METHOD: IDENTIFICATION OF GHB IN A LIQUID

1. SAMPLE REQUIRED

   UNKNOWN LIQUID

2. SCIENTIFIC INSTRUMENTS

   A. FOURIER TRANSFORM INFRARED SPECTROMETER

3. REAGENTS REQUIRED

   A. GHB COLOR TEST REAGENT (50 % H_2SO_4 + .25% CRO_3)

4. PROCEDURES

   A. PUT DROP OF LIQUID IN SPOT PLATE AND ADD 3 DROPS OF GHB TEST REAGENT. ALSO DO A NEGATIVE SPOT TEST USING ONLY GHB COLOR TEST REAGENT AND AN ADDITIONAL NEGATIVE TEST USING A DROP OF DI H_2O AND ADDING 3 DROPS OF GHB TEST REAGENT. A POSITIVE TEST WILL TURN A GREENISH COLOR AND EVENTUALLY WILL TURN A PALE BLUE. A NEGATIVE TEST WILL STAY BRIGHT ORANGE.

   B. IF COLOR TEST IS NEGATIVE, PROCEED UNDER THE ASSUMPTION THAT GHB IS NOT PRESENT. IF COLOR TEST IS POSITIVE, TAKE AN ALIQUOT OF THE SUSPECTED SAMPLE AND PLACE IN A MORTAR. DRY WITH HIGH HEAT UNTIL **TOTALLY DRY.** LET MORTAR COOL COMPLETELY BEFORE ANALYZING.

   C. PERFORM A FOURIER TRANSFORM INFRARED (FTIR) EXAMINATION ON THE RESULTING MATERIAL DRIED IN THE MORTAR, BEING SURE TO THOROUGHLY GRIND AND SCRAPE THE MORTAR BEFORE PREPARING A KBR DISK OF THE SAMPLE AND SCANNING THE % TRANSMITTANCE BETWEEN THE WAVE NUMBERS OF 4000 TO 500 (CM-1) ON A FTIR. RETAIN THE RECORDED SPECTRUM.

   D. COMPARE THE SPECTRA TO THE STANDARD GHB SPECTRUM IN THE STANDARDS BOOK. IF THERE IS NOT SUFFICIENT RESOLUTION OF THE QUESTIONED SAMPLE, DRY THE SAMPLE MORE AND REPEAT.

   E. IDENTIFICATION OF GHB WILL BE BASED UPON THE INFORMATION OBTAINED FROM THE RECORDED SPECTRA. AN ACCEPTABLE INFRARED SPECTRA OF GHB IS CONSIDERED CONFIRMATION OF ITS PRESENCE.

5. PREPARATION OF REAGENTS

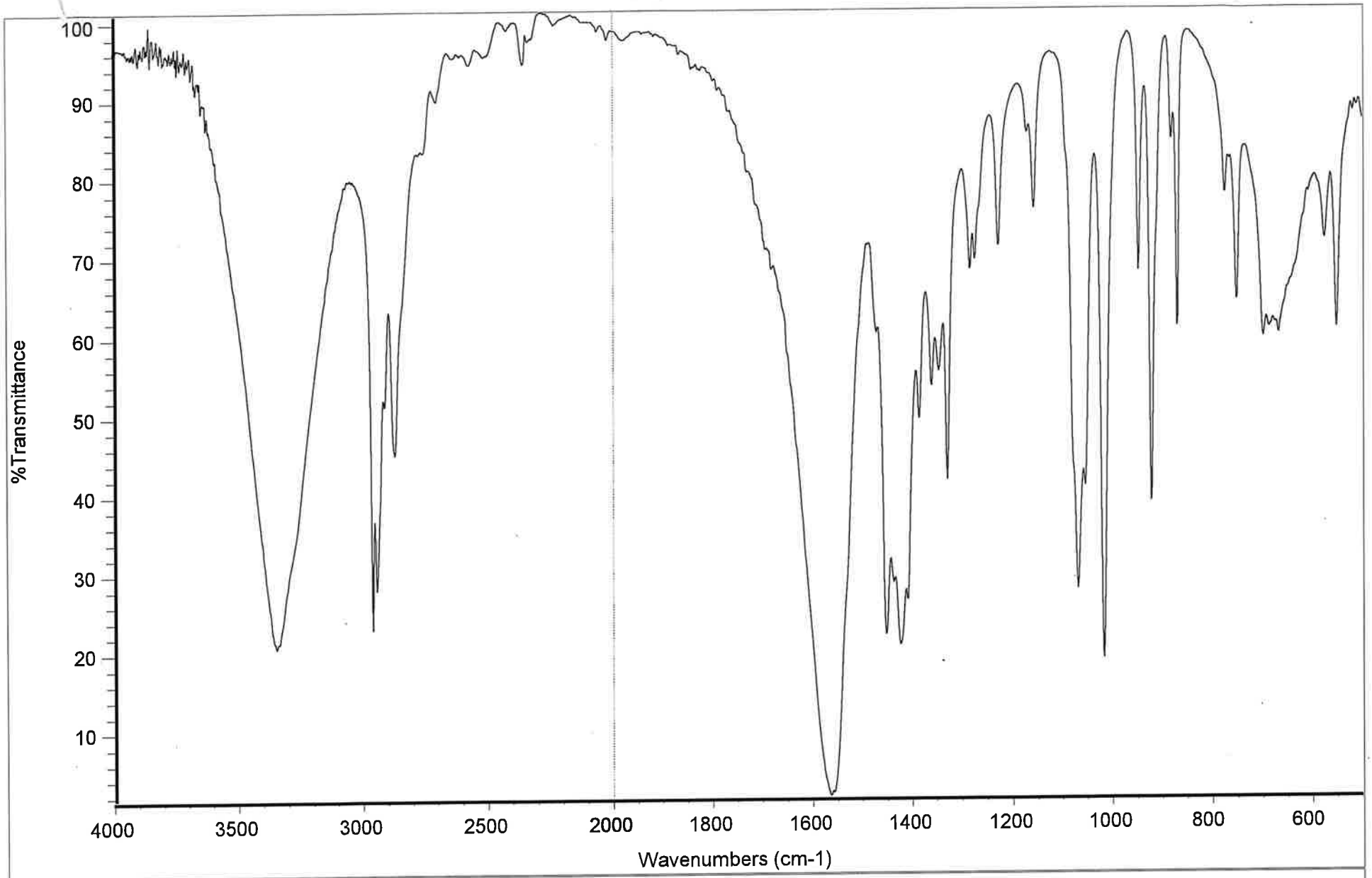
A. GHB COLOR TEST REAGENT - TAKE 50 ML CONCENTRATED H_2SO_4 AND ADD 50 ML DI H_2O. ADD .25 GRAMS OF CRO_3 AND MIX THOROUGHLY.

6. NOTES

A. IF SUSPECTED GHB IS IN A POWDER FORM, DO A COLOR TEST ON THE POWDER, THEN PERFORM A NEAT FOURIER TRANSFORM INFRARED (FTIR) EXAMINATION ON AN ALIQUOT OF THE POWDER BY PREPARING A KBR DISK OF THE SAMPLE AND SCANNING THE % TRANSMITTANCE BETWEEN THE WAVE NUMBERS OF 4000 TO 500 (CM-1) ON A FTIR. RETAIN THE RECORDED SPECTRUM.

B. IF GHB IS SUSPECTED, AN ALIQUOT OF THE LIQUID MAY BE MIXED WITH AN EQUAL PORTION OF MEOH AND INJECTED ON THE GC/MS USING THE GHB PROGRAM (INJECTION PORT TEMPERATURE - 250°C, TEMPERATURE RAMP FROM 60°C TO 280°C AT 70° PER MINUTE). IF GHB IS PRESENT, IT WILL CONVERT TO THE LACTONE IN THE HEATED INJECTION PORT AND PRESENT A PEAK WITH A BASE PEAK OF 42 AND A MOLECULAR ION PEAK OF 86 (SEARCH ON TBI_STD.L). A MODERATELY CONCENTRATED SAMPLE MUST BE USED IN ORDER TO SEE THE LACTONE.

C. IF THE ALIQUOT OF THE SUSPECTED SAMPLE WILL NOT DRY TOTALLY, MEOH CAN BE ADDED TO THE ALIQUOT WITH KBR AND GROUND UP THOUROUGHLY AND THEN DRIED WITH HIGH HEAT UNTIL DRY.

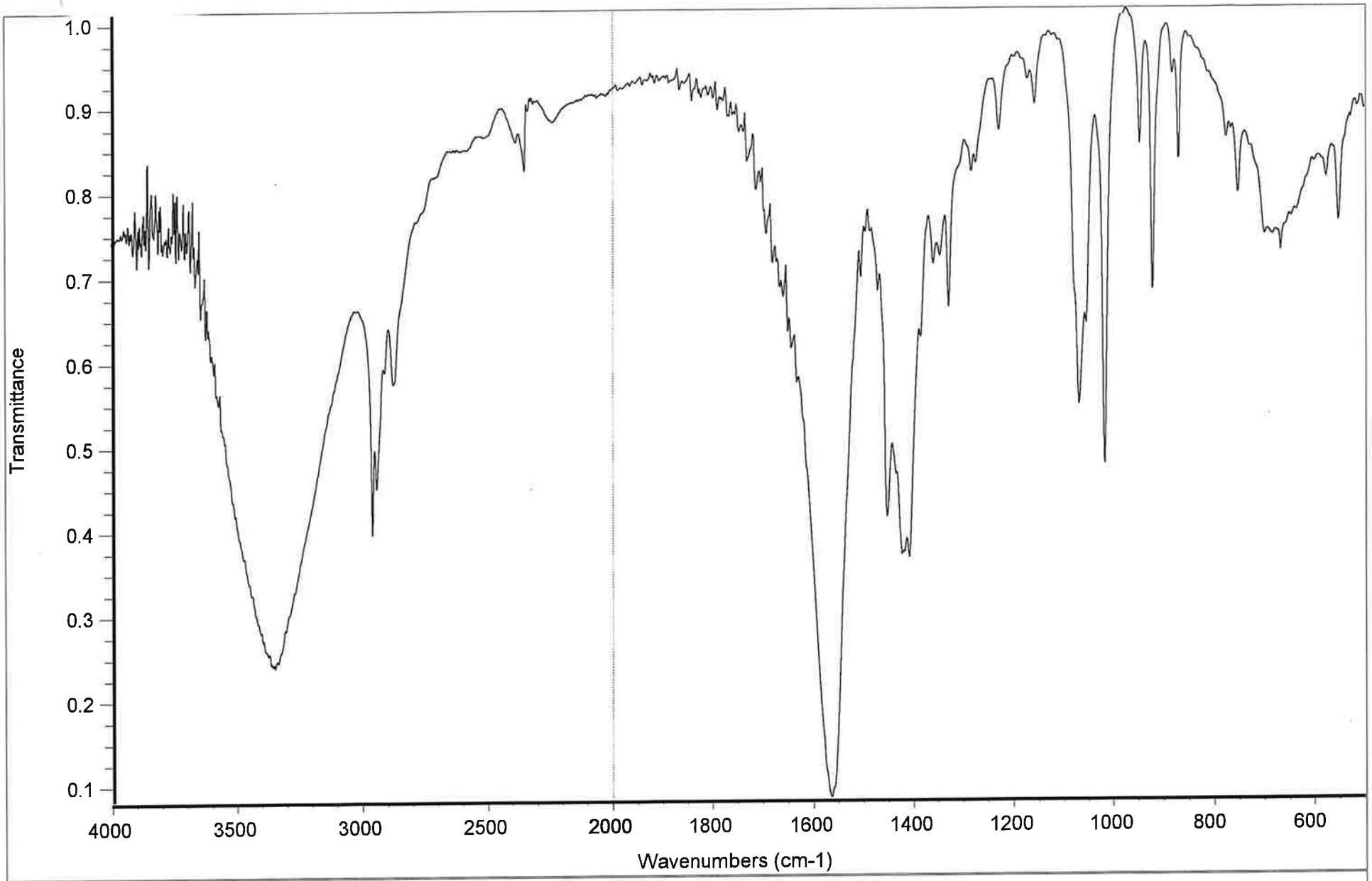


Date: Fri Jan 30 10:00:20 1998

GHB - GAMMAHYDROXYBUTYRIC ACID, SODIUM PMC

Scans: 10

Resolution: 4.000



Date: Thu Dec 05 08:51:20 1996

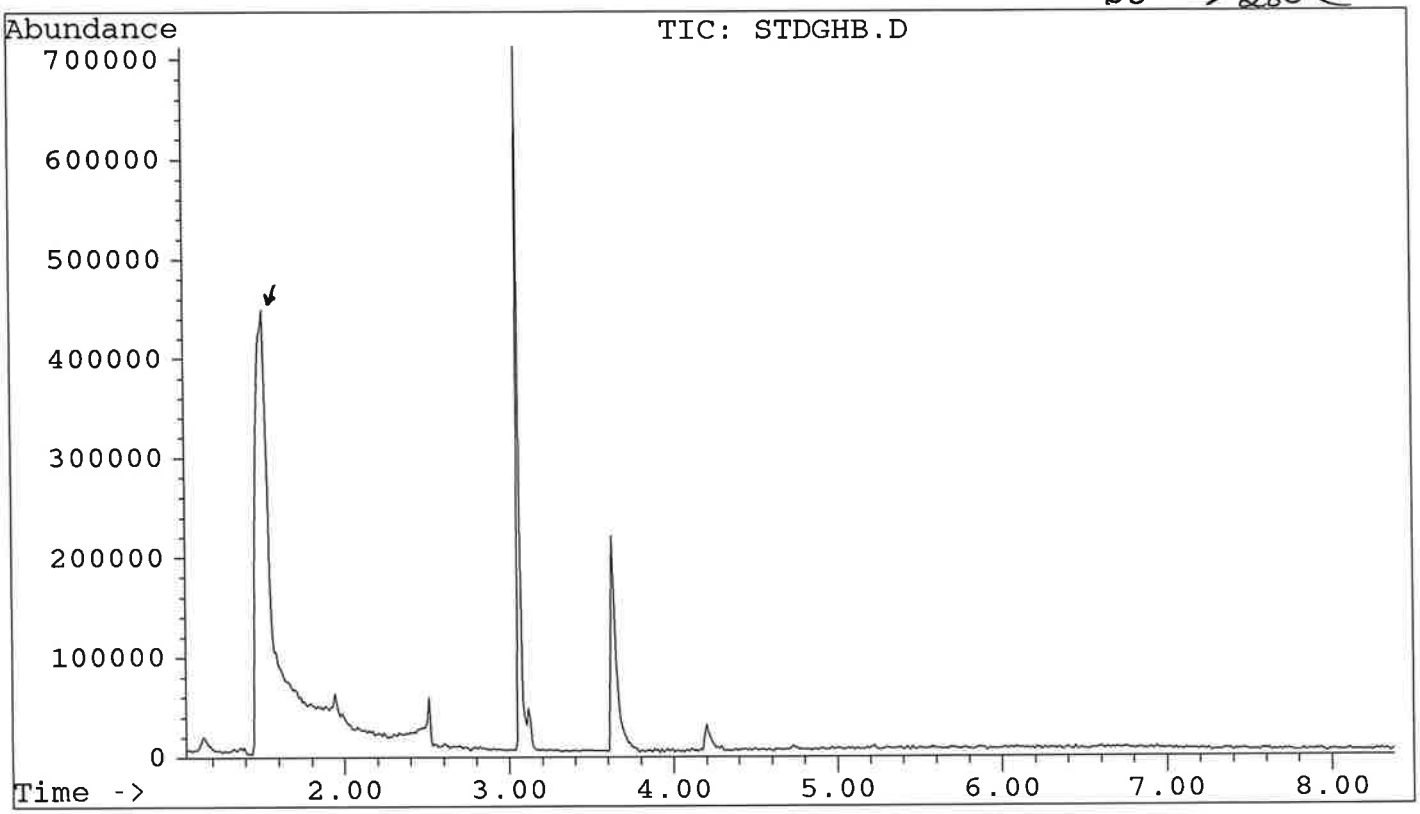
GAMMA-HYDROXYBUTYRIC ACID , SODIUM (GHB) PWF

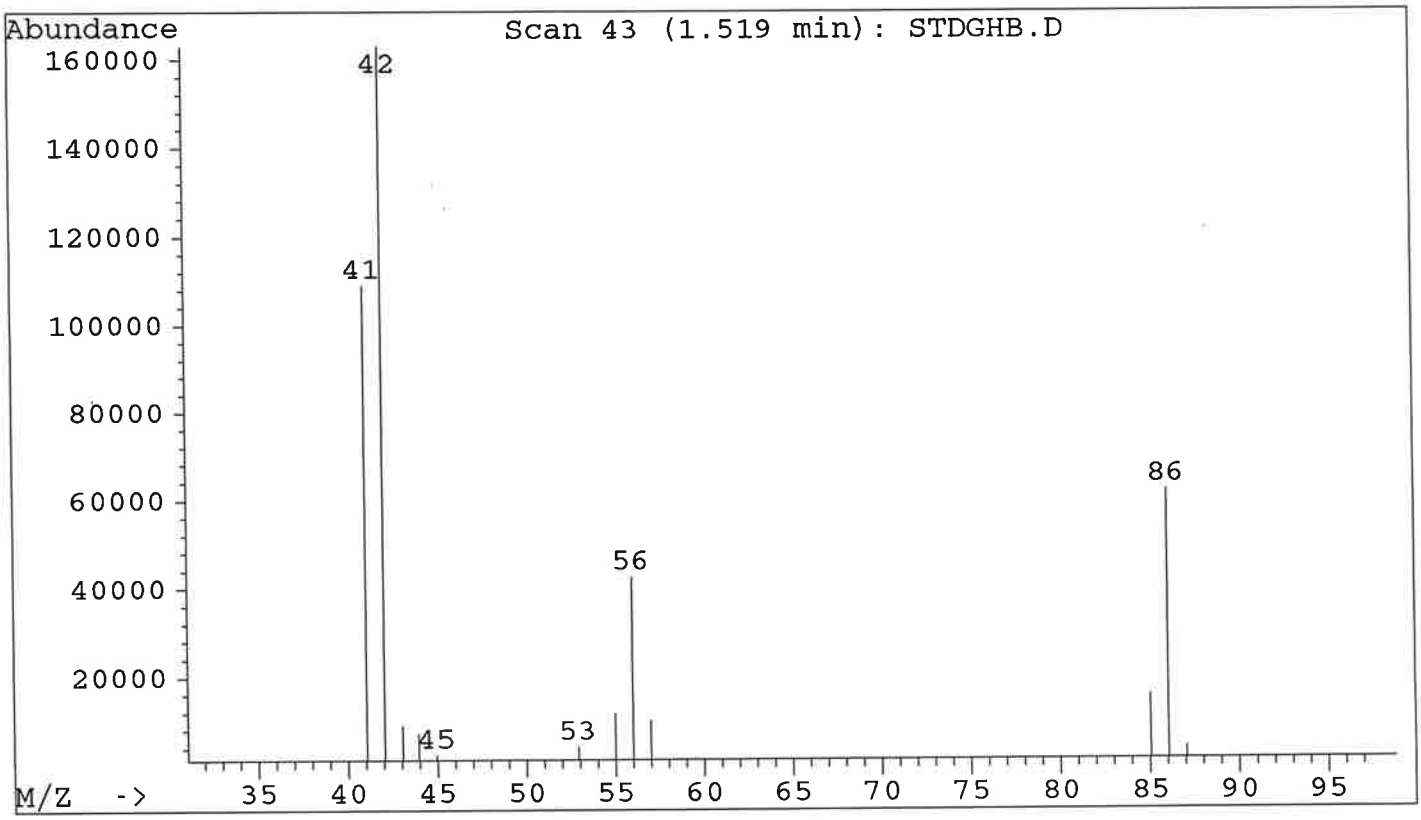
Scans: 10

Resolution: Unknown

File: C:\CHEMPC\DATA\PWF\STDGHB.D
Operator: PWF
Date Acquired: 17 Feb 98 2:48 pm
Method File: DRUGS.M Starting @ 60°C
Sample Name: STD GHB
Misc Info: MEOH
ALS vial: 62

60° → 280°C





α-Hydroxybutyric Acid Lactone

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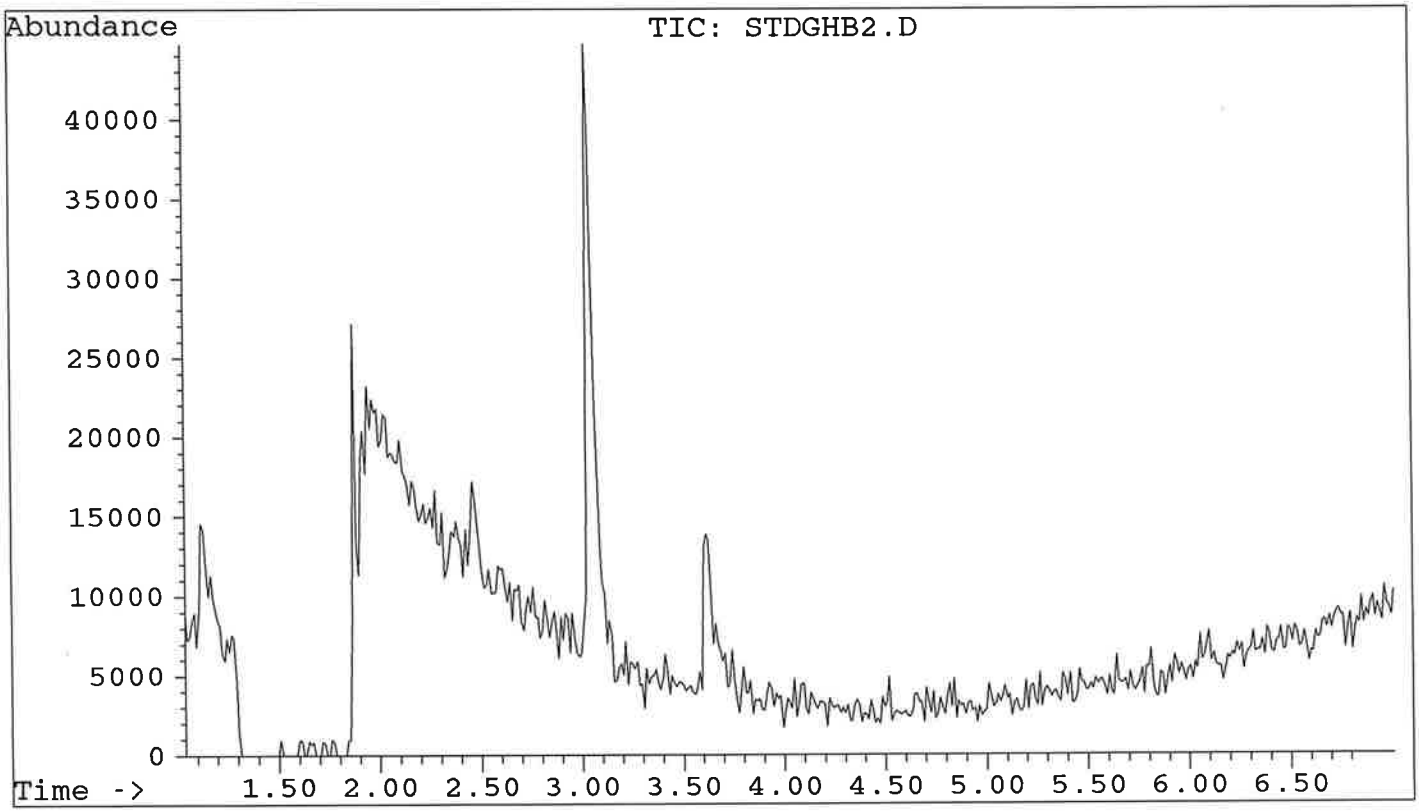
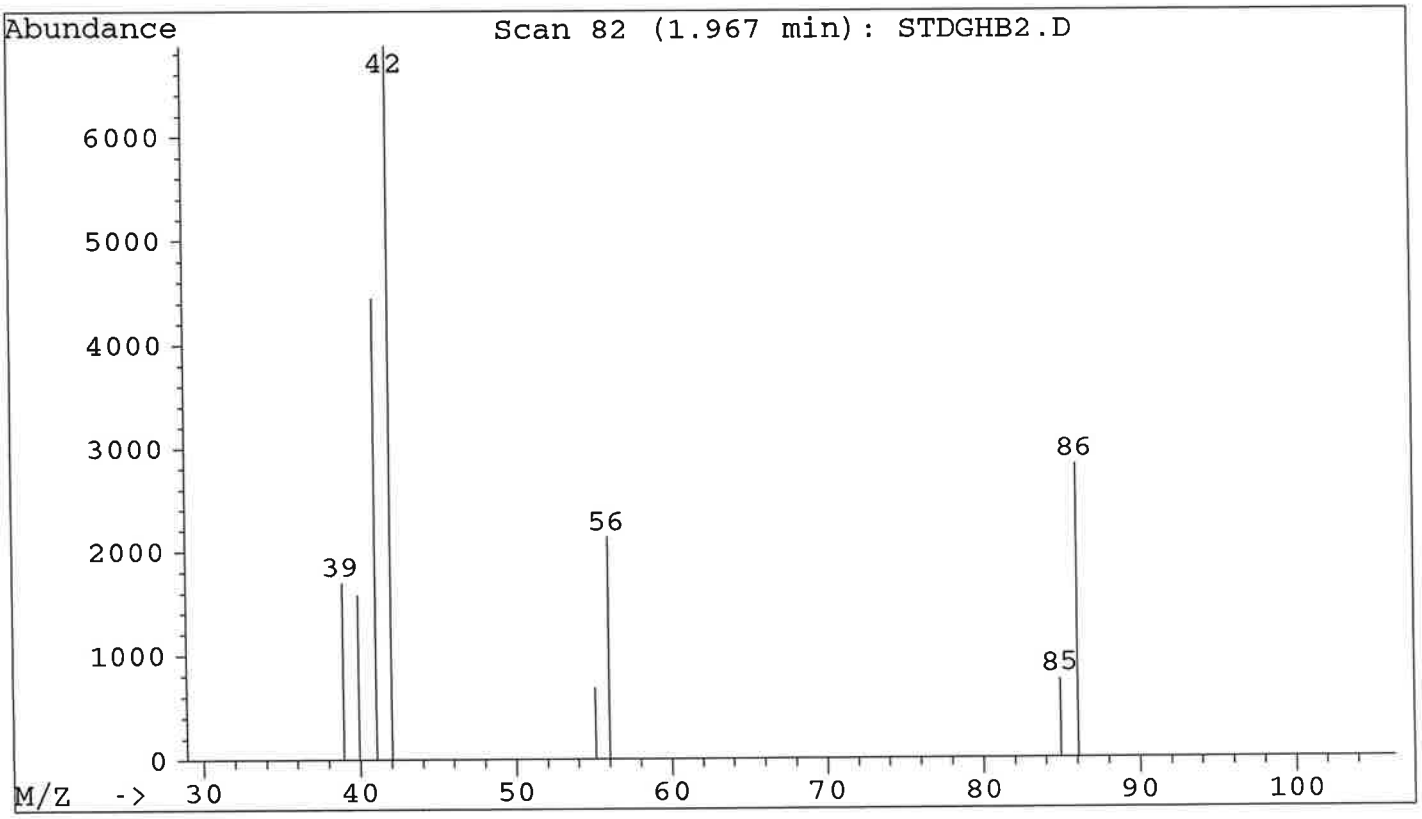
Method File: GHB.M
Sample Name: STD GHB IN H2O
Misc Info: MEOH
ALS vial: 62





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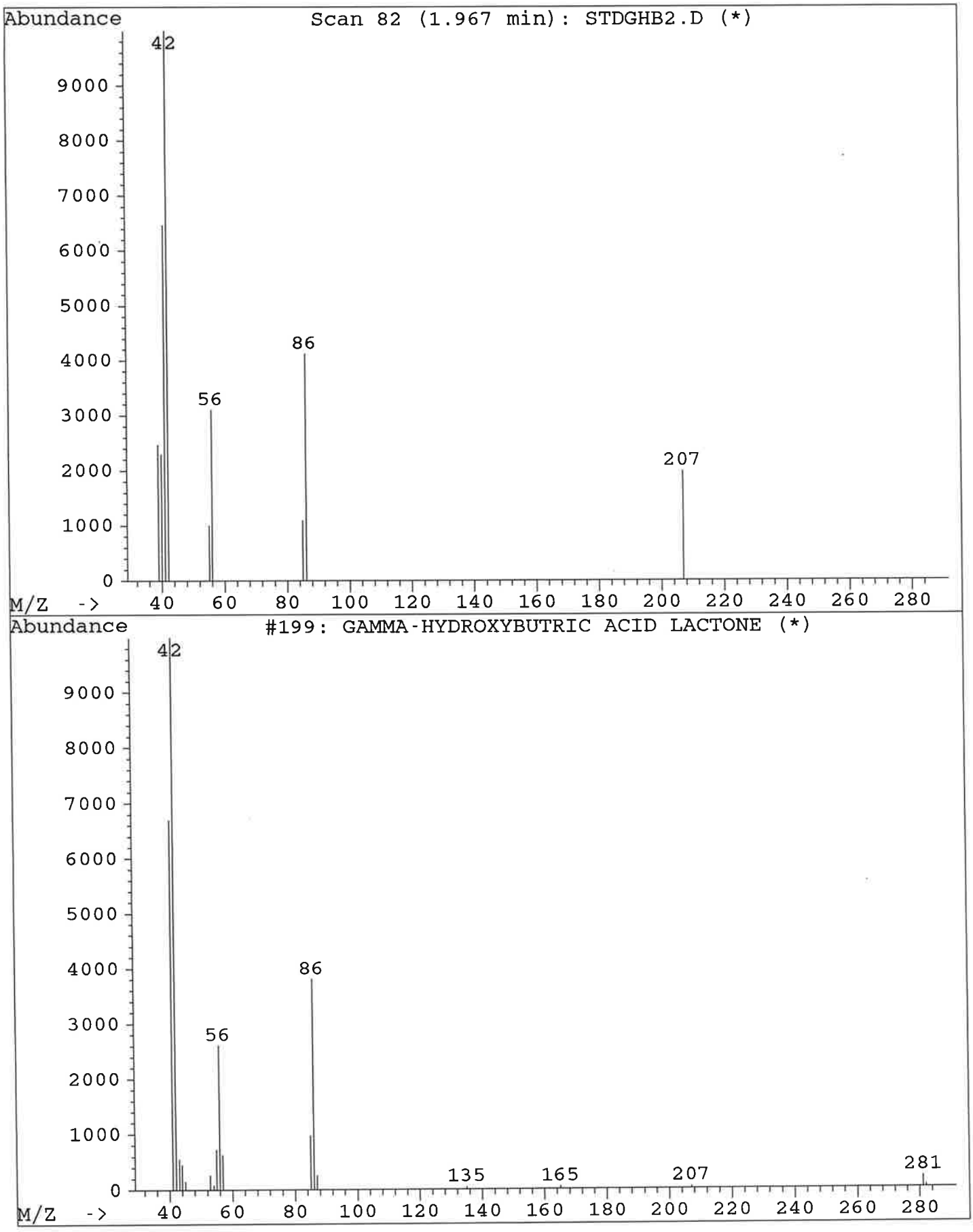
ID : GAMMA-HYDROXYBUTRIC ACID LACTONE



GHB Color Test

David J. Koppenhaver
Indiana State Police Laboratory
Fort Wayne, IN 46804

INTRODUCTION

It has been reported, the usual color tests performed in the laboratory yield no results for GHB[1]. If the laboratory's normal operating procedure is to stop analysis after negative results on color tests, UV, and TLC, then a sample of GHB would go undetected.

There is an oxidation reaction that can be used to distinguish between primary and secondary alcohols from tertiary alcohols and most other compounds except aldehydes. Chromium(VI)Oxide in aqueous Sulfuric acid will change from orange to green. The color test will work for GHB sodium salt and also if it is dissolved in water.

EXPERIMENTAL

Chromic Acid reagents were prepared with different concentrations of H_2SO_4 and CrO_3: Reagent 1; 5M H_2SO_4 saturated with CrO_3, Reagent 2; 50% H_2SO_4 and 0.25% CrO_3, Reagent 3; 50% H_2SO_4, 0.25% CrO_3, and 0.25% $AgNO_3$. Solutions of 10,000, 14,000, 20,000, and 40,000 ppm of GHB (.75, 1, 2, and 3.5 teaspoons/8 oz. H_2O respectively) were prepared. The GHB sodium salt and the dilutions were placed in a spot plate. Next, two or three drops of reagent were added and the color developed.

DISCUSSION

All reagents performed well with GHB sodium salt. Reagent 1 worked best for the solutions of GHB, followed by Reagent 2, and finally Reagent 3. The time for the color to develop was related to the concentration of the reagent. Silver nitrate in Reagent 3 was to act as a catalyst, but appeared to have little effect on time for the color to develop.

There are many false positives such as alcohols, aldehydes, and common cutting agents i.e., sucrose, lactose. Furthermore, KCr_2O_7 will also give the same results.

REFERENCES

1. Blackledge, R.D., Miller, M.D., "The Identification of GHB", Microgram, Vol. XXIV, No. 7, p. 172-179.

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FDLE

Florida Department of Law Enforcement

James T. "Tim" Moore
Commissioner

Tallahassee Regional Operations Center

Post Office Box 1489
Tallahassee, Florida 32302
(850) 488-1040
www.fdle.state.fl.us

FAX COVER SHEET

DATE: 2/12/98

TO: Phil Freeze TENN BI

FROM: Dan Miller FL Dept Law Enf - Tallahassee LAB

REF: GHB ANALYSIS

TOTAL PAGES: 5

FL. Dept Law Enf
Tallahassee RCL
2/12/98
Dan Miller
850-488-7071

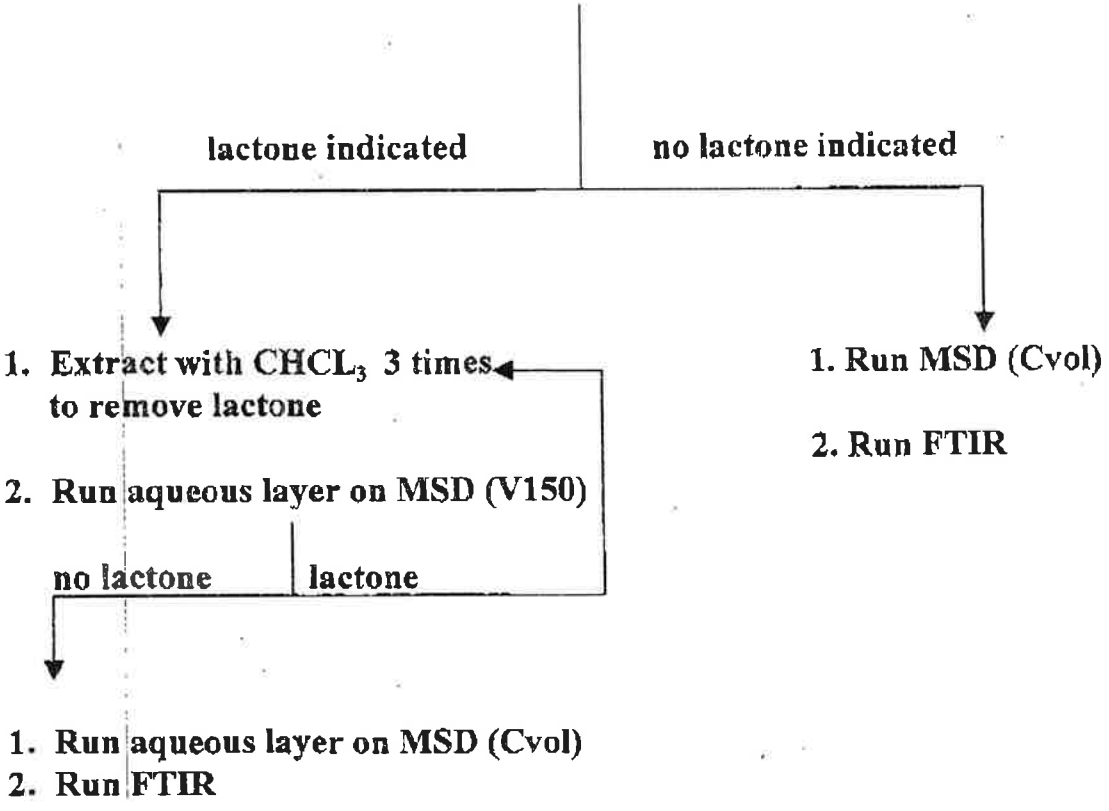
GHB ANALYSIS

1. **Check pH**
   - **most aqueous GHB solutions are pH 5-7**
   - **do not attempt to adjust the pH because GHB easily converts to butyrolactone under low acidic conditions**

2. **Add 2 drops to an autosampler vial and dilute with MeOH**

3. **Run on MSD V150 and C1**
   - **C1 = a temperature program that screens for a wide range of controlled substances ex. 80°(1)-325°(1.6) 50°/min**

   - **V150 = a GC program (on a MS) which is appropriate for volatile samples and has a low injection port temperature ex. 50°(.1)-150°(1.6) 50°/min with inj. port temp. = 150°C**



LAB NOTES:

The following notes and GHB analysis flow chart are only an aid provided to you based on our encounters with GHB samples. If you choose to screen your samples using a volatile program method with a reduced injection port temperature and with a higher injection port temperature, I strongly recommend you purchase standards and perform these analyses on your own instrumentation. Hopefully you will make the same observations and draw the same conclusions that we have.

We used three methods on the GC-MS for screening these samples:

C1 ≡ general screen for controlled substances
80°(1)-325°(1.6) 50°/min

Cvol ≡ a GC program (on a MS) which is appropriate for volatile samples
50°(.1)-150°(1.6) 50°/min with inj. port temp. = 250°C

V150 ≡ same as Cvol but with reduced inj. port temp. = 150°C

You should be following the flow chart as you are reading these notes!!!

- **First attempt to air dry your sample and see if you can get crystals. You may use low heat but remember that butyrolactone will volatilize. If you can get**

crystals, you can simply screen with the MSD using a volatiles program and a general screen and proceed directly to the FTIR. The problem is when your sample contains butyrolactone or GHB in the process of converting to butyrolactone (a mixture).

- **pH of 5-7 is required for GHB to be stable in an aqueous solution**

- **A presumptive examination for the presence of GHB and butyrolactone is accomplished by diluting two drops of the sample with ~1 ml of MeOH and running the sample on a GC-MS**

- **Analyze the sample using one general screening and one method designed to detect highly volatile compounds but with a reduced injection port temperature (150°C)**

- **Our temperature experiments revealed that GHB will not convert to butyrolactone at the low injection port temperature of 150°C. If butyrolactone is indicated it must already be present in the unknown sample.**

- **If butyrolactone is indicated , remove it from the unknown sample by extracting with $CHCL_3$ or a similar solvent. If butyrolactone is not indicated, perform the appropriate analyses as indicated on the flow chart. When you run your unknown sample on the MSD using a volatiles program with a higher injection port temperature (250°C) a higher concentration of butyrolactone should be observed. This will indicate that any GHB in your sample has been converted to butyrolactone by the higher temperature.**

- **Analyze the aqueous layer from your extraction again using a volatiles program with a lower injection port temperature (150°C). If no butyrolactone is indicated, proceed with the final steps in the flow chart otherwise repeat extraction until the sample is sufficiently cleaned up.**

- **The aqueous layer can be easily recrystallized using an appropriate heat source (an oven set at 100°C , hot plate etc.)**

- **GHB is extremely hygroscopic so work quickly when making KBr pellets. It is helpful to add MeOH to the mixture of your KBr and sample in a mortar, place it on a hotplate and use a N_2 stream to drive any moisture from your pellet.**

- **Good Luck!!! Call SCLA Frank Davis or CLA Beth Spence if you need any further assistance**

Dan Miller - Tallahassee LAB FAX. will follow
IR - ultimate id.

Want 2 test
Use gc/ms
you see the lactone on MS if injection port is above 150
The GHB makes the lactone in the port.
Inject from dissolved in ETOH or MEOH

1. Run sample temp program from 50°C → 250°C with injector temp @ 150°C if you see lactone it is a natural component of the sample. If you don't see lactone Assume No Lactone is in sample. Bread peak.

2. If don't see Lactone next run @ injector temp of 265 – you will see Lactone.

When established Wether Lactone is in sample (It forms readily in samples)

use Extraction procedure to separate Lactone from GHB

do $CHCl_3$ extraction several times to get rid of the Lactone. You can follow it by GC.

when you get rid of lactone evaporate on a watch glass with mild warming - get white crystals for I.R.

THE IDENTIFICATION OF GHB

Robert D. Blackledge and Michael D. Miller

Naval Investigative Service Regional Forensic Laboratory

P.O. Box 220, Naval Station

San Diego, CA 92136

SUMMARY

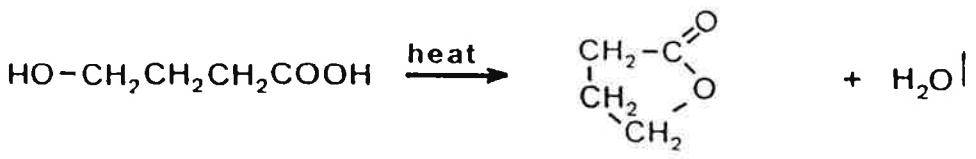
Gamma hydroxy butyrate ("GHB") is discussed in terms of its history of use and abuse, present legal status, and its identification by means of infrared spectroscopy and the mass spectrum of its lactone as well as its derivative with bis-(trimethylsilyl) trifluoroacetamide (BSTFA).

INTRODUCTION

Gamma hydroxy butyrate or "GHB", CAS Registry # [502-85-2], is a rather simple molecule:

$$HO-CH_2\ CH_2\ CH_2\ COOH$$

Other common names include Gamma Hydroxybutyric Acid, Sodium Oxybate, Gamma Hydroxybutyrate Sodium, Gamma-OH, 4-Hydroxy Butyrate, Gamma Hydrate, and Somatomax PM.[1] In powder or tablet form, it is usually sold as the sodium salt, which is a white powder with a melting point between 145-146 C.[2] It may also be encountered in the form of its lactone, CAS Registry # [96-48-0], which is a liquid boiling between 204-205 C.[3]



GHB is not currently listed in any schedule of the Controlled Substances Act, but its only legal use in the United States is under specific Food and Drug Administration (FDA) exemption for research.[1] Additionally, the sale of GHB has been banned in California and Florida. In Europe it has been used to induce sleep as an adjunct to anesthesia. It can't be used by itself as an anesthetic since it has no pain relieving properties.

The first reported instances of abuse of GHB in the United States appear to have been in San Francisco in August of 1990[1], when the San Francisco Bay Area Regional Poison Control Center notified the regional office of the FDA and the California Department of Health Services of several acute poisonings. As of 12 March 1991 at least seventy[4] instances had been reported in several states including California, Georgia, Florida, South Carolina, Minnesota, Arizona, Ohio, Texas, and Virginia.[1]

On 12 March 1991 the Justice Department and the FDA announced indictments against two men who operated a health club in the San Francisco Bay Area.[4] They were charged with producing and distributing GHB. Indictments were also brought against three individuals associated with Amino Discounters Ltd. of Tucson who were charged with the illegal manufacture of GHB and its distribution under the false label of Biosky Research Group, San Francisco, a fictitious business. They were also charged with five counts of introducing the drug into interstate commerce and failing to provide adequate directions for the drug's use on the container label.[4]

GHB has been promoted for body builders, as a sleep aid, and for weight control. The rise in popularity of GHB may be connected to the market recall in November 1989 of L-tryptophan which had been promoted as a food supplement and sleep promoter.[1,5] GHB is produced by the body and is not required nutritionally. It is metabolized to carbon dioxide and water.[1] GHB is normally taken orally, 1/2 to 3 teaspoons dissolved in water, although it has also turned up in the Atlanta area in a "cocktail" mixed with amphetamines and called Max.[6] Symptoms of

GHB abuse include vomiting, drowsiness, seizures, and loss of consciousness. Symptoms occur within an hour and usually go away in the next few days, and the severity and duration of symptoms are dose related and are potentiated if GHB is taken with alcohol or other CNS depressants.[1] Although no deaths have been reported, 14 individuals have been hospitalized and about an equal number required hospital treatment after taking GHB.[4]

EXPERIMENTAL

Preliminary Testing

No reaction was obtained with several reagents commonly used in preliminary drug testing. These included Marquis, Scott, Ehrlich's, Liebermann's, and 5% $AgNO_3$. When the sodium salt is dissolved in a few drops of distilled water there is a slight rise in pH, but this is generally true for salts of weak acids. The crystals of the sodium salt do not fluoresce under short or long wave ultraviolet light (UV), nor does the aqueous solution absorb in the UV region.

Infrared Spectroscopy

Figure 1 shows the infrared (IR) spectrum of the sodium salt of GHB prepared as a KBr disc. The standard was obtained from Aldrich (4-hydroxybutyric acid, sodium salt, page 720 Aldrich 90-91 catalog, # H2,222-1). The IR spectrum may also be found in The Aldrich Library of Infrared Spectra, edition III, 1981, page 326 spectrum H2222-1.

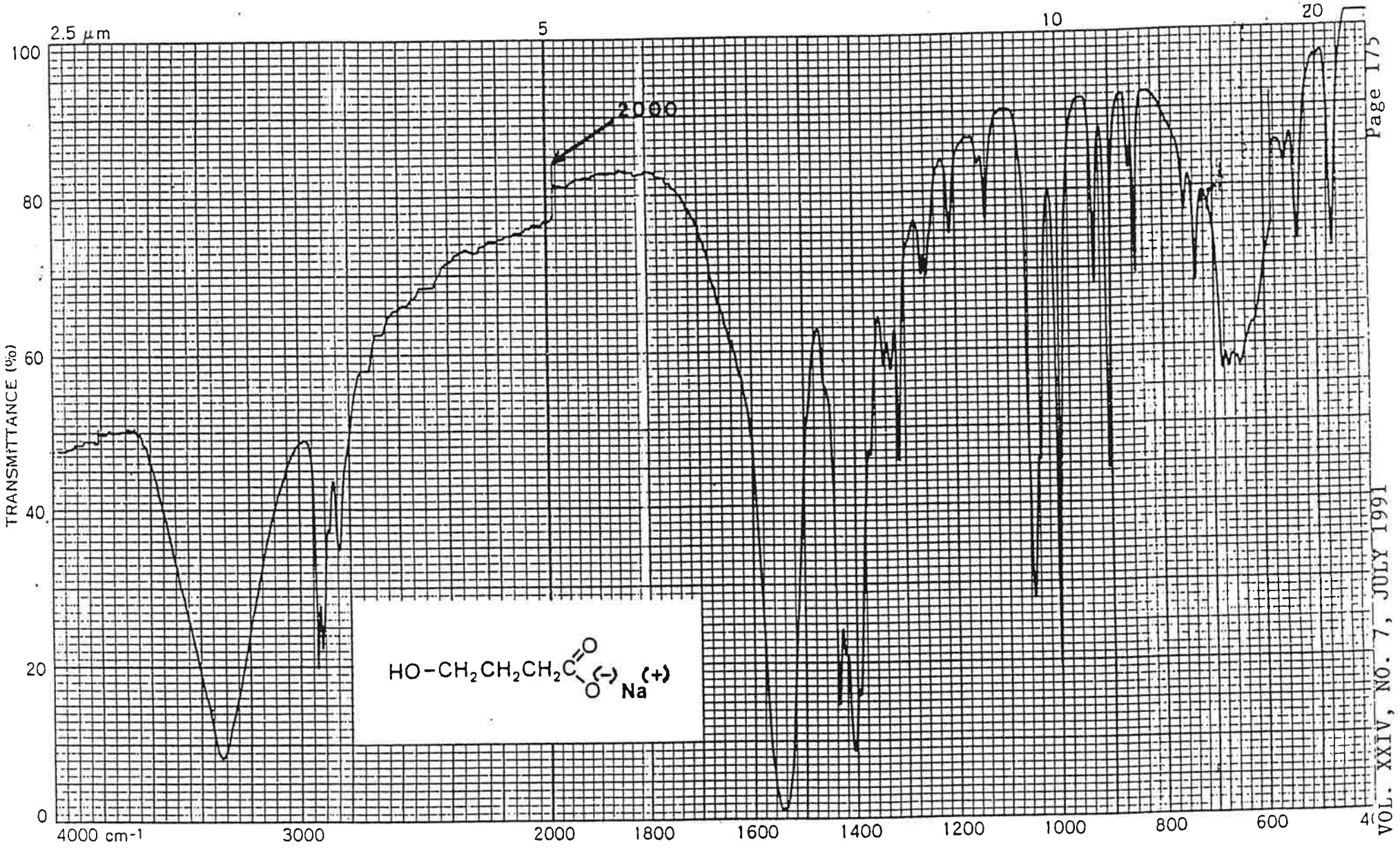


Figure 1. Infrared spectrum of 4-hydroxybutyric acid, sodium salt, in Kbr disc.

MICROGRAM, VOL. XXIV, NO. 7, JULY 1991

Mass Spectrum

Figure 2 shows the mass spectrum, the total ion chromatogram, and the relative abundance of the most prominant ions of the lactone of GHB, gamma-butyrolactone. The lactone was produced from the Aldrich standard of the sodium salt of GHB by adding a few drops of concentrated hydrochloric acid to the powder, heating it gently in a bunsen flame, and collecting the distillate.

Figure 3 shows the total ion chromatogram and the mass spectrum of the bis-(trimethylsilyl) trifluoroacetamide (BSTFA) derivative of GHB. Derivatization conditions were the same as those reported by Sun for the BSTFA derivatization of LSD.[7]

GC/MS Conditions

Instrument system: Hewlett-Packard 5980 gas chromatograph with Hewlett-Packard 5890 mass selective detector.

Column: HP-1 (crosslinked methyl silicone), 25 m x 0.2 mm x 0.33 um film.

Column head pressure: 7 to 10 PSI. Helium carrier gas.

Injection port temp: 250 C.

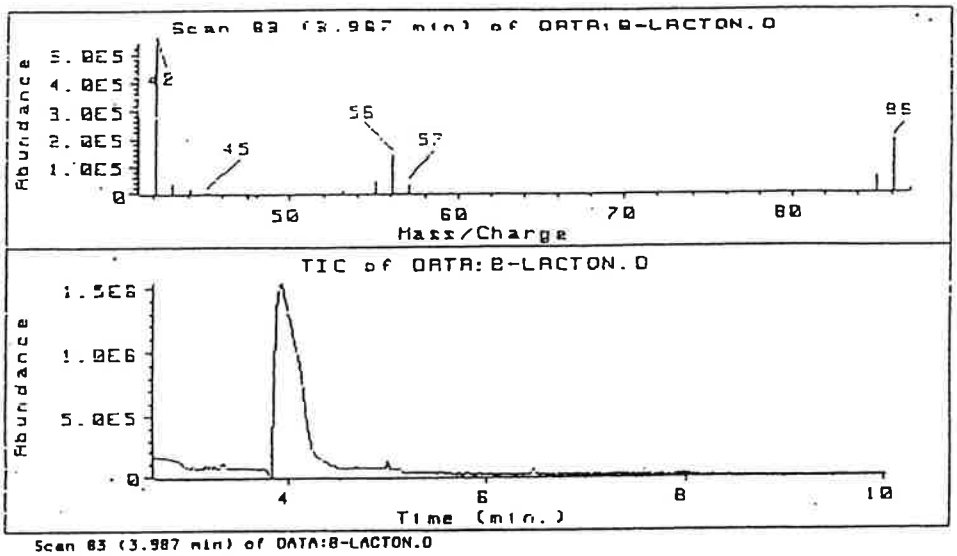
Oven temp: (lactone) 70 C (1 min) at 20 C/min to 300 C (hold 3 min); (BSTFA derivative) 100 C (1 min) at 20 C/min to 300 C (hold 7 min).

Transfer line temp: 280 C.

Injection volume: trace (lactone), 1 uL (BSTFA derivative); split injection, solvent delay 3 min.

EMVolts: 2200.

Scan Range: 40 to 500 amu.



Scan 83 (3.987 min) of DATA:B-LACTON.D
LACTONE OF GHB

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
41.10	279488	44.10	12596	55.10	41016	85.10	52688
42.10	536832	45.10	4293	56.10	135936	86.10	184128
43.10	32920	53.10	8222	57.10	30920	87.10	9481

Fig. 2. Mass spectrum, total ion chromatogram, and the relative abundance of the most prominant ions of gamma-butyrolactone, the lactone of GHB.

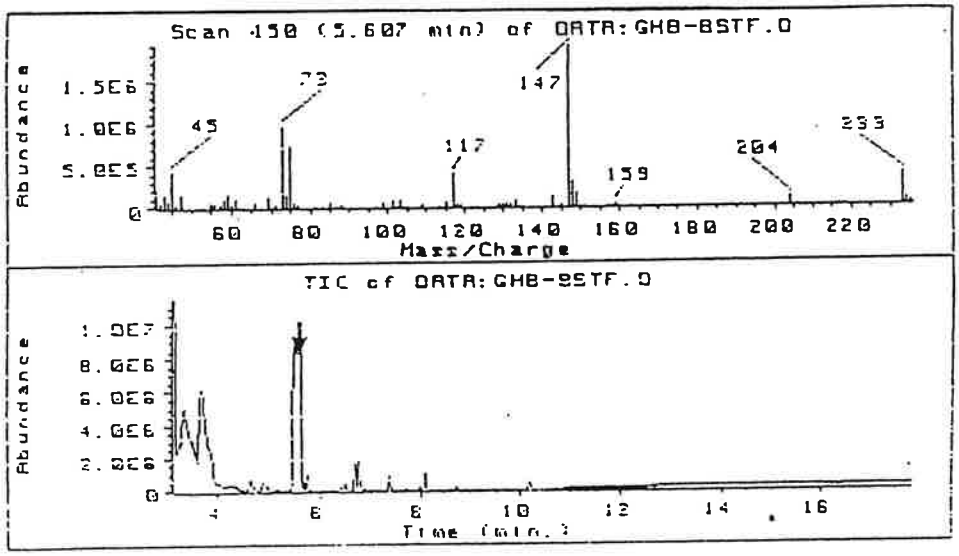
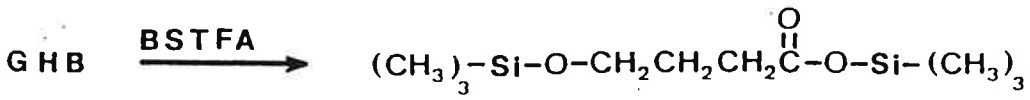


Fig. 3. Mass spectrum and total ion chromatogram of the BSTFA derivative of GHB.

DISCUSSION

Treatment of the sodium salt of GHB with BSTFA will result in a silyl replacement of both the alcohol group hydrogen and the sodium atom on the acid group:



The resulting product has a molecular weight of 248 amu but is not seen under the above conditions. Poole[8] reports that "the molecular ions of TMS ethers are often weak or absent with the $[M-15]^+$ ion obtained by cleavage of a methyl to silicon bond (in part) being more prominent. This ion can be used to define the molecular weight, provided that it is not mistaken for the molecular ion itself." Thus, the peak at 233 m/e in Fig. 3 is the $[M-15]^+$ peak and is indicative of GHB. The ionization voltage on the Hewlett-Packard 5970 mass selective detector is fixed at 70 eV, but those with other GC/MS systems may be able to see the molecular ion if they lower the ionization voltage to around 10-20 eV.[8] Poole adds that "the ion m/e 73 is prominent in virtually all TMS spectra" and he attributes it to $[(CH_3)Si]^+$. He attributes the peak at 147 m/e to $[(CH_3)_2Si=O-Si(CH_3)_3]^+$ and states: "the ion m/e 147 is common in polyhydroxy TMS compounds containing two or more TMS groups either on adjacent carbon atoms or brought near each other through expulsion of the central portion of the molecule." Therefore, the 73 and 147 m/e ions are consistent with the expected mass spectrum of the GHB BSTFA derivative but, by themselves, are not useful for identification purposes.

REFERENCES

1. Auerbach, S.B., "Multistate Outbreak of Poisonings Associated with Illicit Use of Gamma Hydroxy Butyrate," MMWR, 39(47), Nov. 30. 1990, 861-863.

2. Aldrich Chemical Company, Inc., Catalog Handbook of Fine Chemicals, 1990-91, page 720, H2,22-1.

3. ibid., page 249, B10,360-8.

4. Toth, J., Los Angeles Times, "2 Bay Area Men Are Indicted in Sale of Steroids," Mar. 12, 1991, pages A3 and A17.

5. Newton, P., "High Performance Liquid Chromatography and the Mystery of L-Tryptophan," LC-GC, 9(3), March 1991, 208-213.

6. Press release from the Centers for Disease Control, Atlanta, 1st week in Dec. 1990.

7. Sun, J., "Lysergic acid diethylamide (LSD) determination by GC-MS," American Clinical Products Review, 8(6) June 1989, 24-27.

8. Poole, C., in Blau, K. and King, G. (Eds), Handbook of Derivatives for Chromatography, Hayden, London 1978, 183.

3-30-94

To GBI Chemists:

Reference: gamma-hydroxybutyric acid (GHB)

Also known as:

Gamma hydrate
Gamma hydroxybutyrate (sodium salt)
Gamma-OH
4-Hydroxybutanoic acid
4-Hydroxybutyrate
Sodium oxybate (sodium salt)
Somatomax PM

And may be known as:

"G"

Enclosed is some information on GHB. Several law enforcement agencies have been inquiring about this drug.

Note: It would be very easy to miss this compound. There is no UV absorption. The GC/MS conditions are as follows:

30 degrees isothermal or 50 degrees isothermal depending upon the length of the GC column.

GAMMA-HYDROXYBUTYRIC ACID is controlled under Schedule I (Georgia law) as of 3-4-94.

Gamma-hydroxybutyric acid

EXTRACTION AND NMR ANALYSIS:

Dissolve sample in D2O and place in a separatory funnel. Add CHCl3. Shake. Discard CHCl3. (This contains the Gamma-butyrolactone.) Wash several more times with CHCl3, discarding the organic layer.

Run NMR analysis on the D2O solution.

TLC ANALYSIS:

TLC system: 9:1 Ethanol:concentrated NH4OH
Location: Spray with 5% Ferric Chloride solution (pinkish-orange color) or use an Iodine Tank

GC/MS ANALYSIS:

Put the sample in about 8 ml of CHCl3 and add five drops of acetic anhydride. Let stand on the steam bath until the volume is about 2 ml. (DO NOT LET THE SAMPLE GO TO DRYNESS!). Add about 1 ml of ETOH and let stand for 10 minutes. Add about 5 ml of 0.1N HCl and shake well. Remove CHCl3 layer, filter and perform GC/MS analysis **immediately**. The sample will decompose with time or on drying completely down.

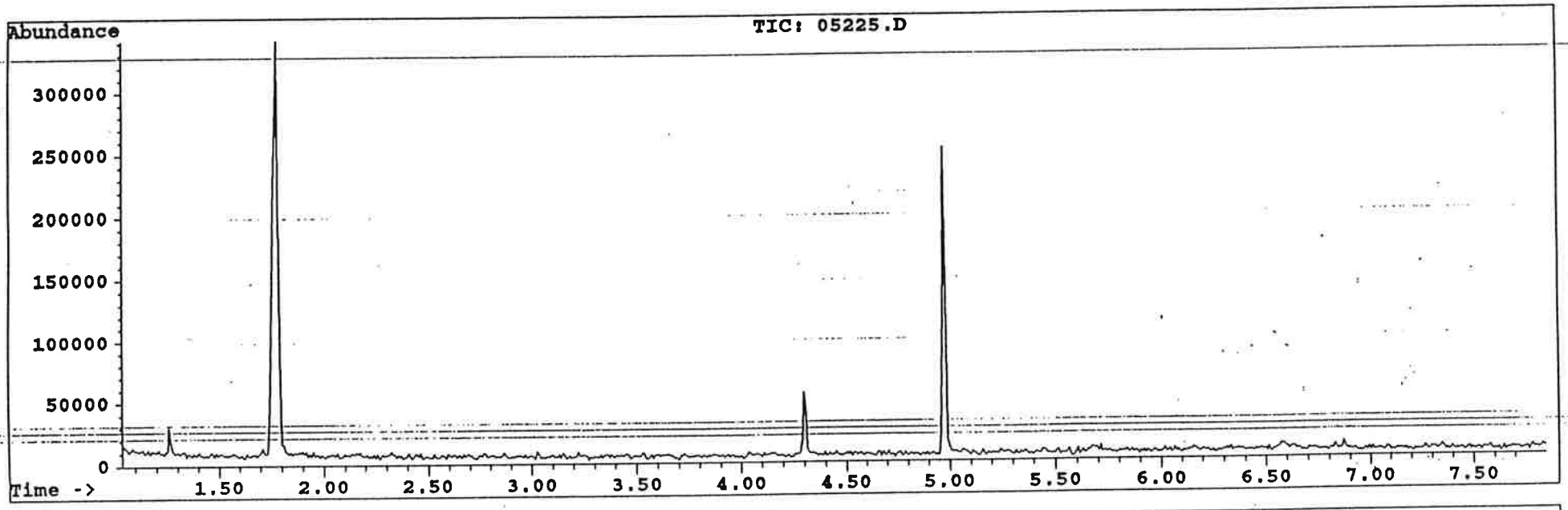
The GHBA acetate peak will appear about 3.5 minutes under the following conditions. The molecular weight of GHBA acetate is 146.

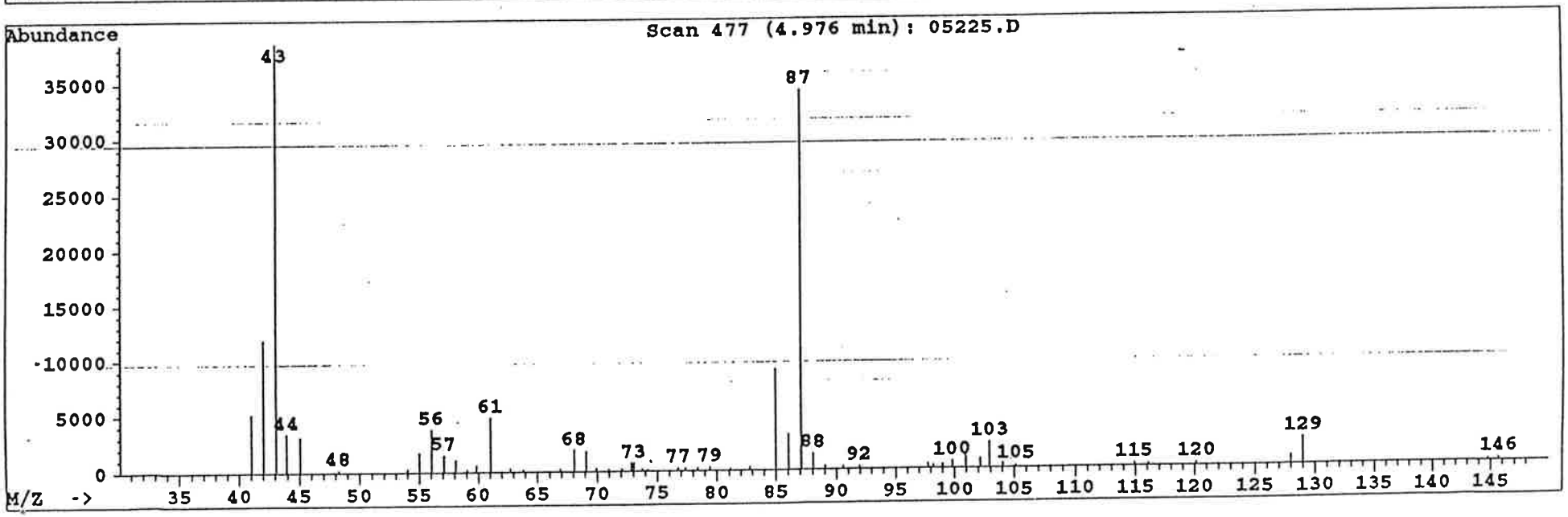
HP-Ultra 1 column, 12 meter, 0.2mm x 0.33 μm film thickness

GC 100 degrees for 2 minutes, then to 275 degrees at 30°/min

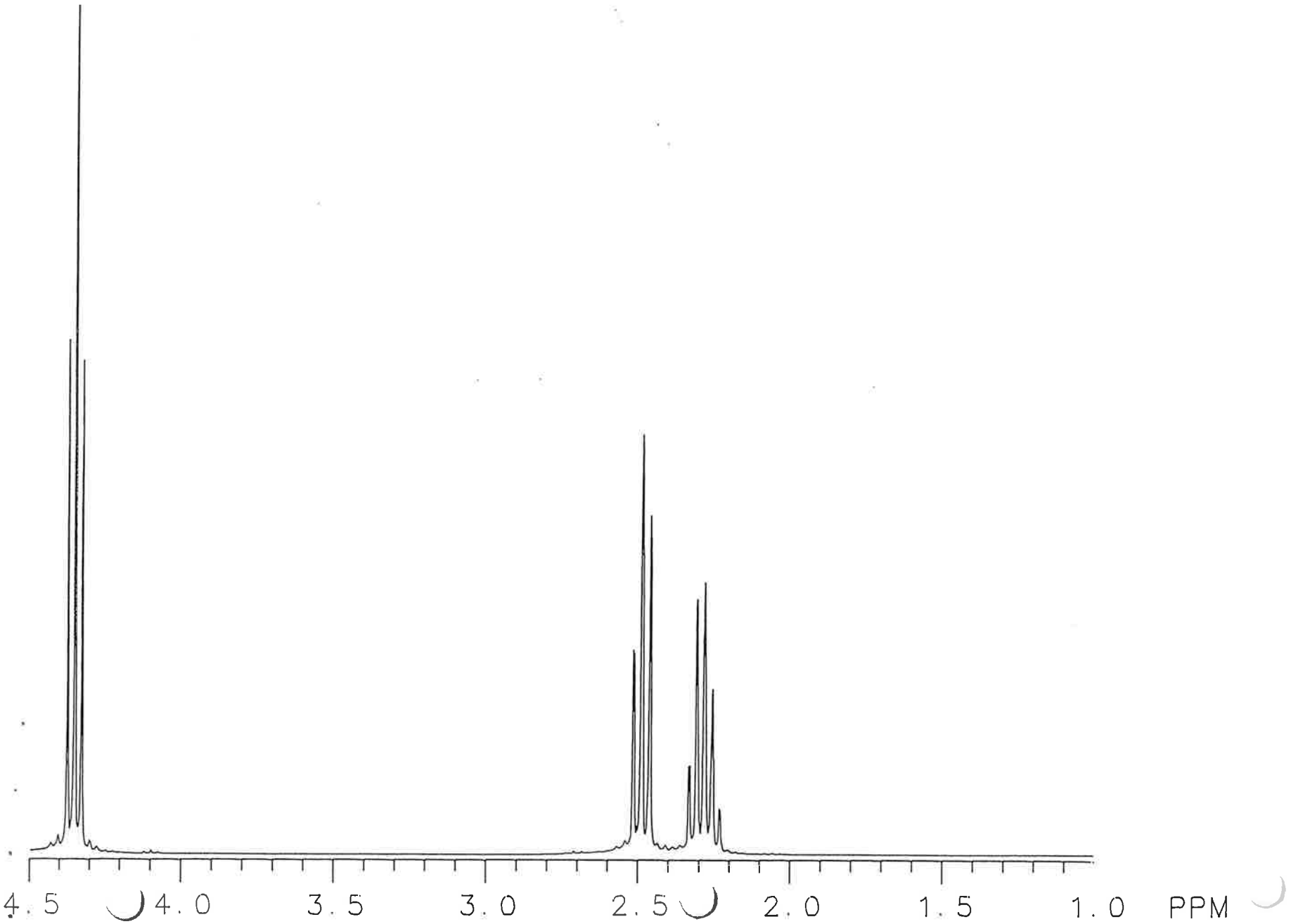
File: C:\CHEMPC\DATA\05225.D
Operator: JCR
Date Acquired: 21 Feb 95 5:11 pm
Method File: ST60_1.M
Sample Name: GHBA-OAC
Misc Info:
ALS vial: 1

GC 60° hold 1 min rate: 20°/min to 275°

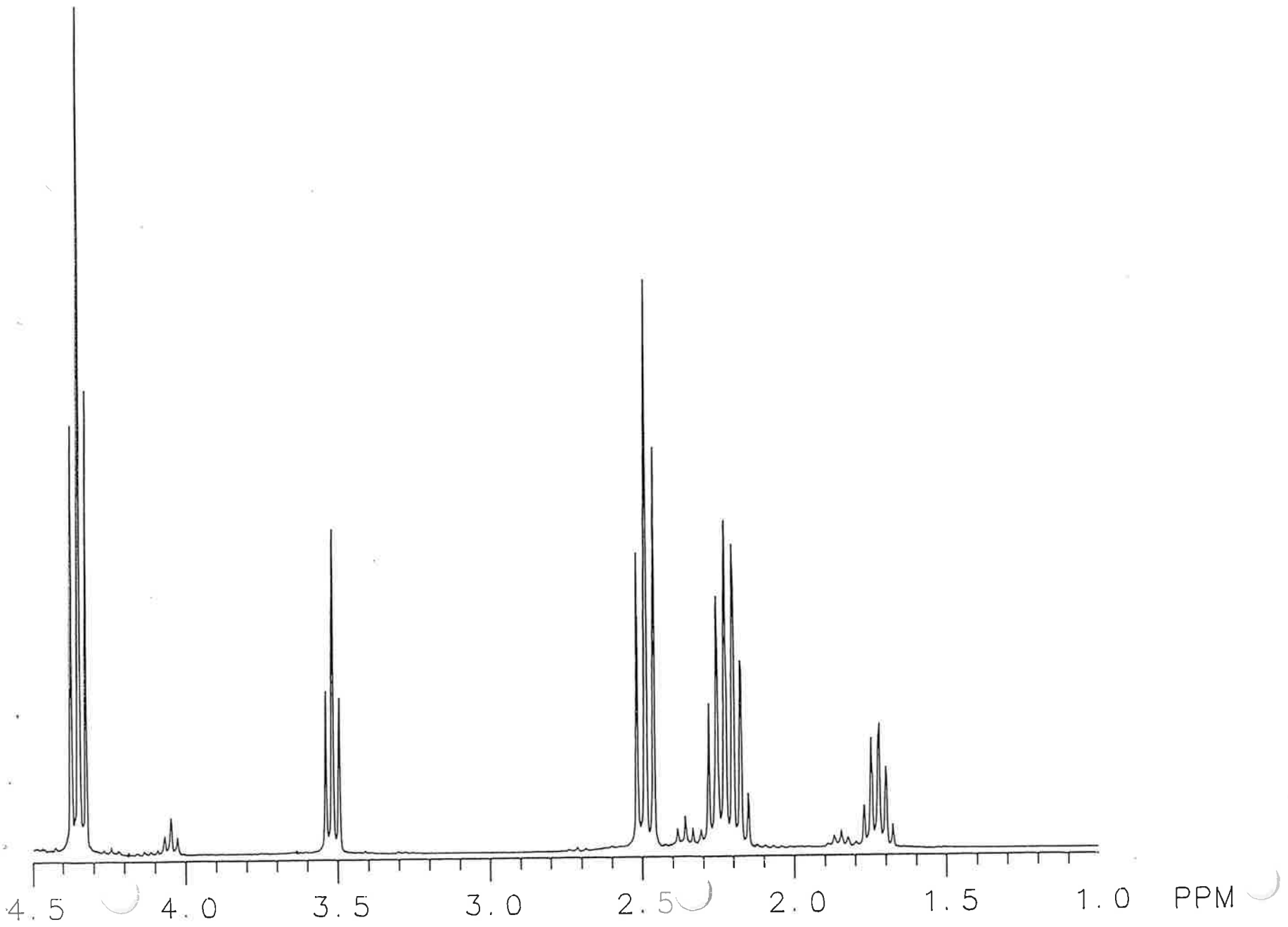




Butyrolactone



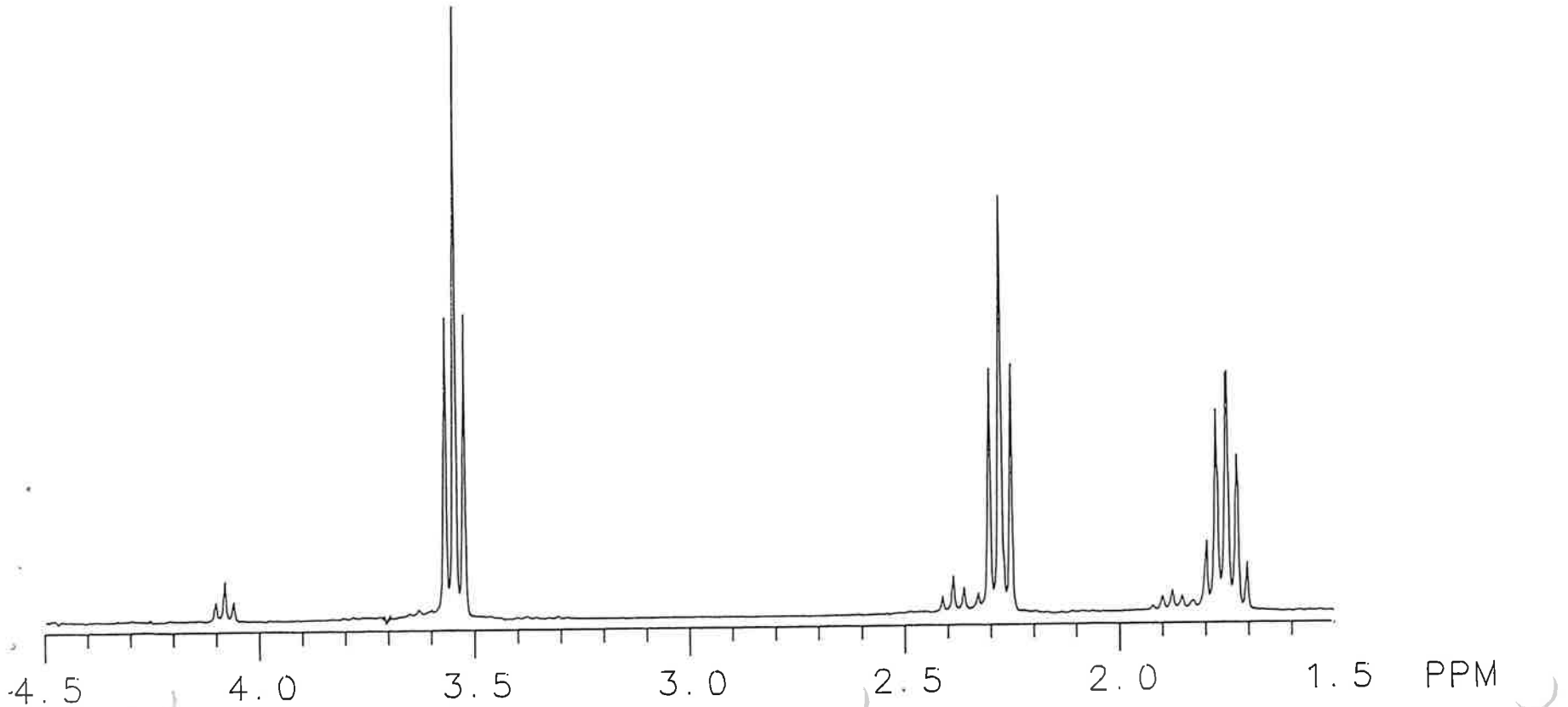
Blue Mixture



$CHCl_3$ ext (D_2O) Found.

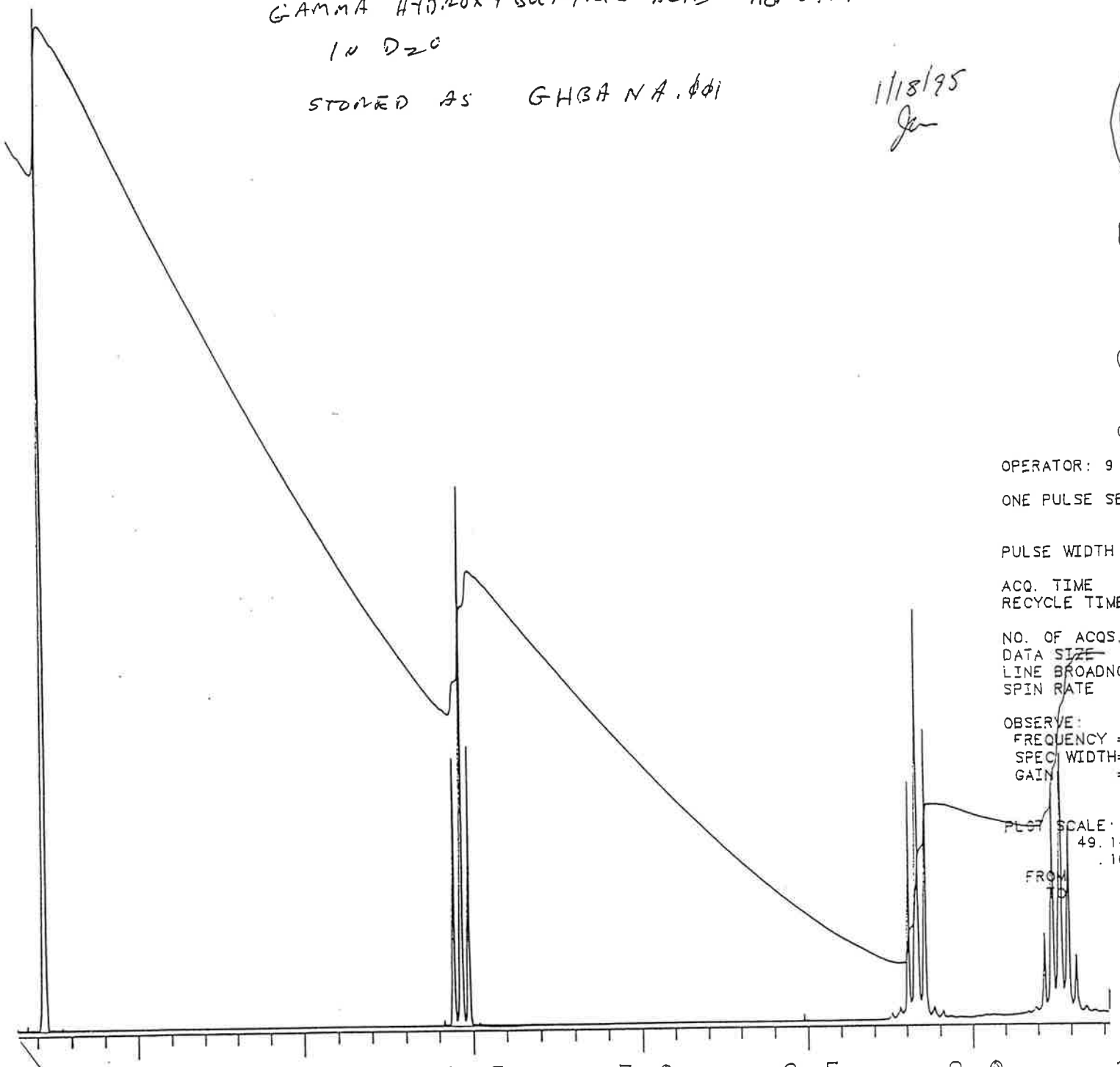
↓

Threw away



GAMMA HYDROXY BUTYRIC ACID Na SALT
IN D_2O
STORED AS GHBA NA.001

1/18/95
Jan



GA DOFS
GE NMR
QE-300

GHBANA.001
18JAN93

GAMMA HYDROXYBUTYRIC ACID SODIUM

OPERATOR: 9

ONE PULSE SEQUENCE

PULSE WIDTH	=	3.00 USEC
	=	38 DEGREES
ACQ. TIME	=	2.72 SEC
RECYCLE TIME	=	3.71 SEC
NO. OF ACQS.	=	8
DATA SIZE	=	32768
LINE BROADNG	=	.00 HZ
SPIN RATE	=	16 RPS

OBSERVE:
FREQUENCY = 300.151850 MHZ
SPEC WIDTH= 6024 HZ
GAIN = 56 +1

PLOT SCALE:
49.14 HZ/CM
.1637 PPM/CM
FROM 4.85
TO 1.58 PPM

State of Georgia
Georgia Bureau of Investigation
Division of Forensic Sciences

Facsimile Cover Sheet

3121 Panthersville Road
Decatur, Georgia 30034
Telefax Number 404-244-2759

To: Mr. Freeze
Company: TBI
Phone:
Fax: 615 741 4787

From: Patti Price
Company:
Phone:
Fax:

Date: 11-20-97
Pages including this cover page:

Comments:

9/24/97

GHB ANALYSIS (QUICK & SIMPLE)

PLACE 1/4 ML OF LIQUID IN TEST TUBE.
IF LIQUID IS HIGHLY VISCOUS — ADD EQUAL VOLUME WATER
WASH 3 TIMES CHCL3 (DISCARD CHCL3)
USING DISPOSABLE PIPET PLACE ONE DROP LIQUID ON WATCH GLASS
DRIVE OFF MOISTURE WHILE SCRATCHING LIQUID WITH POINT OF PIPET — DO THIS WITH UL DRYER
DRY UNTIL ABSOLUTE DRYNESS
EXCESS CRYSTALS ON POINT OF PIPET MAY BE USED FOR NMR IN D20
RESIDUE OF CRYSTALS ON WATCH GLASS SHOULD BE TAKEN UP USING SPATULA & KBR FOR FTIR ANALYSIS

GHB Test Samples 1/30/98 PMC

#1 0.1 gram GHB in 10 m/s. H_2O
#2 0.14 gram GHB in 10 m/s. H_2O
#3 0.20 gram GHB in 10 m/s. H_2O
#4 0.40 gram GHB in 10 m/s. H_2O
#5 0.20 gram Lactose in 10 m/s. H_2O
#6 H_2O

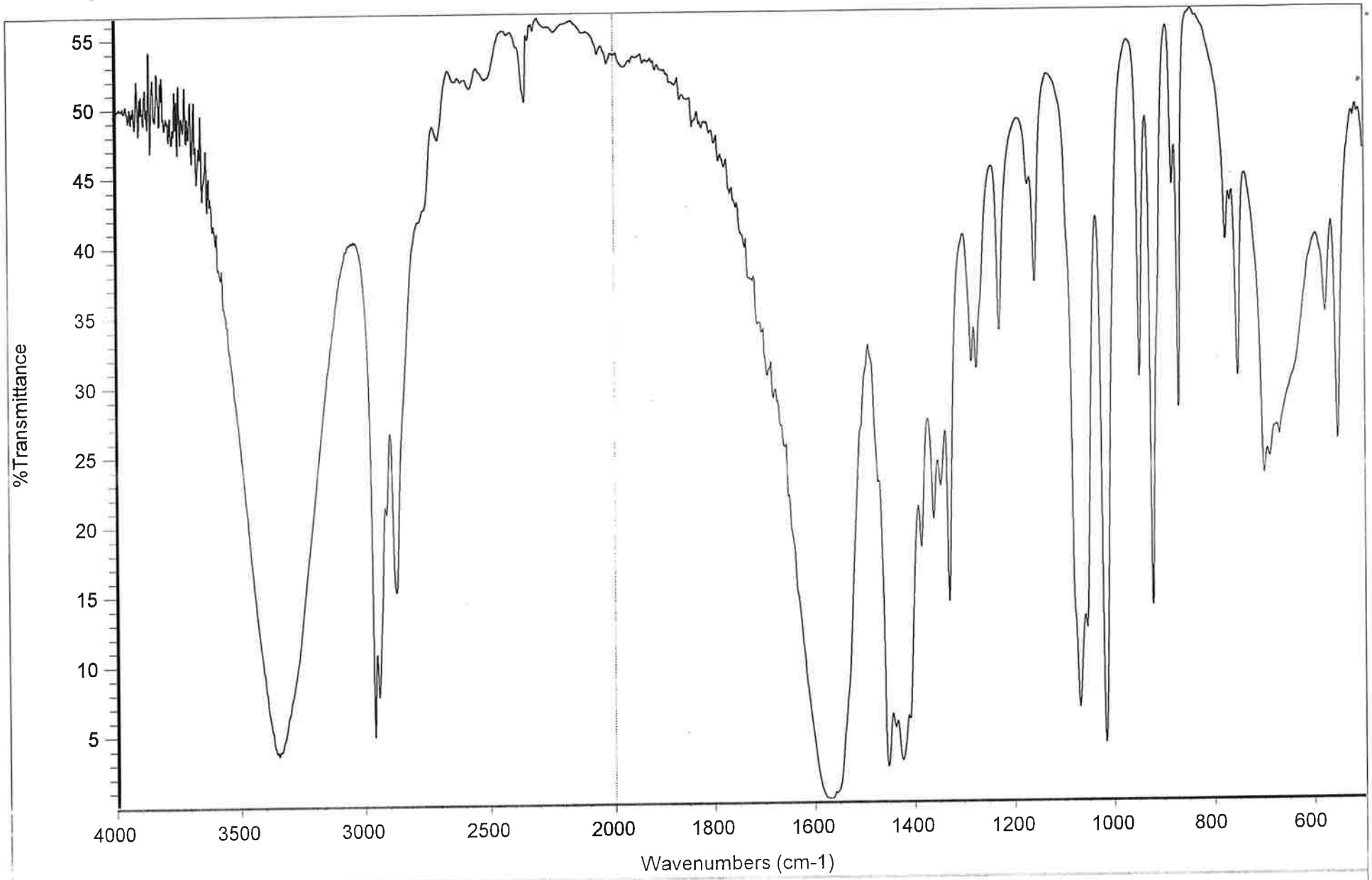
GHB Color Test Reagent - 50% H_2SO_4 and 0.25% CrO_3
50 m/s. conc. H_2SO_4 into 50 m/s. Dionized H_2O plus 0.25 grams of CrO_3

Color test Results:

	PW7	PMC	
#1	+	+	greenish → pale blue
#2	+	+	" "
#3	+	+	" "
#4	+	+	" "
#5	+	+	" "
#6	-	-	No color change

IR Results:

#1	10 dps evp. to dryness	+ GHB - PMC
#2	"	+ GHB - PW7
#3	"	+ GHB - PMC
#4	"	+ GHB - PMC / PW7
#5	"	+ Lactose - PW7

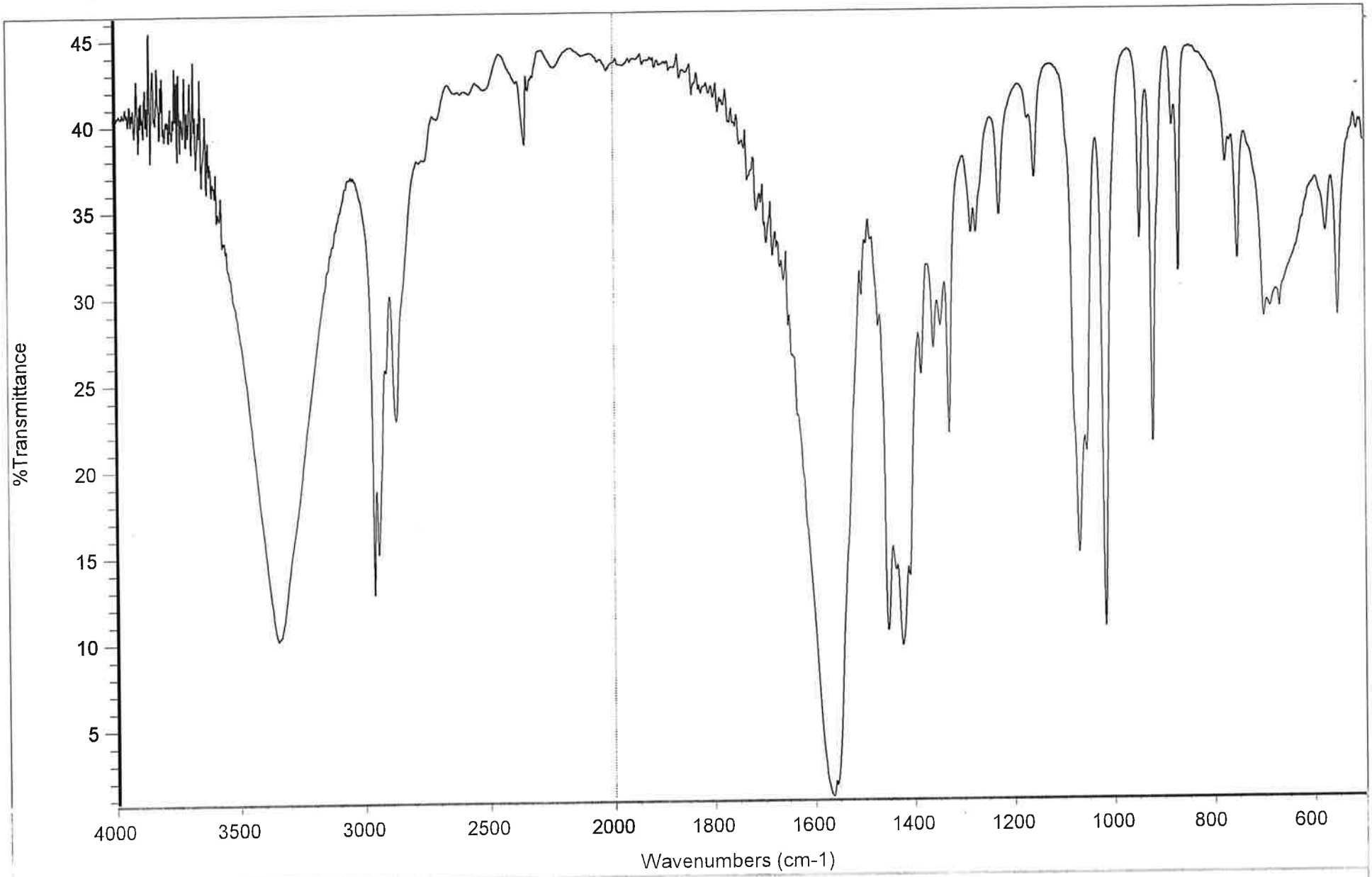


Date: Fri Jan 30 08:34:08 1998

#1 LIQUID SAMPLE DRIED - 10 DROPS - 20 MINUTES - PMC

Scans: 10

Resolution: 4.000

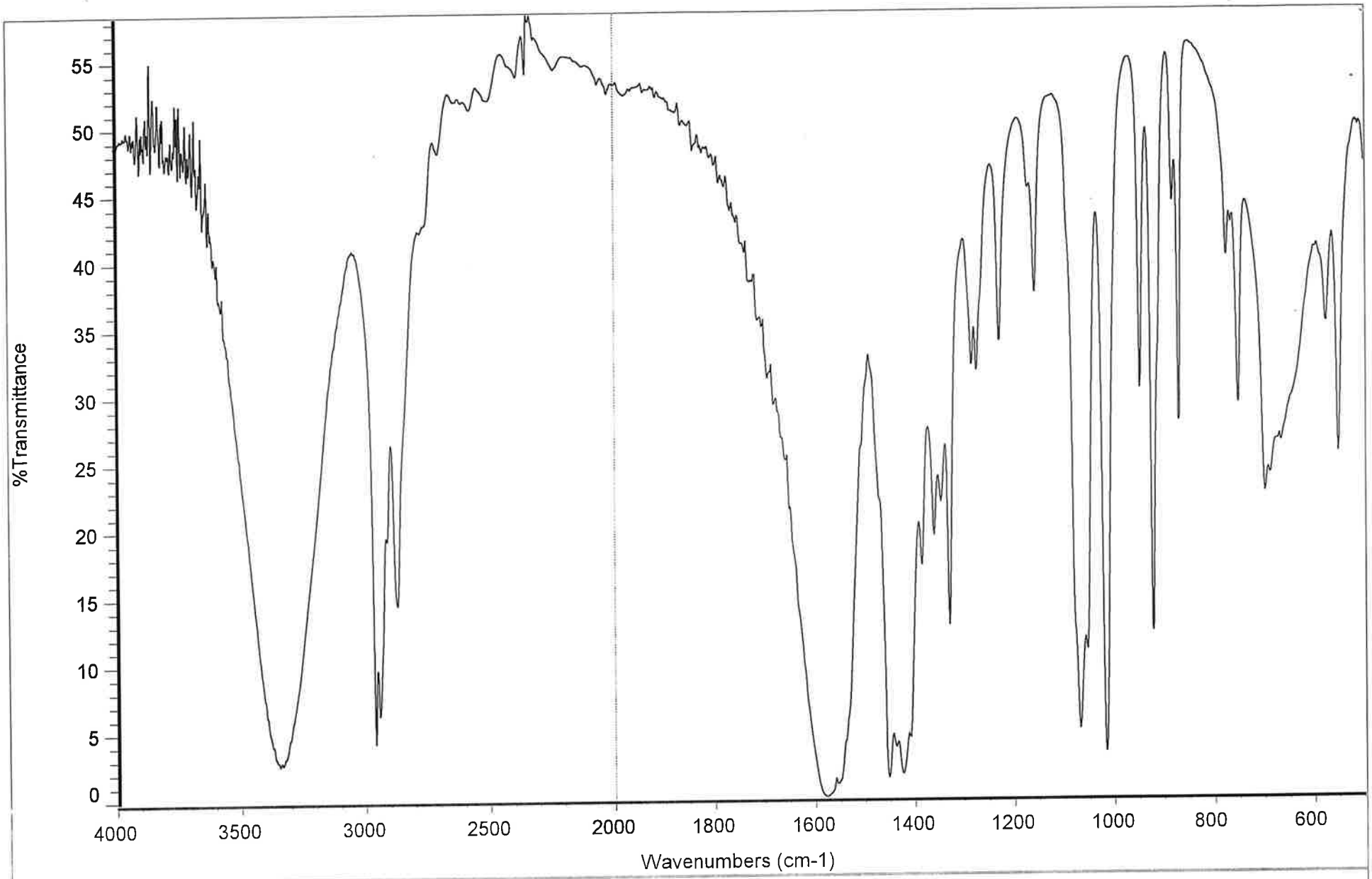


Date: Thu Jan 29 16:01:41 1998

#1 LIQUID SAMPLE DRIED PMC

Scans: 10

Resolution: 4.000

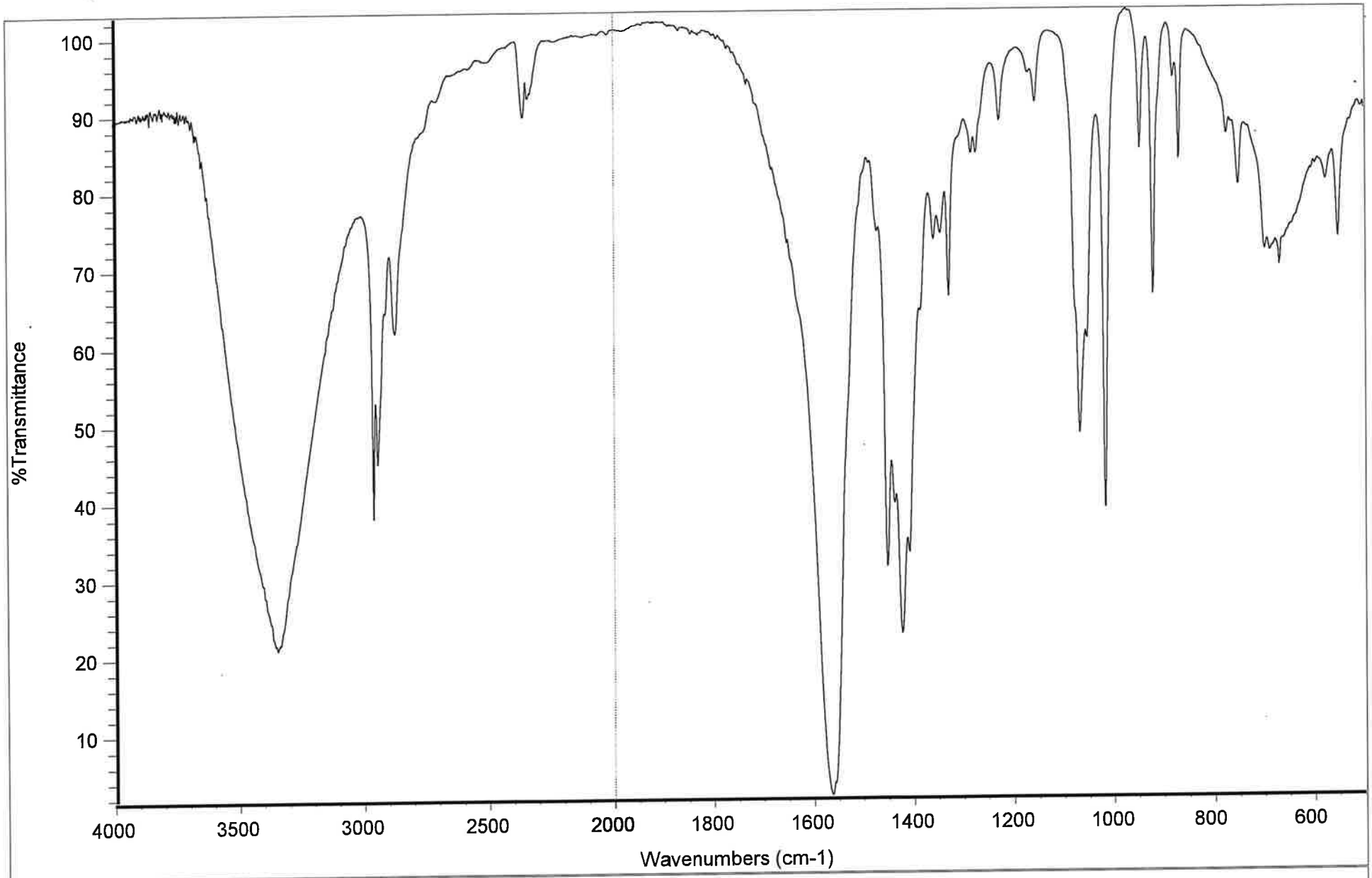


Date: Thu Jan 29 12:15:15 1998

#1 LIQUID SAMPLE DRIED (N2 ONLY) PMC

Scans: 10

Resolution: 4.000

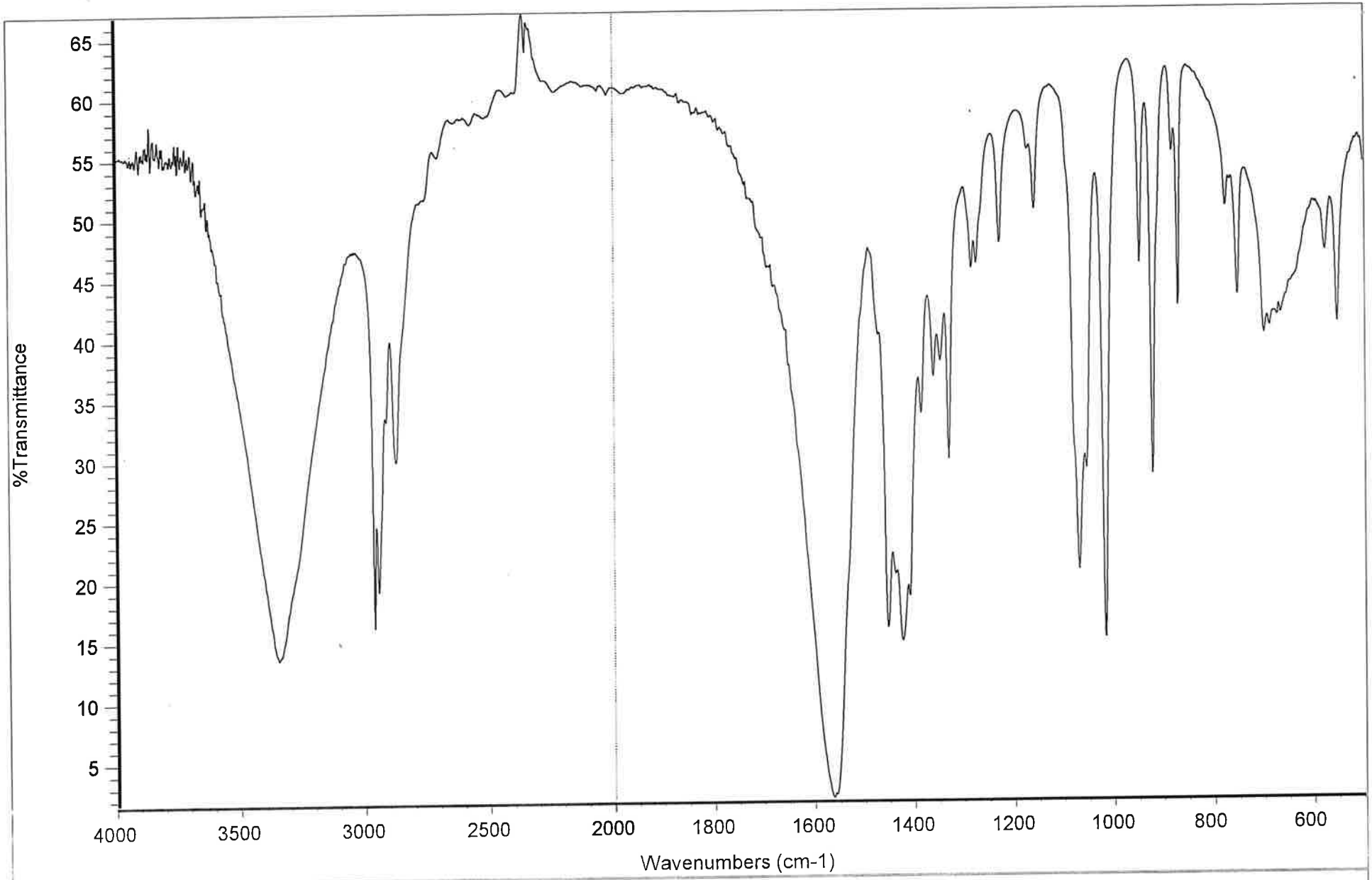


Date: Tue Feb 03 13:38:48 1998

*#2 10 DPS EVP PWF

Scans: 10

Resolution: 4.000

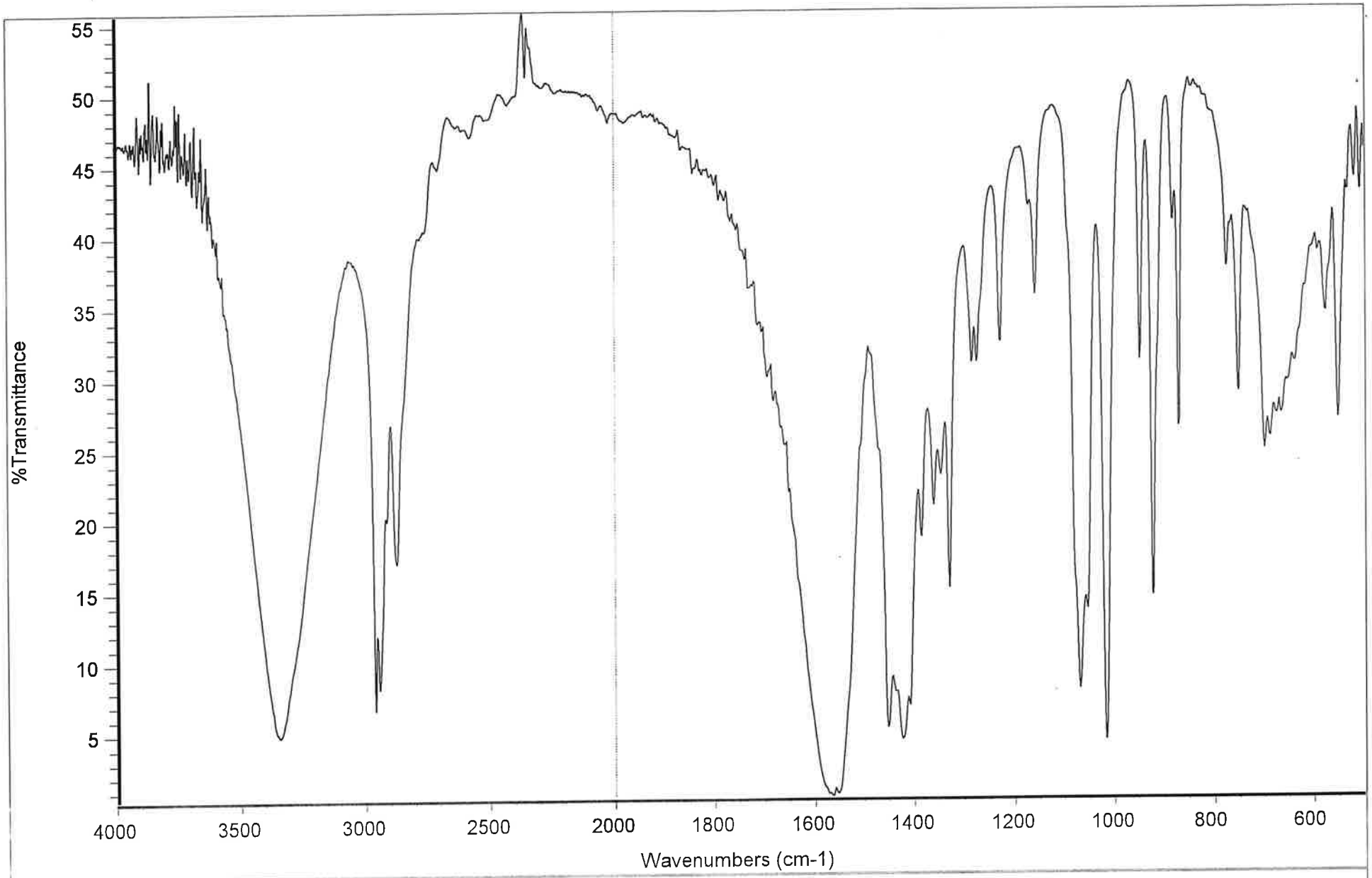


Date: Thu Jan 29 11:29:46 1998

#3 LIQUID SAMPLE DRIED PMC

Scans: 10

Resolution: 4.000

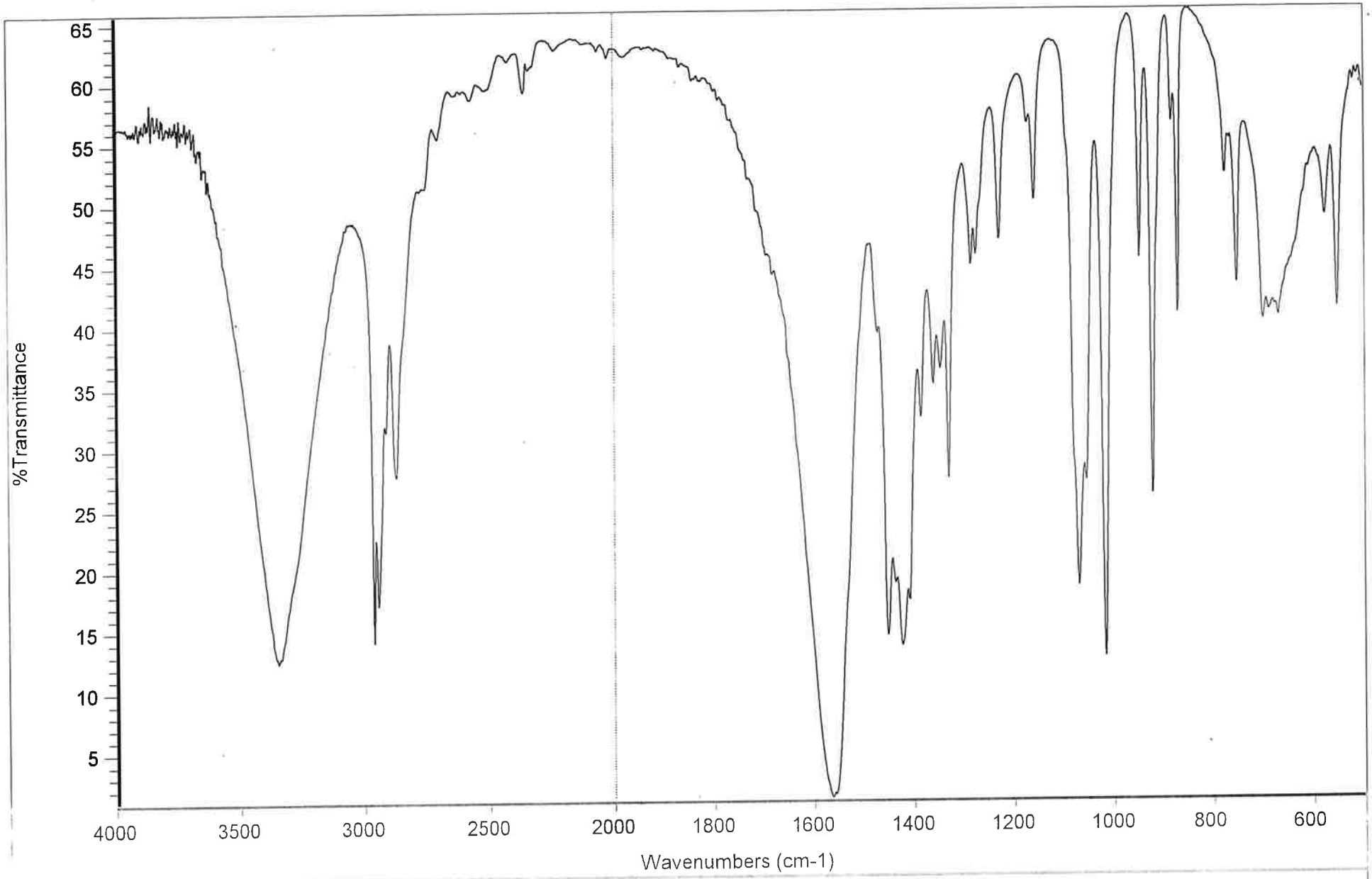


Date: Thu Jan 29 10:03:23 1998

#4 LIQUID SAMPLE DRIED PMC

Scans: 10

Resolution: 4.000

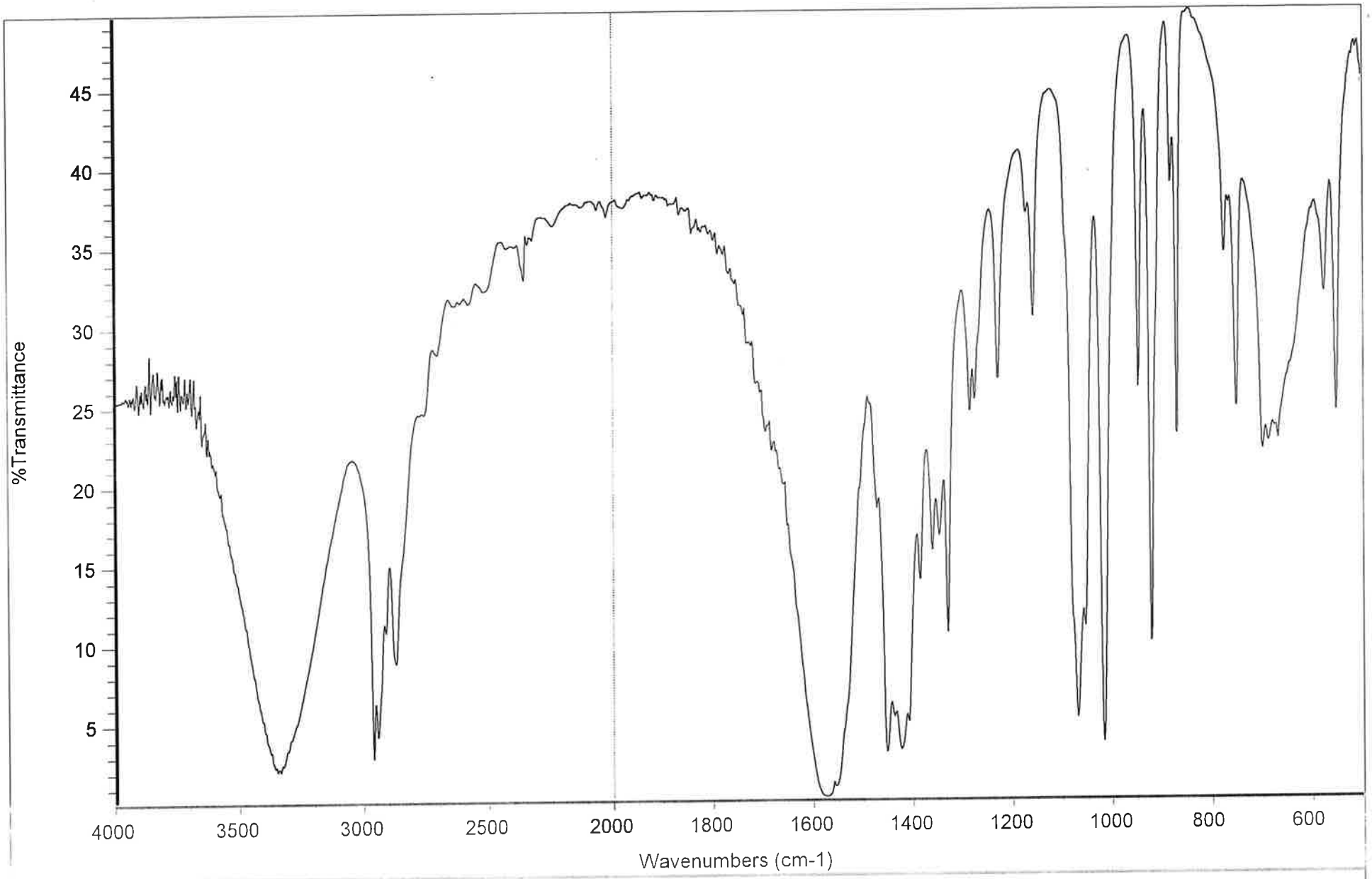


Date: Fri Jan 30 10:00:20 1998

#4 - LIQUID SAMPLE DRIED - 10 DROPS - PMC

Scans: 10

Resolution: 4.000

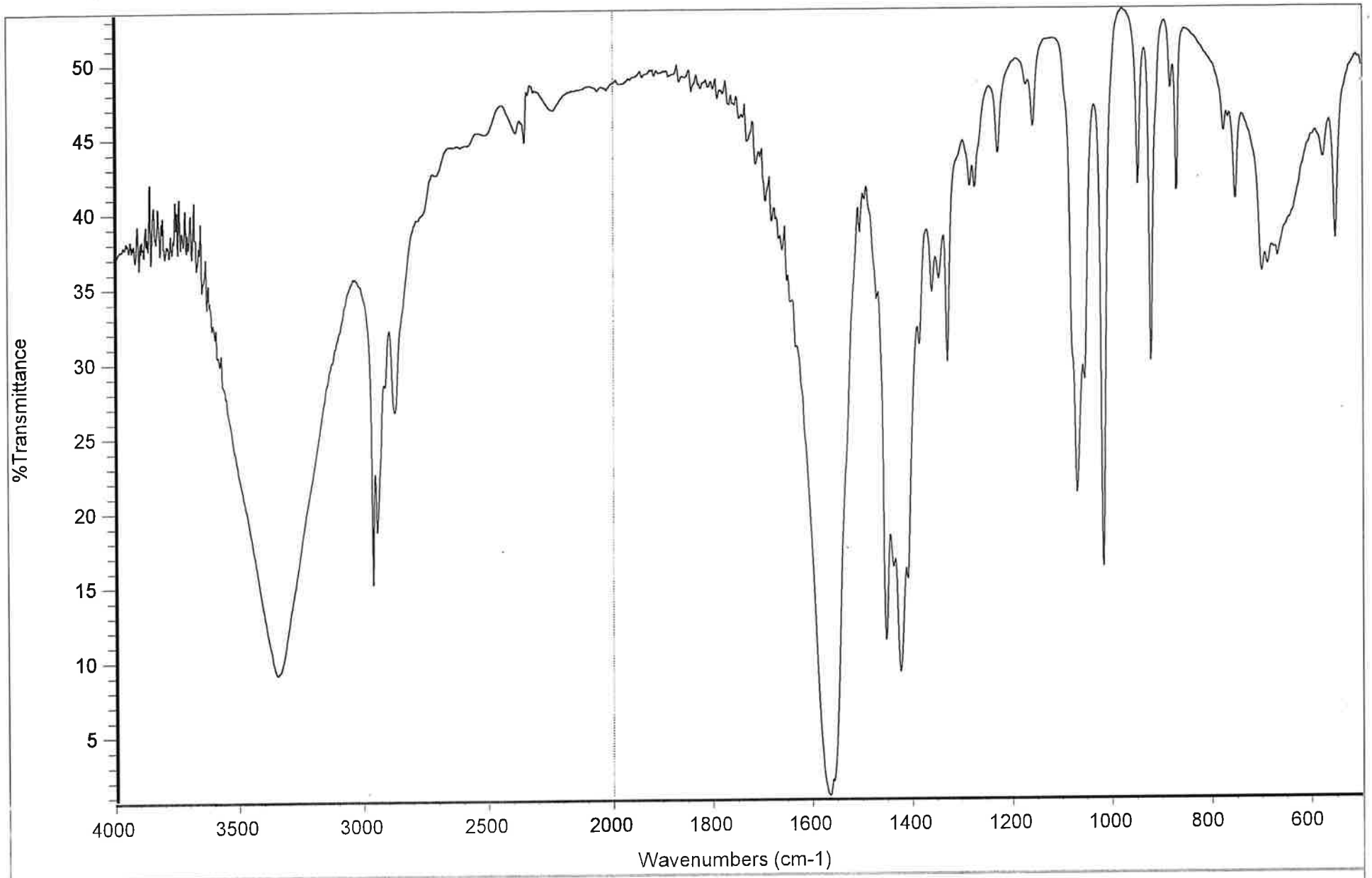


Date: Fri Jan 30 09:52:29 1998

#4 - LIQUID SAMPLE DRIED - 10 DROPS - PMC

Scans: 10

Resolution: 4.000

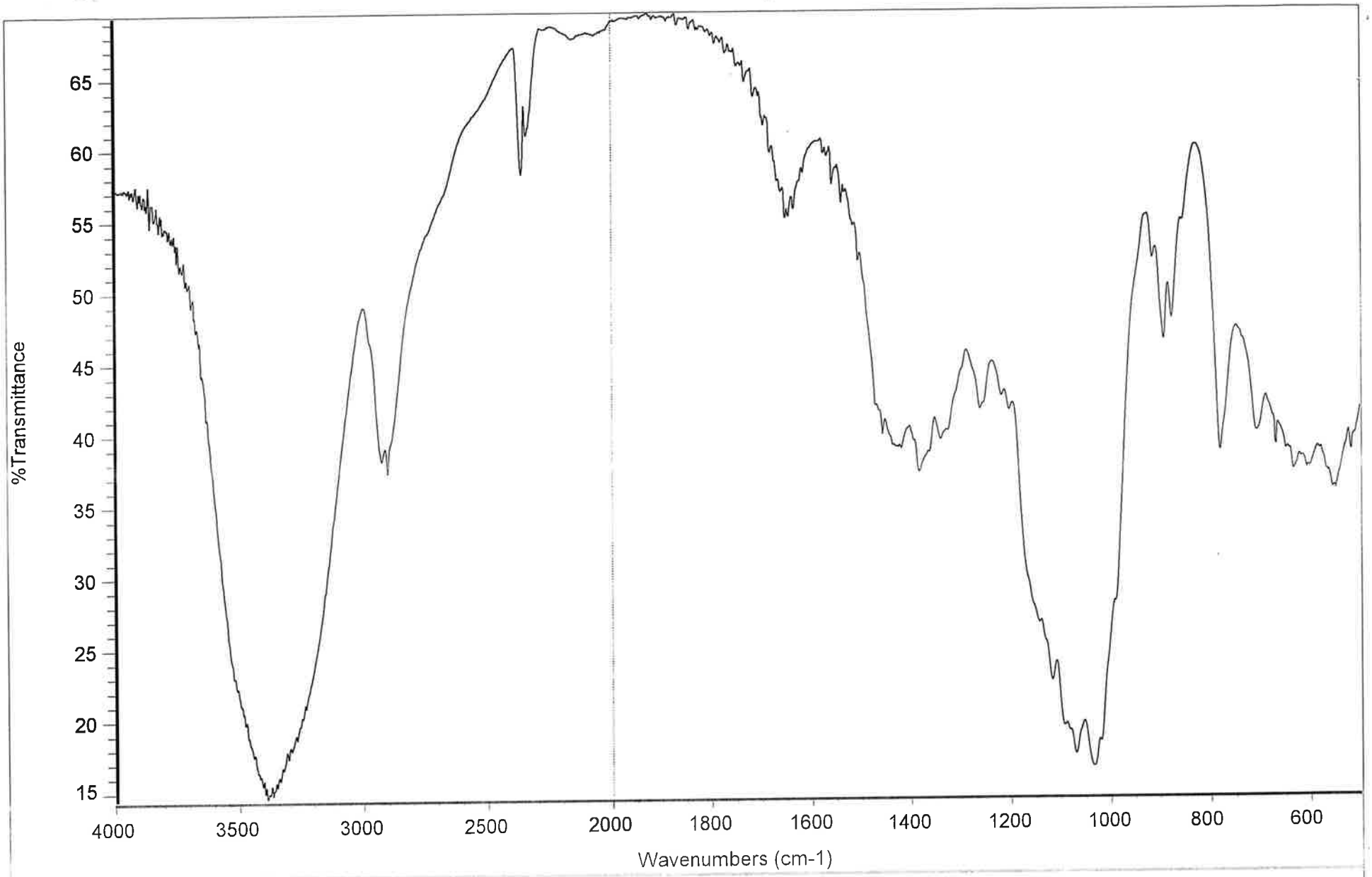


Date: Thu Jan 29 11:59:44 1998

#4 10 DPS EVP PWF

Scans: 10

Resolution: 4.000

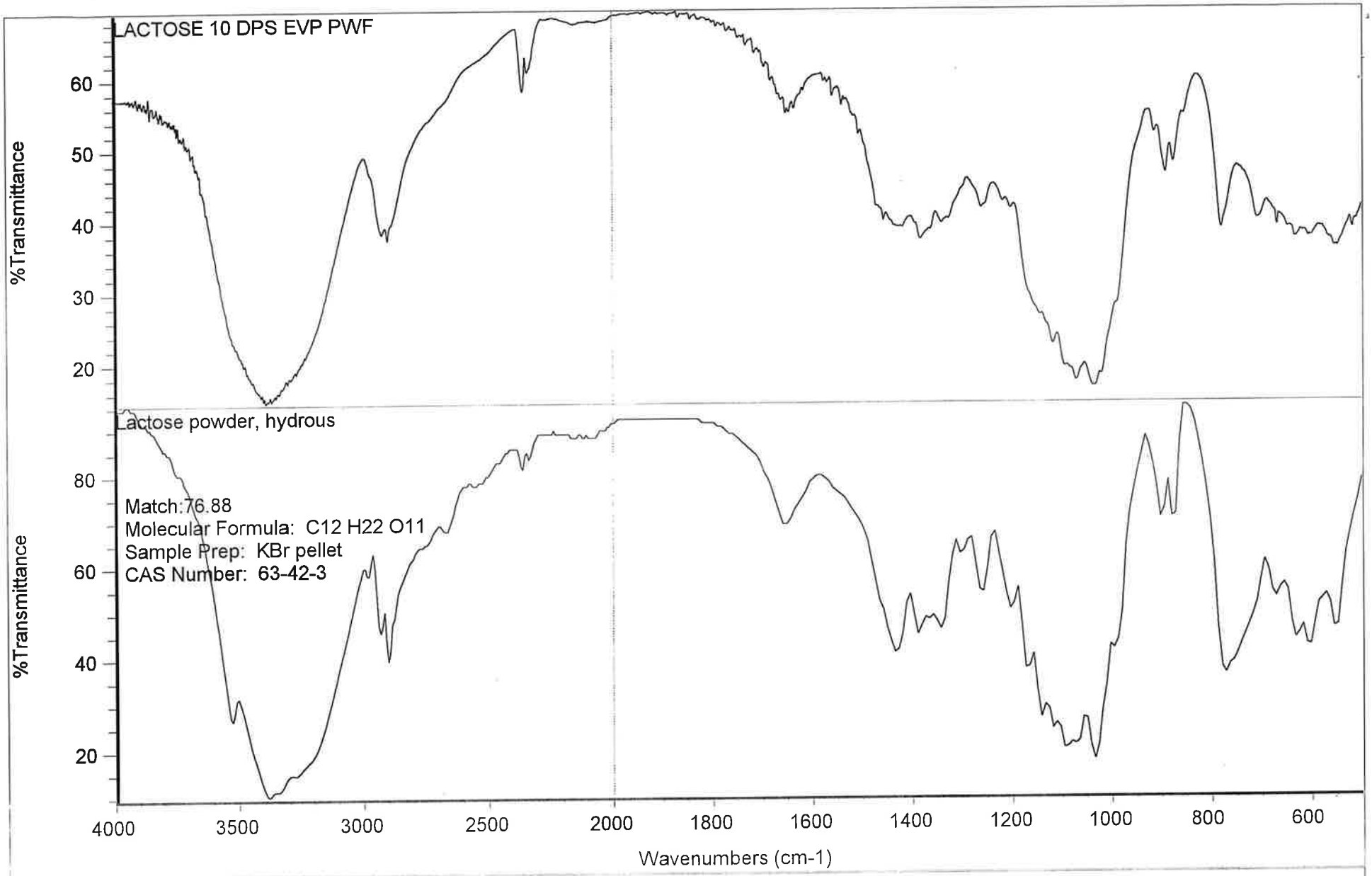


Date: Fri Jan 30 09:13:48 1998

LACTOSE 10 DPS EVP PWF

Scans: 10

Resolution: 4.000



Date: Unknown

Scans: 1

Resolution: Unknown

Lactose powder, hydrous

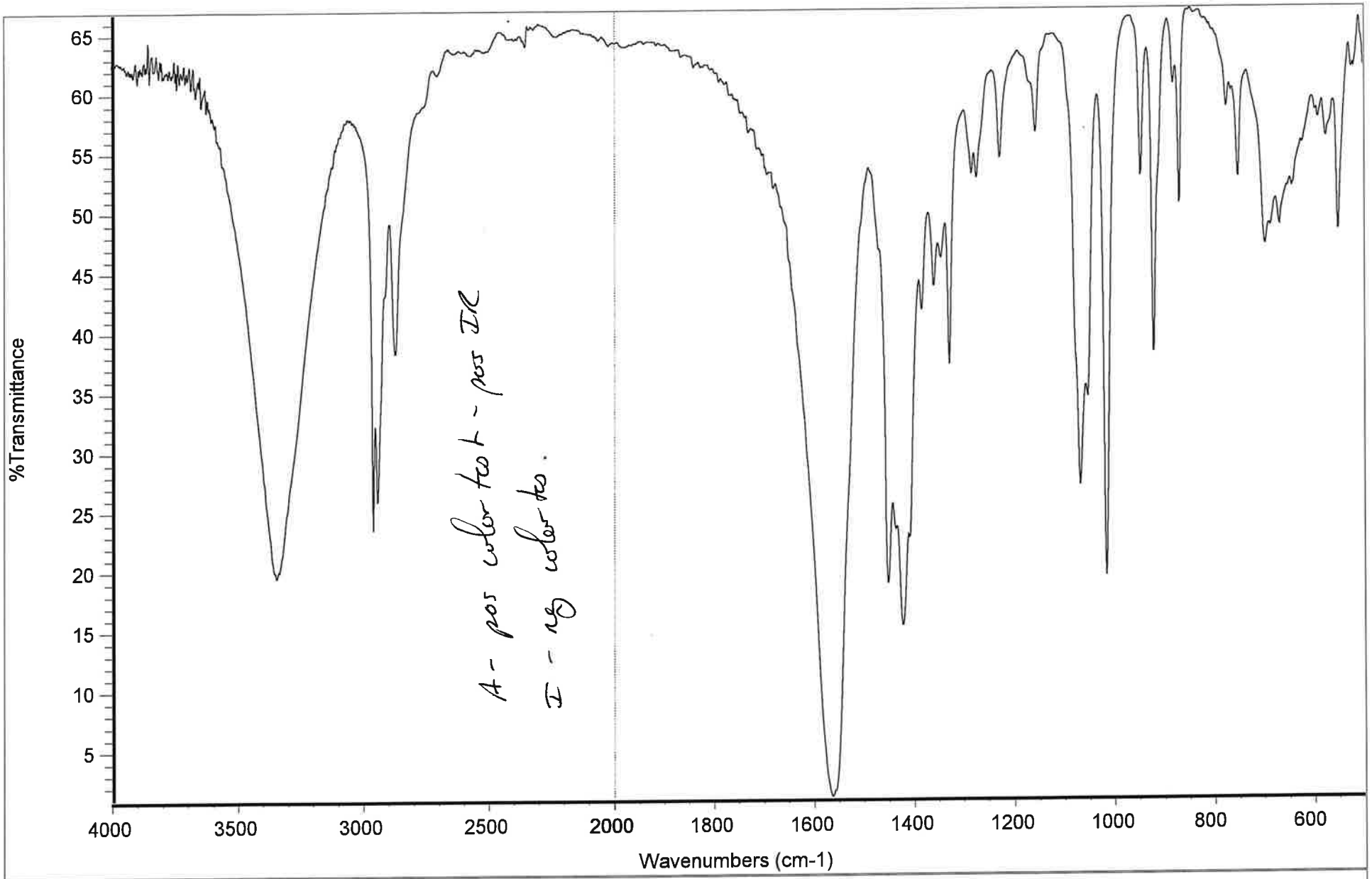
20200120

1/30/98

GHB Procedure - Test Samples

	Substance			Analyst	Results
A.	GHB	0.2g/10ml H_2O	25 dps	WHS	GHB
B.	GHB	0.2g/10ml H_2O	25 dps	PC	GHB
C.	GHB	0.2g/10ml H_2O	25 dps	GG	GHB
D.	GHB	0.2g/10ml H_2O	25 dps	GE	GHB
E.	GHB	0.2g/10ml H_2O	25 dps	DS	GHB
F.	GHB	0.2g/10ml H_2O	25 dps	DF	GHB
G.	GHB	0.2g/10ml H_2O	25 dps	KC	GHB
H.	GHB	0.2g/10ml H_2O	25 dps	KL	GHB
I.	H_2O	25 dps		WHS	Neg
J.	H_2O	25 dps		PC	Neg
K.	H_2O	25 dps		GG	Neg
L.	H_2O	25 dps		GE	Neg
M.	H_2O	25 dps		DS	Neg
N.	H_2O	25 dps		DF	Neg
O.	H_2O	25 dps		KC	Neg
P.	H_2O	25 dps		KL	Neg
Q.	H_2O	25 dps		PF	neg
R.	GHB	25 dps		PF	GHB

Made by PC



Date: Mon Feb 02 12:00:36 1998 TEST SAMPLE A NEAT DRIED DOWN WHS GHB

Scans: 10

Resolution: 4.000

WHS

PATTI CHOATIE 1-30-98

GHB UNKNOWNS

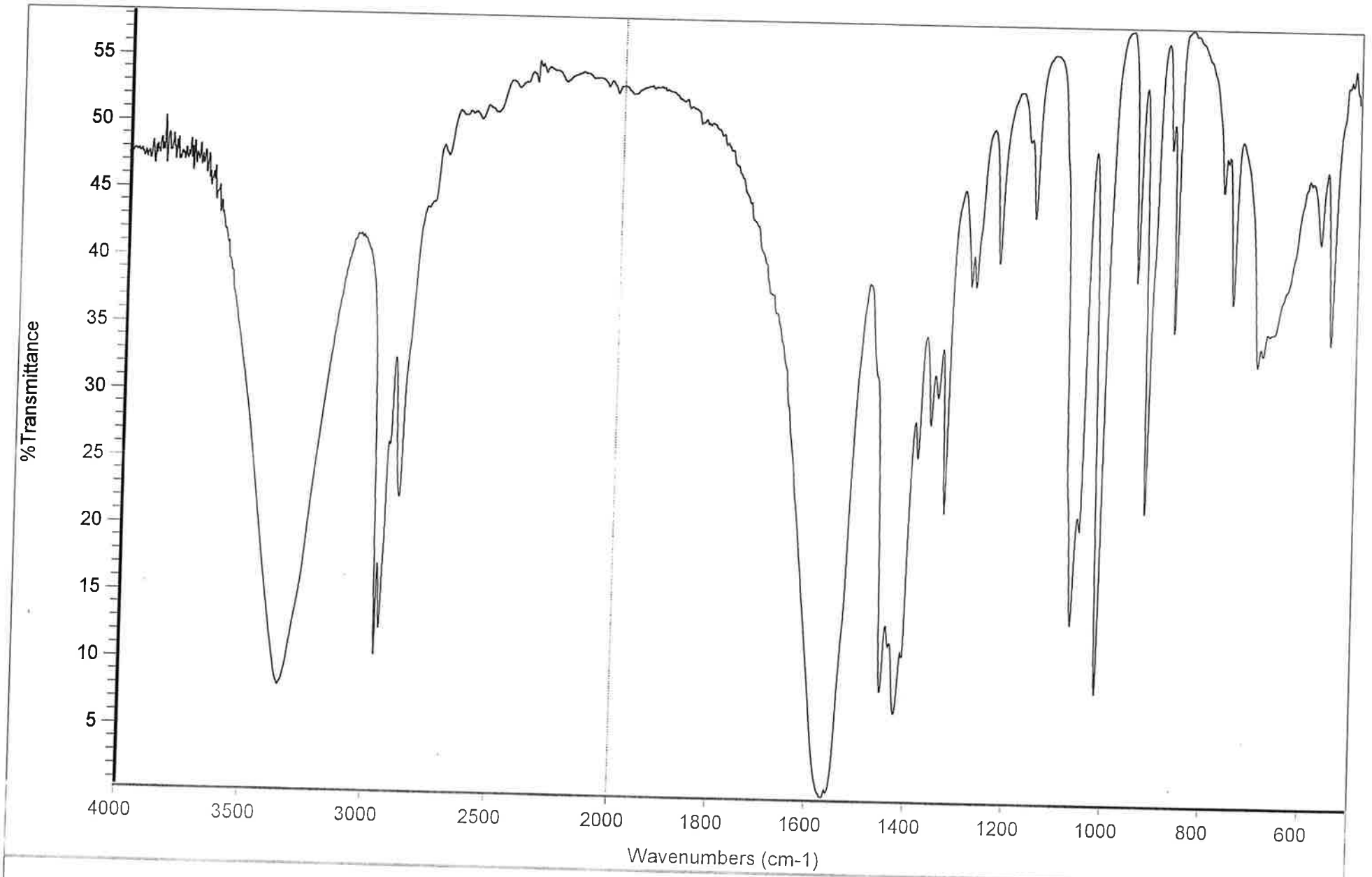
COLOR TEST

B - +

J - -

FTIR - pos GHB - 97.8 hit on Omnic

Patti Choatie



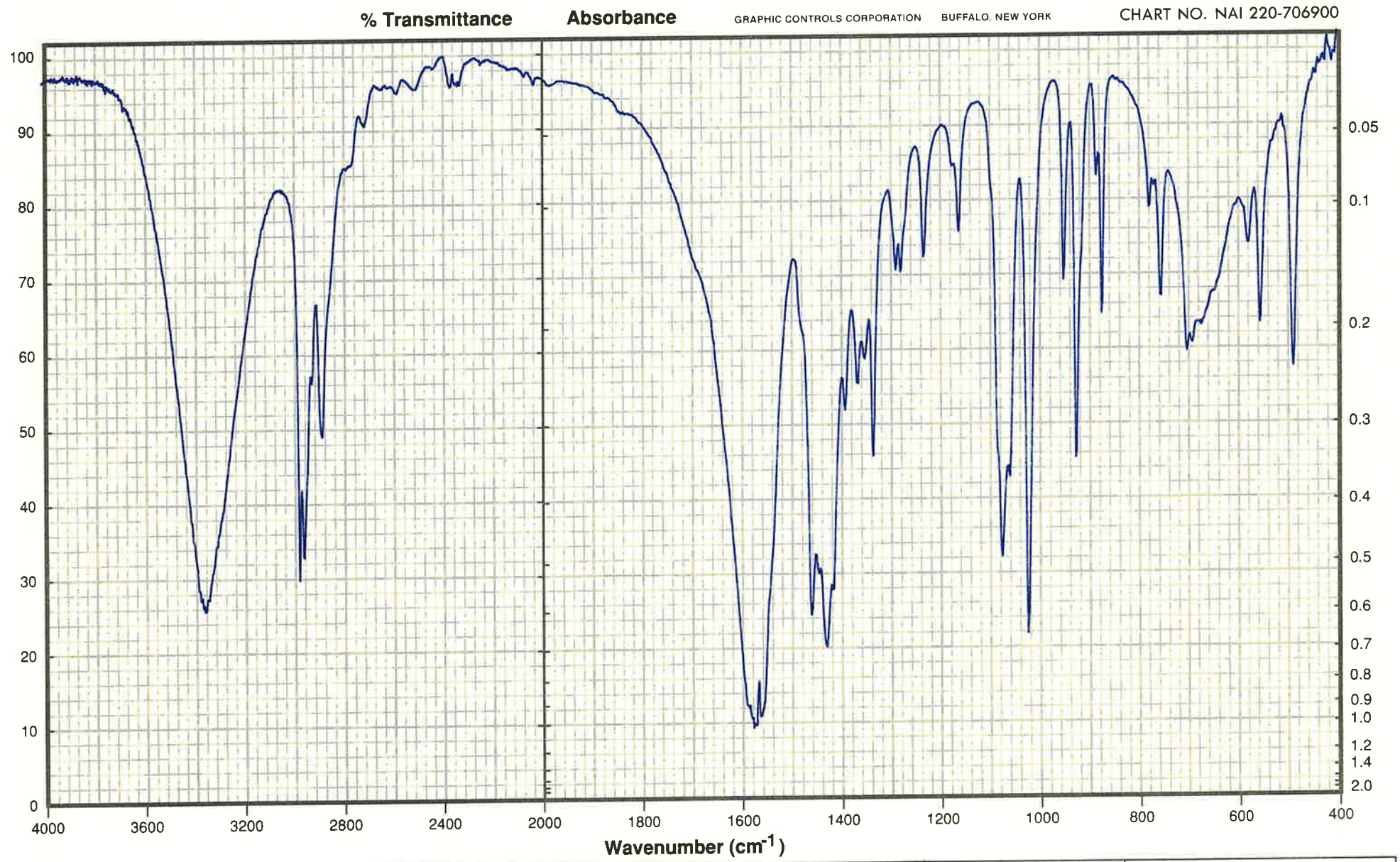
Date: Fri Jan 30 13:25:41 1998

SAMPLE # B NEAT 10 DROPS PMC

Scans: 10

GHB

Resolution: 4.000

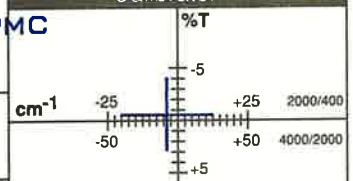


Title: SAMPLE # B NEAT 10 DROPS PMC

Filename:

Date: 30 Jan 98 Time: 13: 03: 59

Calibrator™



Data Processing/Comment: slope level
thickness 0.5000

GHB

Resolution: 4 cm-!

No. Scans: 10

Operator:

Glen Jay Glenn
Unknown Liquid Sample

Vial K

GHBCTR: ⊖ Blanks: ⊖ ⊖

IR: N/A

No controlled Substance Detected

Vial C

GHBCTR: ⊕ Blanks: ⊖ ⊖

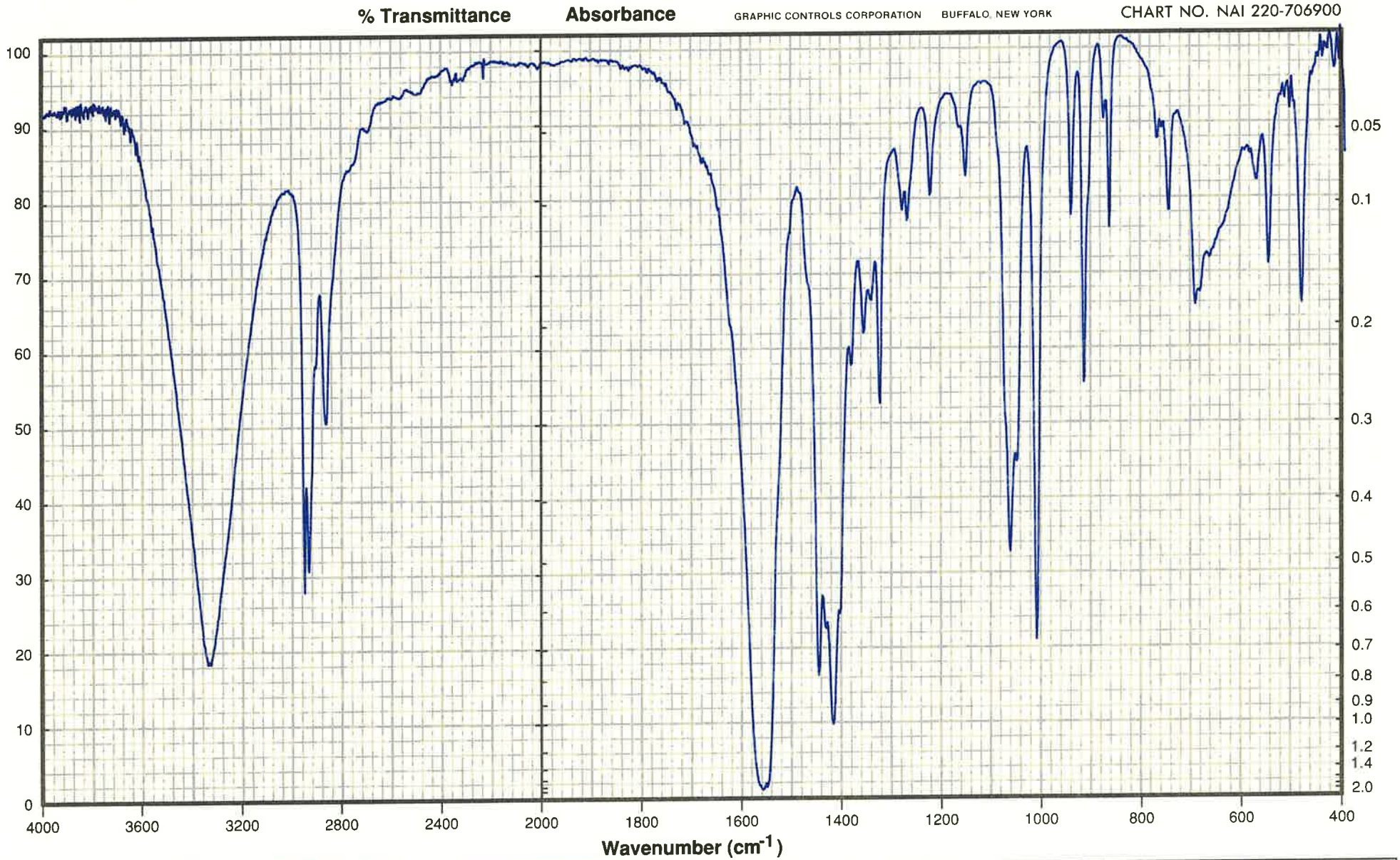
IR: ⊕

GHB

IV

Glen Jay Glenn

January 9, 1998



Title
UNKNOWN LIQUID SAMPLE (VIAL C) GJG

GJG 30-98

Filename

Date 3 Jan 98

Time 16: 58: 42

Calibrator™
%T
cm-1
-5
-25
+25
2000/400
-50
+50
4000/2000
+5

Data Processing/Comment
slope level

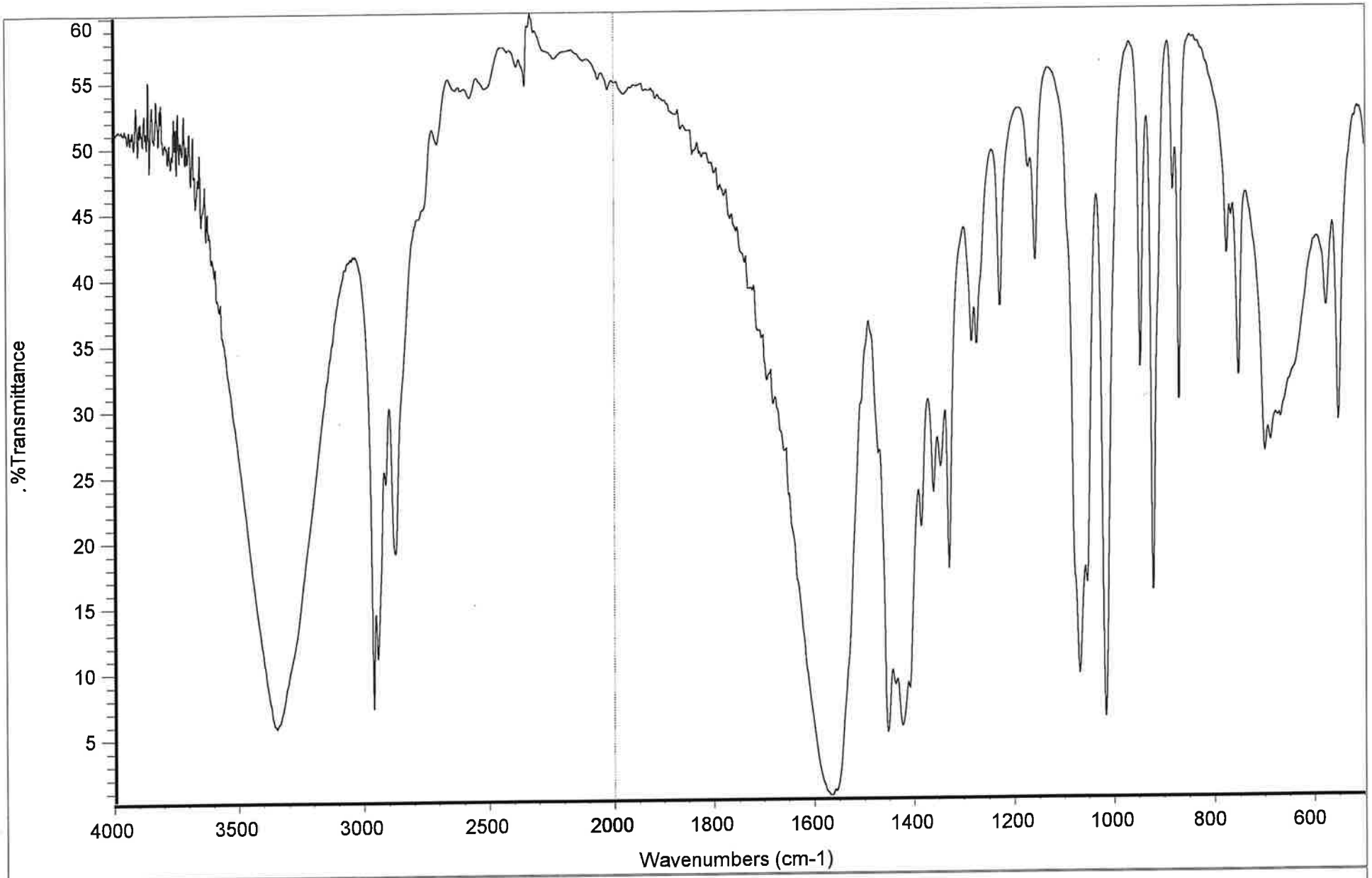
Resolution
4 cm-1

No. Scans
10

Operator

SAMPLE (D) Positive Pale Blue

SAMPLE (L) Negative No color CHANGE

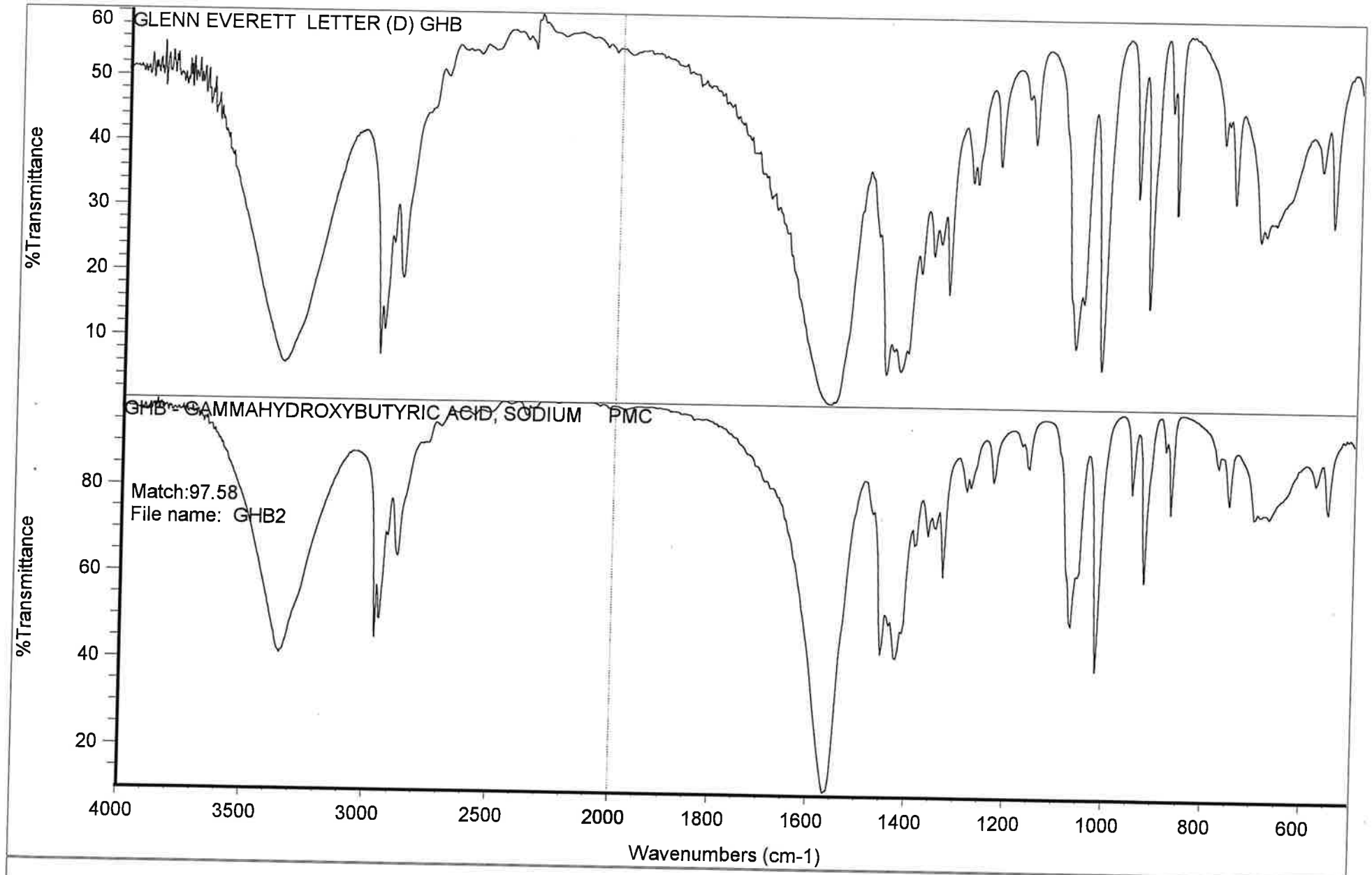


Date: Fri Jan 30 14:59:19 1998

GLENN EVERETT LETTER (D) GHB

Scans: 10

Resolution: 4.000



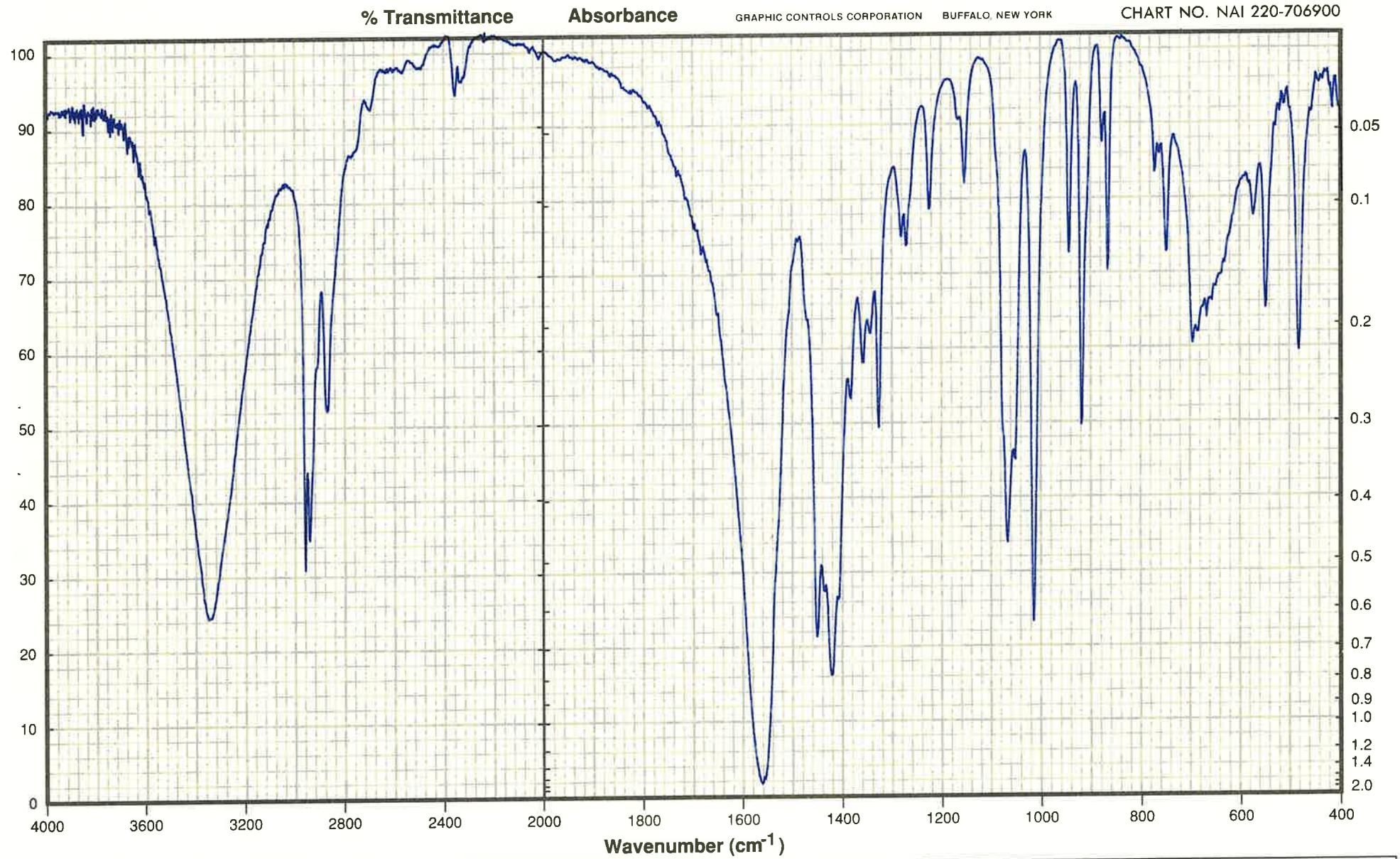
Date: Unknown

Scans: 1

Resolution: Unknown

GHB - GAMMAHYDROXYBUTYRIC ACID, SODIUM PMC

90100181



Title: DMS GHB

Filename:

Date: 02 Fe[illegible] 98 Time: 15: 43: 29

Calibrator™

%T

cm-1 -25 +25 2000/400

-50 +50 4000/2000

-5

+5

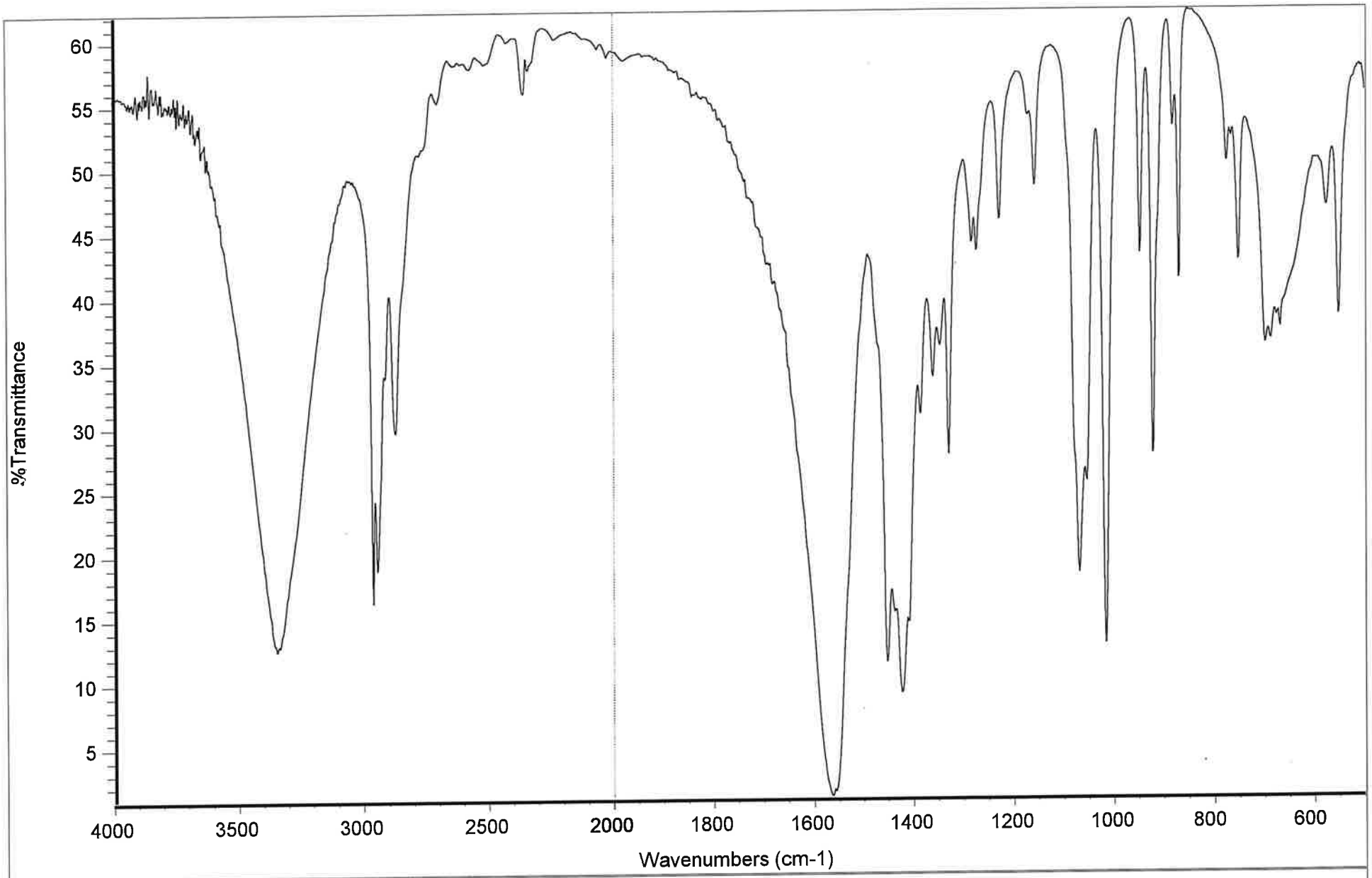
Data Processing/Comment: slope level

IM - Neg

Resolution: 4 cm-1

No. Scans: 10

Operator:



Date: Tue Feb 03 08:49:56 1998

DONNA

Scans: 10

Resolution: 4.000

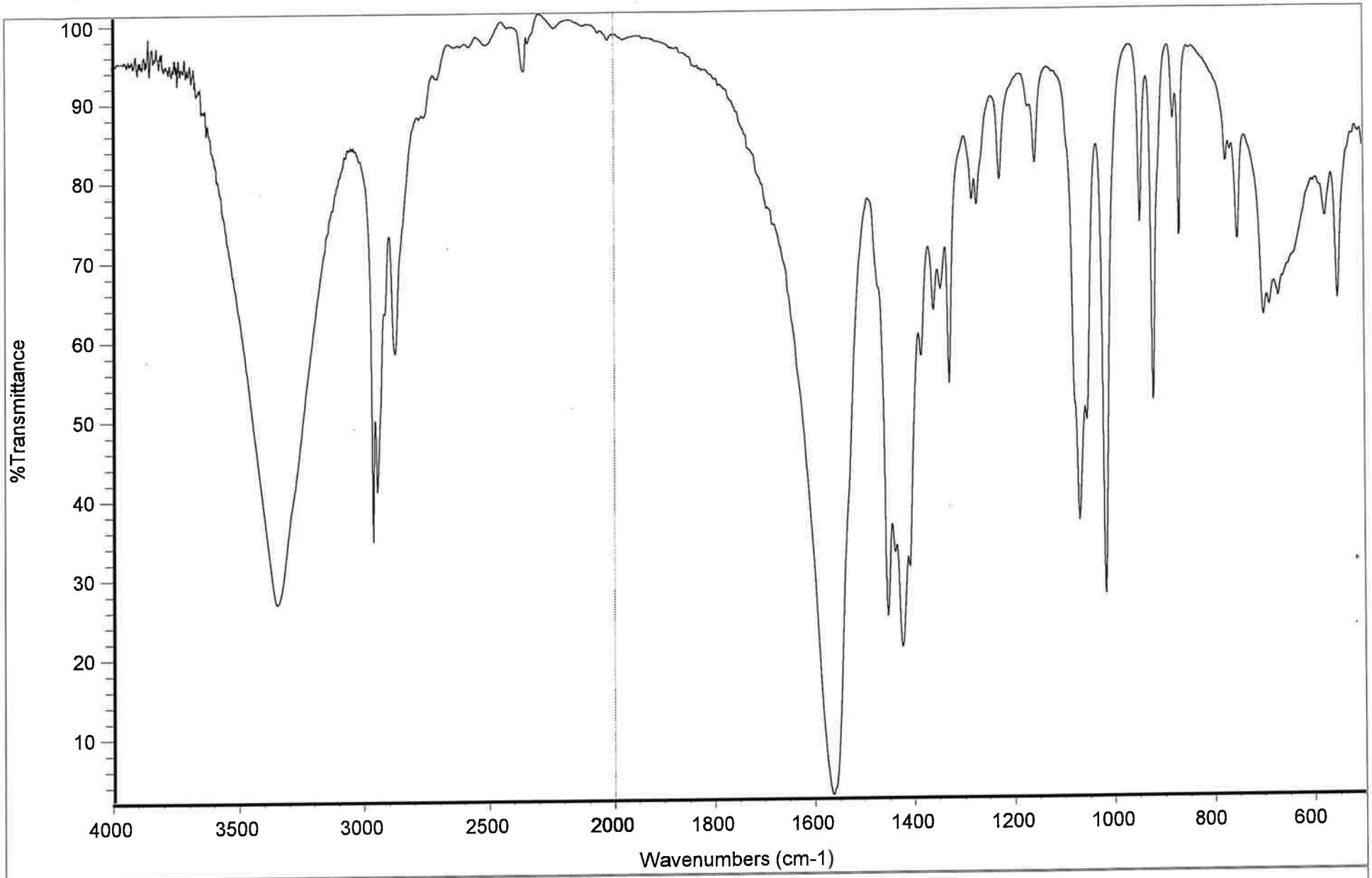
N/- Neg

Phillip Freeze 1/30/98

GHB UnKnowns:

	Color Test	IR
Q -	-	
R -	+	(+) GHB

Sample R - GHB
Sample Q - No Controlled Substance detected.

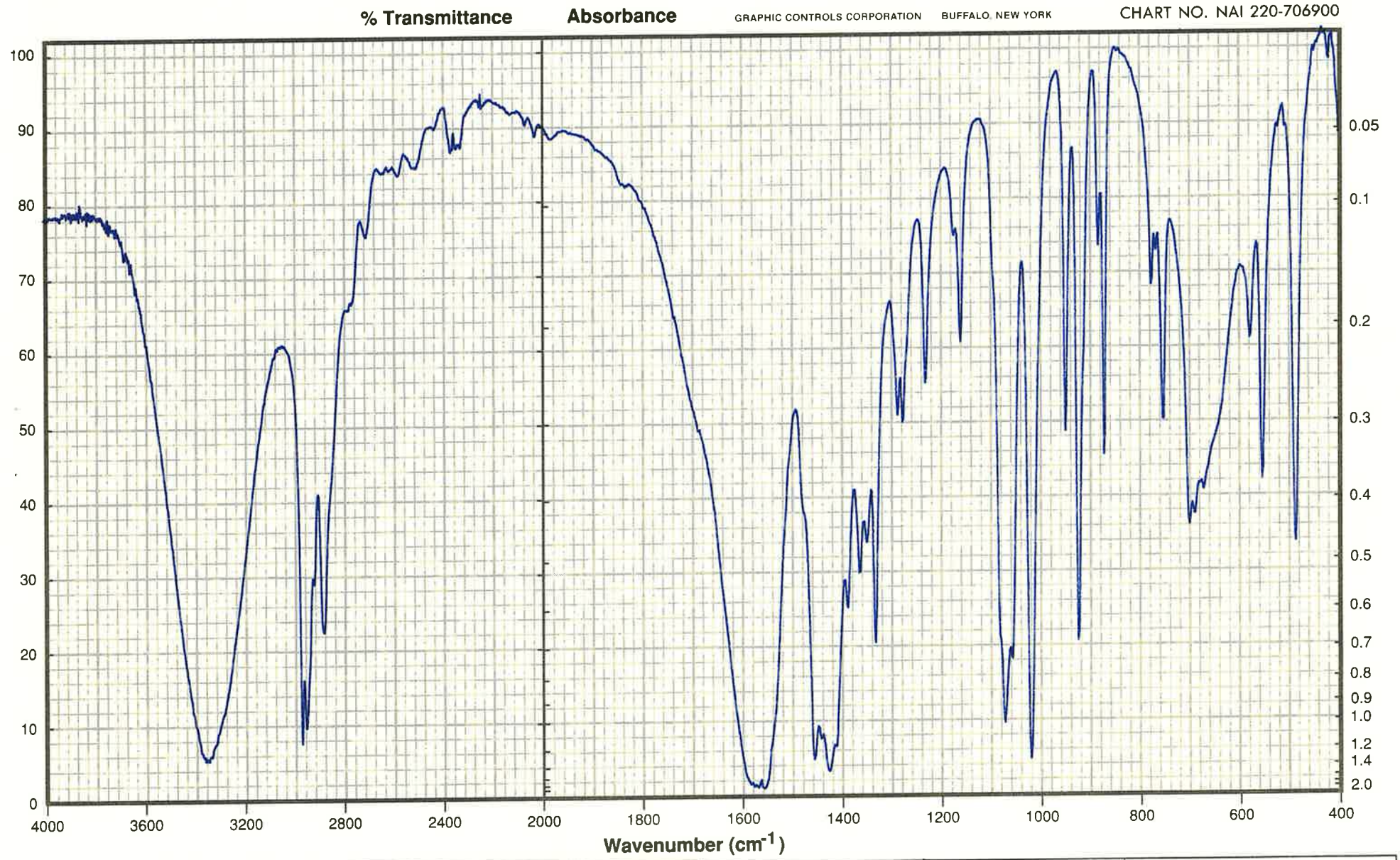


Date: Fri Jan 30 16:19:11 1998

*GHB SAMPLE R 10 DPS EVP PWF

Scans: 10

Resolution: 4.000



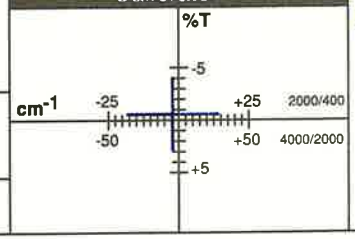
Title: GHB PROFICIENCY TEST

Filename:

Date: 06 Feb 98

Time: 11:10:59

Calibrator™



Data Processing/Comment: slope level

Sample CT (+) positive
(G) positive
Kathy Carman 2/6/98

Resolution: 4 cm-1

No. Scans: 10

Operator:

Sample O negative

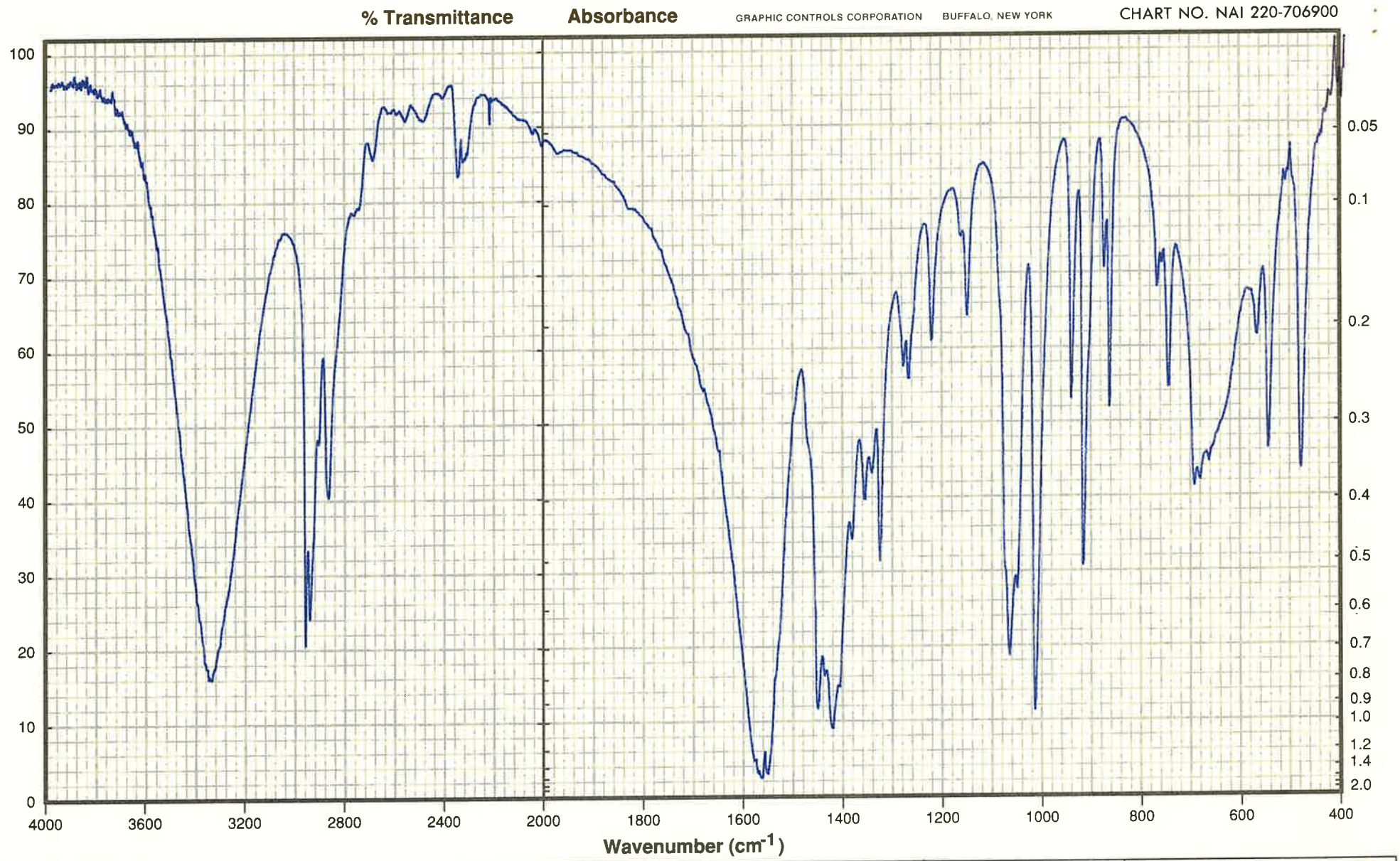
11 Feb 98 ICPEZB "KL" ē 2 small glass vials, one marked "P" one marked "H" ea ē liquid

GHB Color Test

H - slow light blue
P - negative
H_2O - negative
Blank - negative
ETOH - quick light blue

H - Dried down & ran IR - GHB

11 Feb 98
KAL



Title: SAMPLE H DRIED DOWN KAL	Calibrator™	Data Processing/Comment: slope level thickness 0.8000	Resolution: 4 cm-1
Filename: GHB			No. Scans: 10
Date: 11 Feb 98 Time: 13: 20: 29			Operator