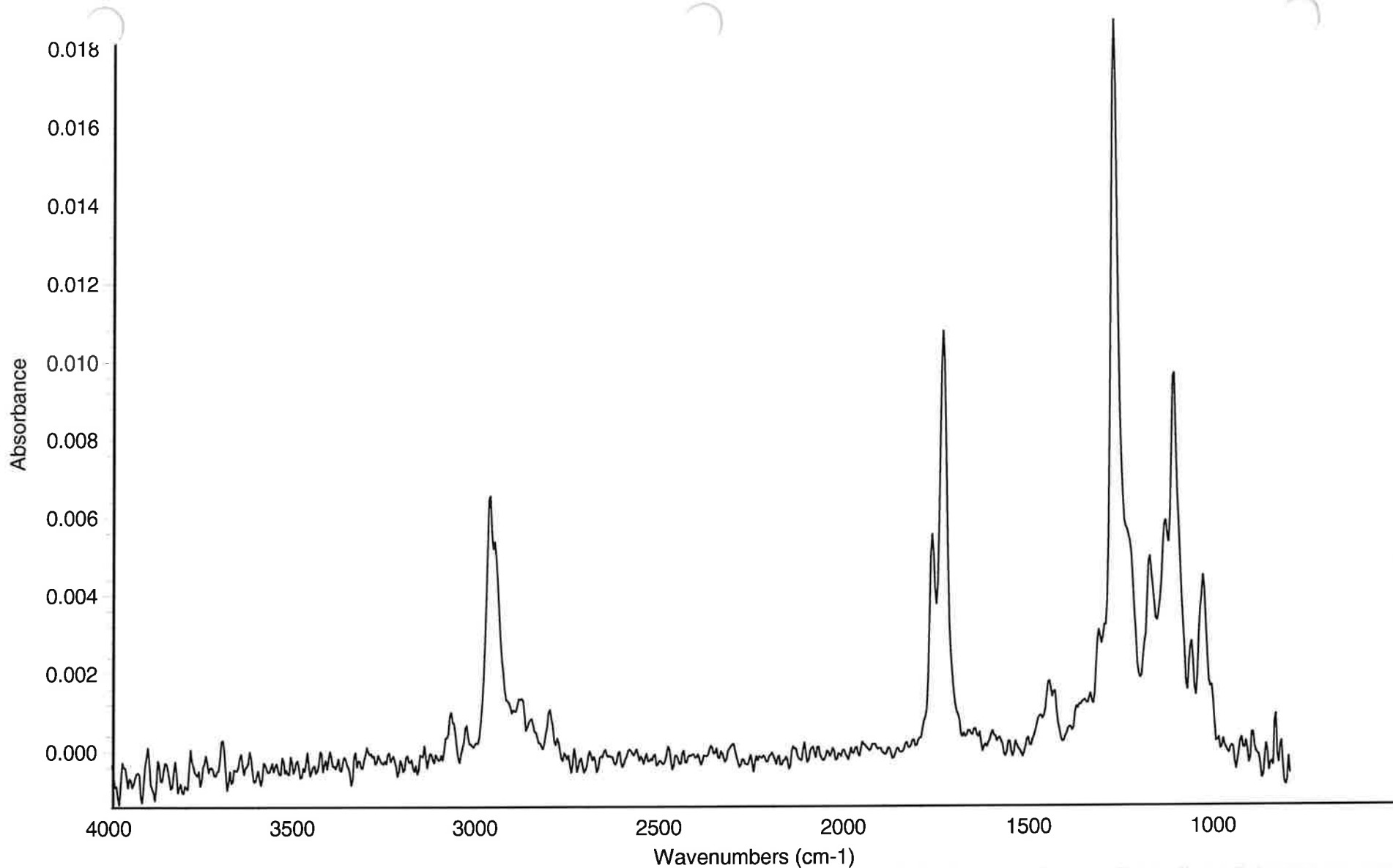
Pethidine Methanol 90- 270c @70c/min for 10 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 12 12:57:30 2014 (GMT-06:00)



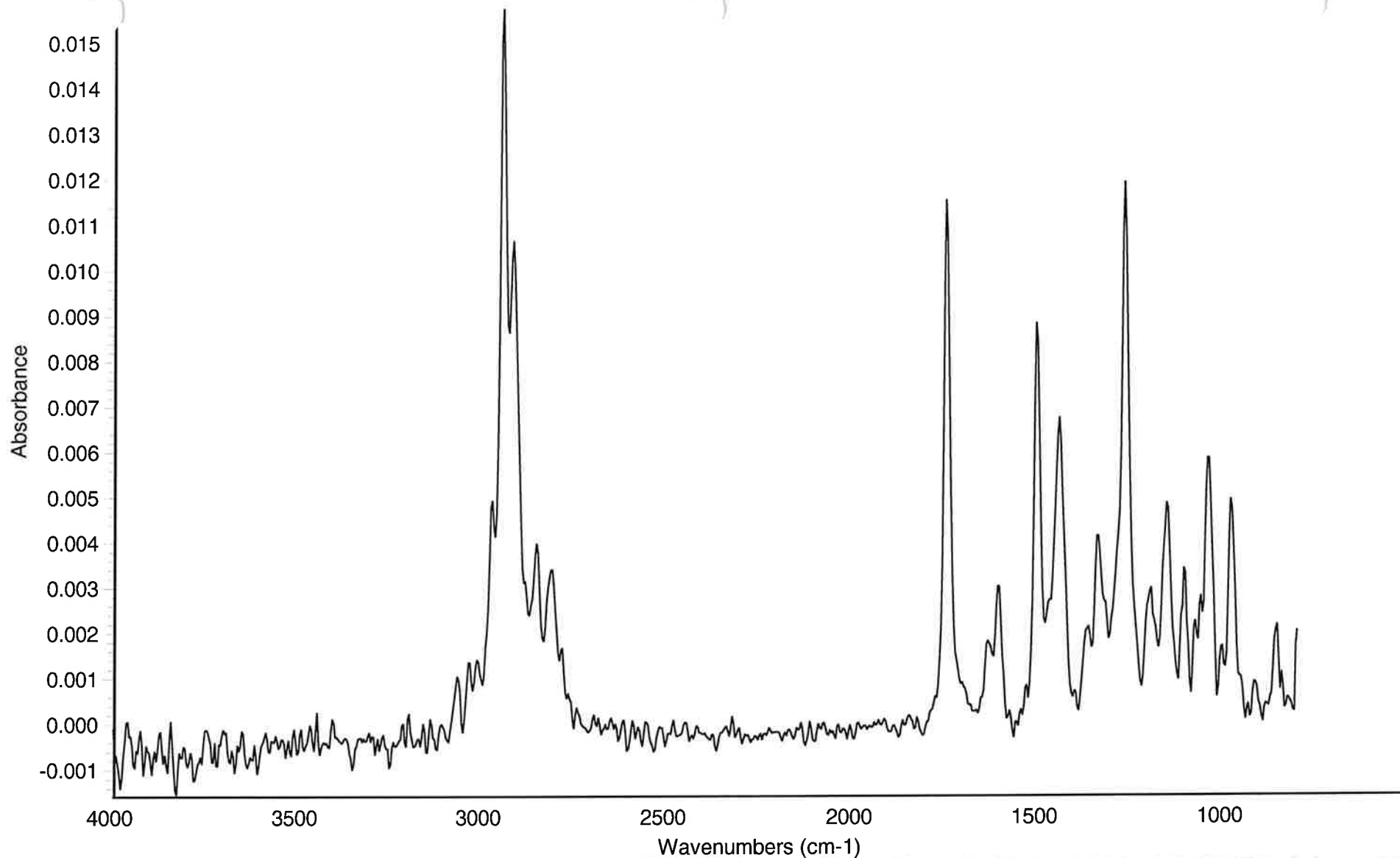
Cocaine Methanol 90- 270c @70c/min for 10 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 12 12:58:30 2014 (GMT-06:00)



Hydrocodone Methanol 90- 270c @70c/min for 10 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

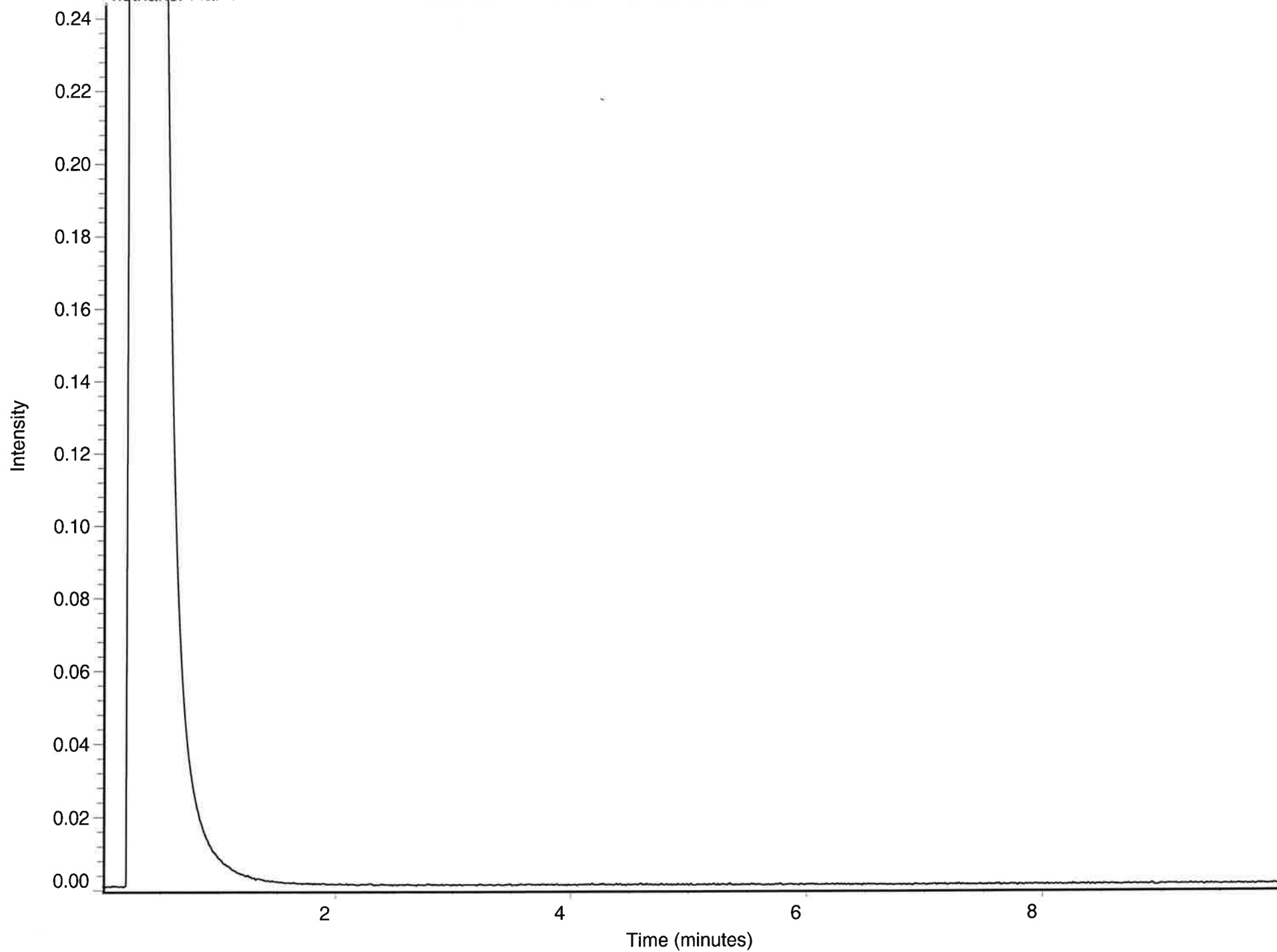
GC/FTIR 1

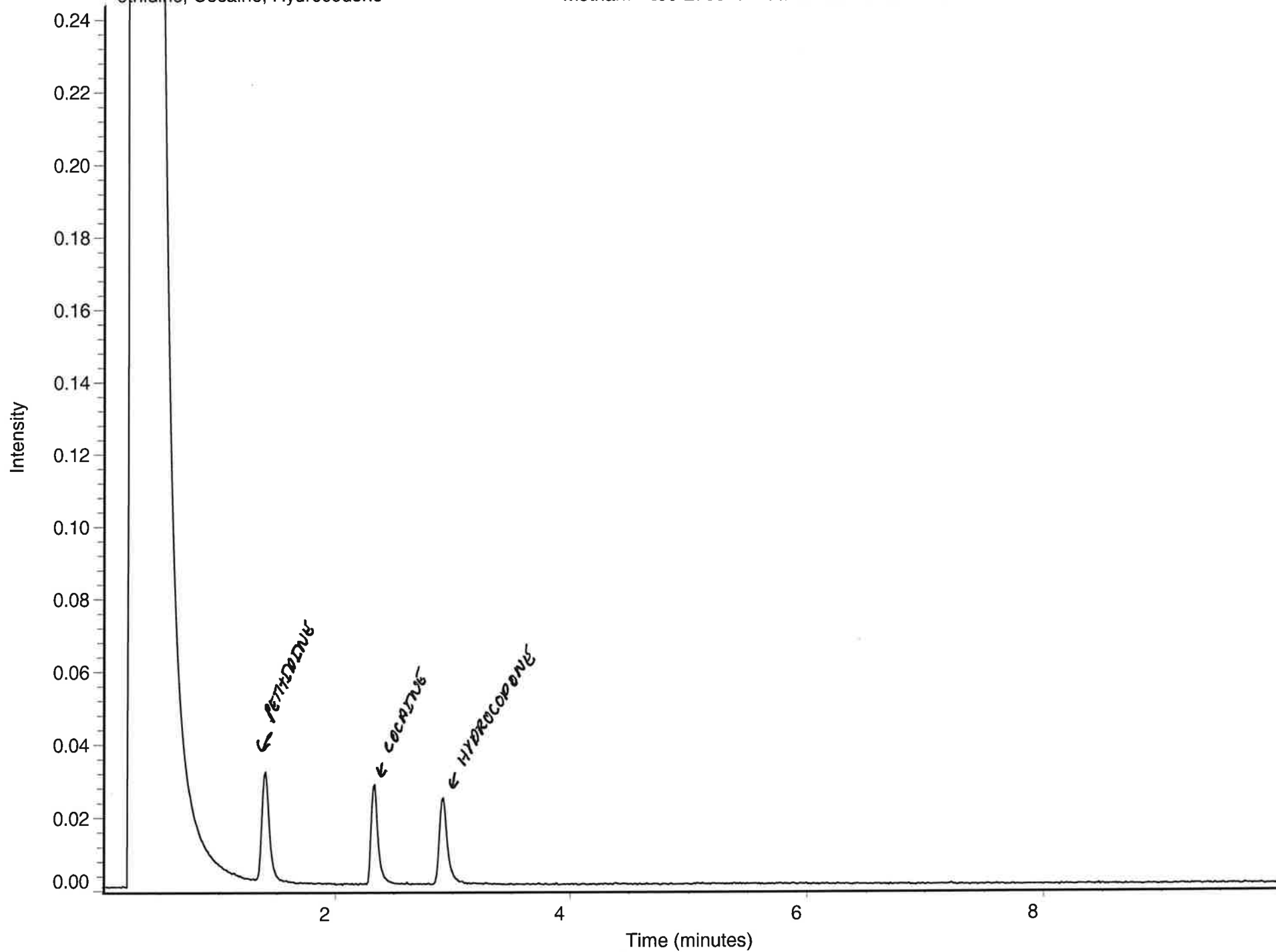
Collection time: Wed Nov 12 12:59:08 2014 (GMT-06:00)

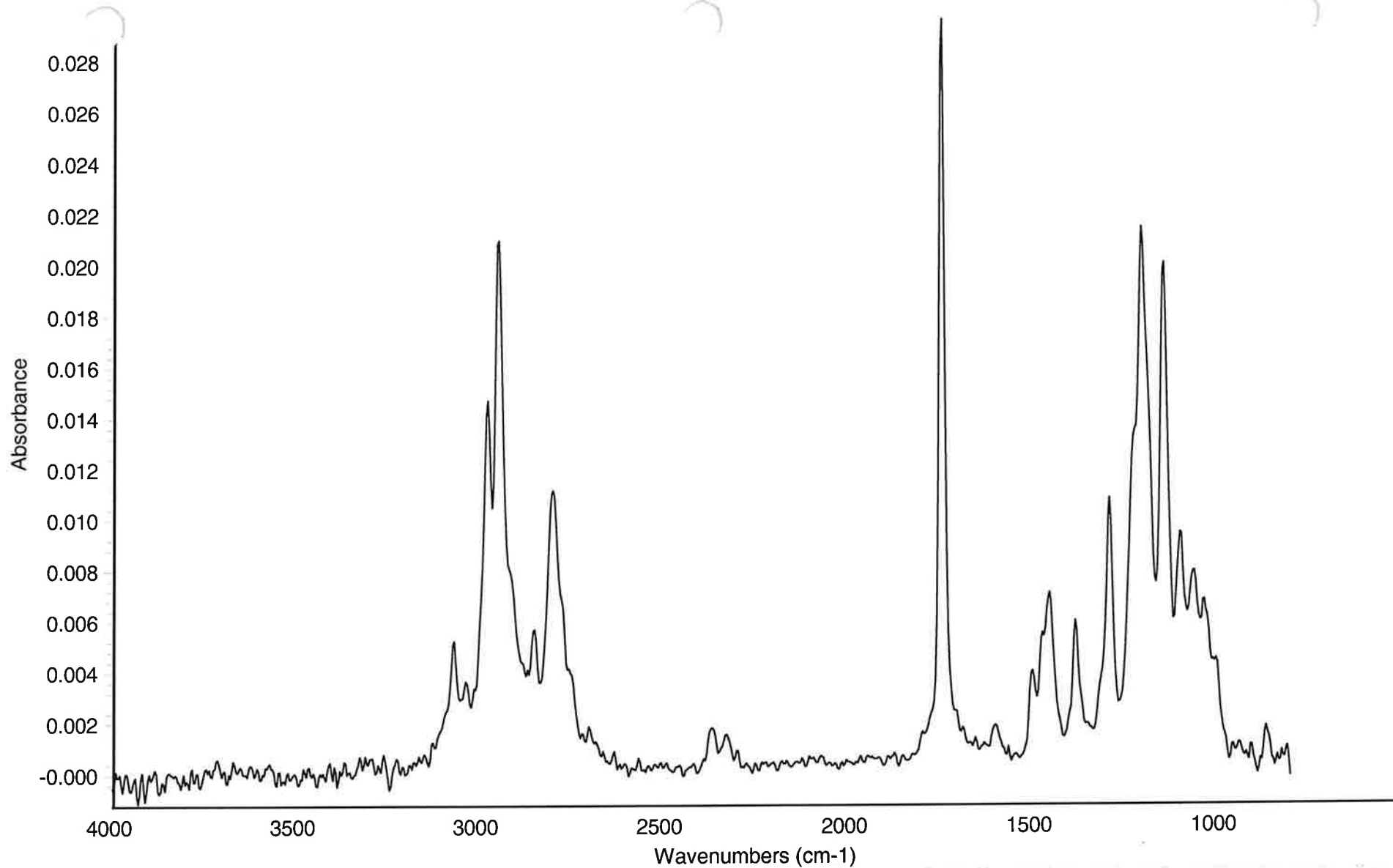
Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

Methanol Blank

Methanol 200-270c @ 70 min for 10 min GCIR #1 11/12/14 LJ







Pethidine

Methanol 200-270c @ 70c/min for 10 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

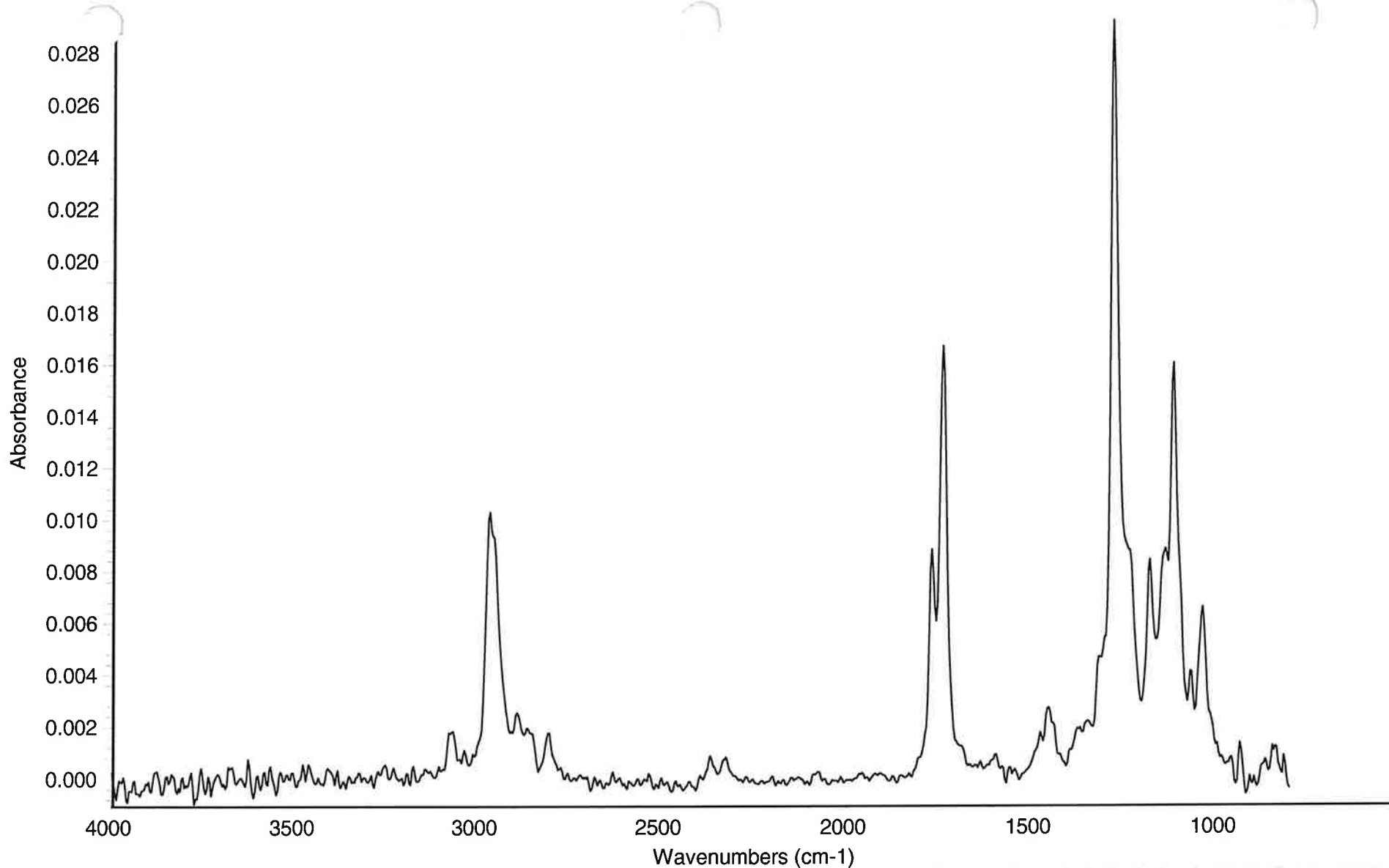
Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 12 14:28:05 2014 (GMT-06:00)



Cocaine

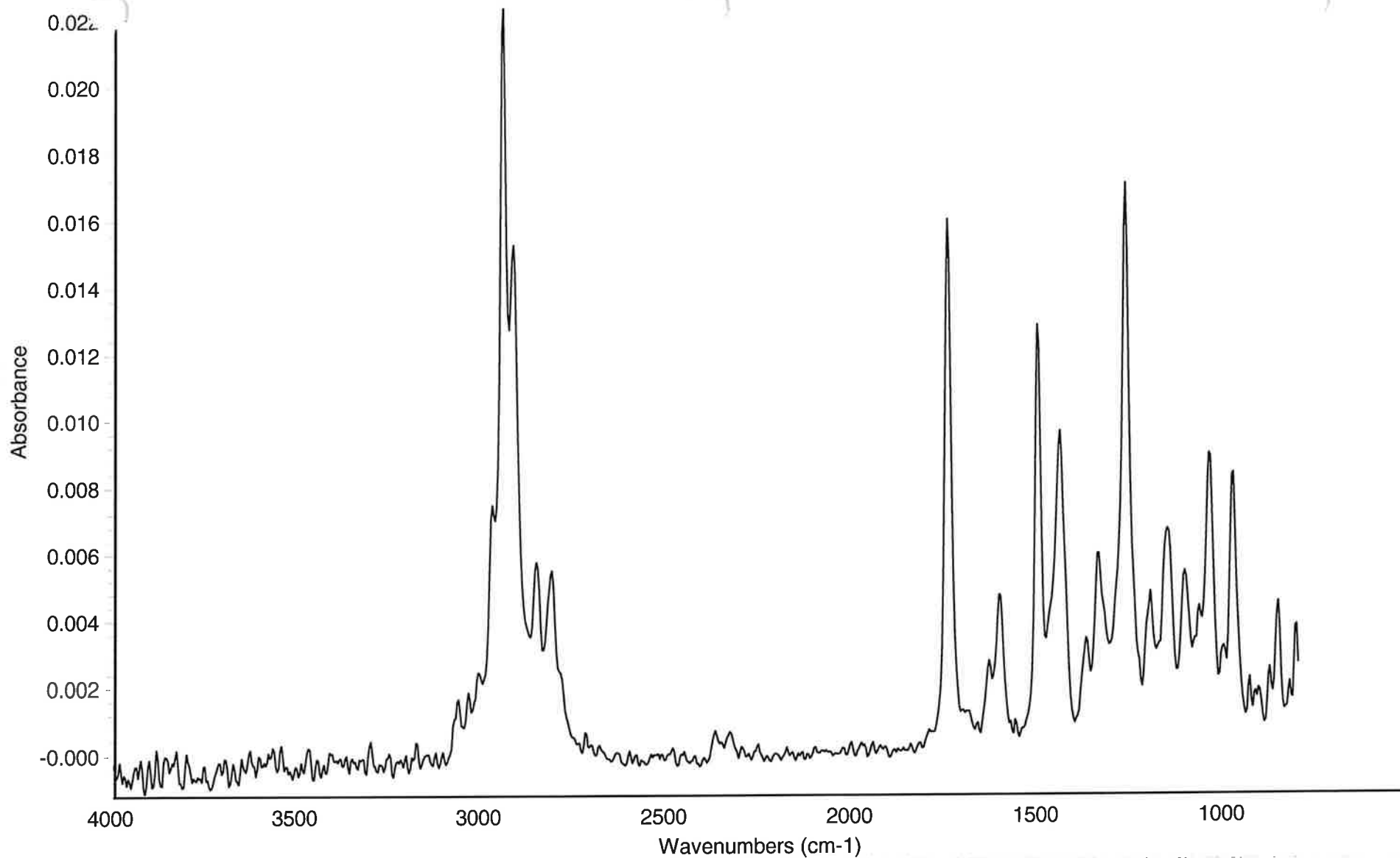
Methanol 200-270c @ 70c/min for 10 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters
Column flow 1.0
Split ratio 2.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 12 14:29:02 2014 (GMT-06:00)



Hydrocodone

Methanol 200-270c @ 70c/min for 10 min GCIR #1 11/12/14 LJ

Column 260B309P 5 Meters

Column flow 1.0

Split ratio 2.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT-High D* Number of sample scans: 4
Beamsplitter: KBr Number of background scans: 10
Source: IR Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 1

Collection time: Wed Nov 12 14:29:37 2014 (GMT-06:00)

GC/IR #2

GC/IR #2 (long column)

	Methods					
<u>Compounds</u>	1L	2L	3L	4L	5L	6L
Amphetamine	/	/	/	/	+	+
Phentermine	/	/	/	/	+	+
Methamphetamine	/	/	/	/	+	+
Pethidine	+	+	+	+	/	/
Cocaine	+	+	+	+	/	/
Hydrocodone	+	+	+	+	/	/

/ = Compounds not run on method

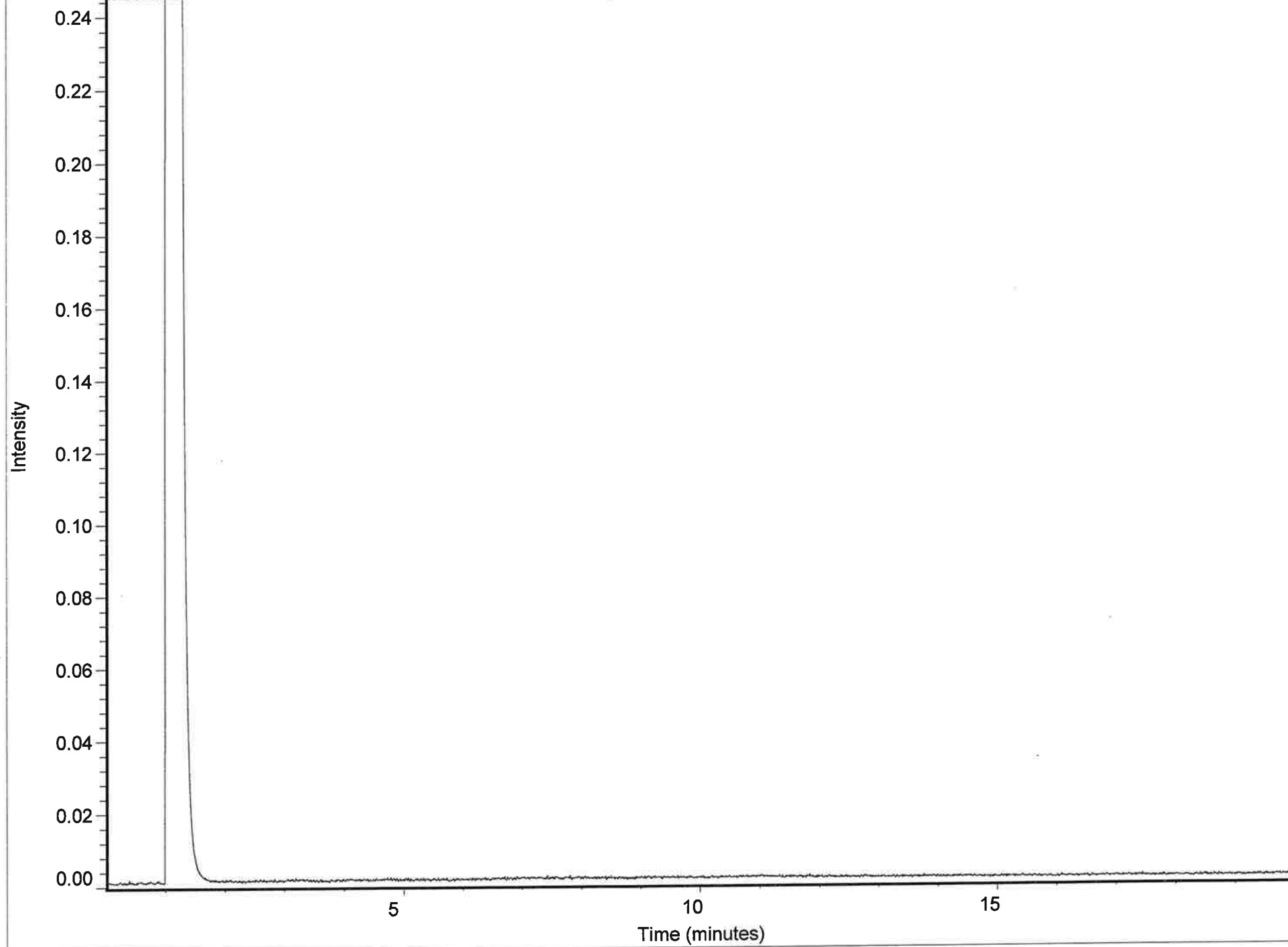
+ = Compounds present

- = Compounds absent

Methanol Blank

Methanol 120-270c @70c. min for 20 min

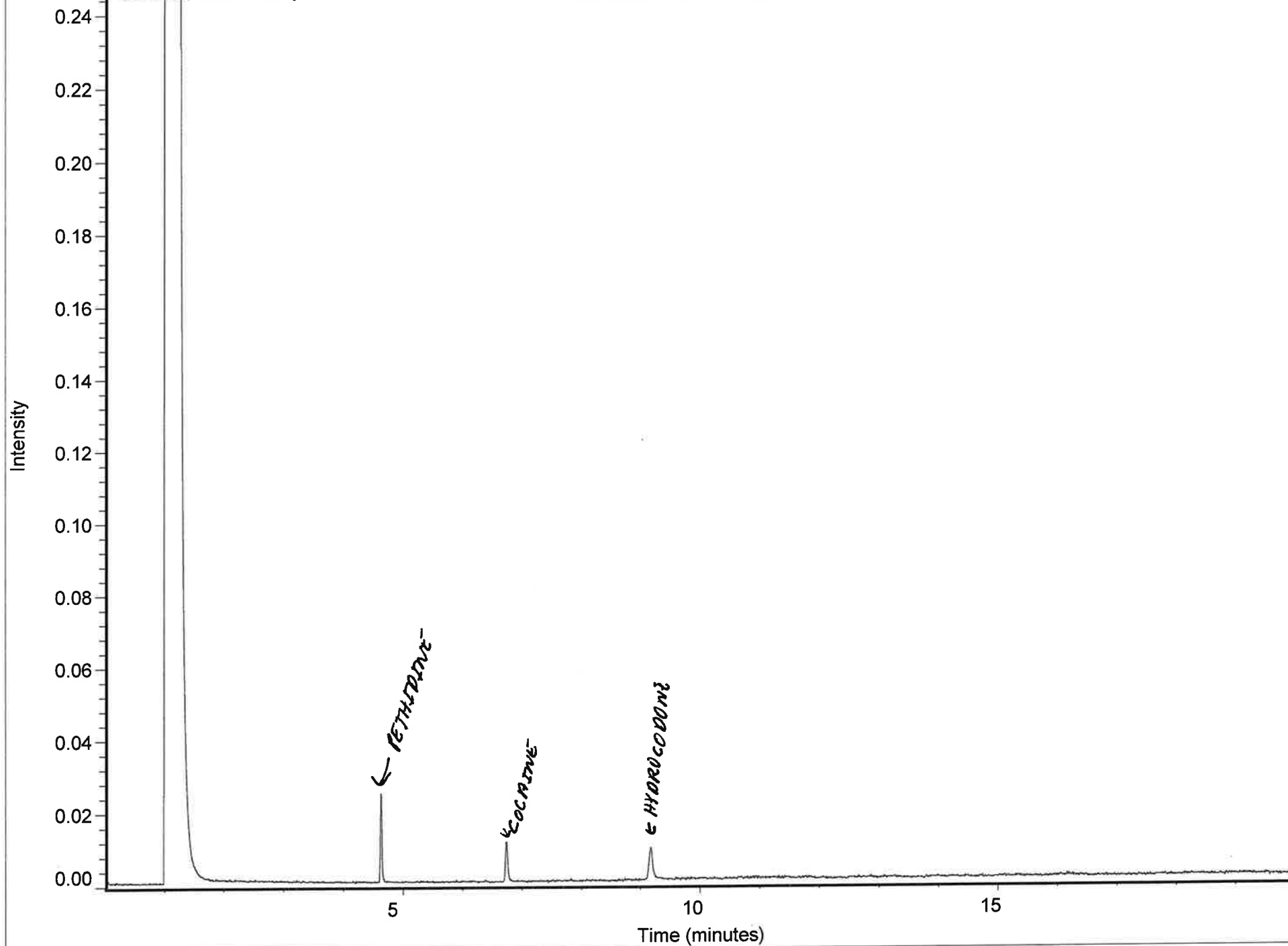
GCIR #2 11/5/14 LJ

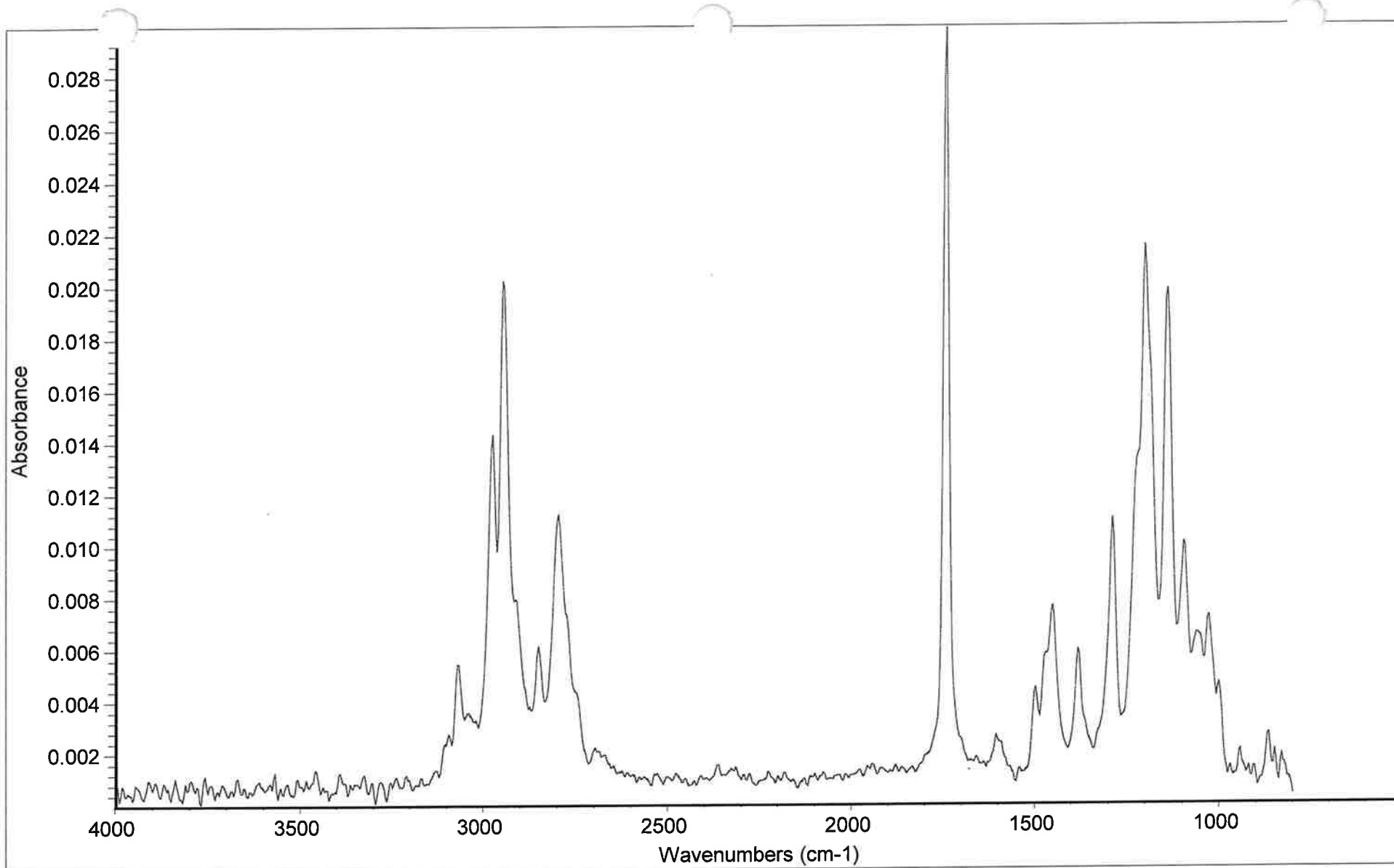


ethidine, Cocaine, Hydrocodone

Methanol 20-270c @70c/ min for 20 min

GCIR #2 11/5/14 LJ





Pethidine,

Methanol 120-270c @70c/ min for 20 min

GCIR #2 11/5/14 LJ

Column 19091Z-213 30 Meters

Column flow 3.0

Split ratio 3.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT/A

Beamsplitter: KBr

Source: IR

Number of sample scans: 4

Number of background scans: 10

Resolution: 8.000

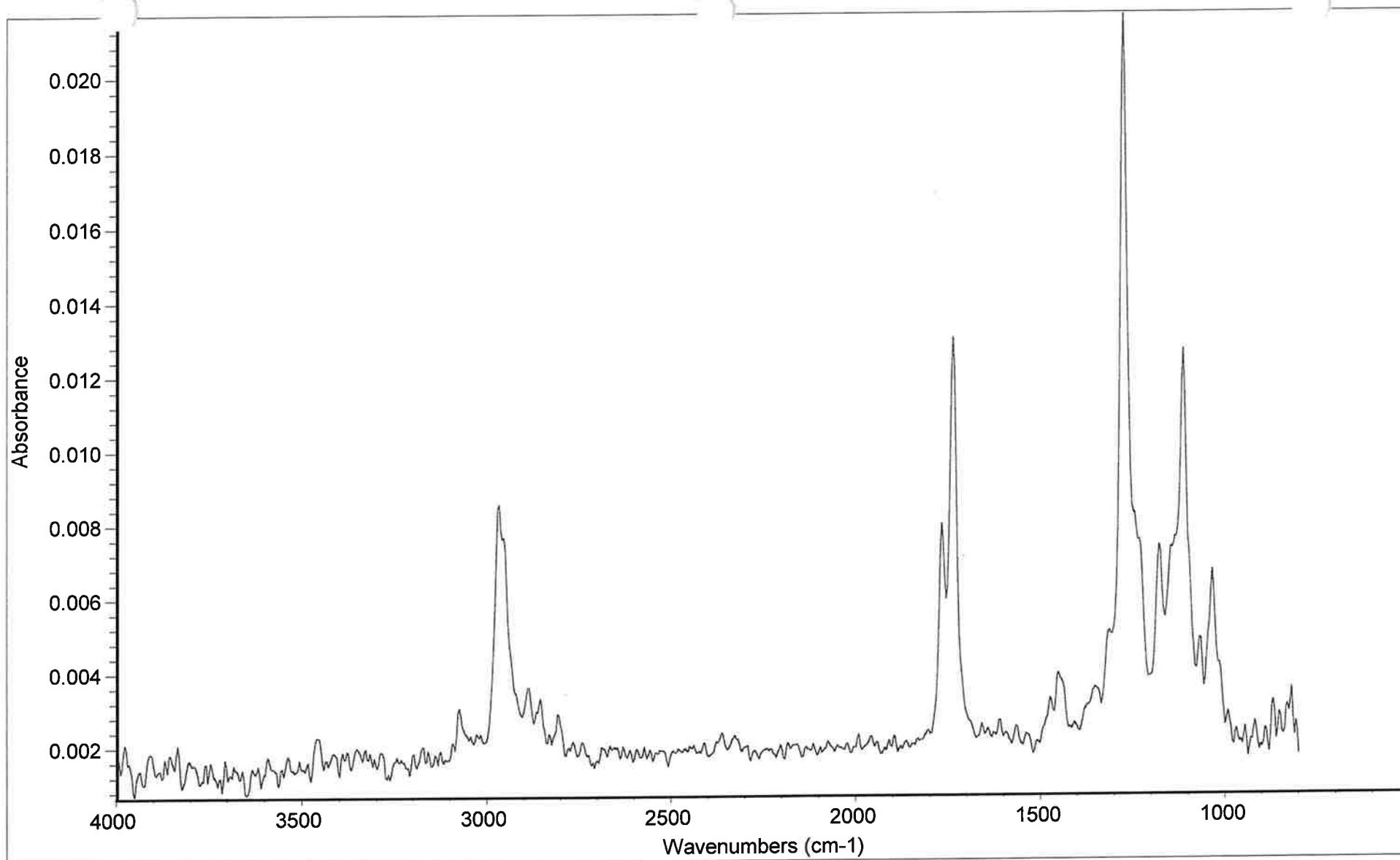
Sample gain: 2.0

Mirror velocity: 3.1647

Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 05 08:51:31 2014 (GMT-06:00)



Cocaine,

Methanol 120-270c @70c/ min for 20 min

GCIR #2 11/5/14 LJ

Column 19091Z-213 30 Meters

Column flow 3.0

Split ratio 3.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT/A

Beamsplitter: KBr

Source: IR

Number of sample scans: 4

Number of background scans: 10

Resolution: 8.000

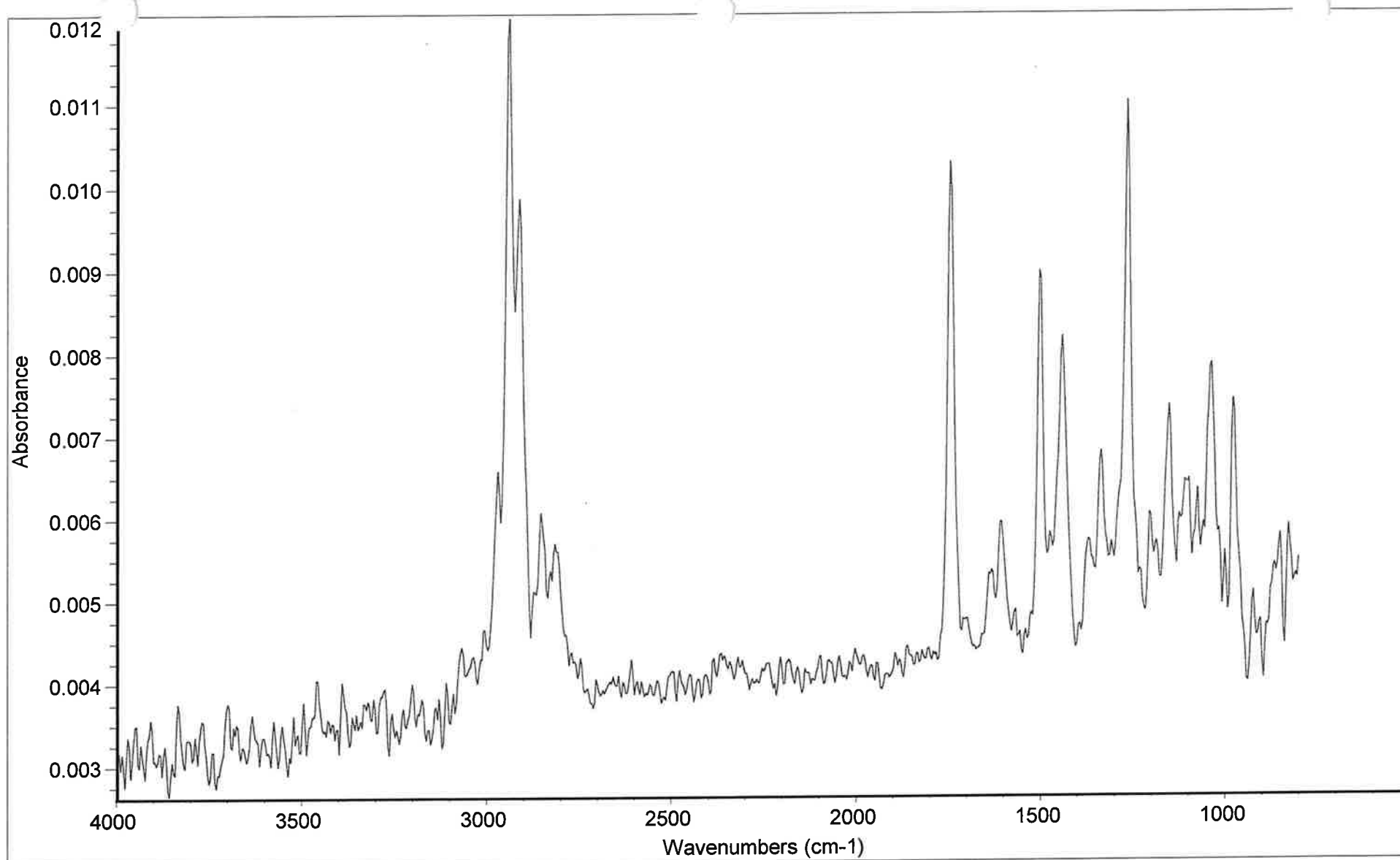
Sample gain: 2.0

Mirror velocity: 3.1647

Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 05 08:53:38 2014 (GMT-06:00)



Hydrocodone

Methanol 120-270c @70c/ min for 20 min

GCIR #2 11/5/14 LJ

Column 19091Z-213 30 Meters

Column flow 3.0

Split ratio 3.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

GC/FTIR 2

Collection time: Wed Nov 05 08:56:03 2014 (GMT-06:00)

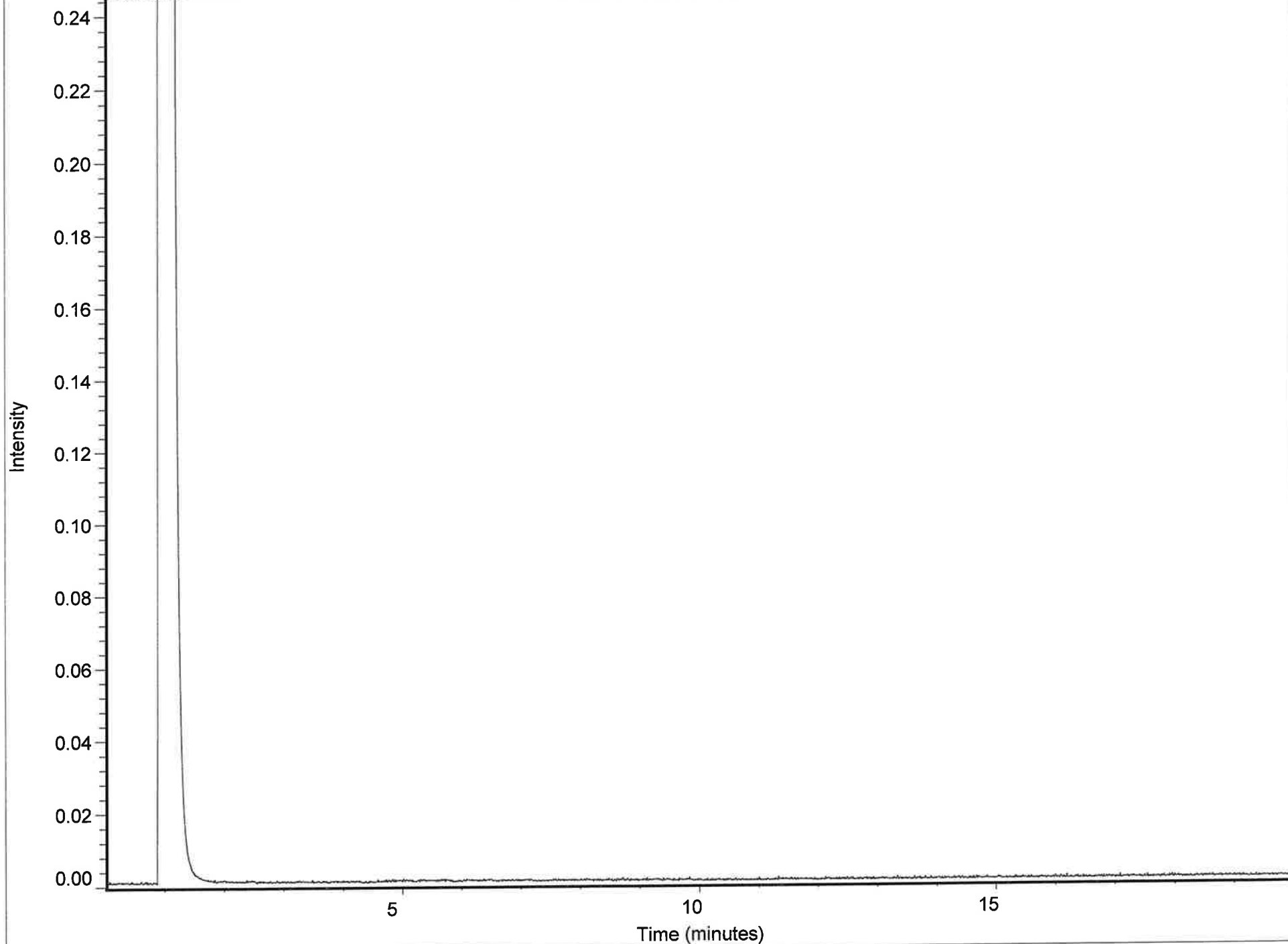
Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

Methanol Blank

Methanol 200-270c @70c/min for 20 min

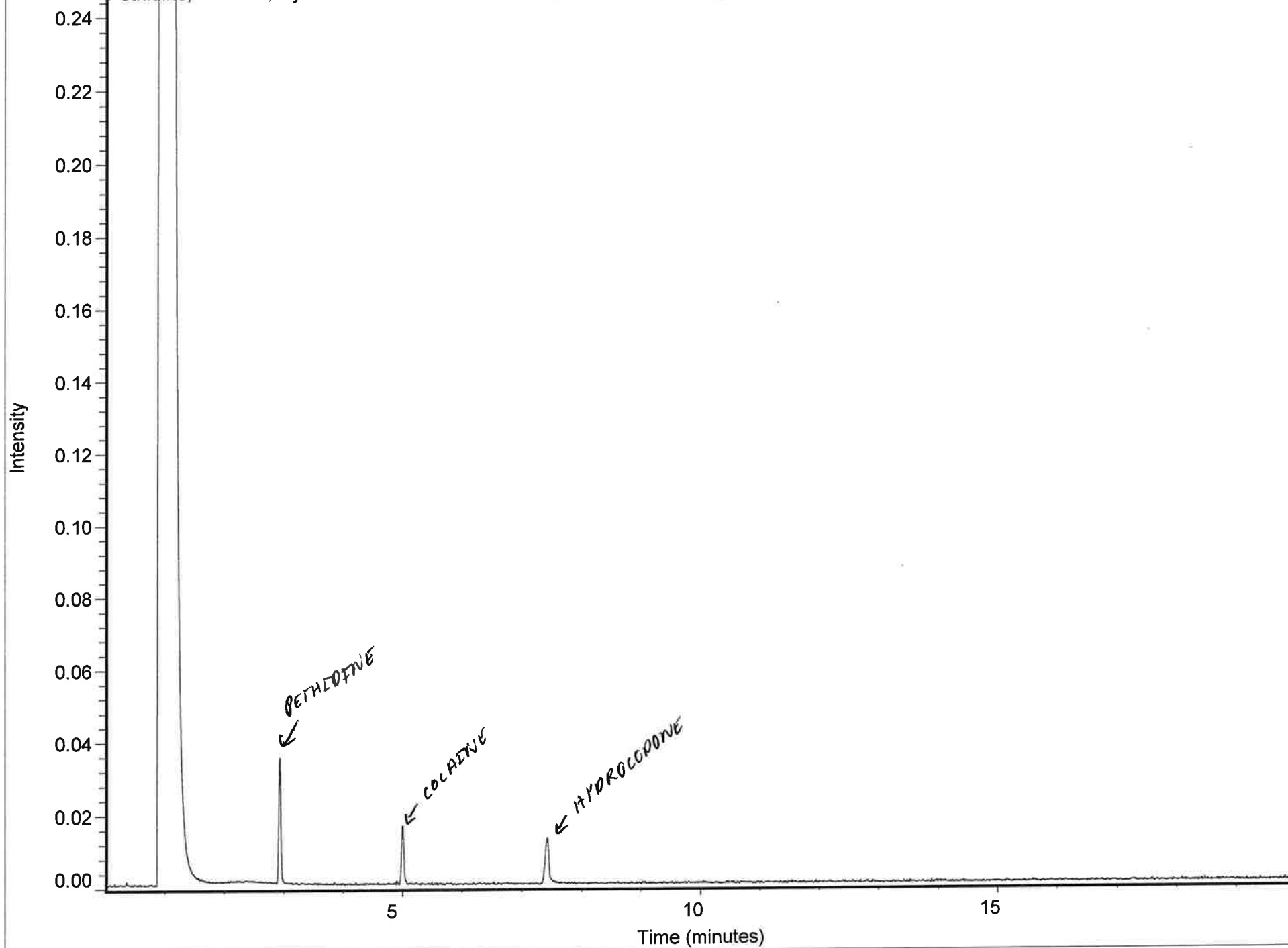
GCIR #2 11/5/14 LJ

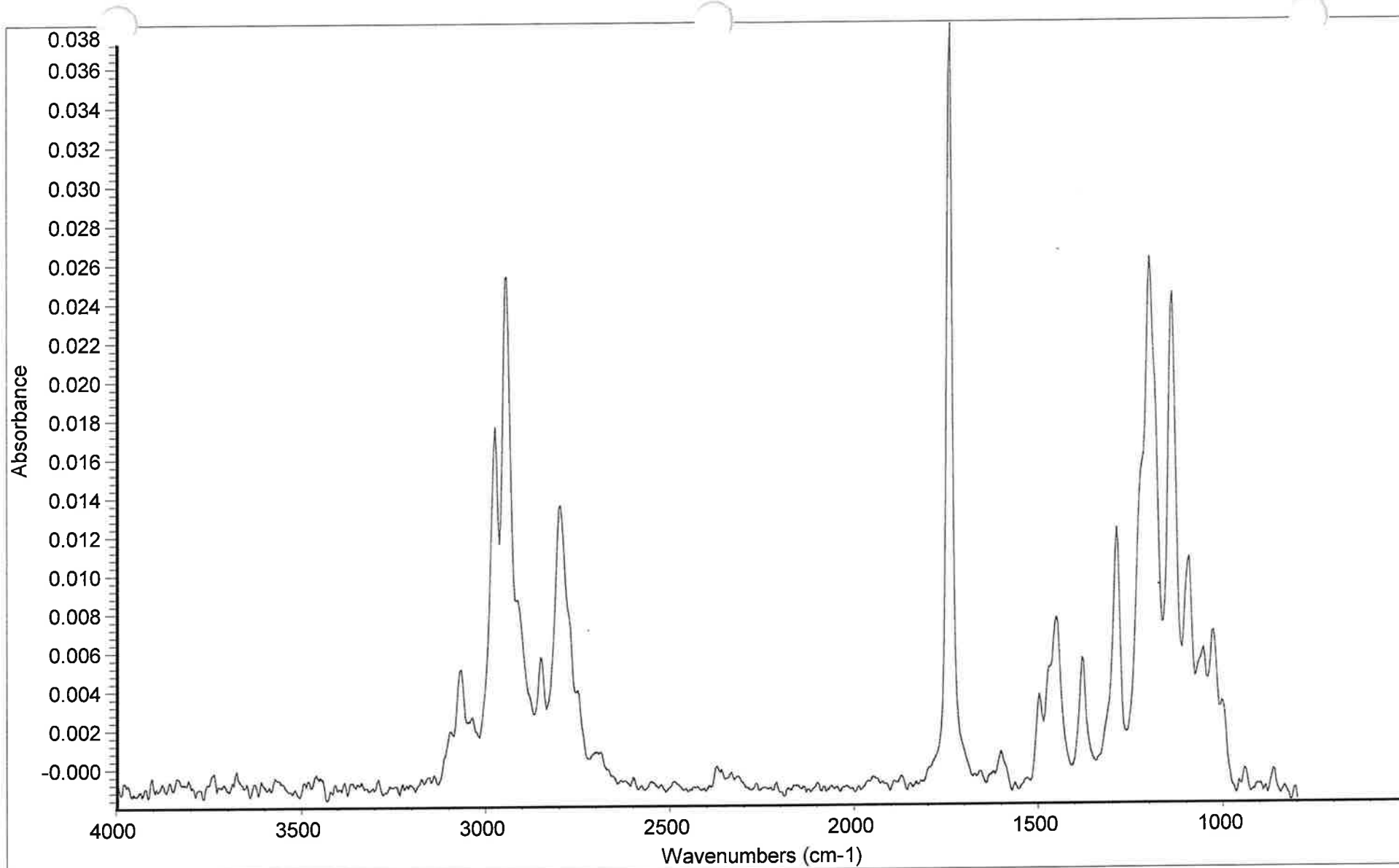


Pethidine, Cocaine, Hydrocodone

Methanol 260-270c @70c/ min for 20 min

GCIR #2 11/5/14 LJ





Pethidine

Methanol 200-270c @70c/ min for 20 min

GCIR #2 11/5/14 LJ

Column 19091Z-213 30 Meters

Column flow 3.0

Split ratio 3.0

Transfer Line 280 degrees C

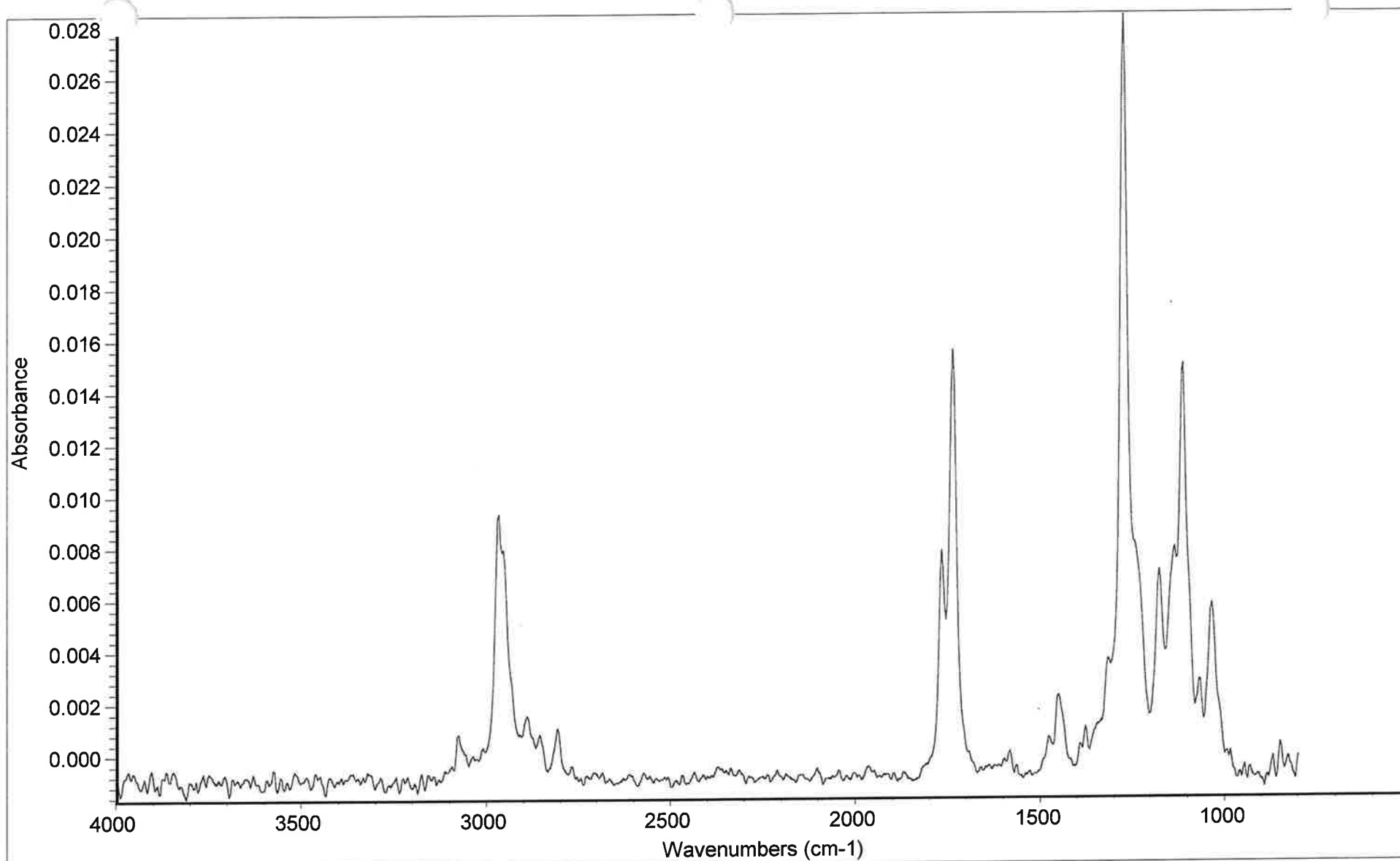
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 05 09:56:20 2014 (GMT-06:00)



Cocaine

Methanol 200-270c @70c/ min for 20 min

GCIR #2 11/5/14 LJ

Column 19091Z-213 30 Meters

Column flow 3.0

Split ratio 3.0

Transfer Line 280 degrees C

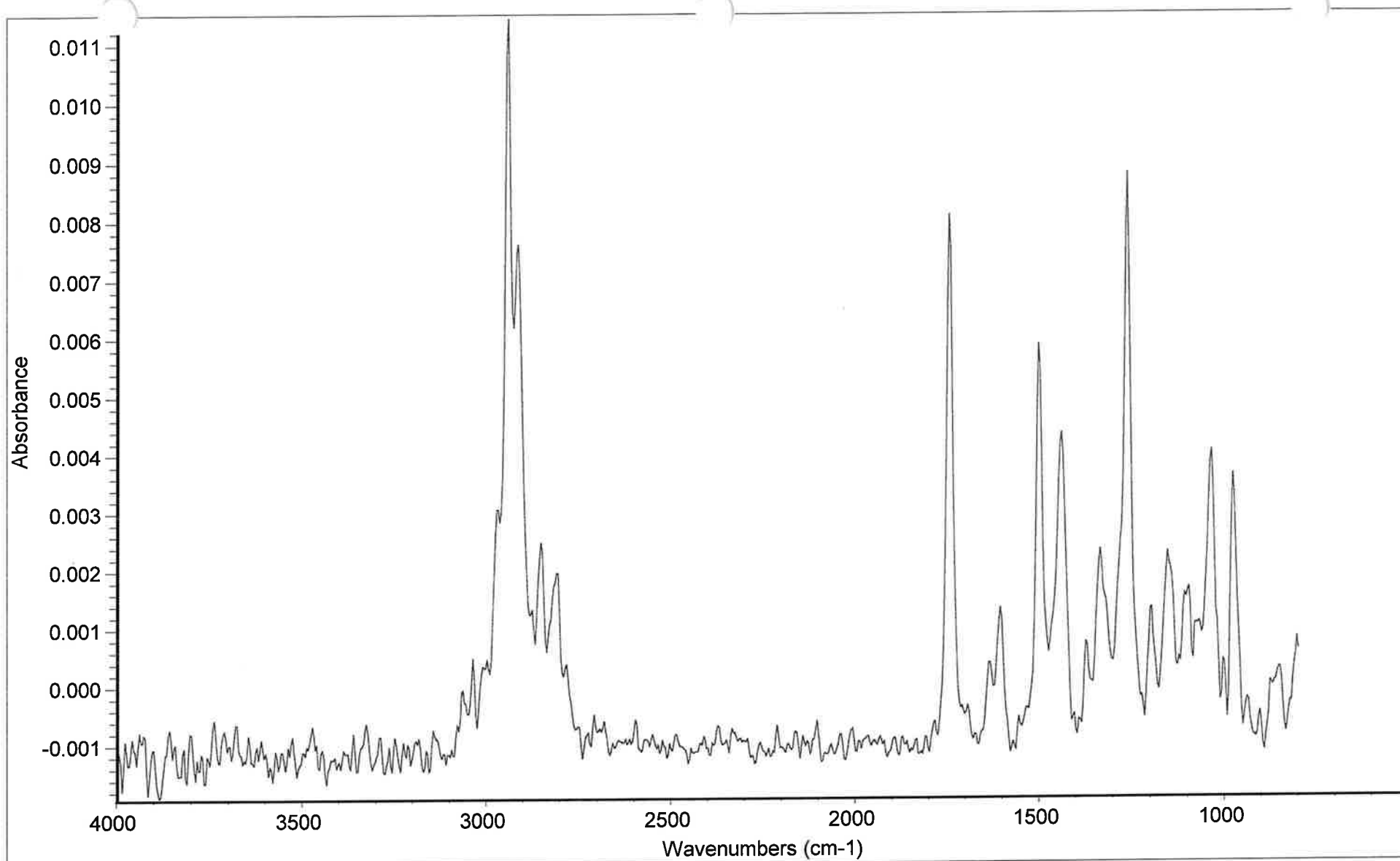
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 05 09:58:24 2014 (GMT-06:00)



Hydrocodone

Methanol 200-270c @70c/ min for 20 min

GCIR #2 11/5/14 LJ

Column 19091Z-213 30 Meters

Column flow 3.0

Split ratio 3.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

GC/FTIR 2

Collection time: Wed Nov 05 10:00:50 2014 (GMT-06:00)

Detector: MCT/A

Beamsplitter: KBr

Source: IR

Number of sample scans: 4

Number of background scans: 10

Resolution: 8.000

Sample gain: 2.0

Mirror velocity: 3.1647

Aperture: 100.00

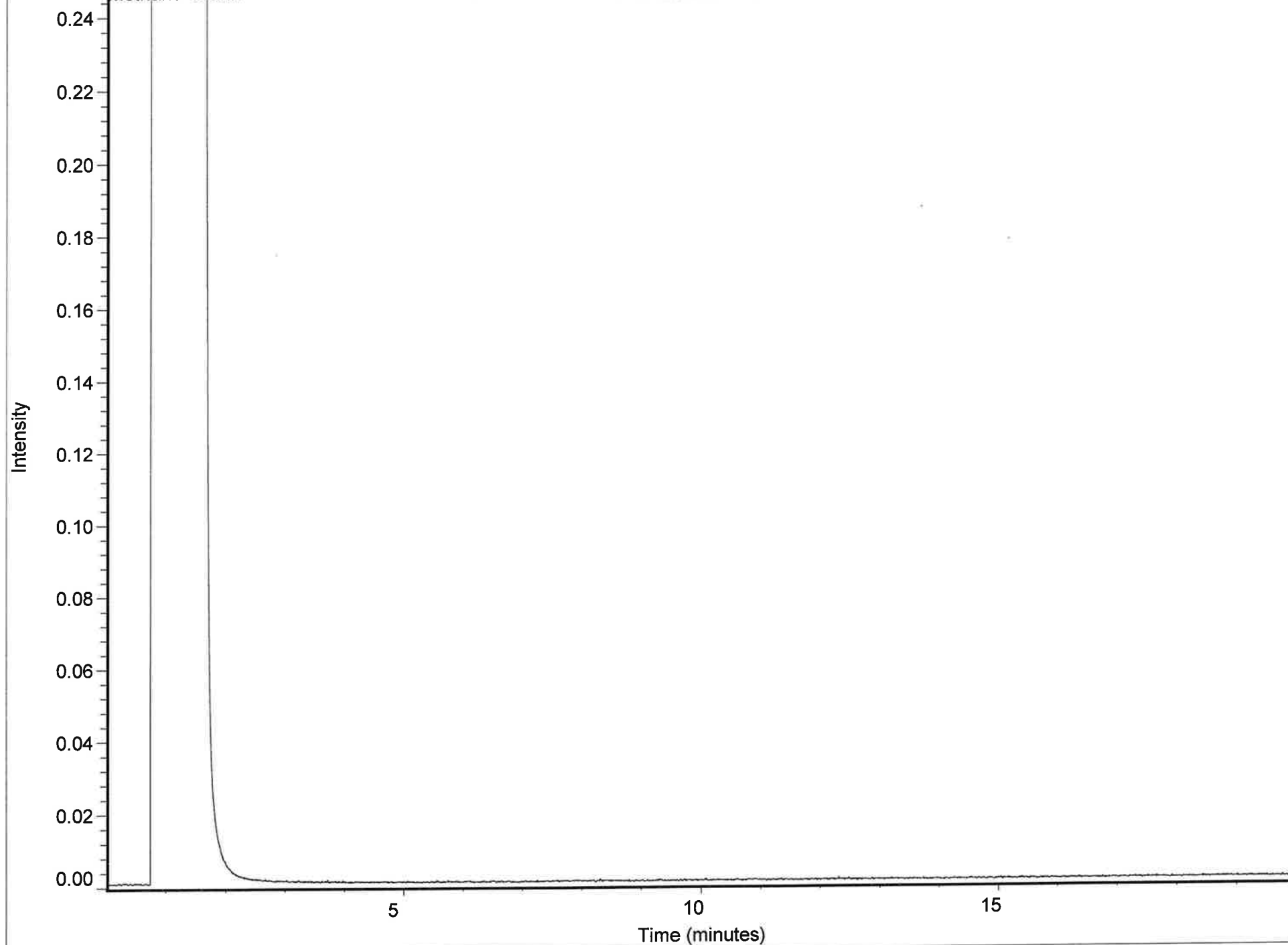
Methanol Blank

Methanol

270c for 20 min

GCIR #2

10/5/14 LJ



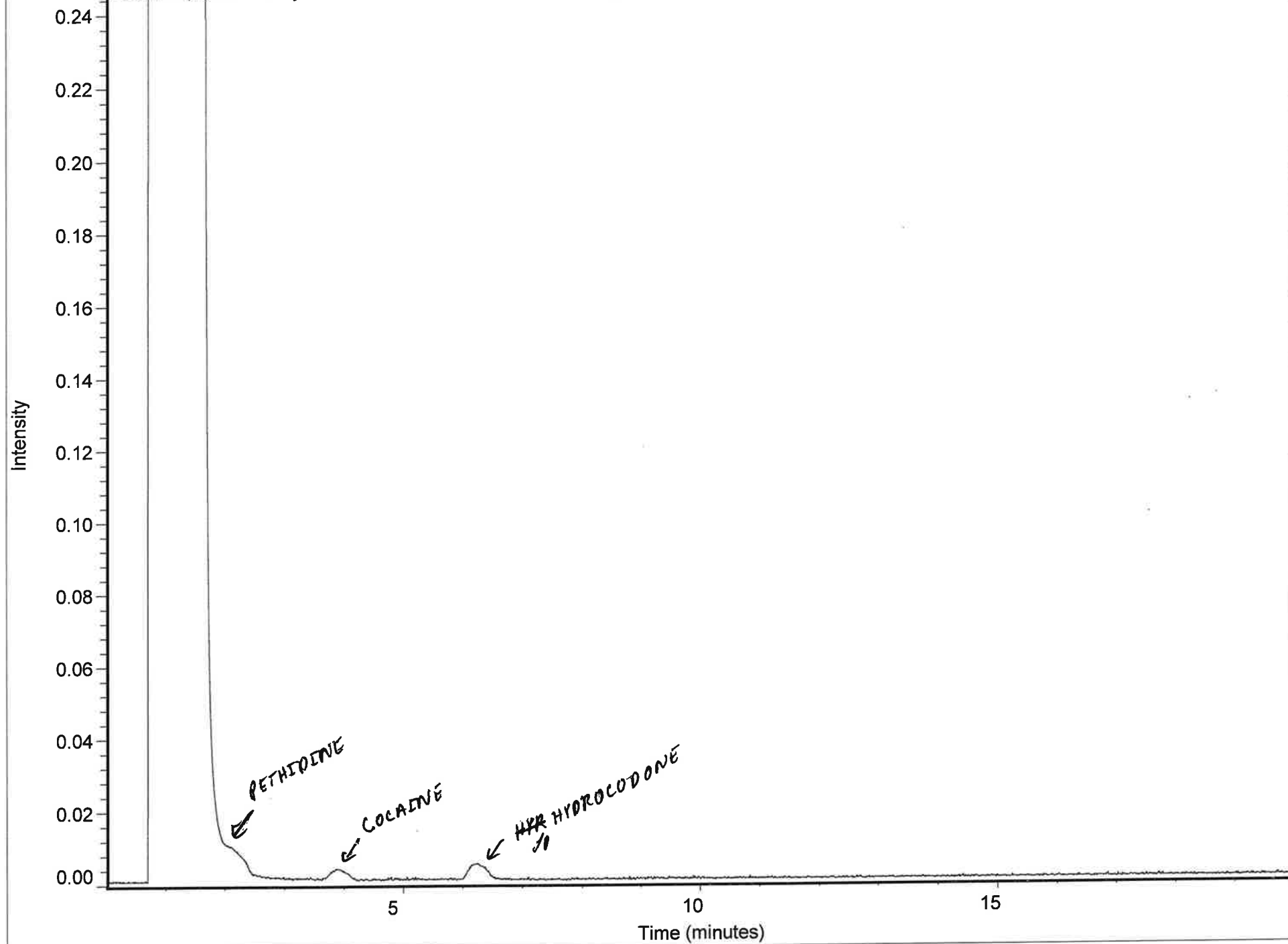
ethidine, Cocaine, Hydrocodone

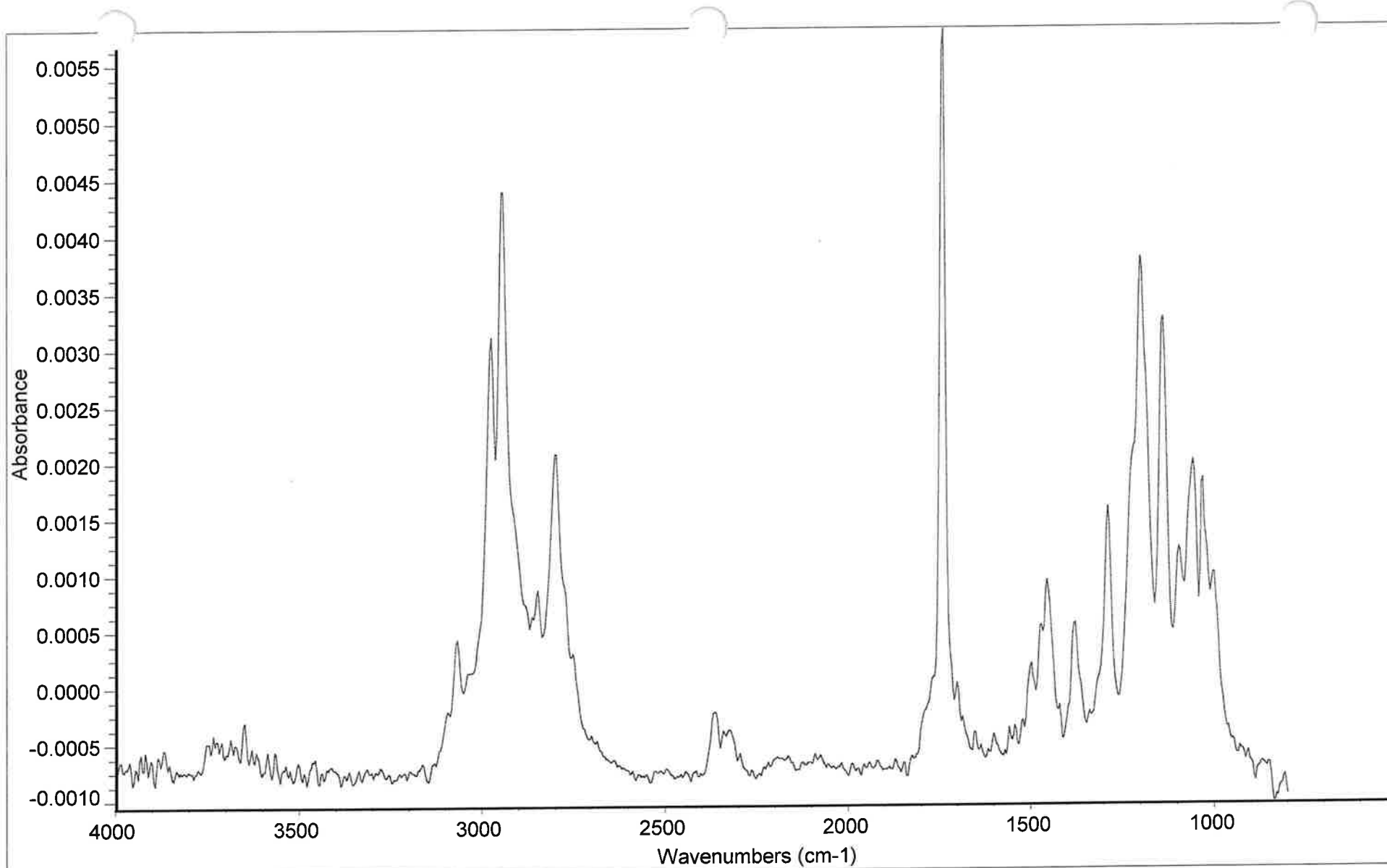
Metabolite

270c for 20 min

GCIR #2

10/5/14 LJ





Pethidine

Methanol 270c for 20 min GCIR #2 10/5/14 LJ

Column 19091Z-213 30 Meters

Column flow 3.0

Split ratio 3.0

Transfer Line 280 degrees C

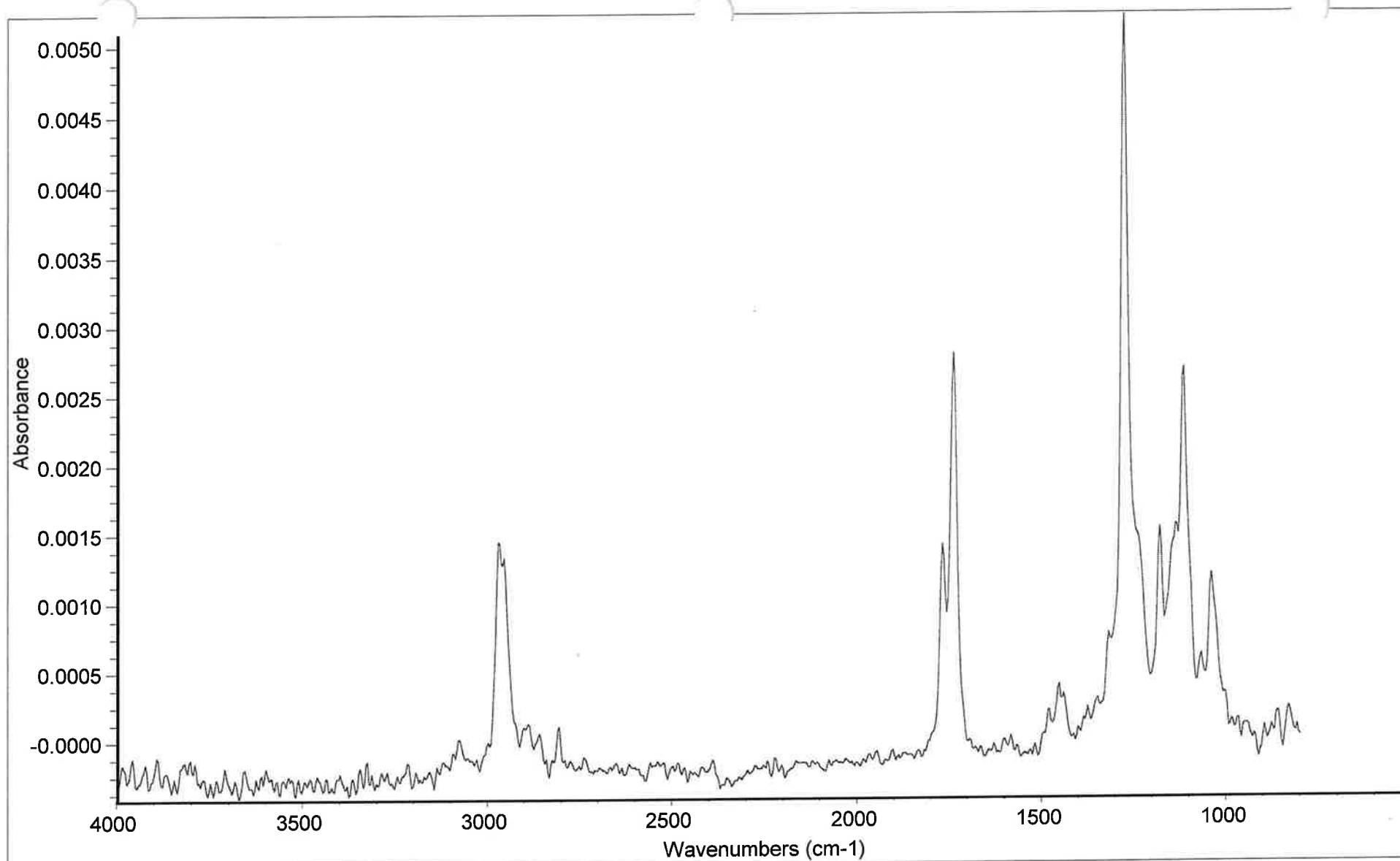
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 104
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 05 14:16:21 2014 (GMT-06:00)



Cocaine

Methanol 270c for 20 min GCIR #2 10/5/14 LJ

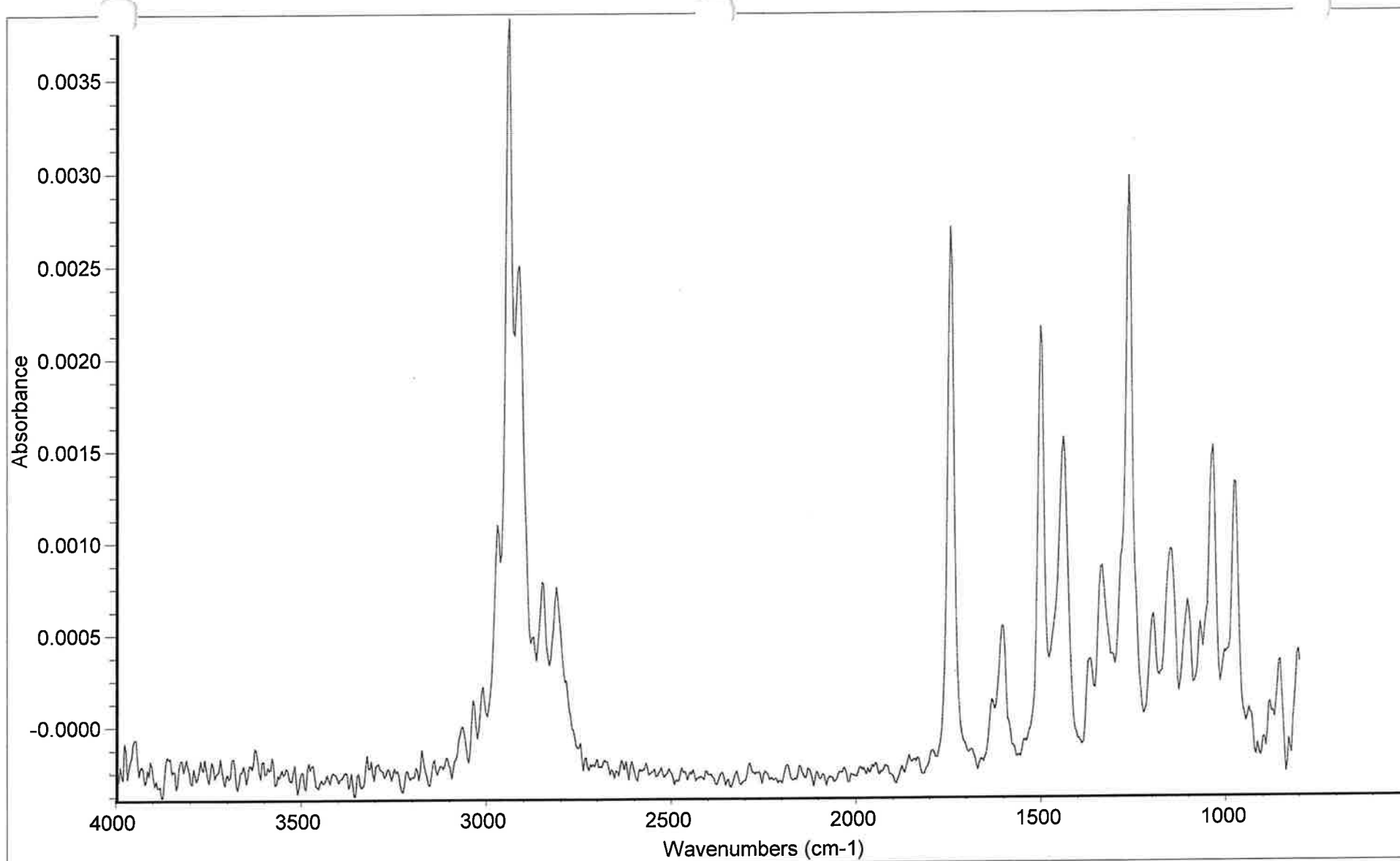
Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

GC/FTIR 2

Collection time: Wed Nov 05 15:21:24 2014 (GMT-06:00)

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 128
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00



Hydrocodone

Methanol 270c for 20 min GCIR #2 10/5/14 LJ

Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

GC/FTIR 2

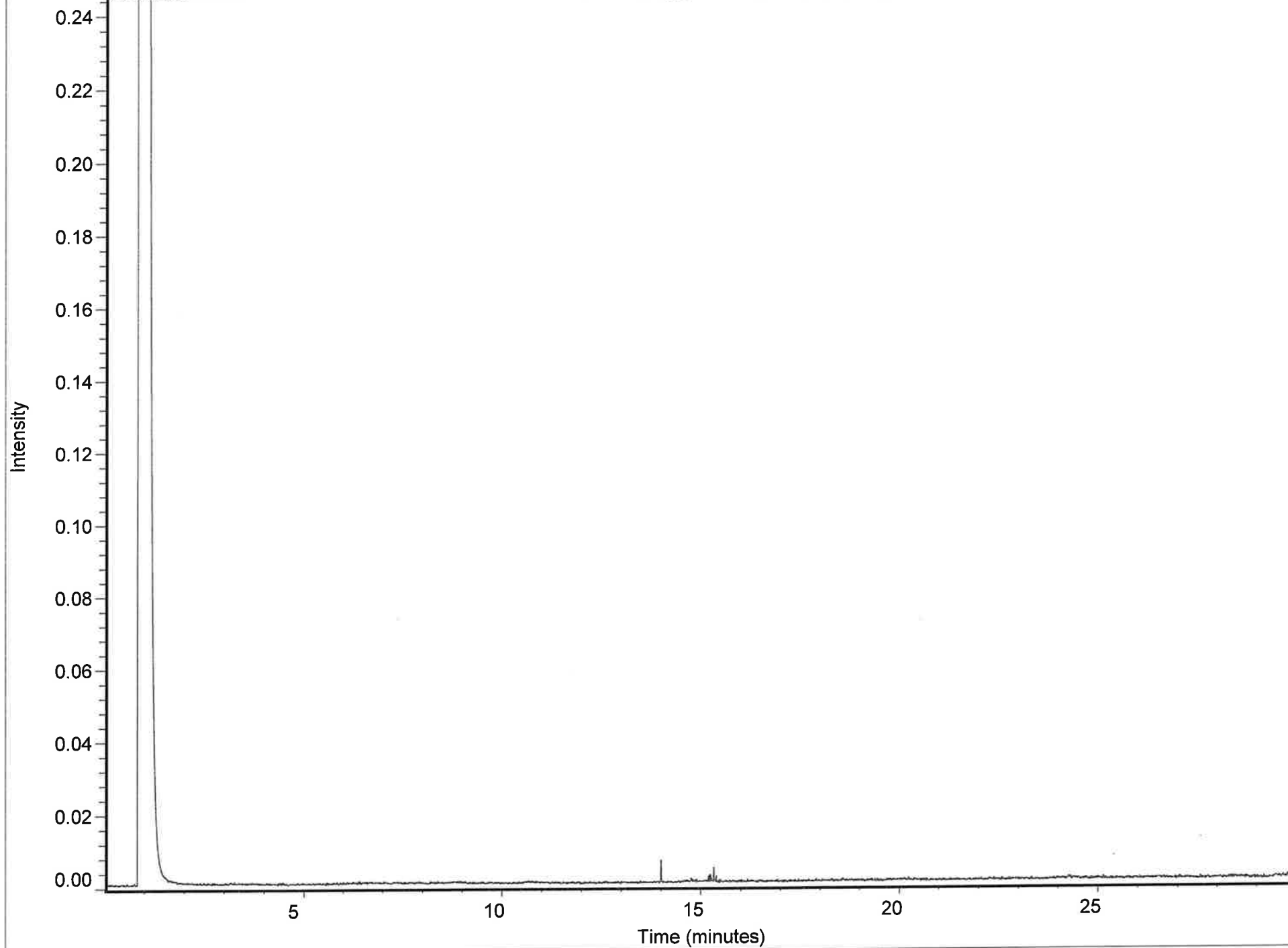
Collection time: Wed Nov 05 16:24:12 2014 (GMT-06:00)

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 120
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

Methanol Blank

Methanol 270c for 30 min GCIR #2 11/12/14 LJ



ethidine, Cocaine, Hydrocodone

Methanol 270c for 30 min GCIR #2 11/12/14 LJ

Intensity

1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1

ETHIDINE



COCAINE



HYDROCODONE



5

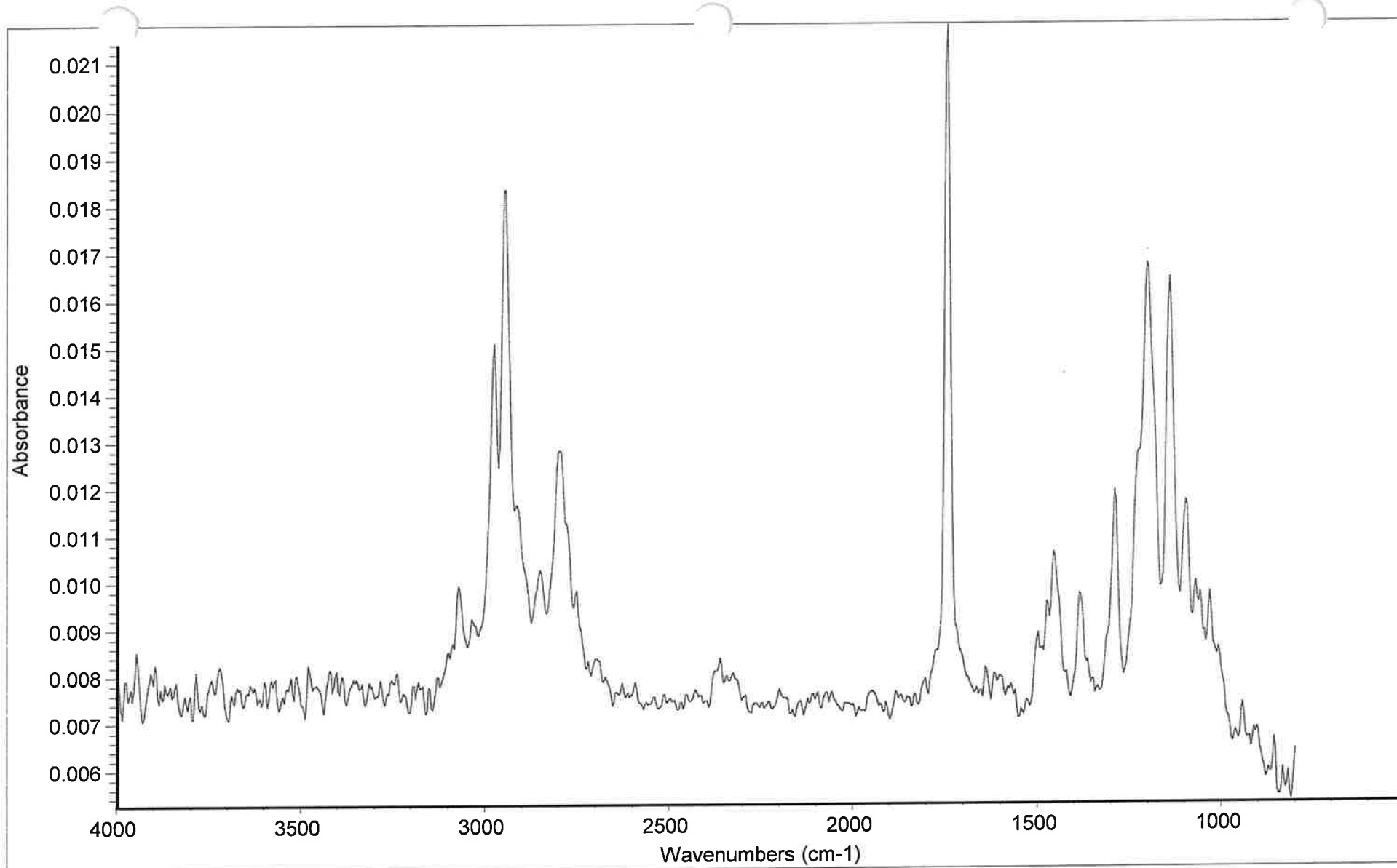
10

15

20

25

Time (minutes)



Pethidine Methanol 270c for 30 min GCIR #2 11/12/14 LJ

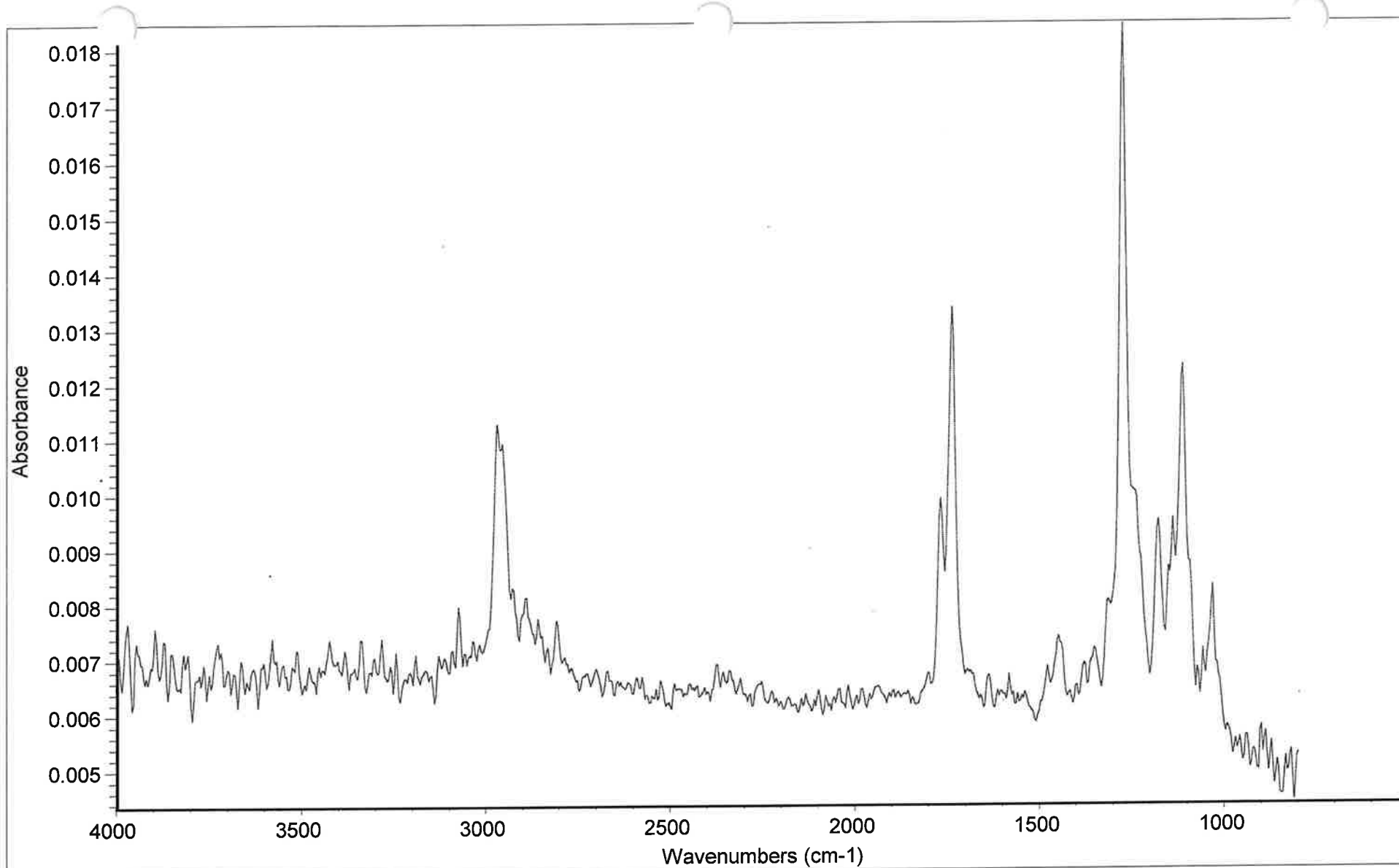
Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 10:09:21 2014 (GMT-06:00)



Cocaine Methanol 270c for 30 min GCIR #2 11/12/14 LJ

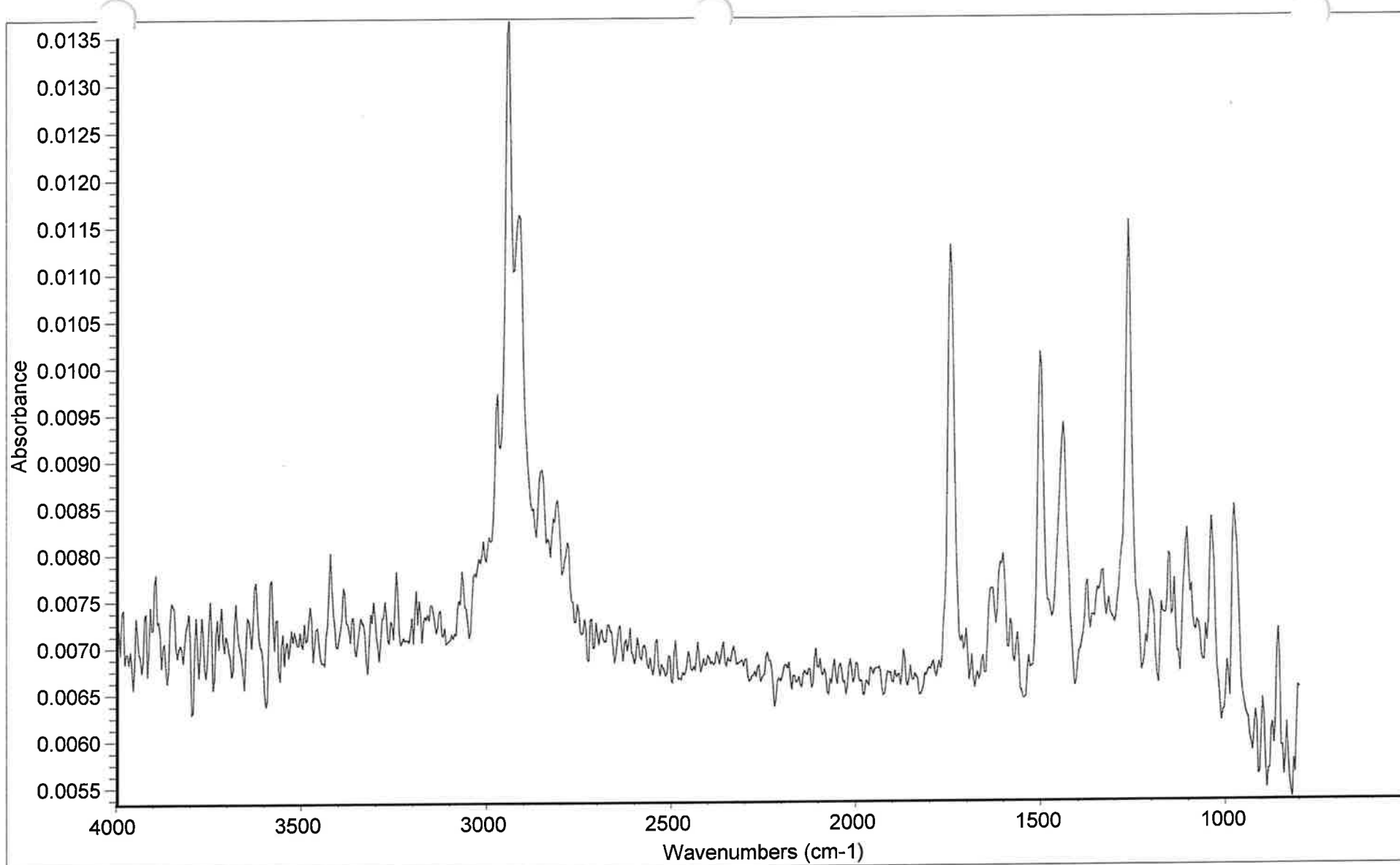
Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 10:11:05 2014 (GMT-06:00)



Hydrocodone Methanol 270c for 30 min GCIR #2 11/12/14 LJ

Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

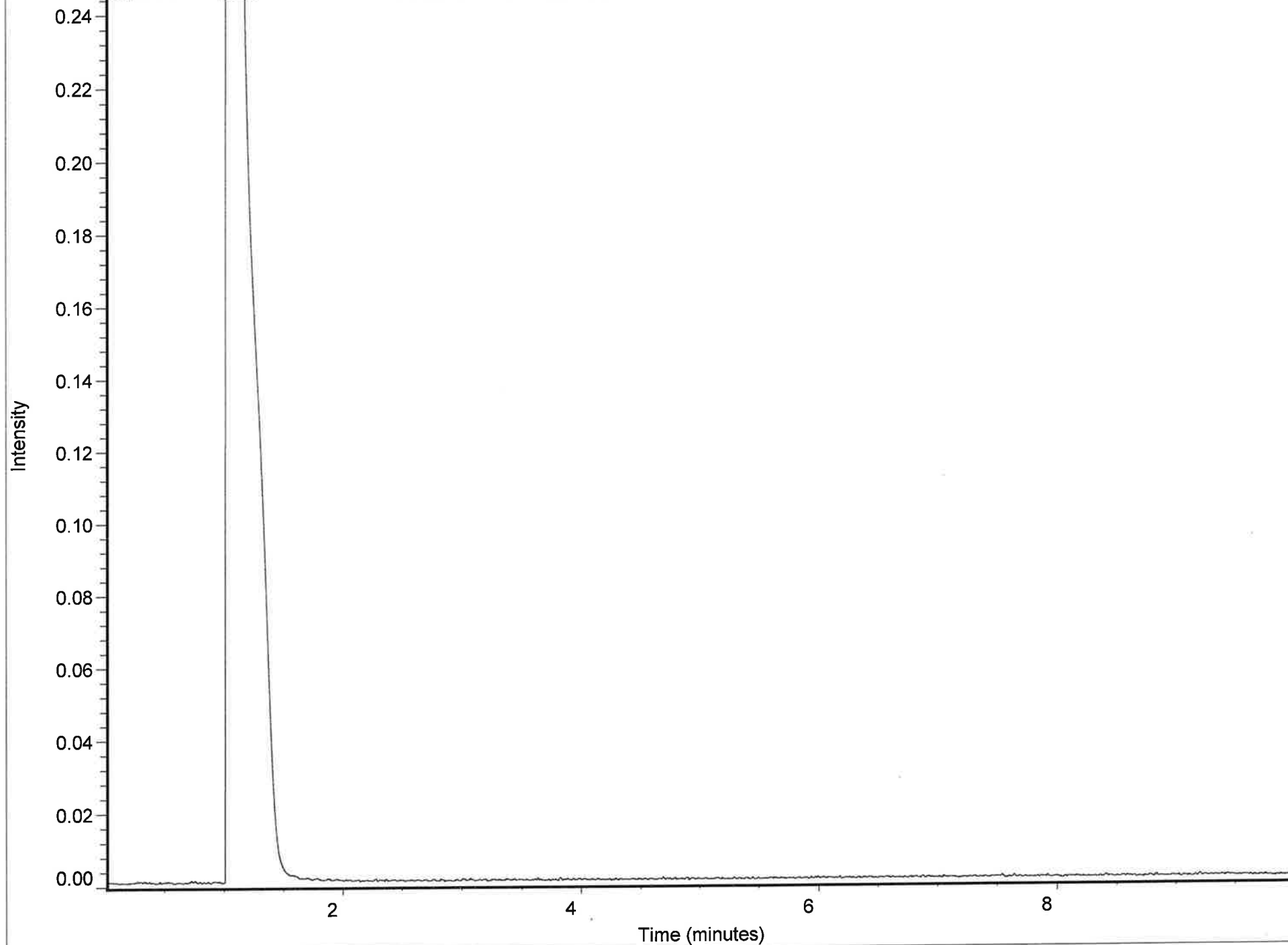
Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 10:13:26 2014 (GMT-06:00)

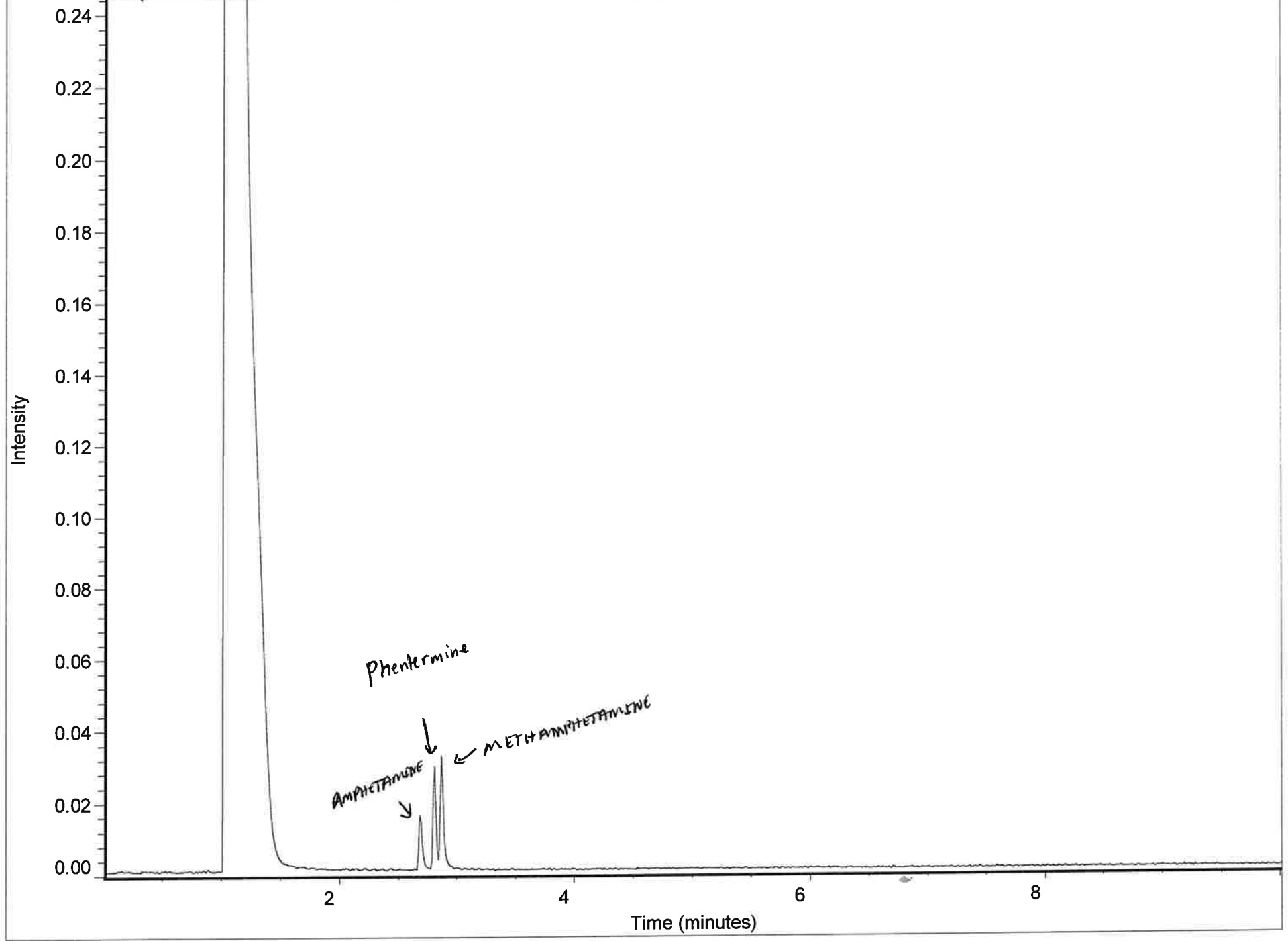
Chloroform Blank

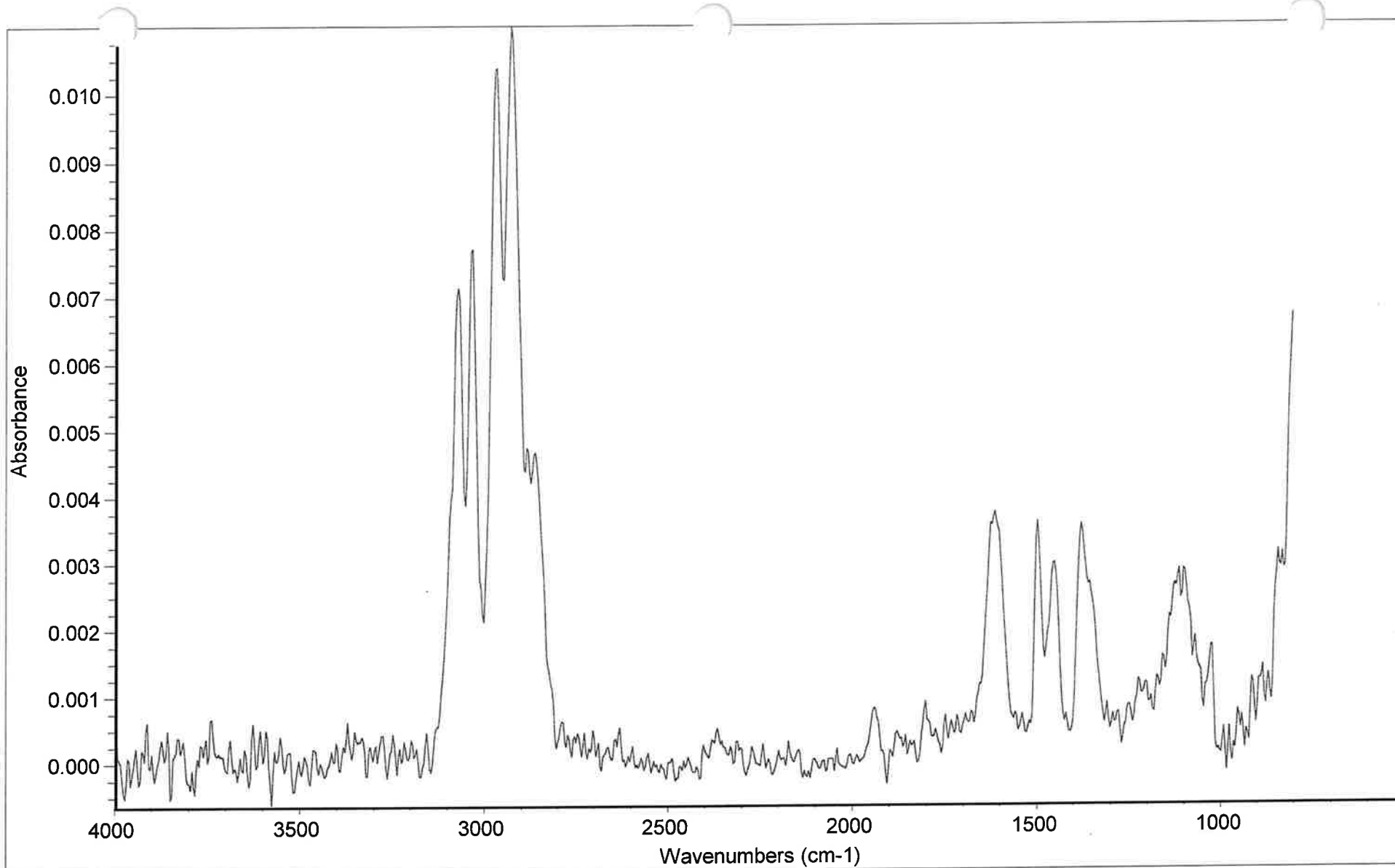
Chloroform 120- 270c @70c/min for 10 min GCIR #2 11/12/14 LJ



Amphetamine, Methamphetamine, Phentermine

Chl. Storm 120- 270c @70c/min for 10 min GCIR #2 11/12/14 LJ





Amphetamine Chloroform 120- 270c @70c/min for 10 min GCIR #2 11/12/14 LJ

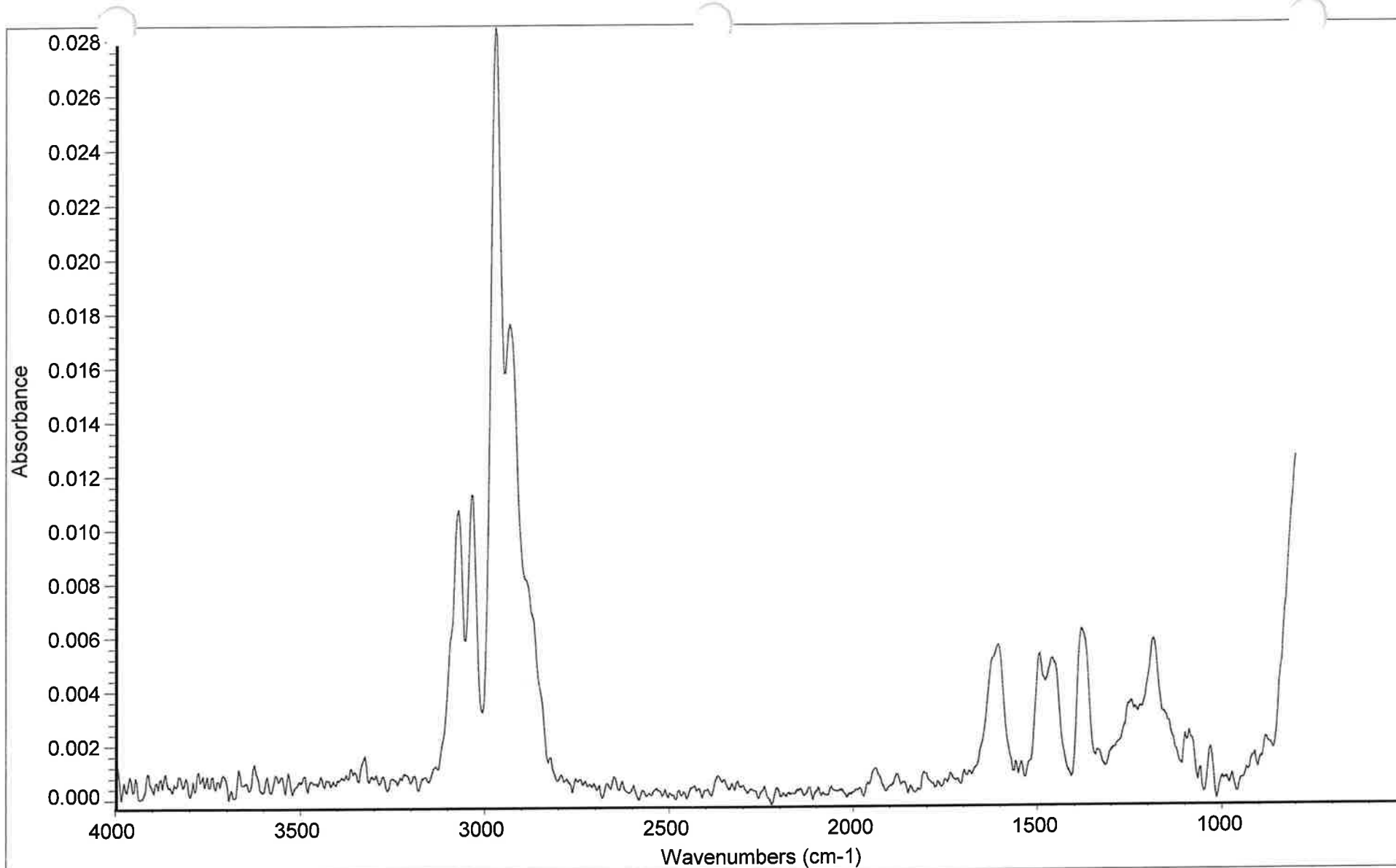
Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 11:22:29 2014 (GMT-06:00)



Phentermine Chloroform 120- 270c @70c/min for 10 min GCIR #2 11/12/14 LJ

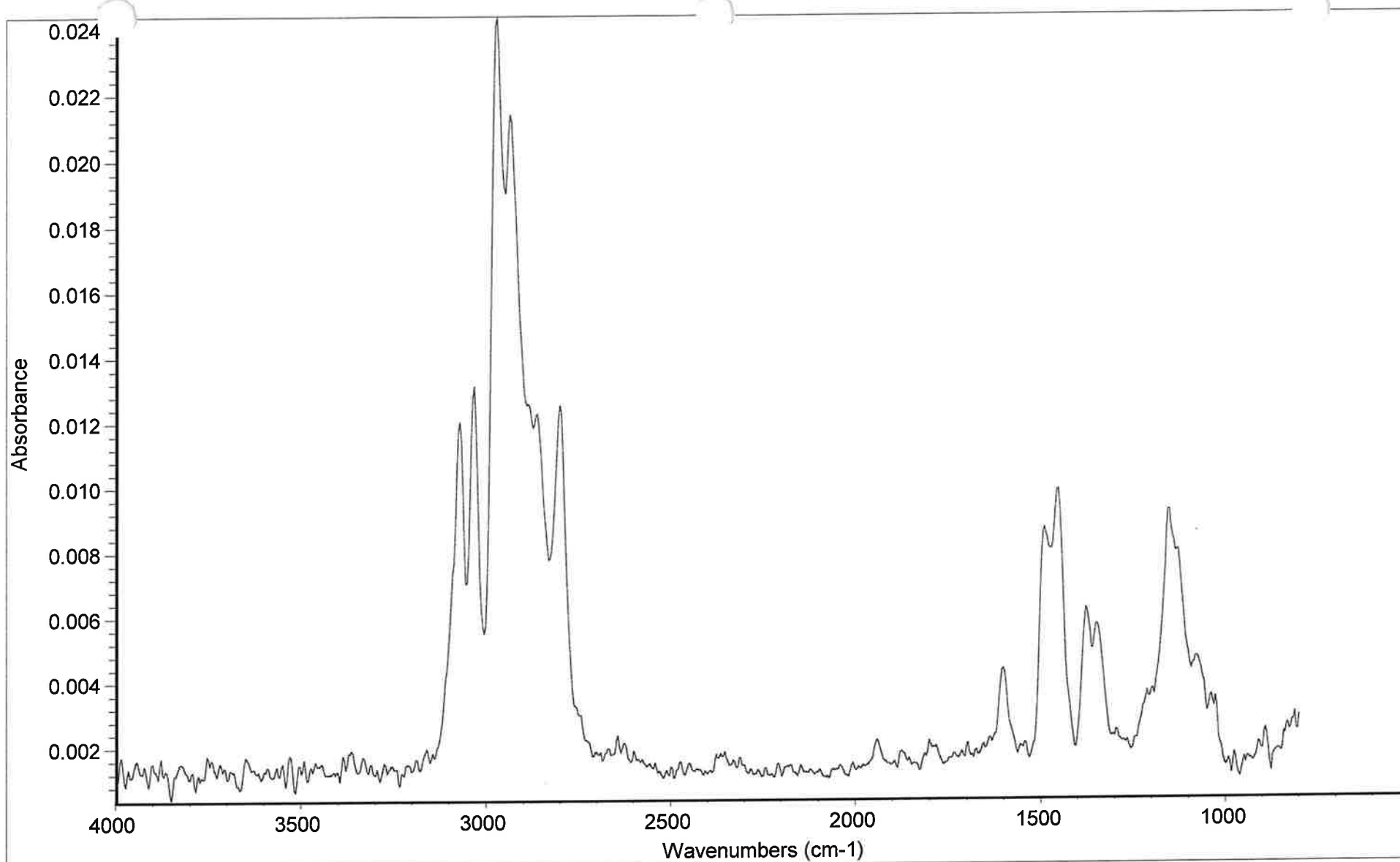
Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 11:22:37 2014 (GMT-06:00)



Methamphetamine Chloroform 120- 270c @70c/min for 10 min GCIR #2 11/12/14 LJ

Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

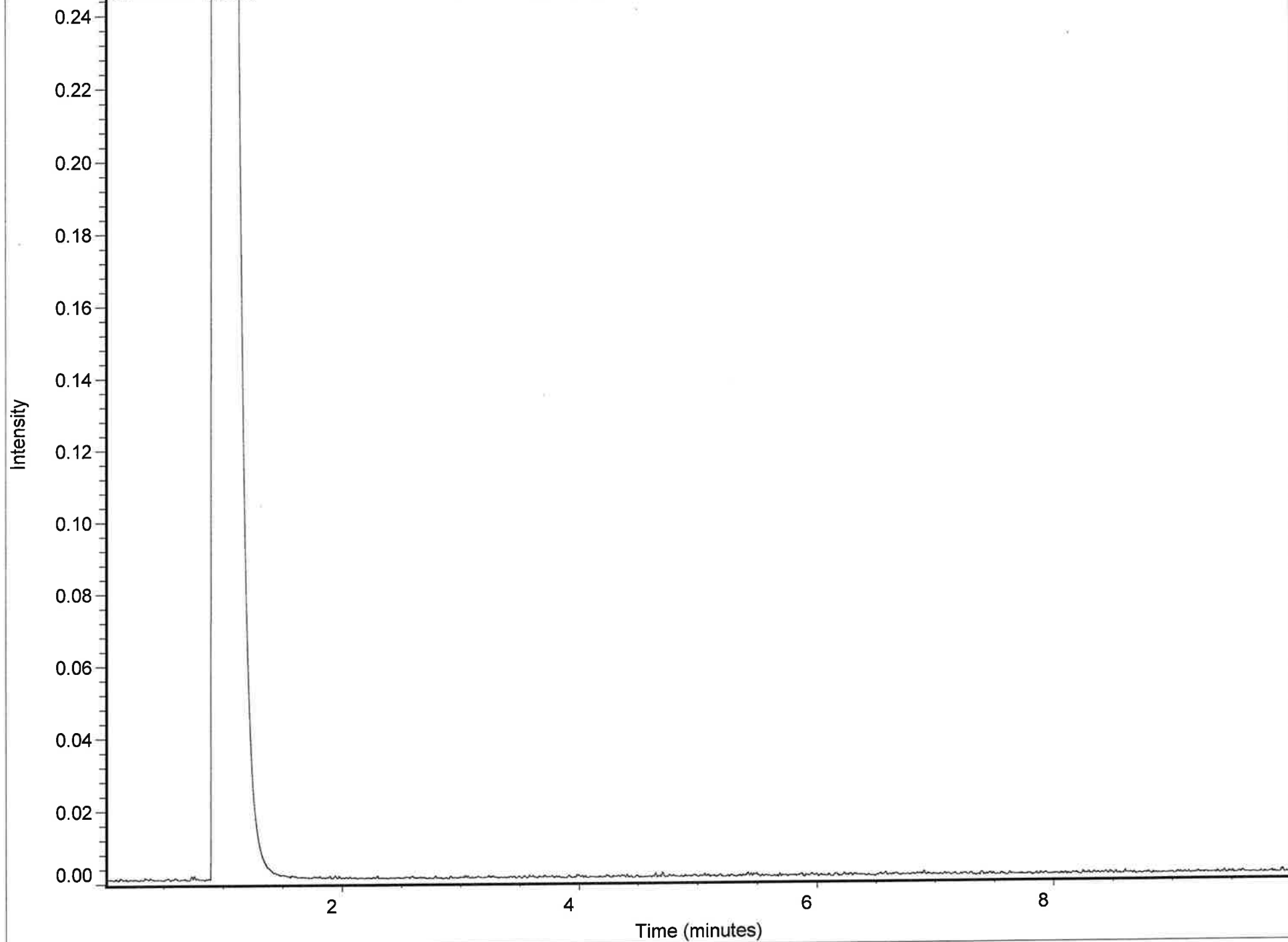
Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 11:22:40 2014 (GMT-06:00)

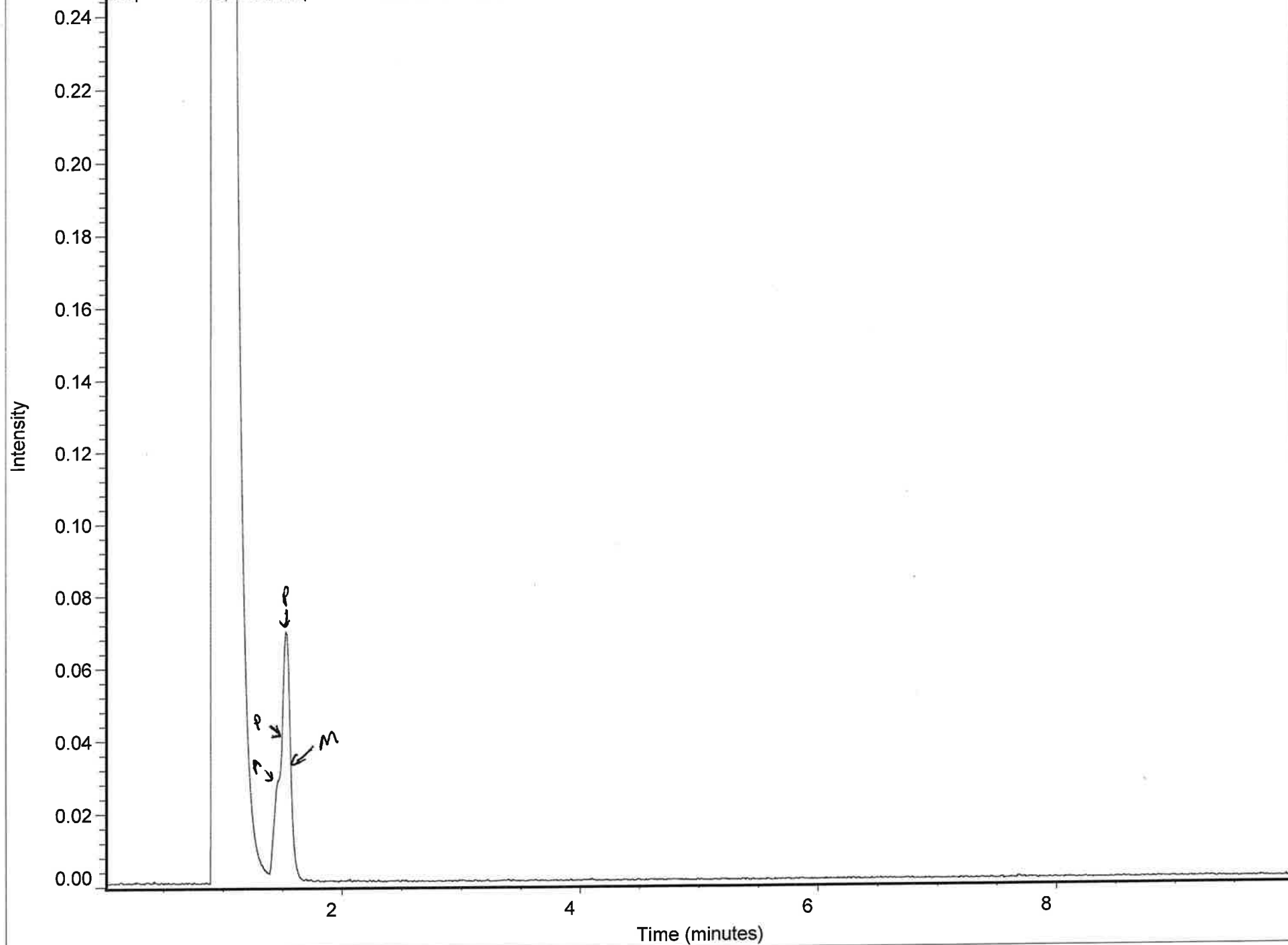
Chloroform Blank

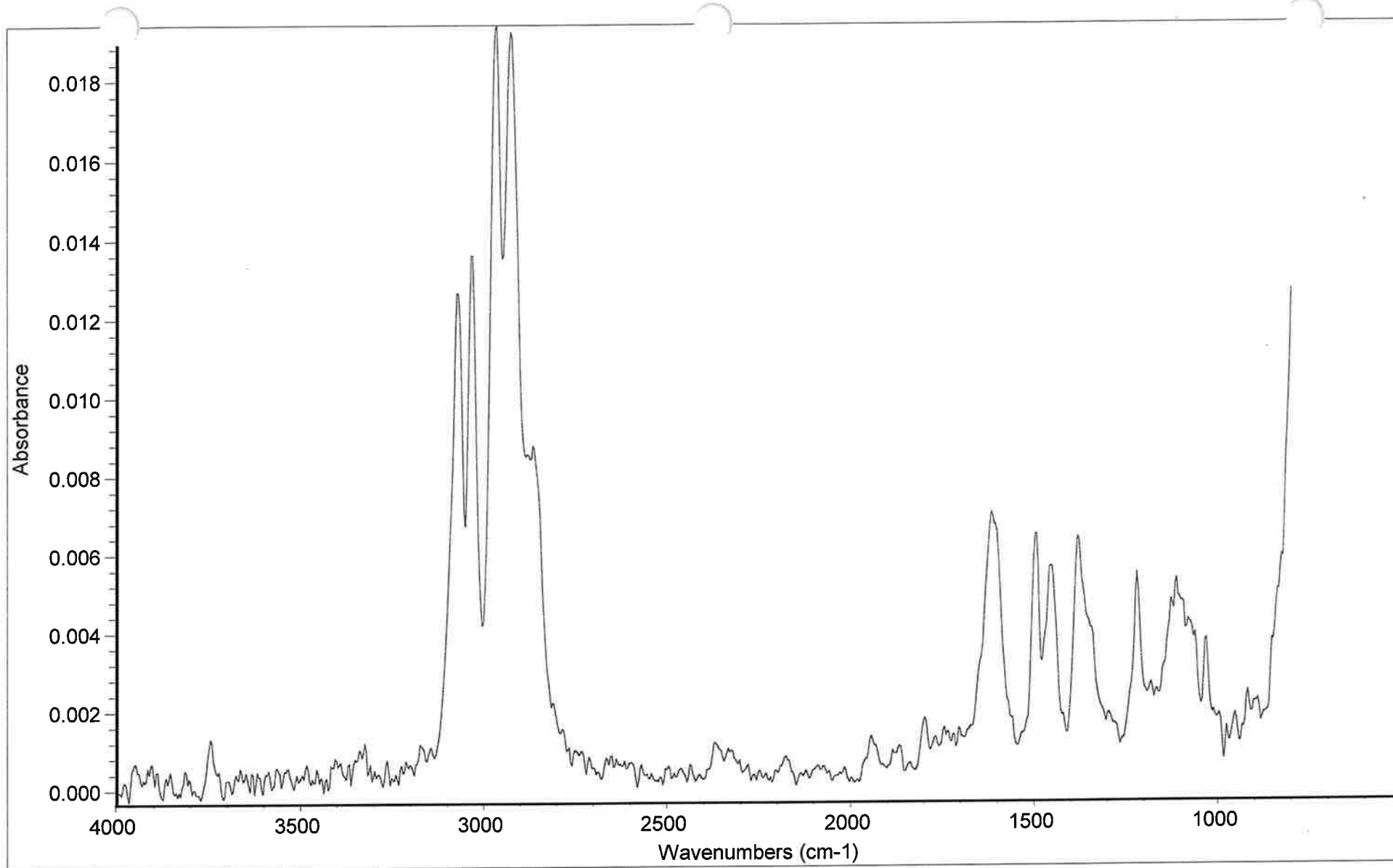
Chloroform 200- 270c @70c/min for 1.0 min GCIR #2 11/12/14 LJ



Amphetamine, Methamphetamine, Phentermine

Chloroform 200- 270c @70c/min for 10 min GCIR #2 11/12/14





Amphetamine

Chloroform 200- 270c @70c/min for 10 min GCIR #2 11/12/14 LJ

Column 19091Z-213 30 Meters

Column flow 3.0

Split ratio 3.0

Transfer Line 280 degrees C

Light Pipe 280 degrees C

Detector: MCT/A

Beamsplitter: KBr

Source: IR

Number of sample scans: 4

Number of background scans: 10

Resolution: 8.000

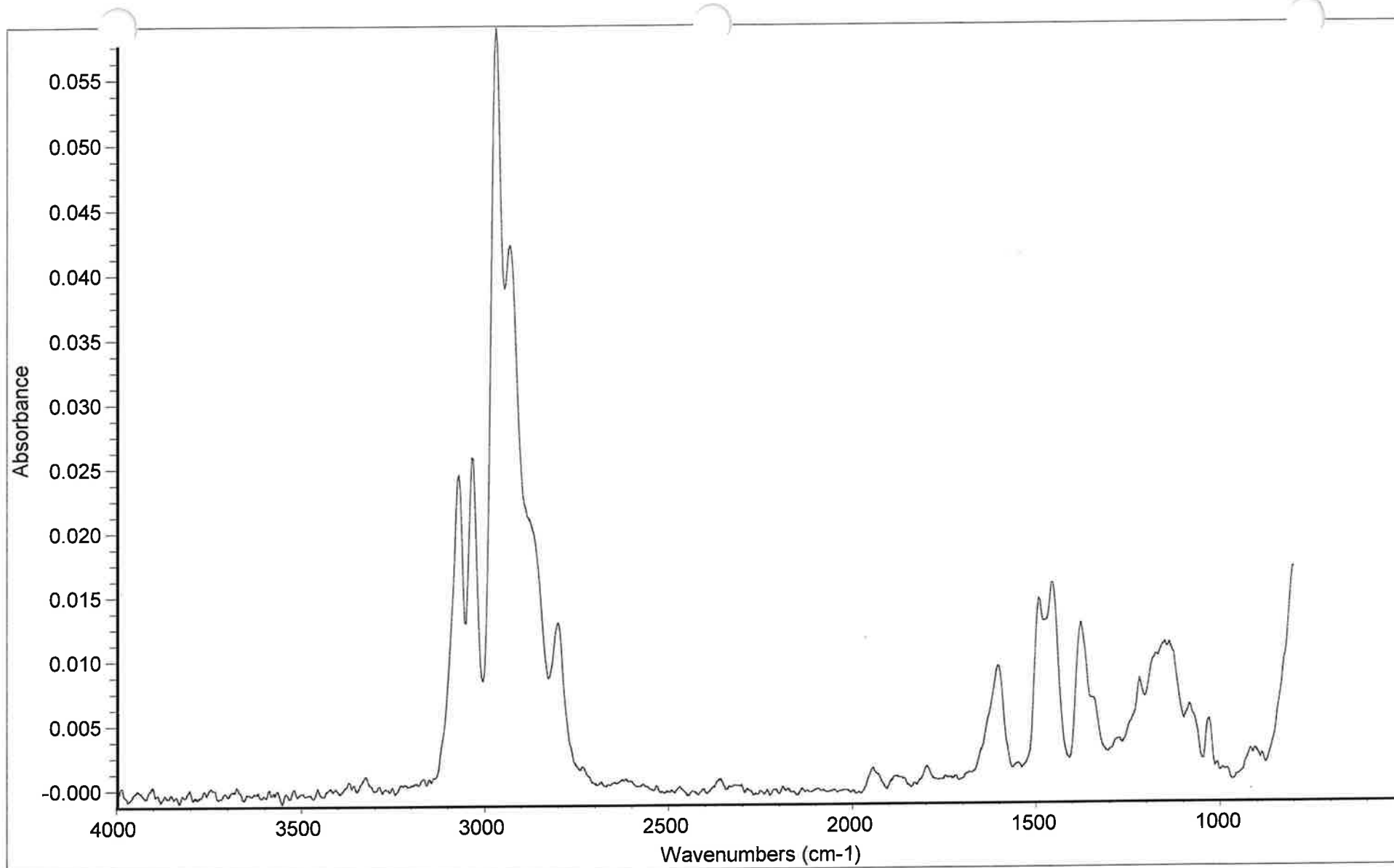
Sample gain: 2.0

Mirror velocity: 3.1647

Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 13:04:53 2014 (GMT-06:00)



Phentermine

Chloroform 200- 270c @70c/min for 10 min GCIR #2 11/12/14 LJ

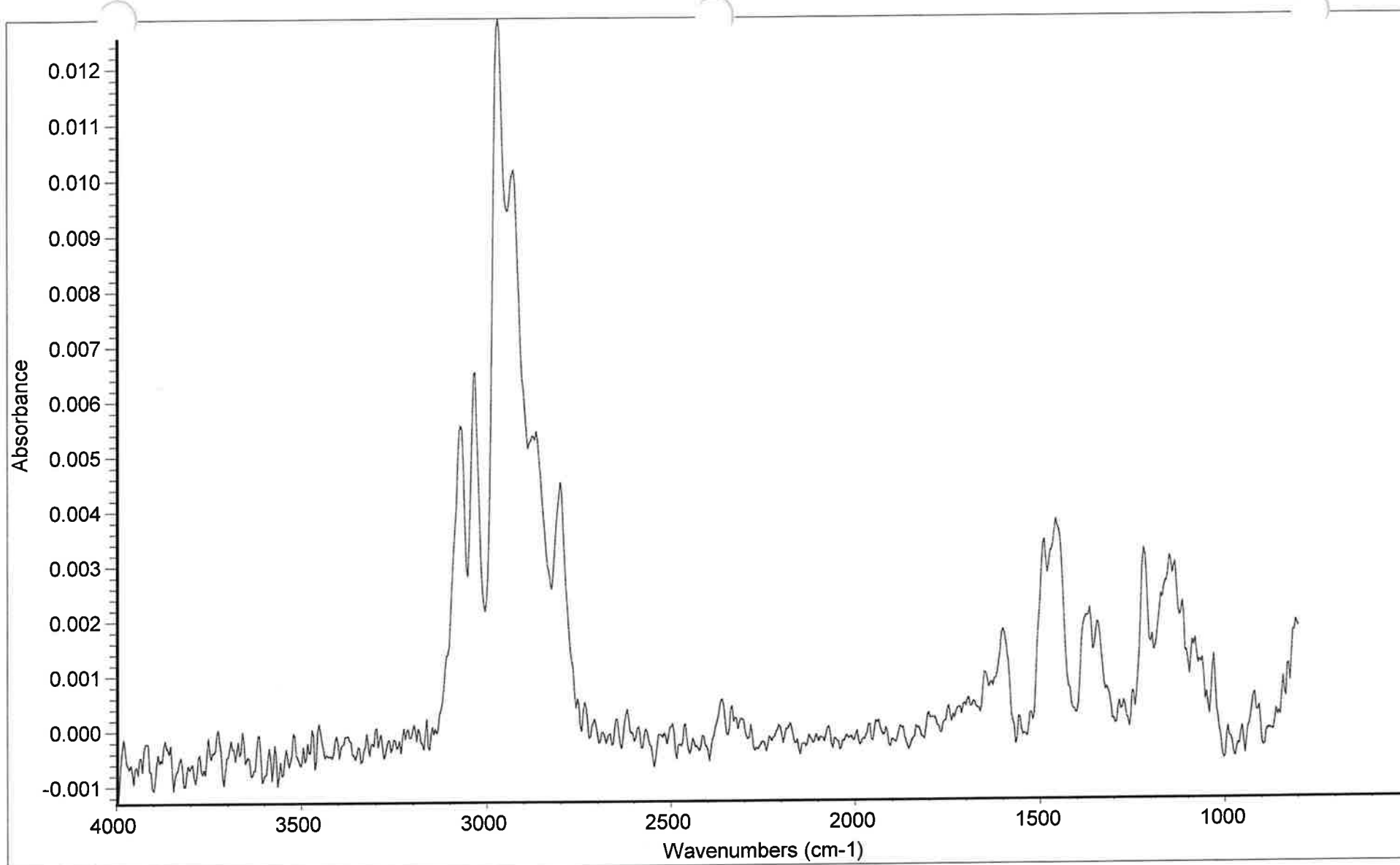
Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 13:04:57 2014 (GMT-06:00)



Methamphetamine

Chloroform 200- 270c @70c/min for 10 min GCIR #2 11/12/14 LJ

Column 19091Z-213 30 Meters
Column flow 3.0
Split ratio 3.0
Transfer Line 280 degrees C
Light Pipe 280 degrees C

Detector: MCT/A
Beamsplitter: KBr
Source: IR

Number of sample scans: 4
Number of background scans: 10
Resolution: 8.000
Sample gain: 2.0
Mirror velocity: 3.1647
Aperture: 100.00

GC/FTIR 2

Collection time: Wed Nov 12 13:05:00 2014 (GMT-06:00)