

SADTLER RESEARCH LABORATORIES, INC.

Sadtler
Infrared Vapor Phase
Spectra
(at 180 psi)
Volume 1
1 - 500 V

CREATIVE CHEMISTS SINCE 1874

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On the other hand every effort is made by Sadtler Research Laboratories, Inc. to assure the reliability of the published spectra. When improved data is available or errors are called to our attention we revise and reissue the proper replacement spectra.

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INFRARED VAPOR PHASE SPECTRA AT 180 psi

INTRODUCTION

This collection of 500 infrared absorption spectra of compounds which are liquids at room temperature is intended to provide a reference library for spectroscopists identifying compounds in the vapor state as the trapped components from gas chromatography separations.

All spectra were determined at Sadtler Research Laboratories using a Digilab FTS-14 Fourier transform spectrometer in the spectral region 4000 cm^{-1} to 700 cm^{-1} with a constant resolution of approximately 4 cm^{-1} being maintained across the entire spectral region. A Sadtler CIRA 101 chromatographic infrared analyzer with blank columns was used to vaporize and trap the compounds for examination. The carrier gas was helium.

The compounds were examined at either 240°C or 280°C ; the temperature selected depending on the boiling point of the material and its chemical stability (easily decomposed compounds containing a carbonyl group were always examined at 240°C).

EXPERIMENTAL

Approximately $2\text{ }\mu\text{l}$ of the liquid sample was injected into the CIRA 101 with the helium flow rate operating at 4 - 6 ml/min. and the vaporization temperature was selected. When the GC recorder indicated that the compound was emerging from the column the vapor was allowed to accumulate in the cell for 2 to 10 seconds, the flow was stopped and the interferogram measured. While the spectrum was being computed, the gas flow was restarted for 3 - 5 minutes to purge the sample from the system before injecting the next sample. The entire system was cleared periodically by purging with a mixture of 2% oxygen in helium at 240°C .

PRESENTATION

The heading accompanying each spectrum shows the description and analytical data for the compound and the supplier of the sample together with the instrumental conditions applying to that spectrum. The number given next to the IR Liquid title is the spectrum number of the corresponding liquid phase spectrum in the Sadtler Standard Infrared Grating publication.

The indexes which accompany this collection list the contents by either chemical name, molecular formula, chemical classification or spectrum number. Also included is a Spec-Finder[®] which is arranged by absorption peaks of the spectra, permitting comparison and location of reference spectra against the spectrum of an unknown compound. Detailed descriptions of the indexes are given in the introductions to those sections of the publication.

2-METHYL-2-PROPANOL

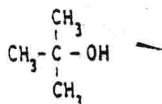
1V



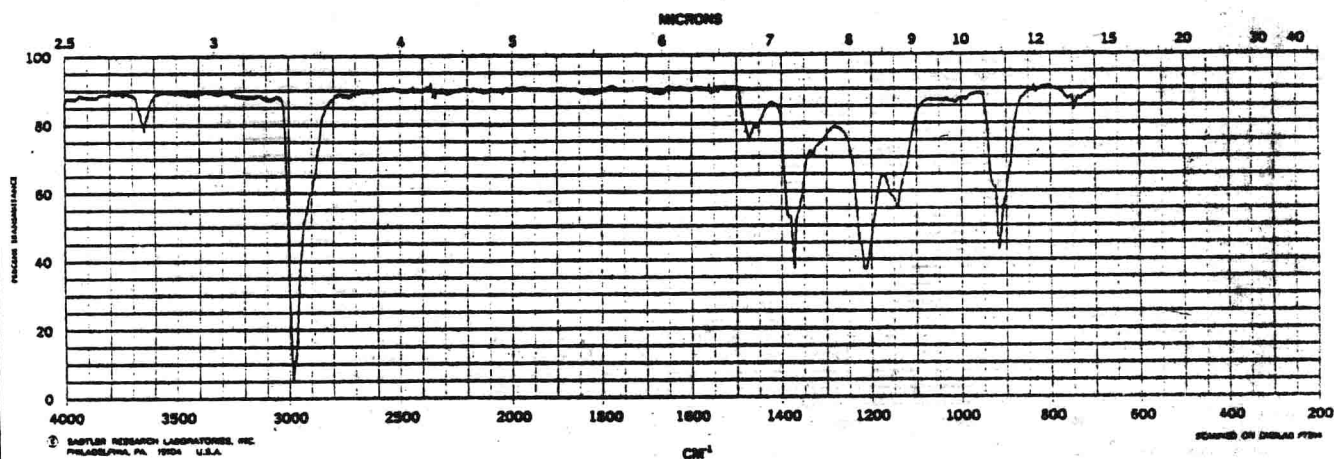
Mol. Wt. 74.12

Boiling Point: 83°C
Vaporization Temp.: 240°C
Cell Volume: 7.2 cc

IR Liquid: 2 K
Injection Amount: 2 μ l
Path Length: 7.6 cm
Pressure: 180 psi
Scale Expansion: 1



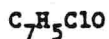
Source of Sample:
MCB Manufacturing Chemists,
Norwood, Ohio



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BENZOYL CHLORIDE

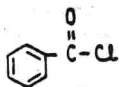
2V



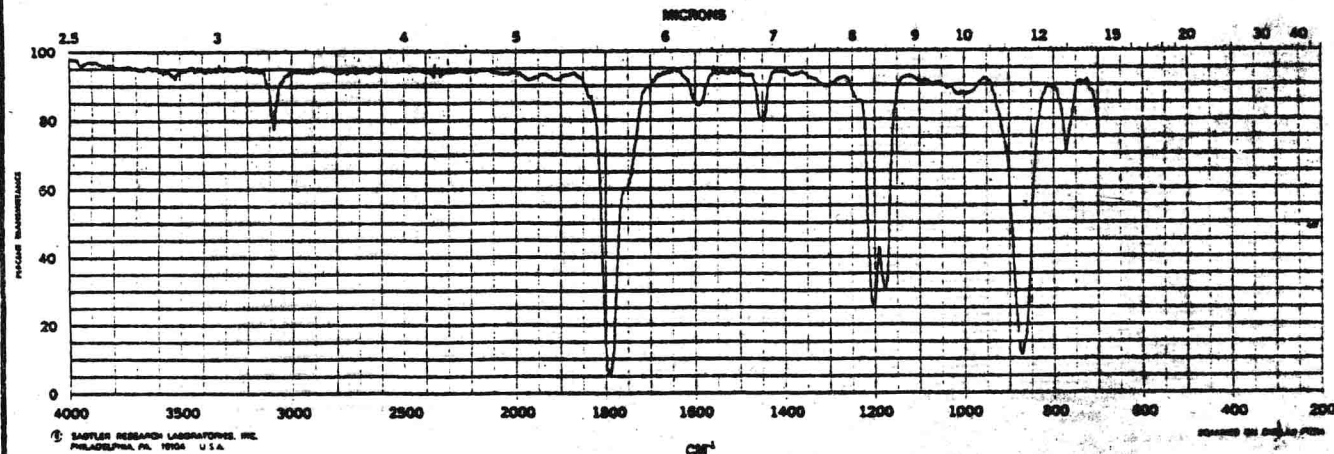
Mol. Wt. 140.57

Boiling Point: 198°C
Vaporization Temp.: 240°C
Cell Volume: 7.2 cc

IR Liquid: 5402 K
Injection Amount: 2 μ l
Path Length: 7.6 cm
Pressure: 180 psi
Scale Expansion: 1



Source of Sample:
Tokyo Kasei Kogyo Company Ltd.,
Tokyo, Japan



ACETIC ACID, ETHYL ESTER

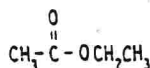
3V



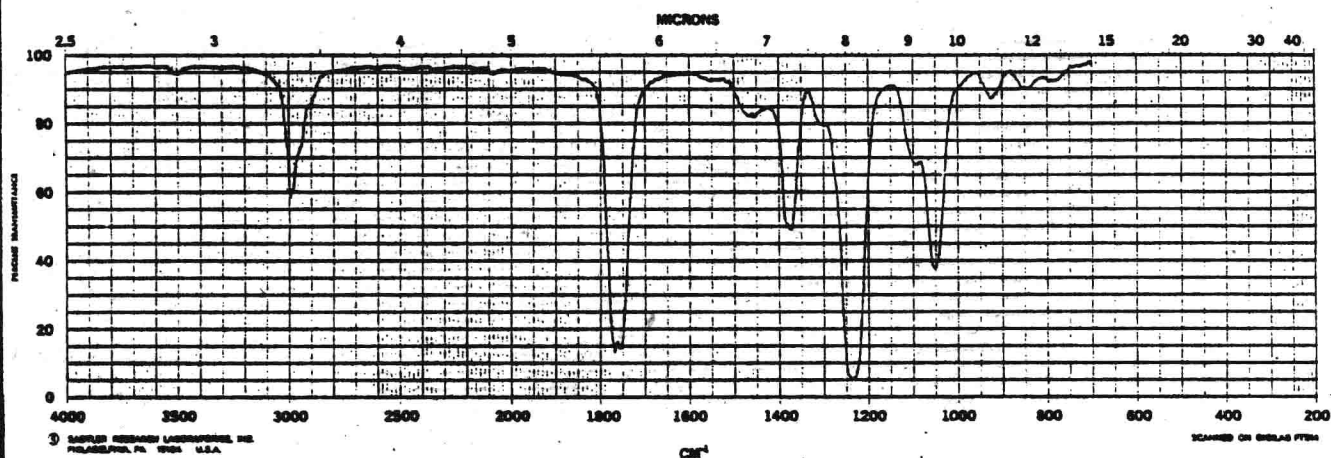
Mol. Wt. 88.11

Boiling Point: 78.2°C
Vaporization Temp.: 240°C
Cell Volume: 7.2 cc

IR Liquid: 3 K
Injection Amount: 2 μ l
Path Length: 7.6 cm
Pressure: 180 psi
Scale Expansion: 1



Source of Sample:
Dodge & Olcott, Inc.,
New York, New York



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N,N-DIMETHYLANILINE

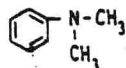
4V



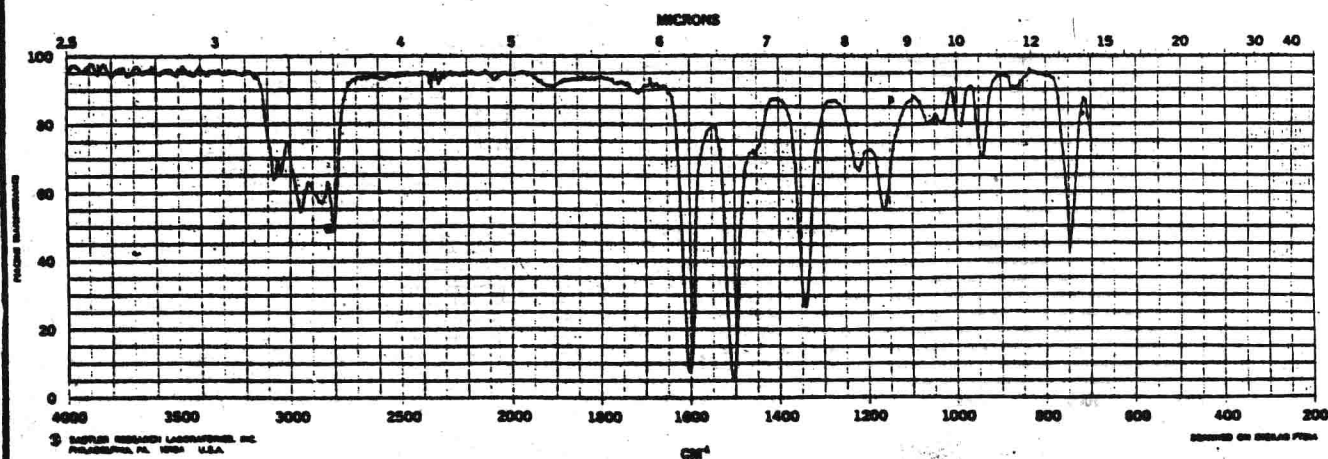
Mol. Wt. 121.18

Boiling Point: 192.5-193.5°C
Vaporization Temp.: 240°C
Cell Volume: 7.2 cc

IR Liquid: 4 K
Injection Amount: 2 μ l
Path Length: 7.6 cm
Pressure: 180 psi
Scale Expansion: 1

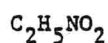


Source of Sample:
MCB Manufacturing Chemists,
Norwood, Ohio



NITROETHANE

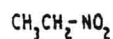
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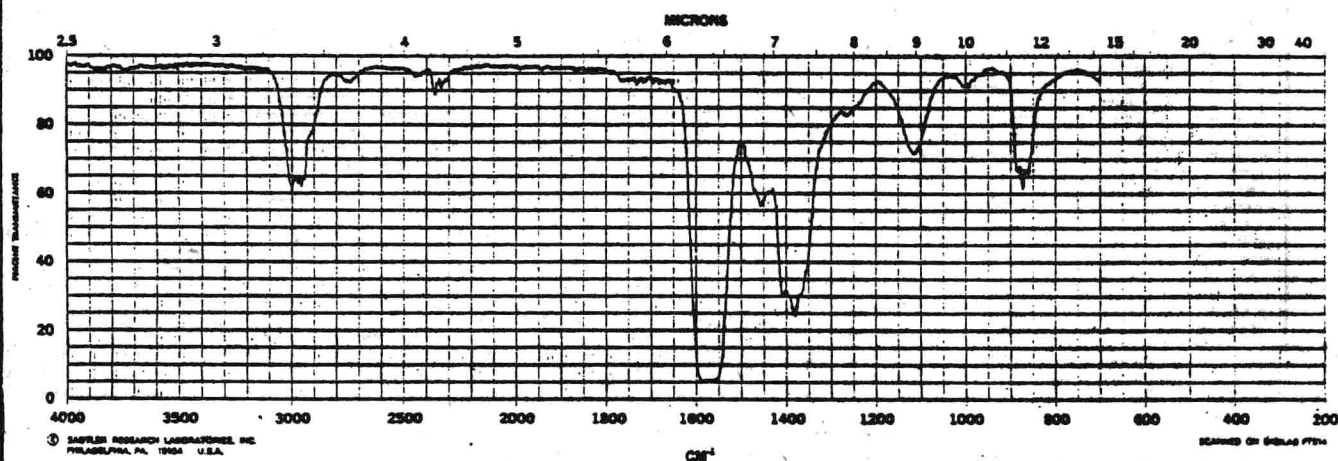
Mol. Wt. 75.07

Boiling Point: 112-114°C
Vaporization Temp.: 240°C
Cell Volume: 7.2 cc

IR Liquid: 5 K
Injection Amount: 2 μ l
Path Length: 7.6 cm
Pressure: 180 psi
Scale Expansion: 1



Source of Sample:
Commercial Solvents Corporation,
New York, New York



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2-PICOLINE

6V



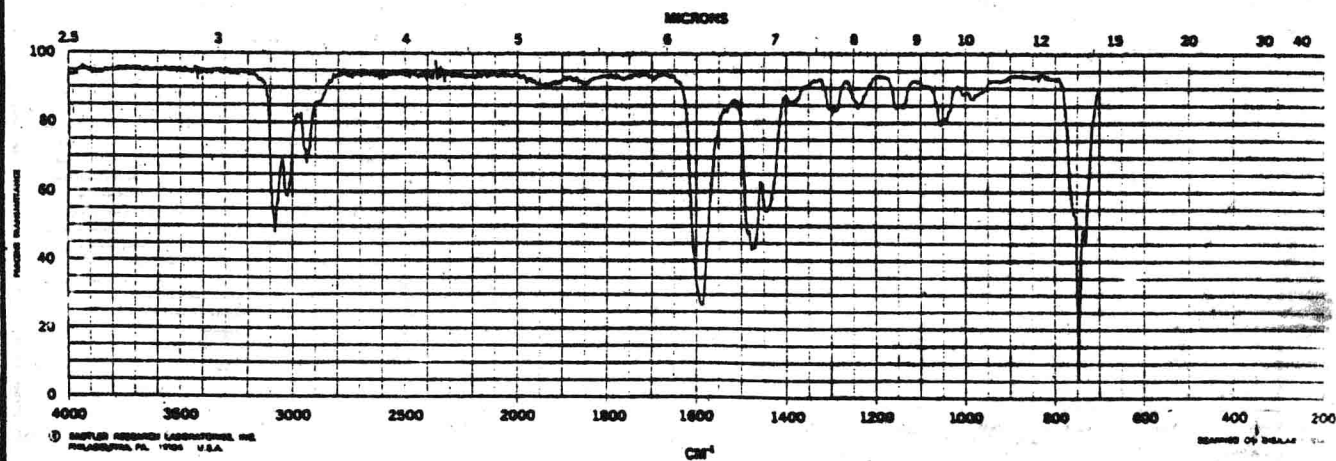
Mol. Wt. 93.13

Boiling Point: 128°C
Vaporization Temp.: 240°C
Cell Volume: 7.2 cc

IR Liquid: 7 K
Injection Amount: 2 μ l
Path Length: 7.6 cm
Pressure: 180 psi
Scale Expansion: 1



Source of Sample:
Fluka AG,
Buchs, Switzerland



7V

BROMOFORM



Mol. Wt. 252.75

Boiling Point: 146-150°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

IR Liquid: 8 K

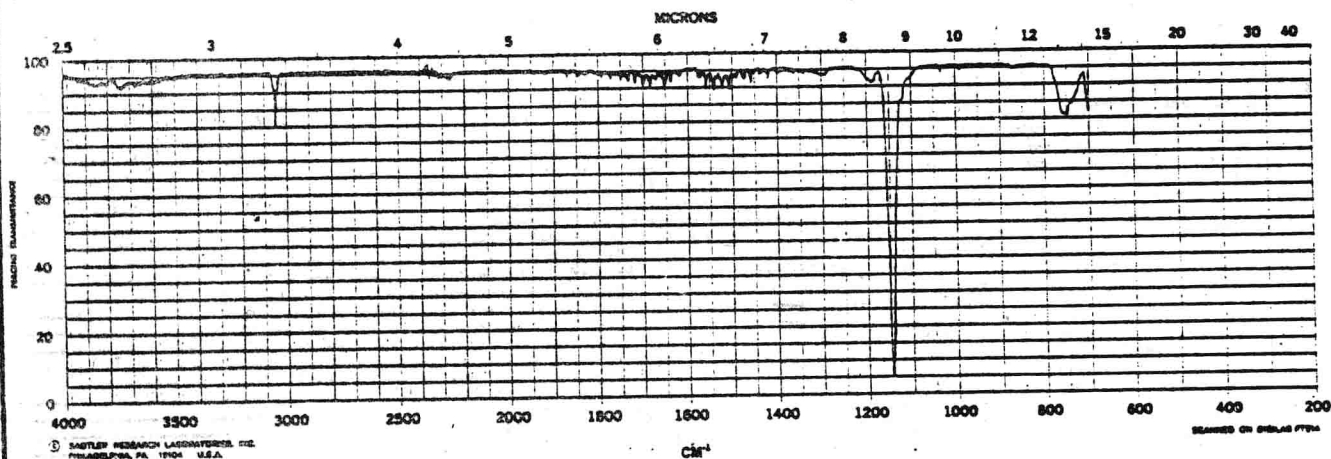
Injection Amount: 2 μl

Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1

Source of Sample:
MCB Manufacturing Chemists,
Norwood, Ohio



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8V

o-XYLENE



Mol. Wt. 106.17

Boiling Point: 144°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

IR Liquid: 9 K

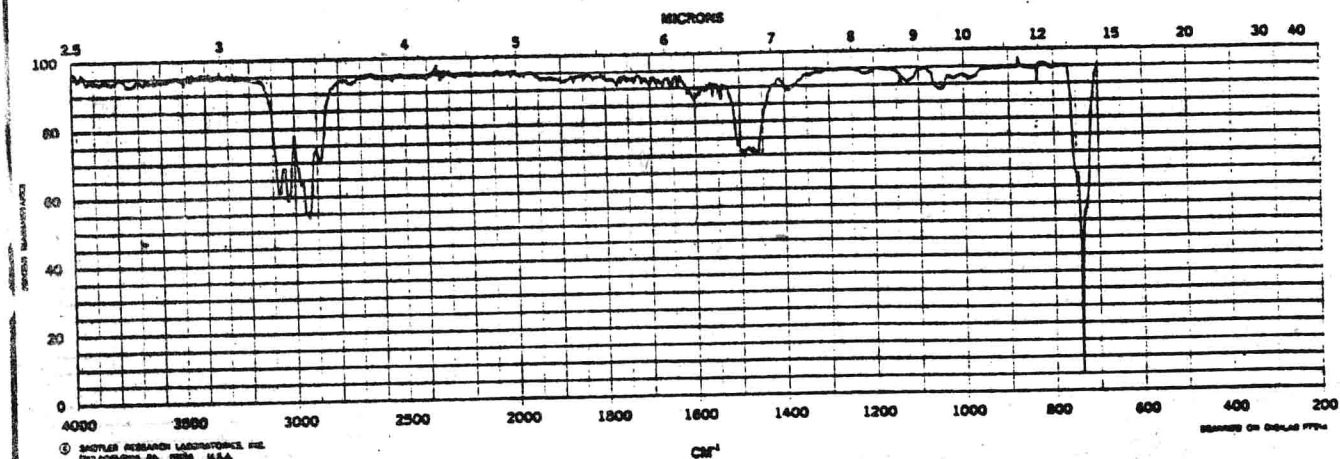
Injection Amount: 2 μl

Path Length: 7.6 cm

Pressure: 180 psi

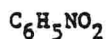
Scale Expansion: 1

Source of Sample:
MCB Manufacturing Chemists,
Norwood, Ohio



NITROBENZENE

9V



Mol. Wt. 123.11

Boiling Point: 210-211°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

IR Liquid: 10 K

Injection Amount: 2 μ l

Path Length: 7.6 cm

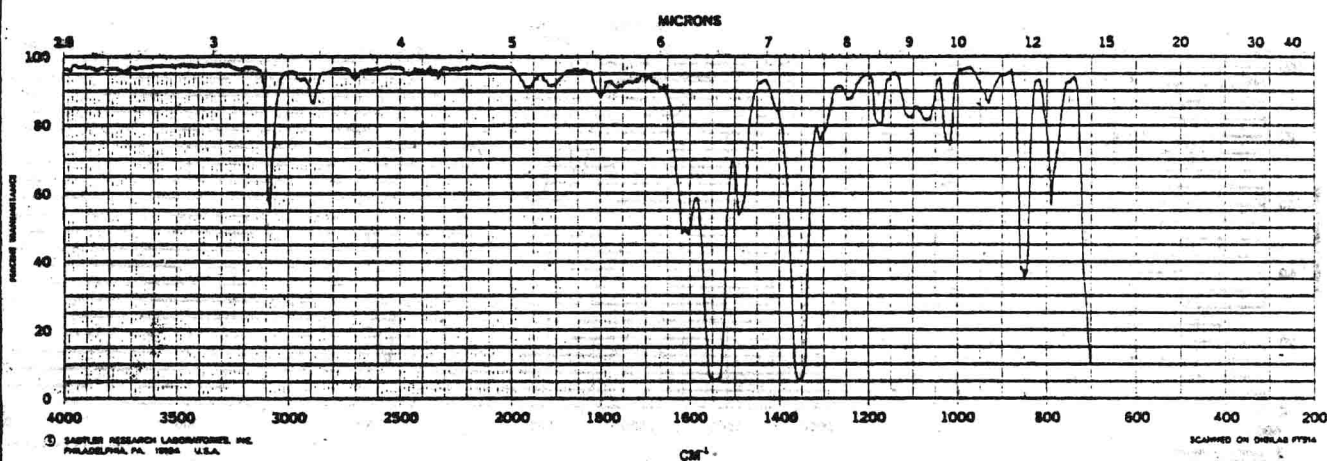
Pressure: 180 psi

Scale Expansion: 1



Source of Sample:

MCB Manufacturing Chemists.
Norwood, Ohio



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PYRIDINE

10V



Mol. Wt. 79.10

Boiling Point: 115°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

IR Liquid: 12 K

Injection Amount: 4 μ l

Path Length: 7.6 cm

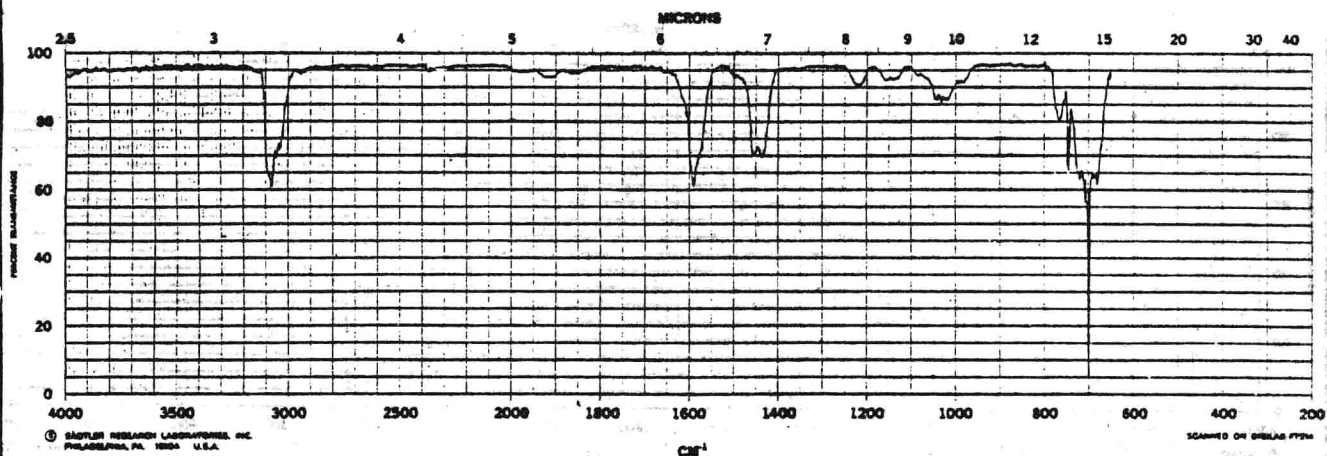
Pressure: 180 psi

Scale Expansion: 1



Source of Sample:

Aldrich Chemical Company, Inc.,
Milwaukee, Wisconsin



PHOSPHORIC ACID, TRI-*o*-TOLYL ESTER

13V

$C_{21}H_{21}O_4P$

Mol. Wt. 368.37

Boiling Point: -

Vaporization Temp.: 280°C

Cell Volume: 7.2 cc

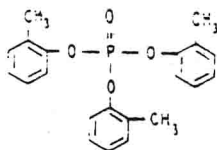
IR Liquid: 15001 K

Injection Amount: 2 μ l

Path Length: 7.6 cm

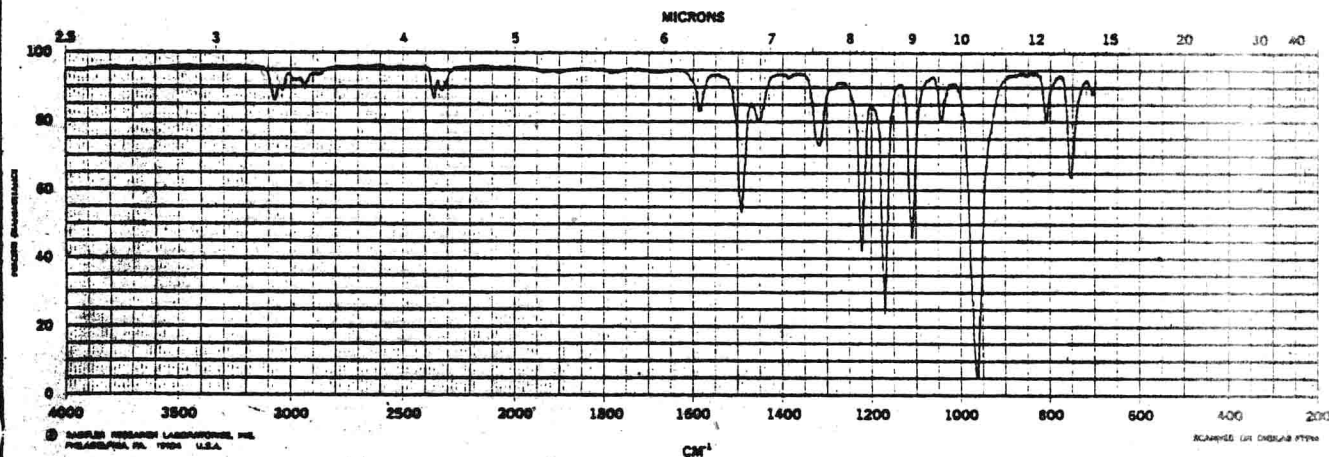
Pressure: 180 psi

Scale Expansion: 1



Source of Sample:

Monsanto Company,
St. Louis, Missouri



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PHTHALIC ACID, BIS(2-METHOXYETHYL) ESTER

14V

$C_{14}H_{18}O_6$

Mol. Wt. 282.30

Boiling Point: 190-203°C/4 mm

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

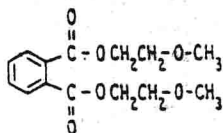
IR Liquid: 14 K

Injection Amount: 2 μ l

Path Length: 7.6 cm

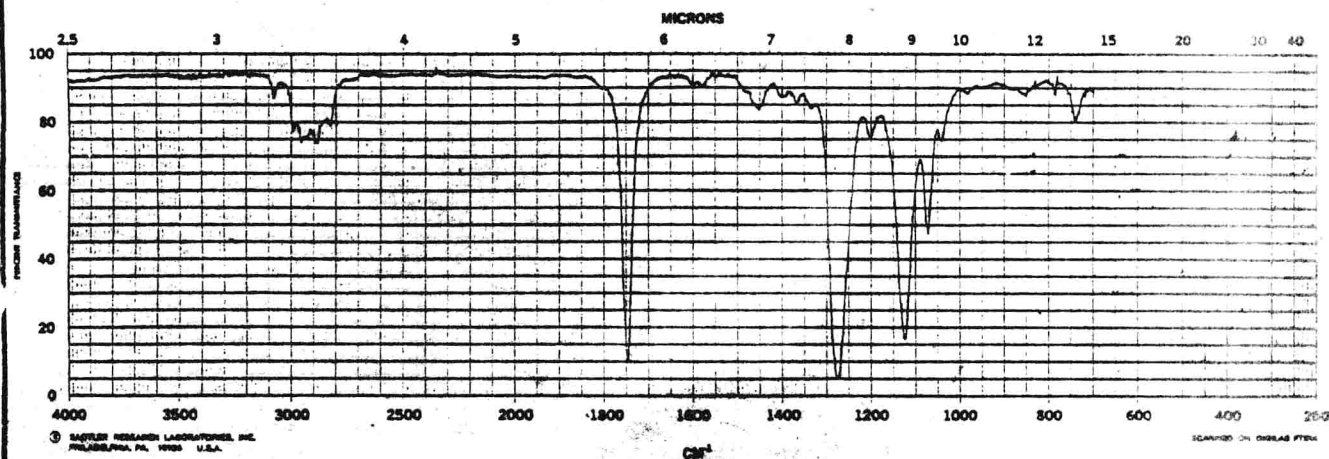
Pressure: 180 psi

Scale Expansion: 1



Source of Sample:

Ohio-Apex, Inc.,
Nitro, West Virginia



15V

ADIPIC ACID, BIS(2-ETHYLHEXYL) ESTER

 $C_{22}H_{42}O_4$

Mol. Wt. 370.58

Boiling Point: 208-218°C/4 mm

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

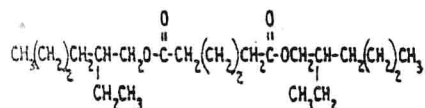
IR Liquid: 8003 K

Injection Amount: 2 μ l

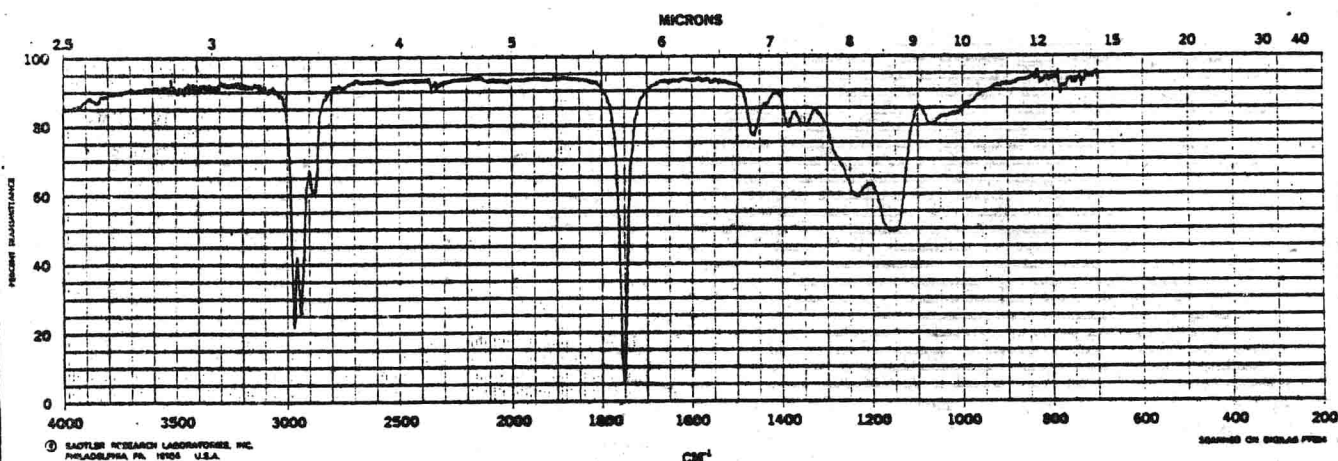
Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1



Source of Sample:
Ohio-Apex, Inc.,
Nitro, West Virginia



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16V

PHTHALIC ACID, BIS(2-BUTOXYETHYL) ESTER

 $C_{20}H_{30}O_6$

Mol. Wt. 366.46

Boiling Point: -

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

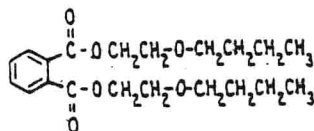
IR Liquid: 16 K

Injection Amount: 2 μ l

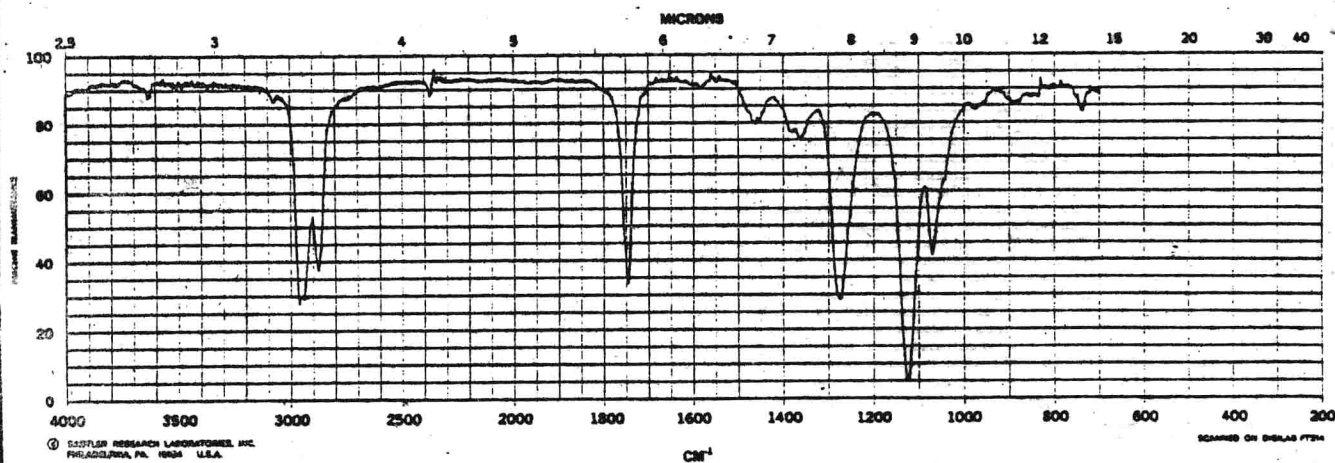
Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1



Source of Sample:
Kessler Chemical Company, Inc.,
Philadelphia, Pennsylvania



4-PICOLINE

17V



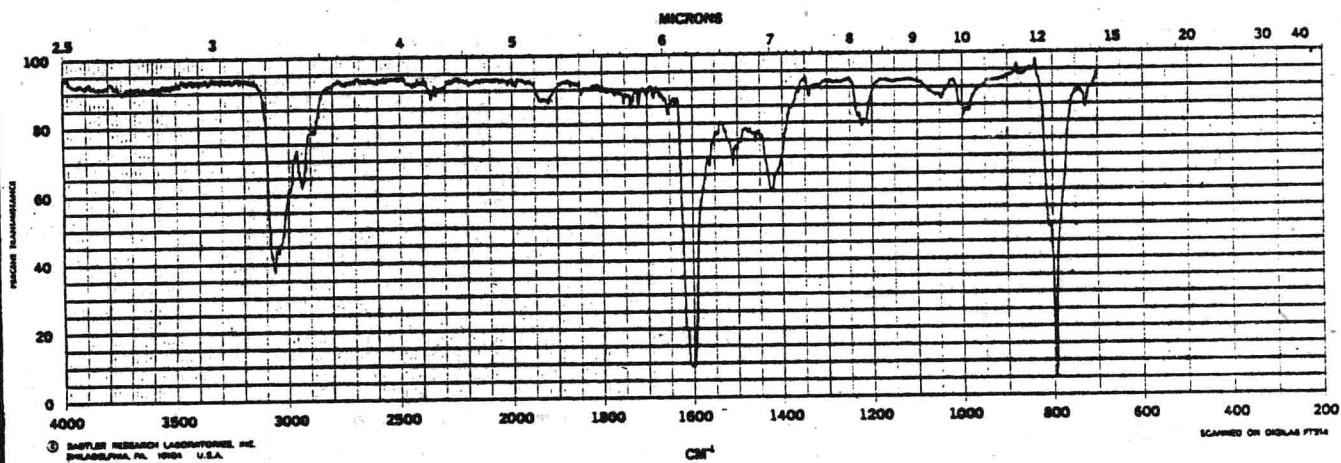
Mol. Wt. 93.13

Boiling Point: 143°C
Vaporization Temp.: 240°C
Cell Volume: 7.2 cc

IR Liquid: 17 K
Injection Amount: 2 μ l
Path Length: 7.6 cm
Pressure: 180 psi
Scale Expansion: 1



Source of Sample:
Ansul Chemical Company,
Marinette, Wisconsin



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p-CRESOL

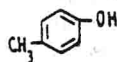
18V



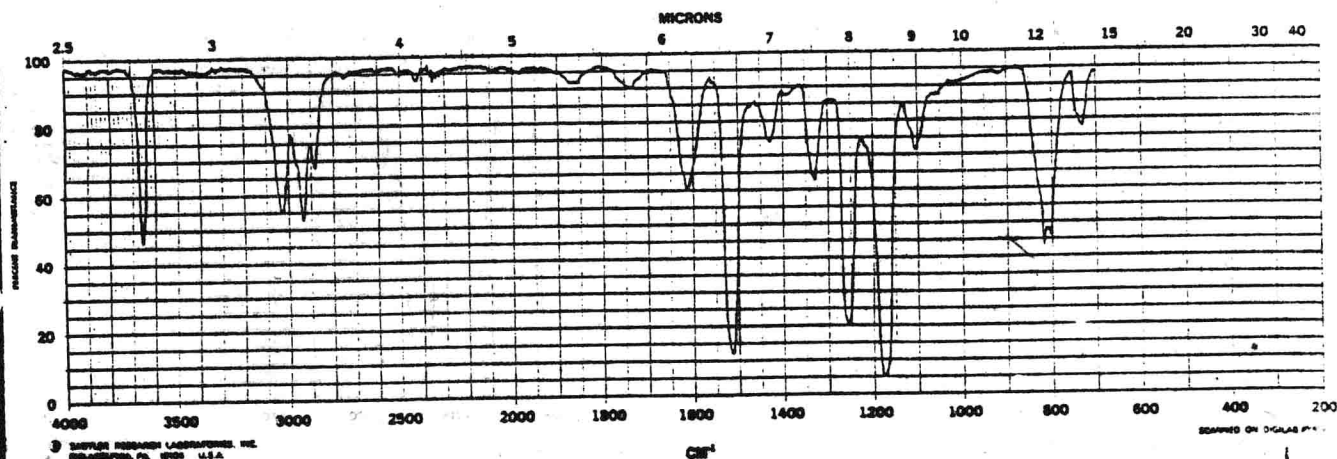
Mol. Wt. 108.14

Boiling Point: 202.5°C
Vaporization Temp.: 240°C
Cell Volume: 7.2 cc

IR Liquid: 8005 K
Injection Amount: 2 μ l
Path Length: 7.6 cm
Pressure: 180 psi
Scale Expansion: 1

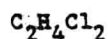


Source of Sample:
MCB Manufacturing Chemists,
Norwood, Ohio



19V

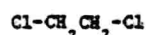
1,2-DICHLOROETHANE



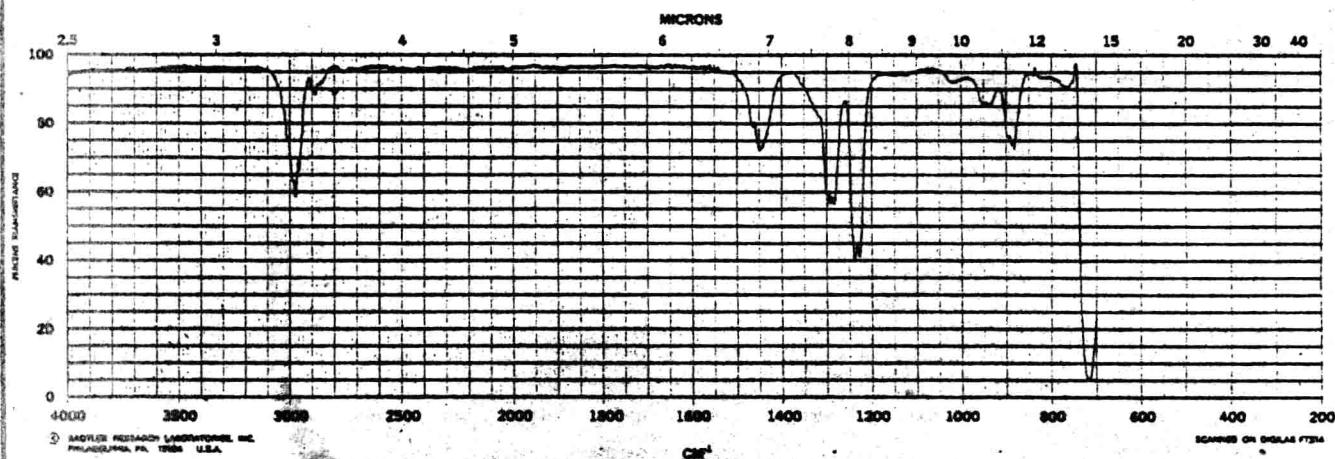
Mol. Wt. 98.96

Boiling Point: 83.7°C
 Vaporization Temp.: 240°C
 Cell Volume: 7.2 cc

IR Liquid: 20 K
 Injection Amount: 2 μ l
 Path Length: 7.6 cm
 Pressure: 180 psi
 Scale Expansion: 1



Source of Sample:
 MCB Manufacturing Chemists,
 Norwood, Ohio



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20V

1,4-DIOXANE



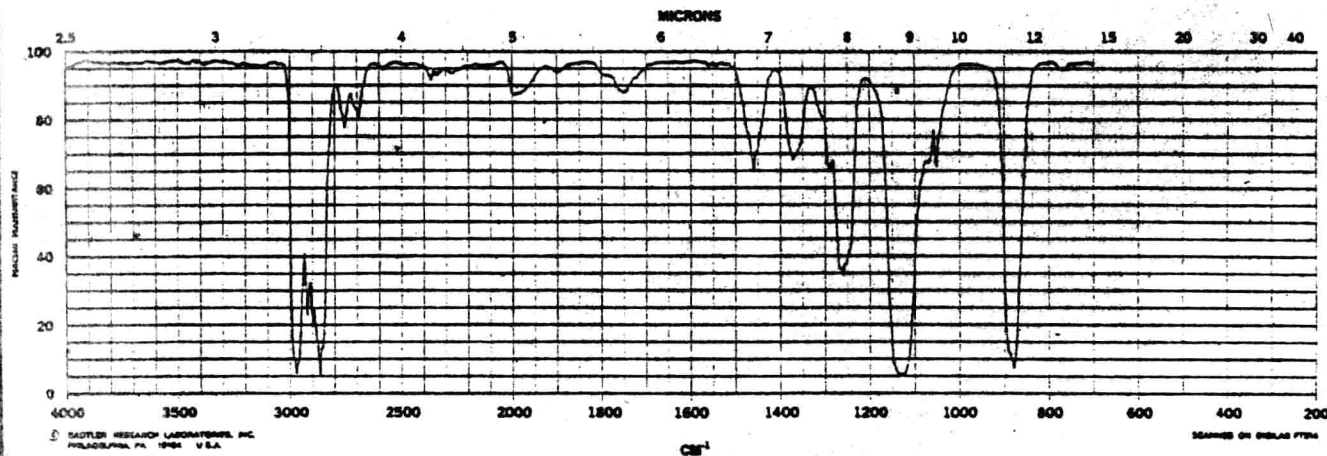
Mol. Wt. 88.11

Boiling Point: 101.1°C
 Vaporization Temp.: 240°C
 Cell Volume: 7.2 cc

IR Liquid: 21 K
 Injection Amount: 2 μ l
 Path Length: 7.6 cm
 Pressure: 180 psi
 Scale Expansion: 1



Source of Sample:
 MCB Manufacturing Chemists,
 Norwood, Ohio



CYCLOHEXANOL

21 V



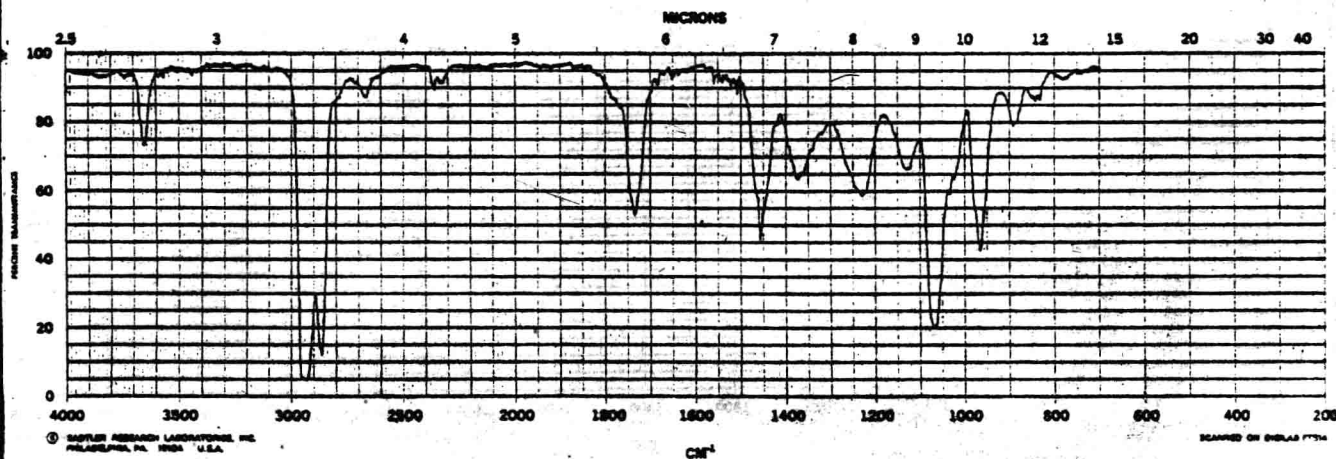
Mol. Wt. 100.16

Boiling Point: 160-161°C
 Vaporization Temp.: 240°C
 Cell Volume: 7.2 cc

IR Liquid: 10960 K
 Injection Amount: 2 μ l
 Path Length: 7.6 cm
 Pressure: 180 psi
 Scale Expansion: 1



Source of Sample:
 MCB Manufacturing Chemists,
 Norwood, Ohio



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4-METHYLCYCLOHEXANONE

22 V



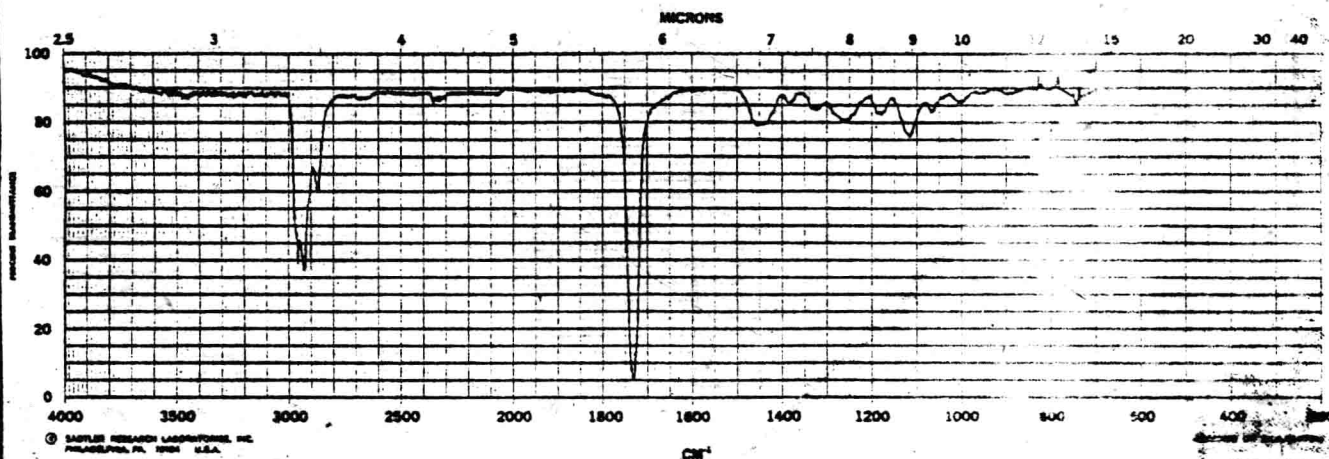
Mol. Wt. 112.17

Boiling Point: 169°C
 Vaporization Temp.: 240°C
 Cell Volume: 7.2 cc

IR Liquid: 24506 K
 Injection Amount: 2 μ l
 Path Length: 7.6 cm
 Pressure: 180 psi
 Scale Expansion: 1

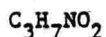


Source of Sample:
 Eastman Organic Chemicals,
 Rochester, New York



1-NITROPROPANE

23V



Mol. Wt. 89.09

Boiling Point: 132°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

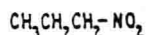
IR Liquid: 22 K

Injection Amount: 2 μ l

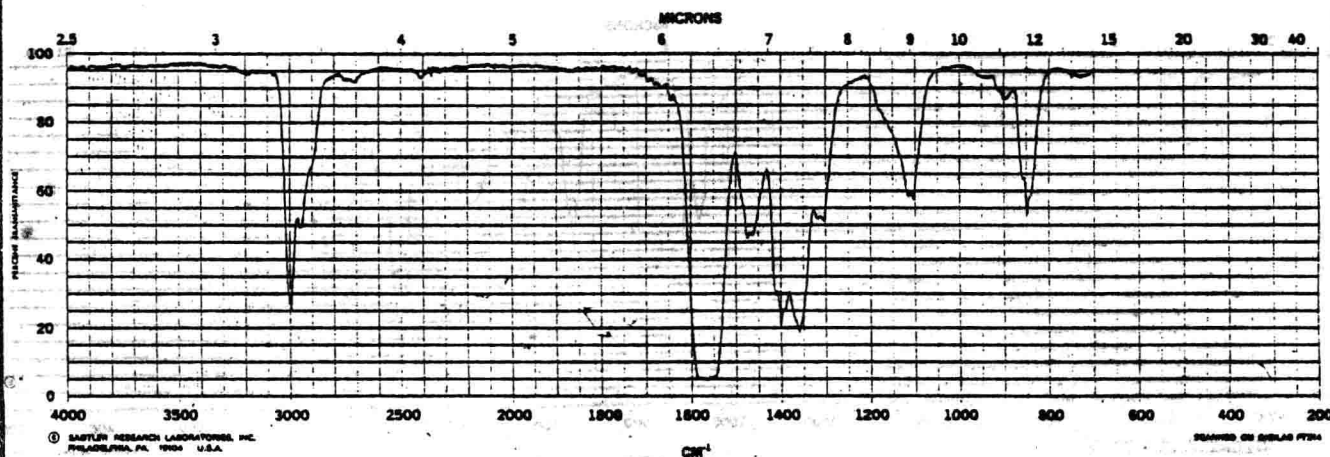
Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1



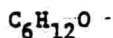
Source of Sample:
MCB Manufacturing Chemists,
Norwood, Ohio



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4-METHYL-2-PENTANONE

24V



Mol. Wt. 100.16

Boiling Point: 114.8°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

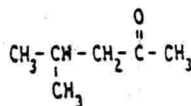
IR Liquid: 23 K

Injection Amount: 2 μ l

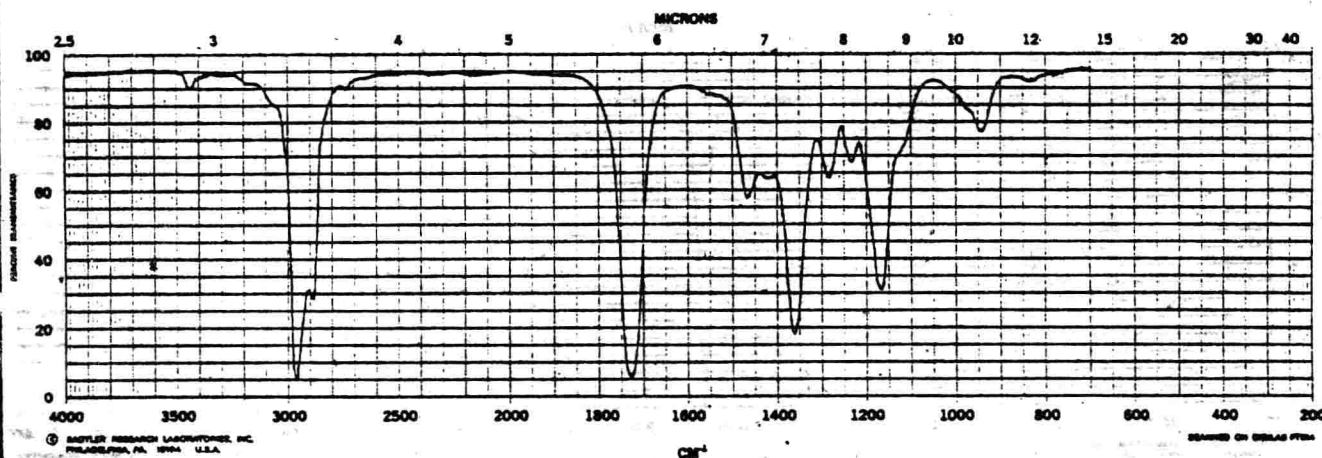
Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1



Source of Sample:
Union Carbide Corporation,
New York, New York



1-PENTANOL

25V



Mol. Wt. 88.15

Boiling Point: 136-138°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

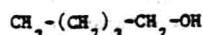
IR Liquid: 205 K

Injection Amount: 2 μl

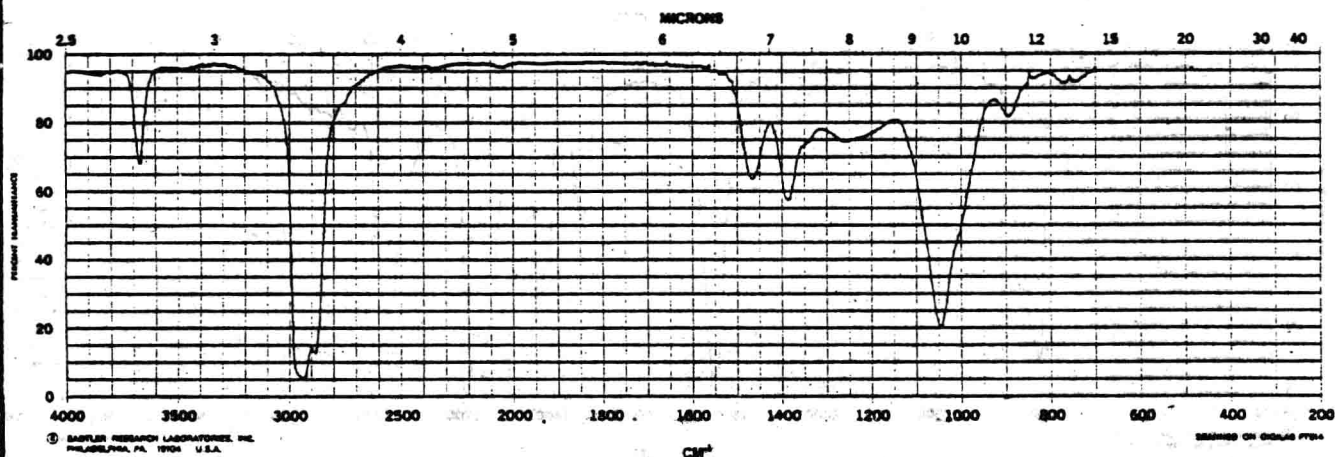
Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1



Source of Sample:
 Pennwalt Corporation,
 Philadelphia, Pennsylvania



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IODOETHANE

26V



Mol. Wt. 155.97

Boiling Point: 68-74°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

IR Liquid: 28501 K

Injection Amount: 2 μl

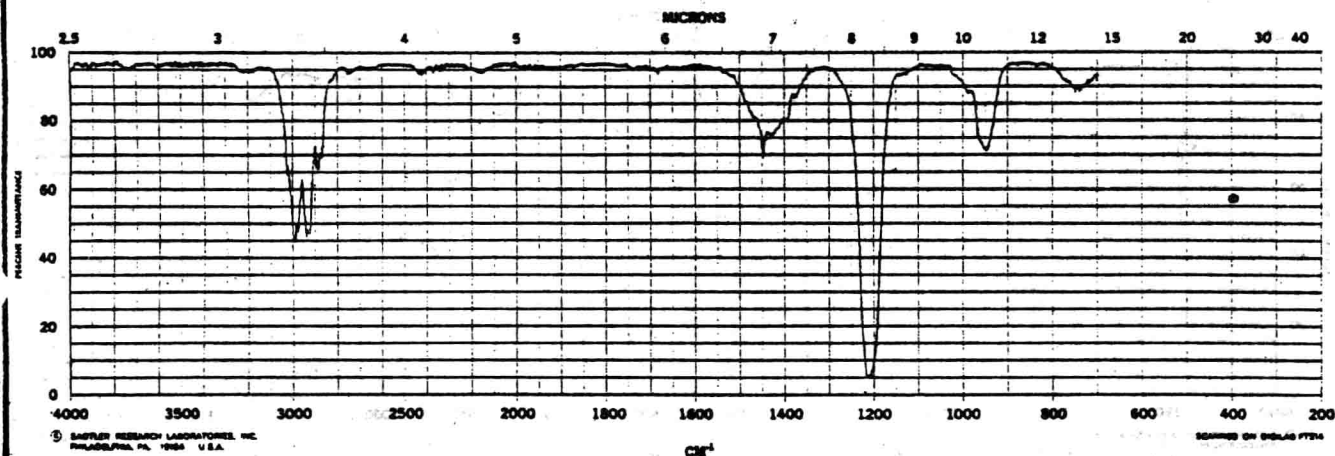
Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1

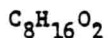


Source of Sample:
 Eastman Organic Chemicals,
 Rochester, New York



27V

ACETIC ACID, 2-ETHYLBUTYL ESTER



Mol. Wt. 144.22

Boiling Point: 162.4°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

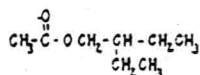
IR Liquid: 15002 K

Injection Amount: 2 μ l

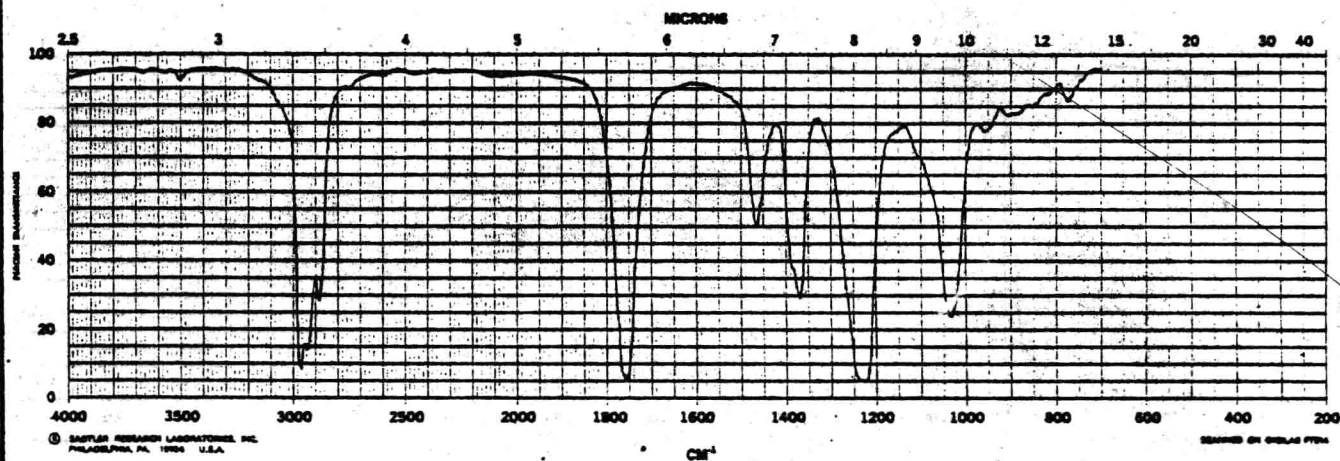
Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1



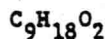
Source of Sample:
Union Carbide Corporation,
New York, New York



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28V

NONANOIC ACID



Mol. Wt. 158.24

Boiling Point: 254°C

Vaporization Temp.: 240°C

Cell Volume: 7.2 cc

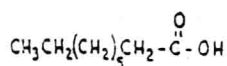
IR Liquid: 24507 K

Injection Amount: 2 μ l

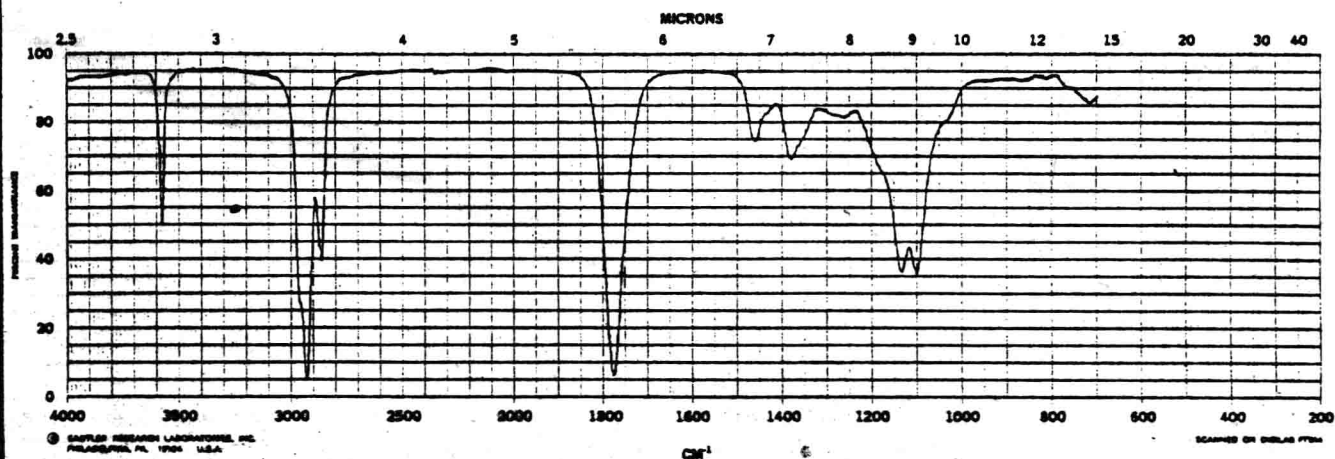
Path Length: 7.6 cm

Pressure: 180 psi

Scale Expansion: 1



Source of Sample:
Emery Industries, Inc.,
Cincinnati, Ohio



29V

NITROMETHANE



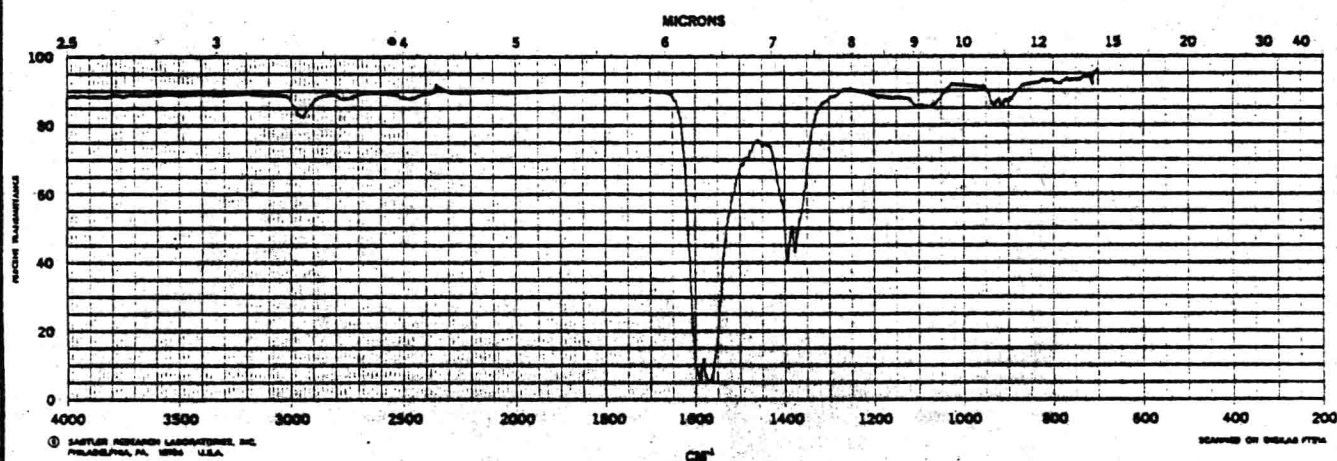
Mol. Wt. 61.04

Boiling Point: 101°C
 Vaporization Temp.: 240°C
 Cell Volume: 7.2 cc

IR Liquid: 25 K
 Injection Amount: 2 μl
 Path Length: 7.6 cm
 Pressure: 180 psi
 Scale Expansion: 1



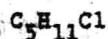
Source of Sample:
 MCB Manufacturing Chemists,
 Norwood, Ohio



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30V

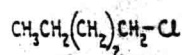
1-CHLOROPENTANE



Mol. Wt. 106.60

Boiling Point: 108°C
 Vaporization Temp.: 240°C
 Cell Volume: 7.2 cc

IR Liquid: 28503 K
 Injection Amount: 2 μl
 Path Length: 7.6 cm
 Pressure: 180 psi
 Scale Expansion: 1



Source of Sample:
 Fluka AG,
 Buchs, Switzerland

