

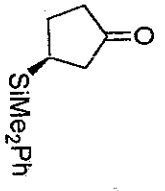
**Enantioselective Conjugate Silyl Additions to Cyclic and Acyclic
Unsaturated Carbonyls Catalyzed by Cu Complexes of
Chiral *N*-Heterocyclic Carbenes**

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*Department of Chemistry, Merkert Chemistry Center,
Boston College, Chestnut Hill, Massachusetts 02467*

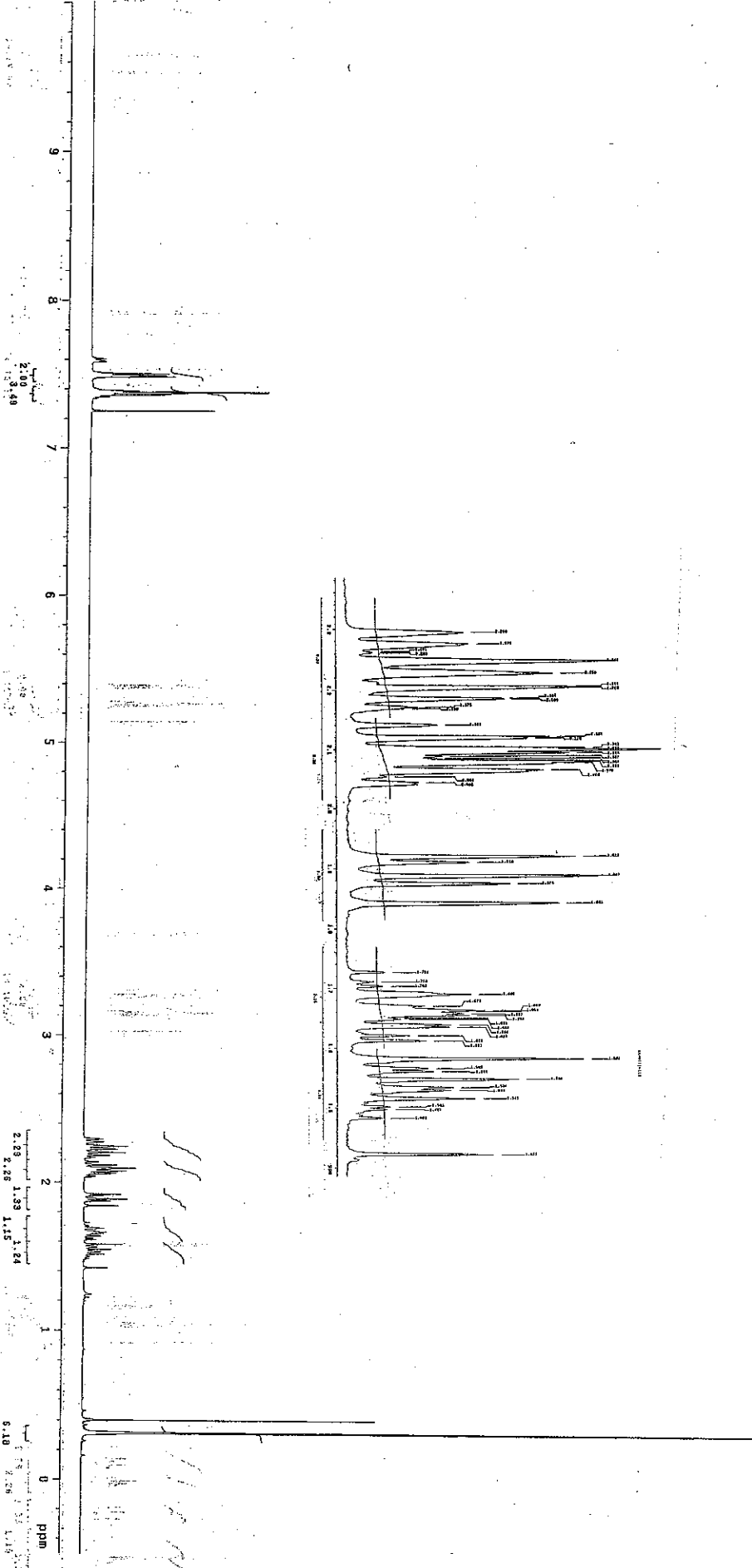
SUPPORTING INFORMATION, PART II

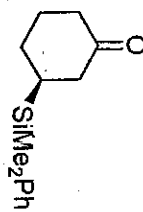
NMR Spectra



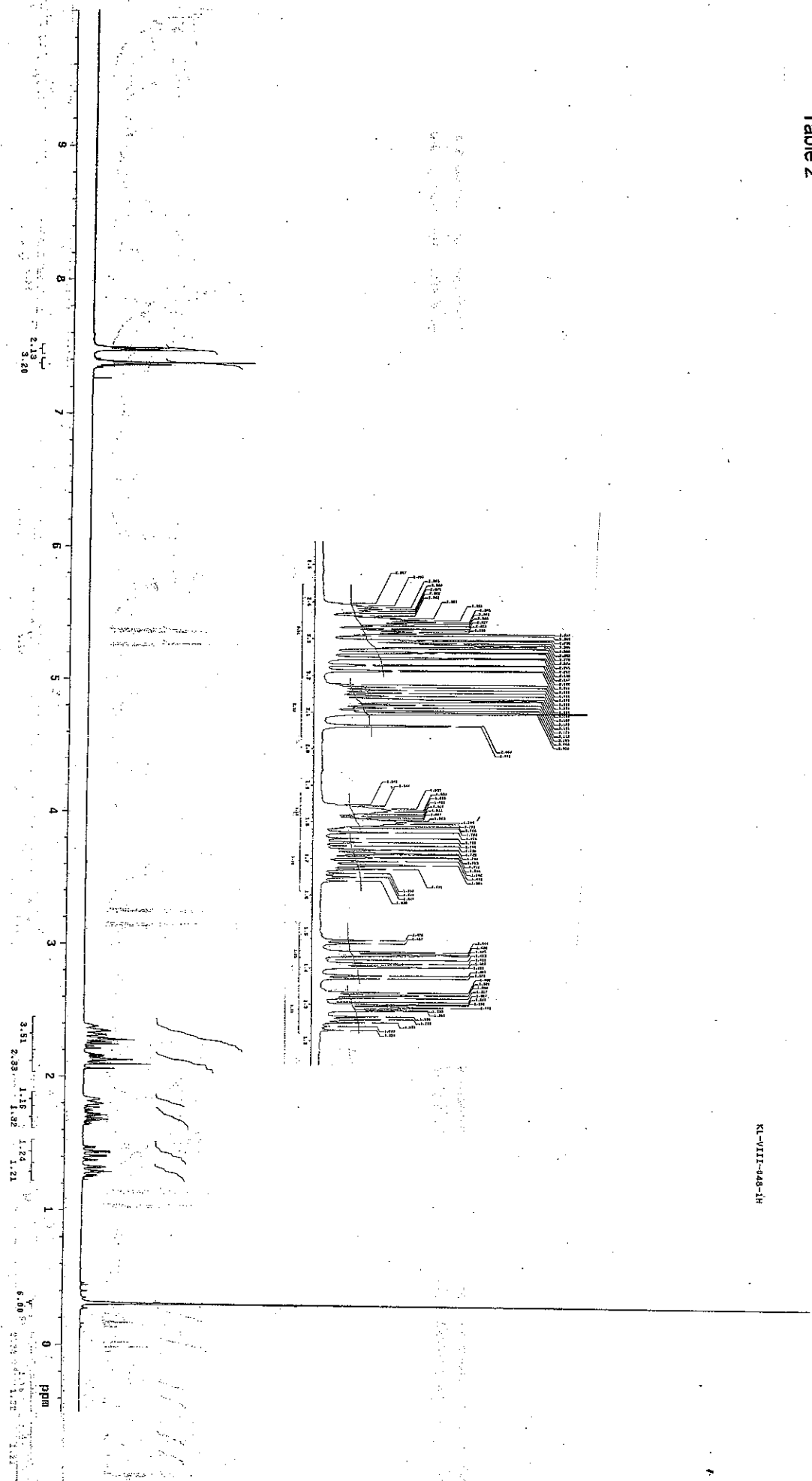
Entry 1
Table 2

KL-VIIZI-116

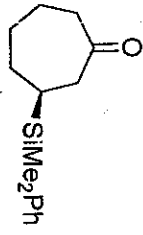




Entry 2
Table 2

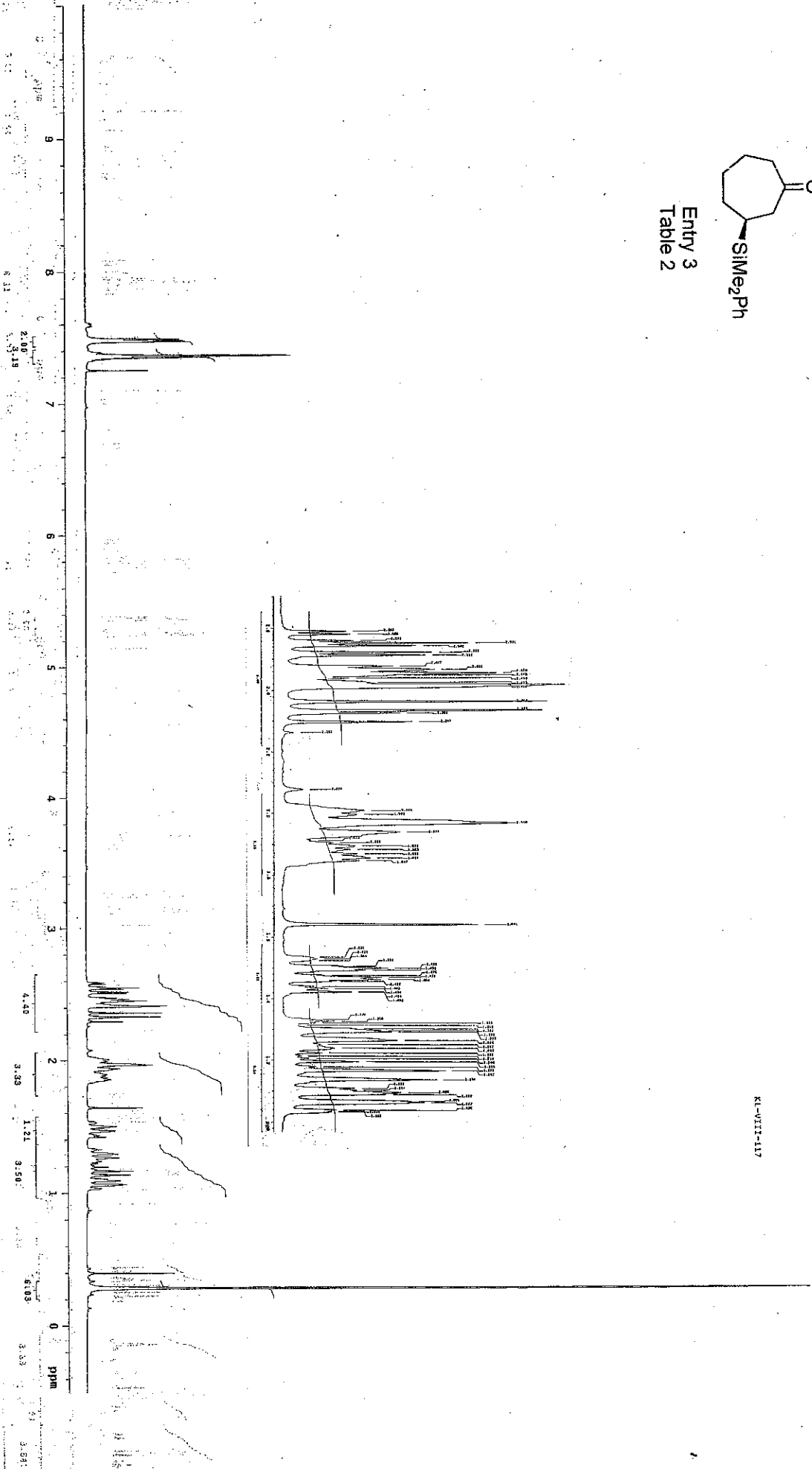


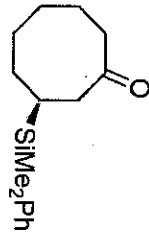
KL-VIII-948-1H



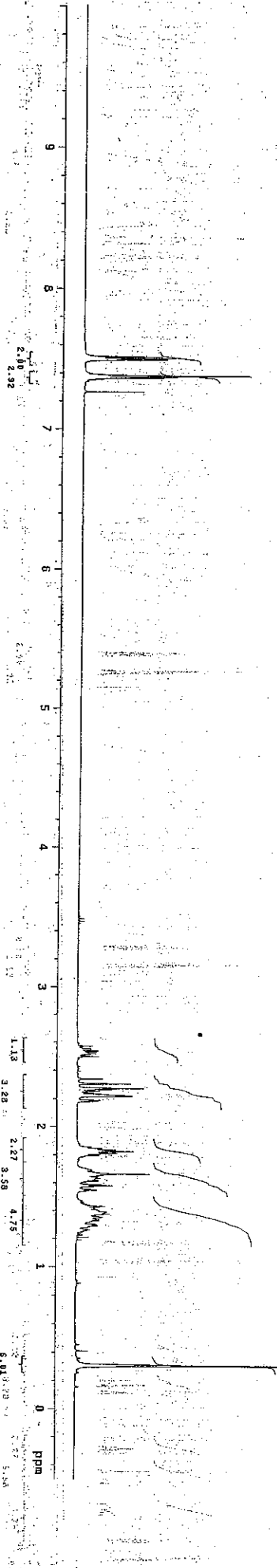
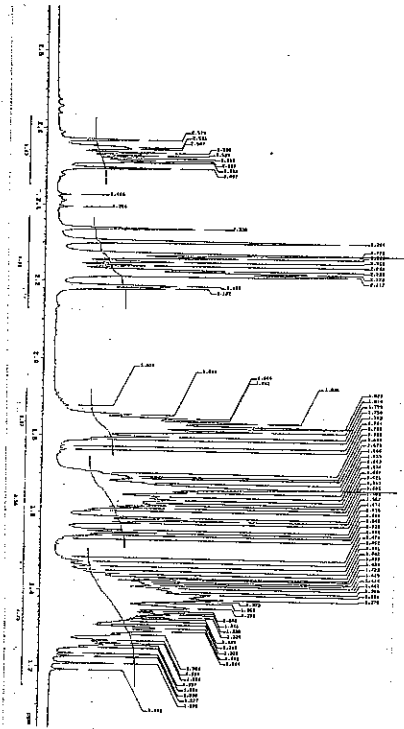
Entry 3
Table 2

KL-VII-117

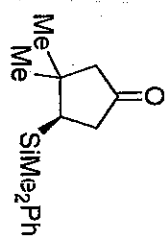




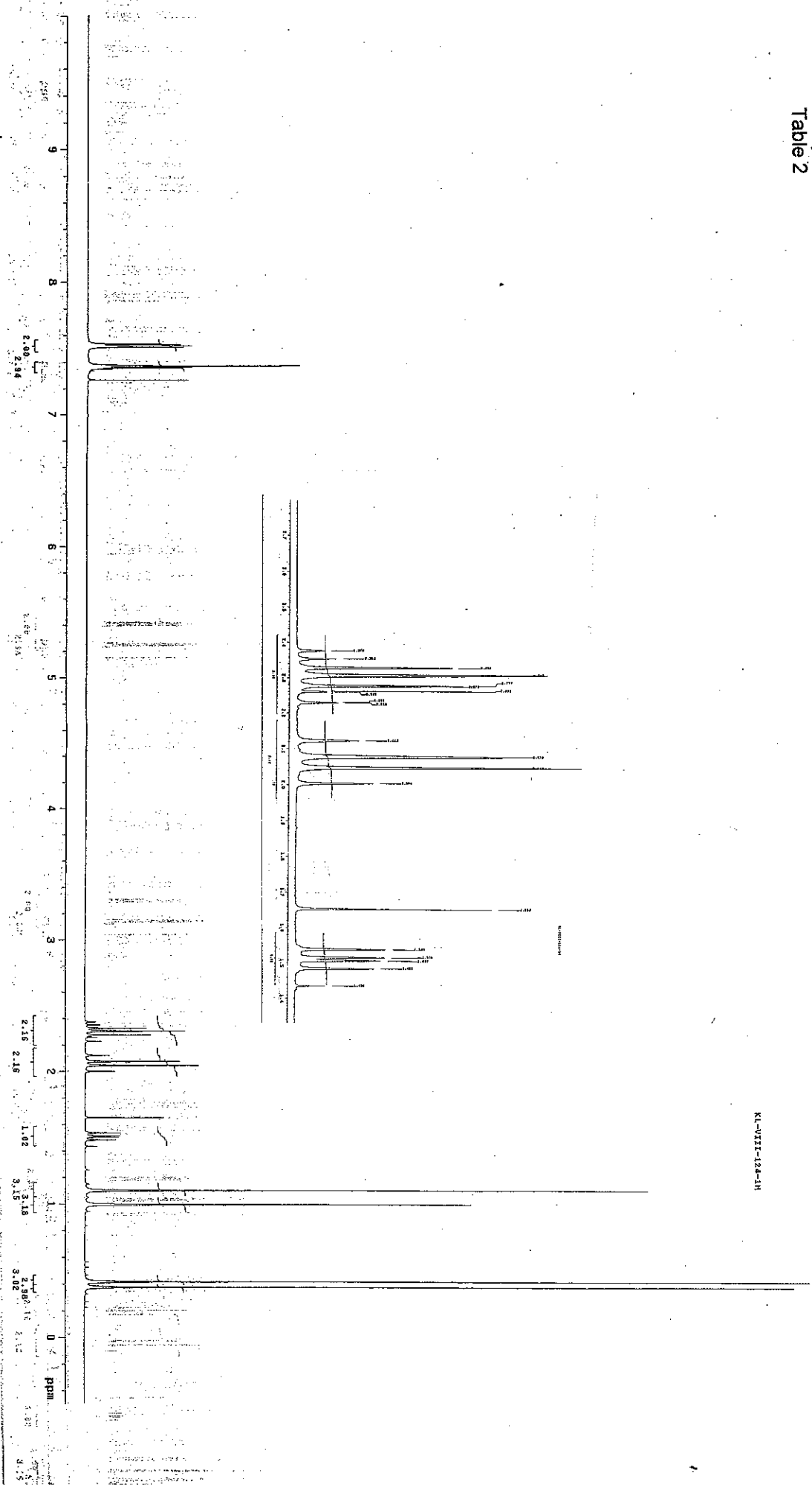
Entry 4
Table 2



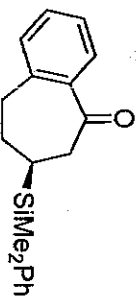
KI-VIII-118



Entry 5
Table 2

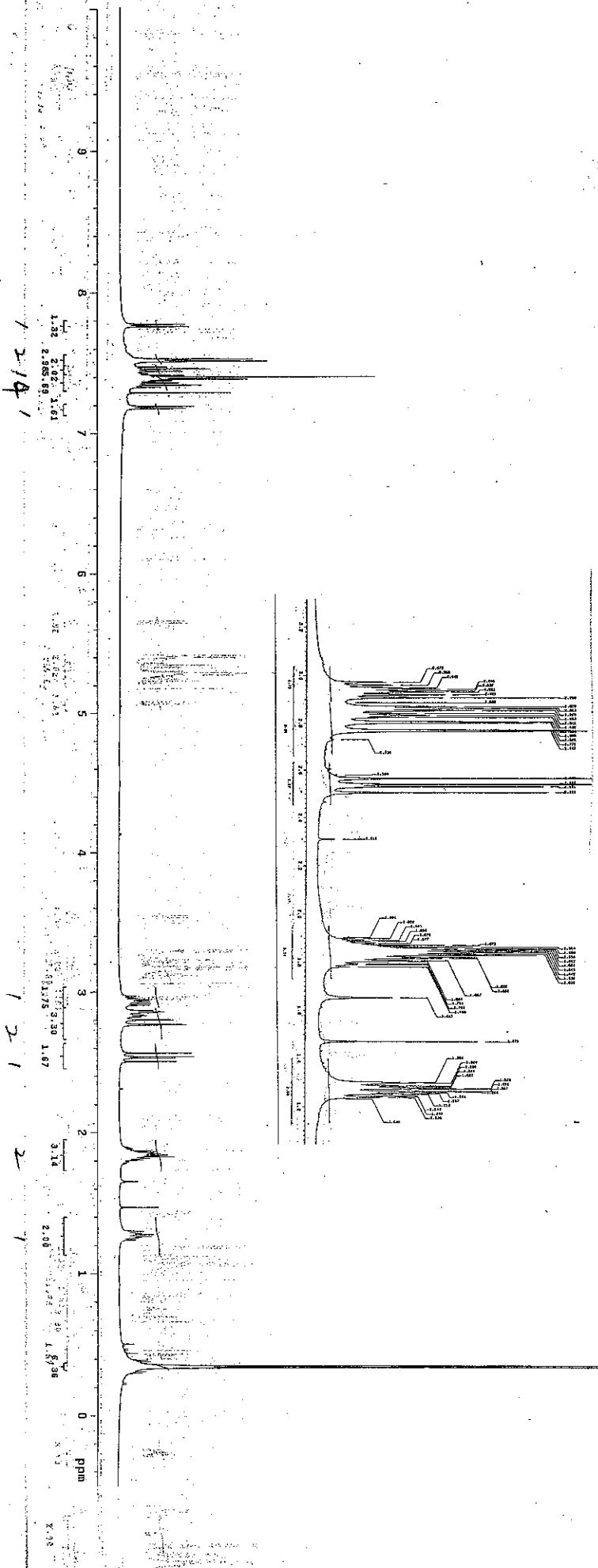


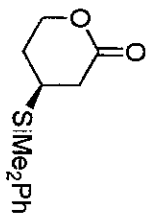
KL-VII-124-1H



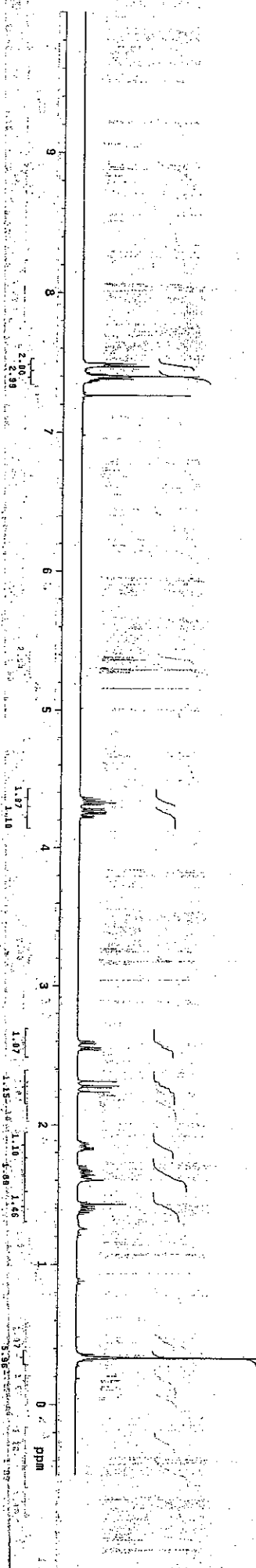
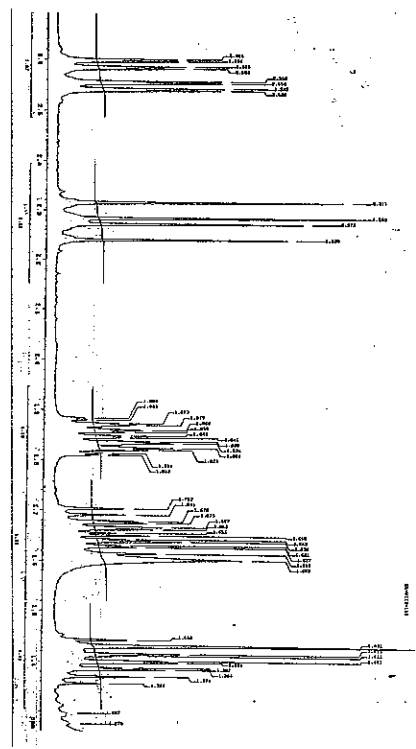
Entry 7
Table 2

KL-VIII-139

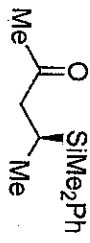




Entry 8
Table 2

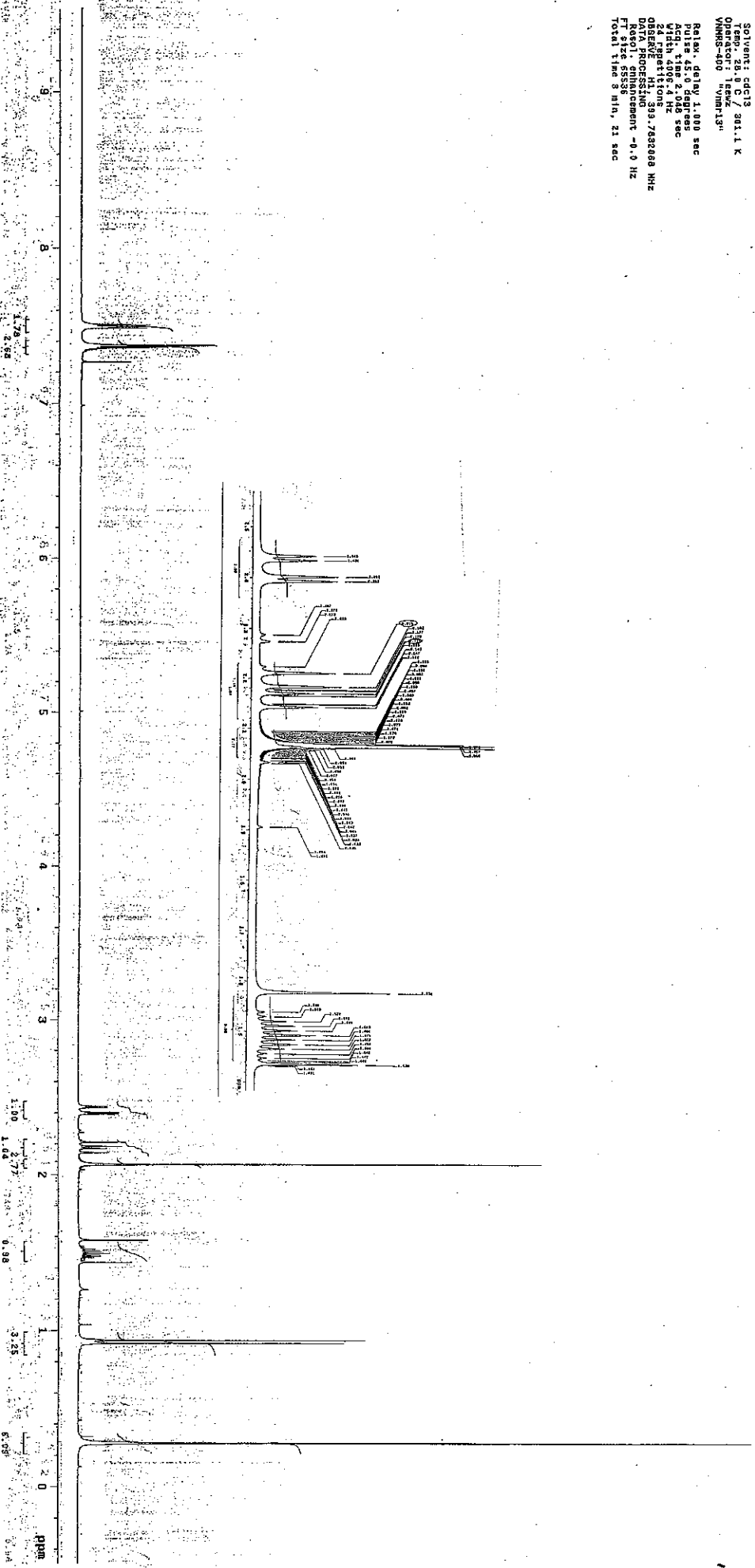


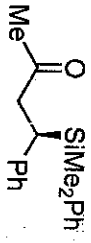
KJ-VIII-119



Entry 1
Table 3

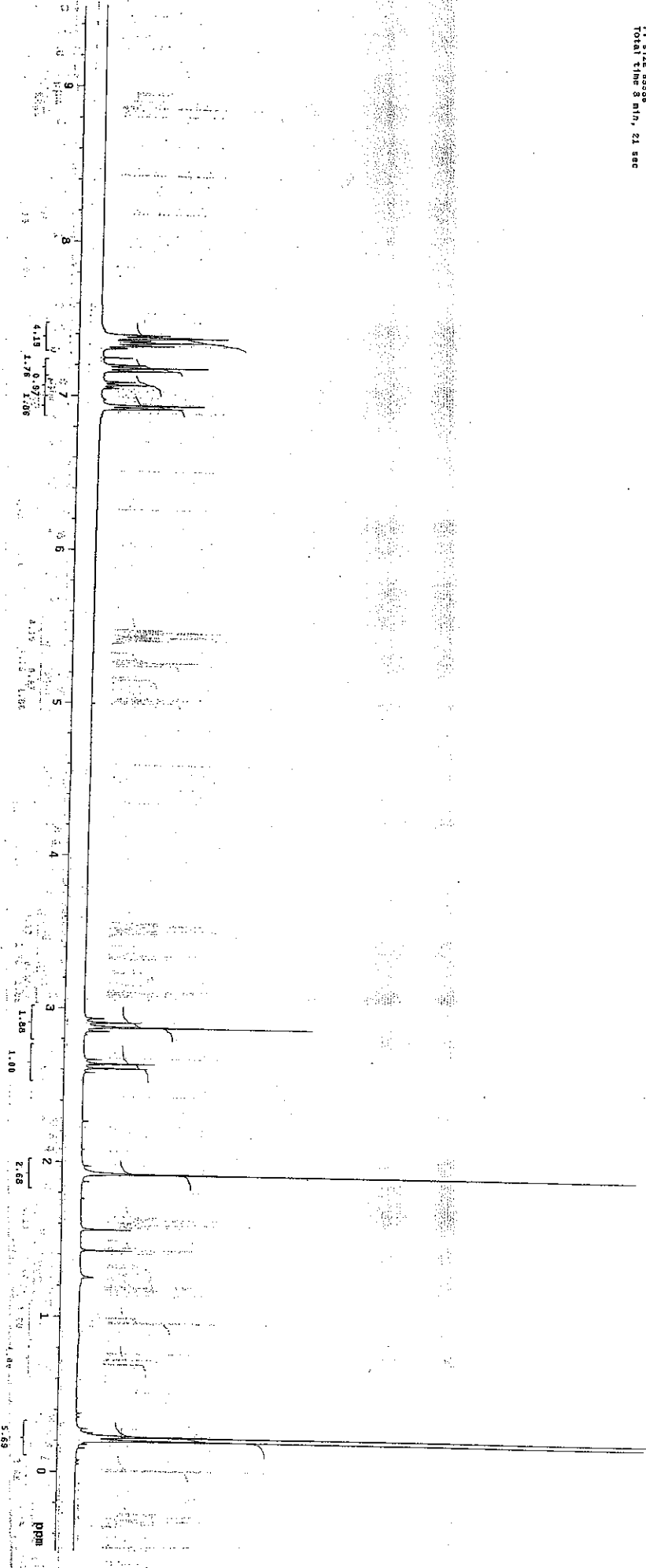
Sample: KL-1X-0/3-1H
 File: 8X
 Pulse sequence: rzpu1
 Solvent: cdcl3
 Omega: 29.9867 301.1 K
 Omega: 29.9867 301.1 K
 VNAME: 4D0 "vnmr13"
 Relax: delay 1.000 sec
 Acq: time 2.000 sec
 Width 4000.4 Hz
 ZG: PrePulsions 99.7632000 MHz
 DATA PROCESSING
 Resol: enhancement -0.0 Hz
 F1 size 65536
 Total time 9 min, 21 sec



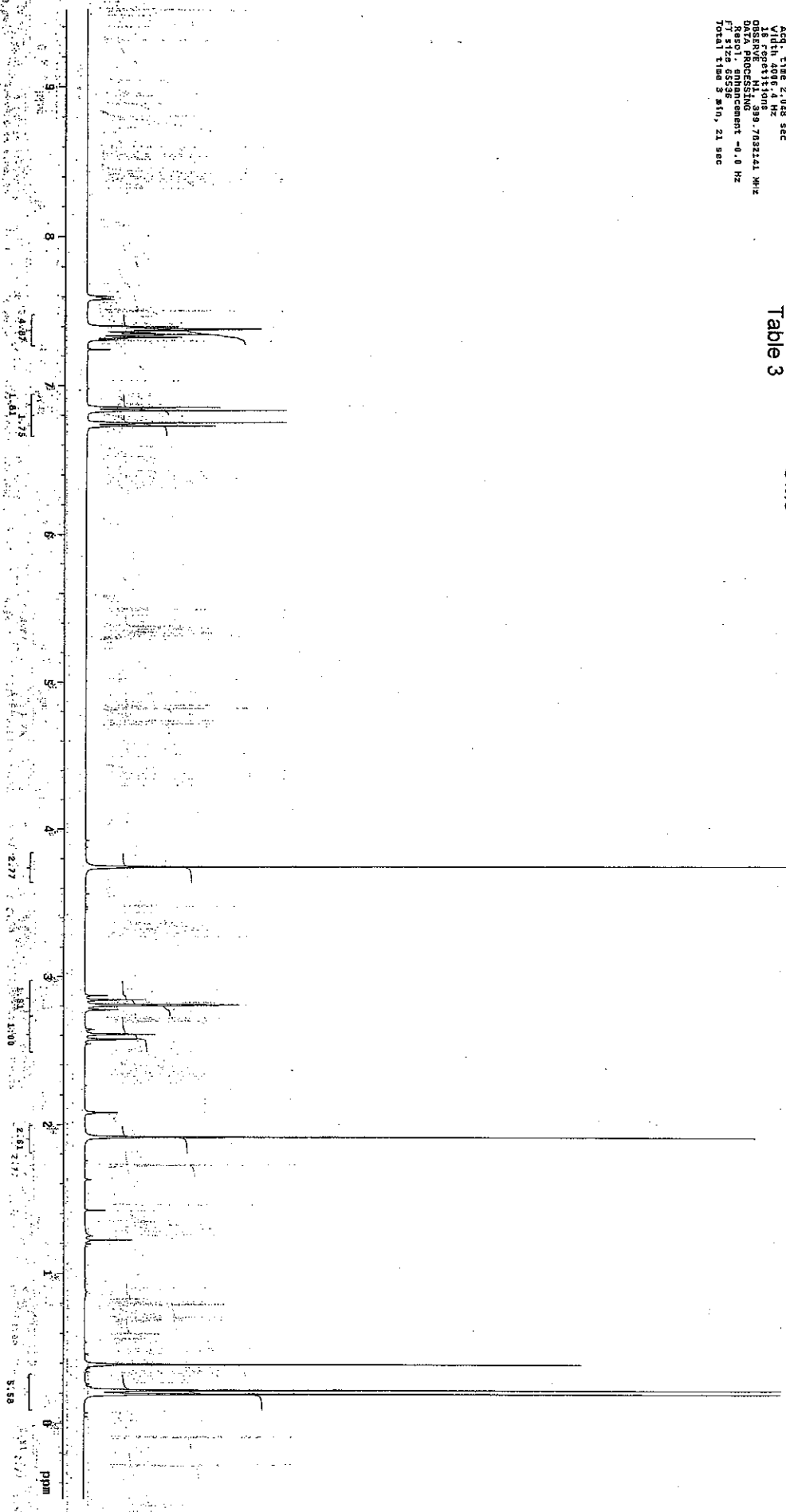
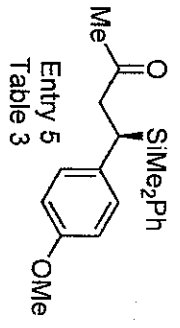


Entry 4
Table 3

SAMPLE: KI-IX-051-1H
Filter: exp
Pulse Sequence: sfgpu1
Solvent: CDCl₃
Operator: lewz
VHRS-400 "VHMR13"
Date: 02/07/1999
Acq. time: 2.048 sec
V/ich: 4000.4 Hz
OBSERVE: H1309.7632141 MHz
F2: 100.626126 MHz
F3: 101.325126 MHz
Total time: 8 min, 21 sec

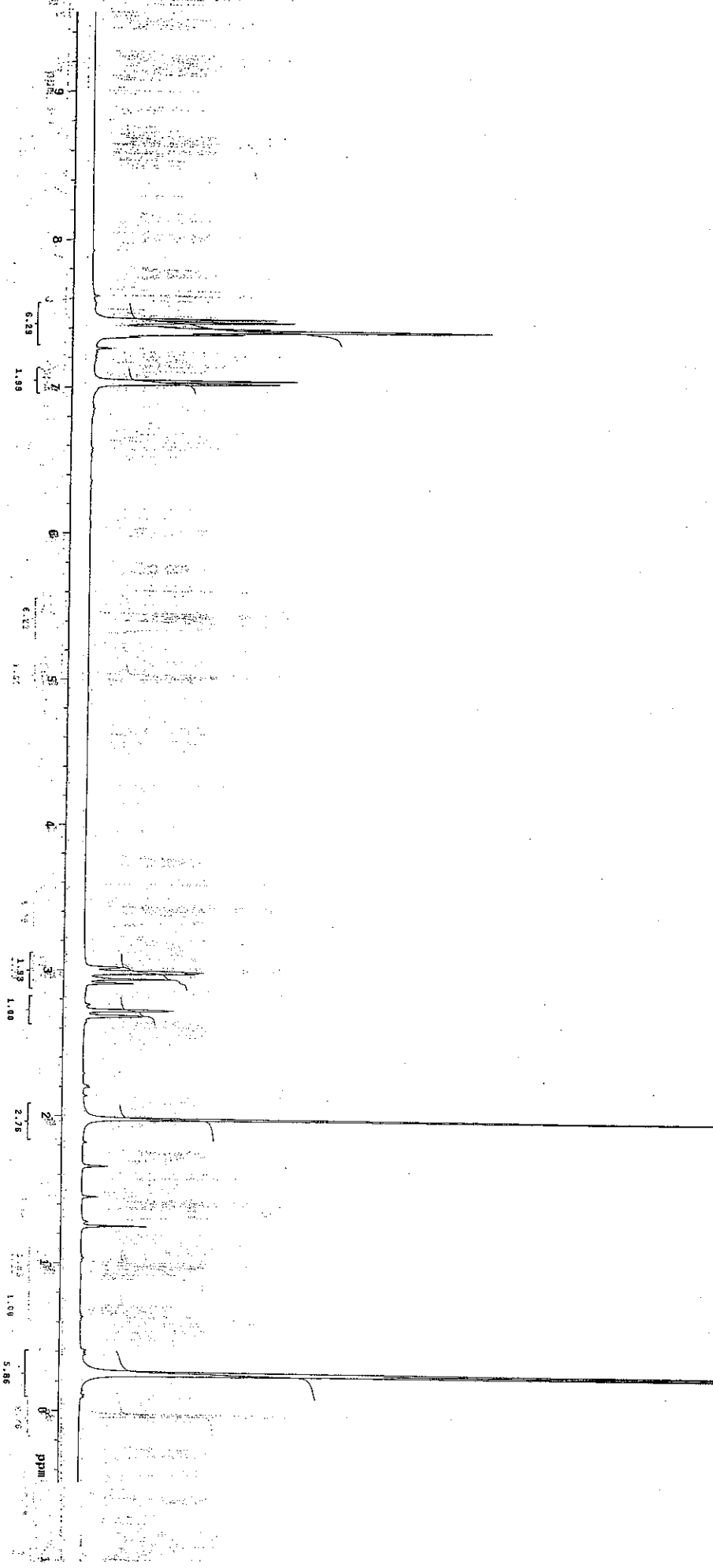
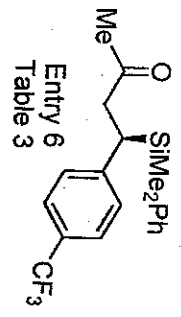


Sample: KL-IX-098-1H
 F1: 1: exp
 Pulse Sequence: s2pu1
 Solvent: cdcl3
 Ambient Temperature
 VHSR-400 100mmr130
 Relax: delay 1.000 sec
 Pulse: 45.0 degrees
 Width: 4000.4 Hz
 16 F2: 100.626199 MHz
 002: 100.626199 MHz
 Resol: enhancement -0.0 Hz
 FT size: 65536
 Total time: 3 min, 21 sec

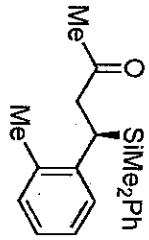


Sample: Kl-IX-100-1H
 File: exp
 Pulse Sequence: zgpg1
 Solvent: CDCl3
 Ambient Temperature
 Operator: lewz
 VNAME: 400 VNMJ13"

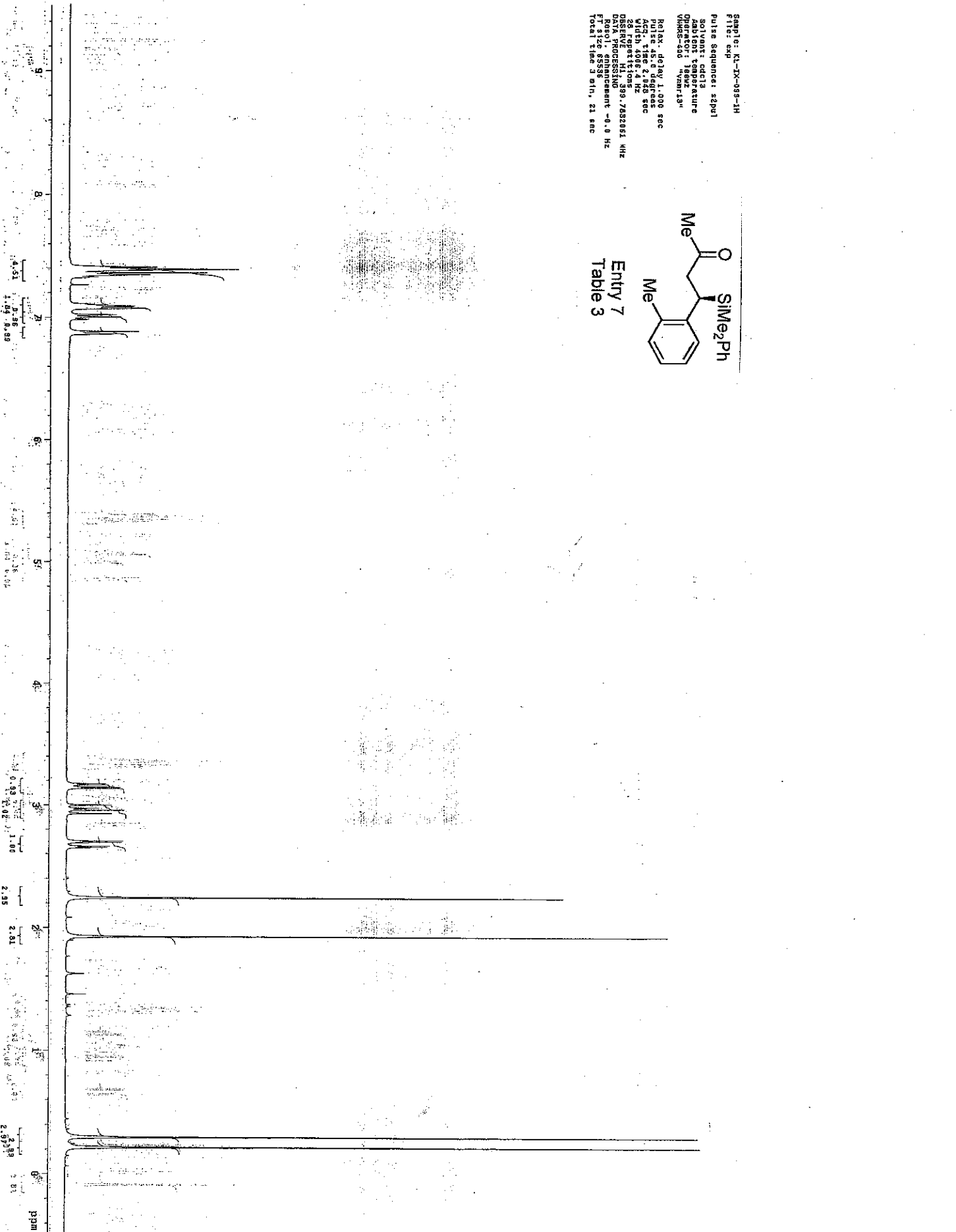
Relax. delay 1.000 sec
 Pulse 45.0 degree
 AQR1 time 2.000 sec
 AQR2 time 2.000 sec
 AQR3 time 2.000 sec
 20 repetitions
 OBSERVE: H1 399.7620047 MHz
 DATA PROCESSING
 Reference: solvent -0.0 Hz
 FT size 6536
 Total time 3 min, 21 sec



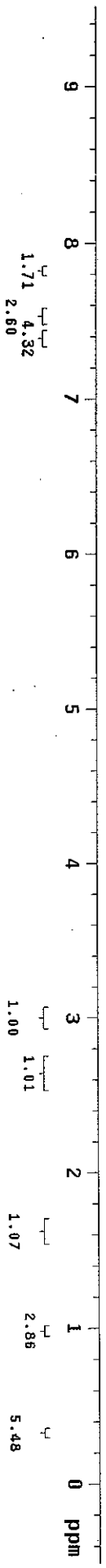
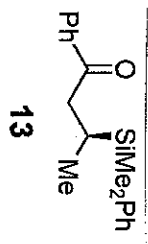
Sample: KI-IX-089-1H
 Filter: exp
 Pulse Sequence: zgpg30
 Solvent: cdcl3
 Solvent Temperature: 300.2 K
 Operator: jsm
 Name: 089-1H
 Relax. delay: 1.000 sec
 Pulse: 45.0 degrees
 A1: 1.000 sec
 A2: 1.000 sec
 A3: 1.000 sec
 D1: 2.000 sec
 D2: 2.000 sec
 D3: 2.000 sec
 D4: 2.000 sec
 D5: 2.000 sec
 D6: 2.000 sec
 D7: 2.000 sec
 D8: 2.000 sec
 D9: 2.000 sec
 D10: 2.000 sec
 D11: 2.000 sec
 D12: 2.000 sec
 D13: 2.000 sec
 D14: 2.000 sec
 D15: 2.000 sec
 D16: 2.000 sec
 D17: 2.000 sec
 D18: 2.000 sec
 D19: 2.000 sec
 D20: 2.000 sec
 D21: 2.000 sec
 D22: 2.000 sec
 D23: 2.000 sec
 D24: 2.000 sec
 D25: 2.000 sec
 D26: 2.000 sec
 D27: 2.000 sec
 D28: 2.000 sec
 D29: 2.000 sec
 D30: 2.000 sec
 D31: 2.000 sec
 D32: 2.000 sec
 D33: 2.000 sec
 D34: 2.000 sec
 D35: 2.000 sec
 D36: 2.000 sec
 D37: 2.000 sec
 D38: 2.000 sec
 D39: 2.000 sec
 D40: 2.000 sec
 D41: 2.000 sec
 D42: 2.000 sec
 D43: 2.000 sec
 D44: 2.000 sec
 D45: 2.000 sec
 D46: 2.000 sec
 D47: 2.000 sec
 D48: 2.000 sec
 D49: 2.000 sec
 D50: 2.000 sec
 D51: 2.000 sec
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 D68: 2.000 sec
 D69: 2.000 sec
 D70: 2.000 sec
 D71: 2.000 sec
 D72: 2.000 sec
 D73: 2.000 sec
 D74: 2.000 sec
 D75: 2.000 sec
 D76: 2.000 sec
 D77: 2.000 sec
 D78: 2.000 sec
 D79: 2.000 sec
 D80: 2.000 sec
 D81: 2.000 sec
 D82: 2.000 sec
 D83: 2.000 sec
 D84: 2.000 sec
 D85: 2.000 sec
 D86: 2.000 sec
 D87: 2.000 sec
 D88: 2.000 sec
 D89: 2.000 sec
 D90: 2.000 sec
 D91: 2.000 sec
 D92: 2.000 sec
 D93: 2.000 sec
 D94: 2.000 sec
 D95: 2.000 sec
 D96: 2.000 sec
 D97: 2.000 sec
 D98: 2.000 sec
 D99: 2.000 sec
 D100: 2.000 sec
 Total time: 21 min, 21 sec



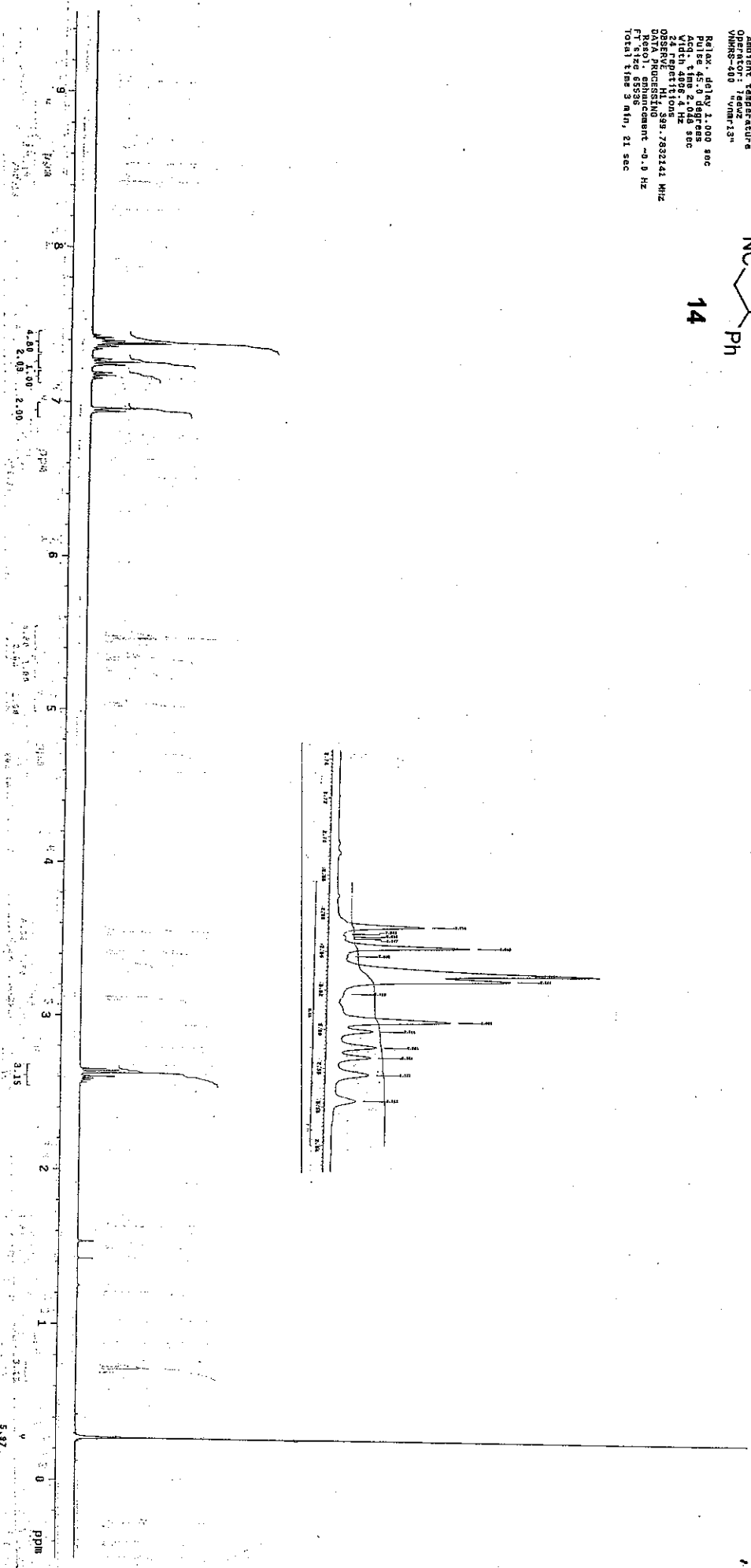
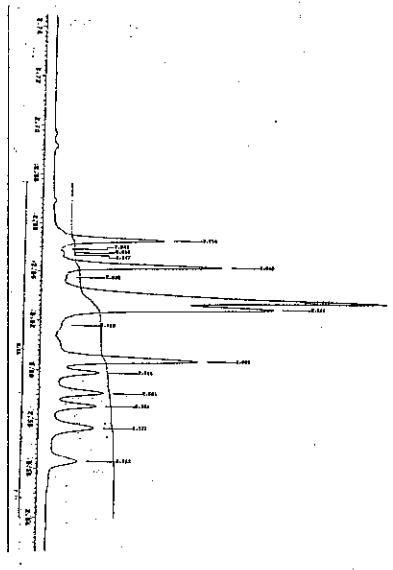
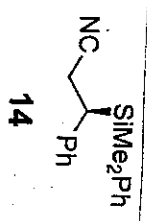
Entry 7
Table 3



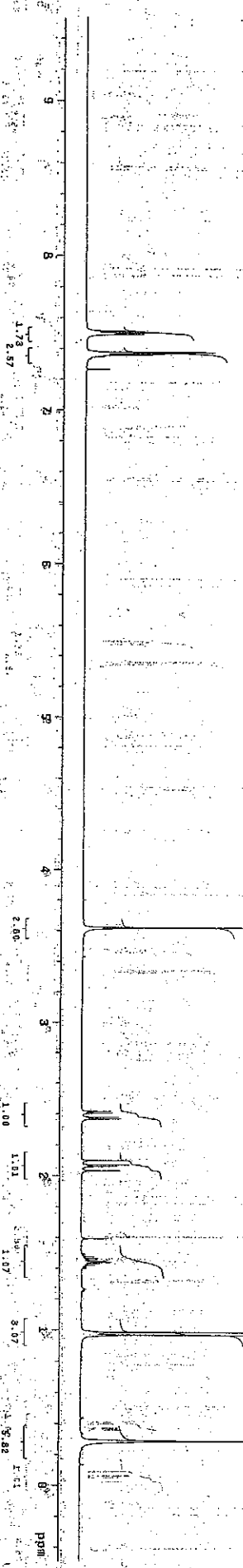
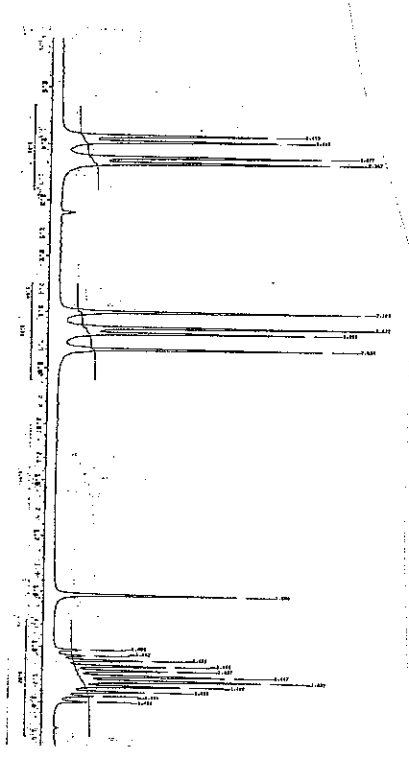
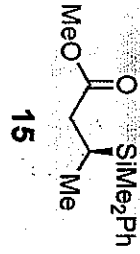
Sample: KL-IX-044-c
File: exp
Pulse Sequence: szpu1
Solvent: cdcl3
Temp: 28.0 C / 301.1 K
Operator: leewz
VNMRS-400 "vnmr13"
Relax. delay 1.000 sec
Pulse 45.0 degrees
Acq. time 2.048 sec
Width 4006.4 Hz
28 repetitions
OBSERVE H1, 399.7832141 MHz
DATA PROCESSING
Resol: enhancement -0.0 Hz
FT size 85358
Total time 3 min, 21 sec



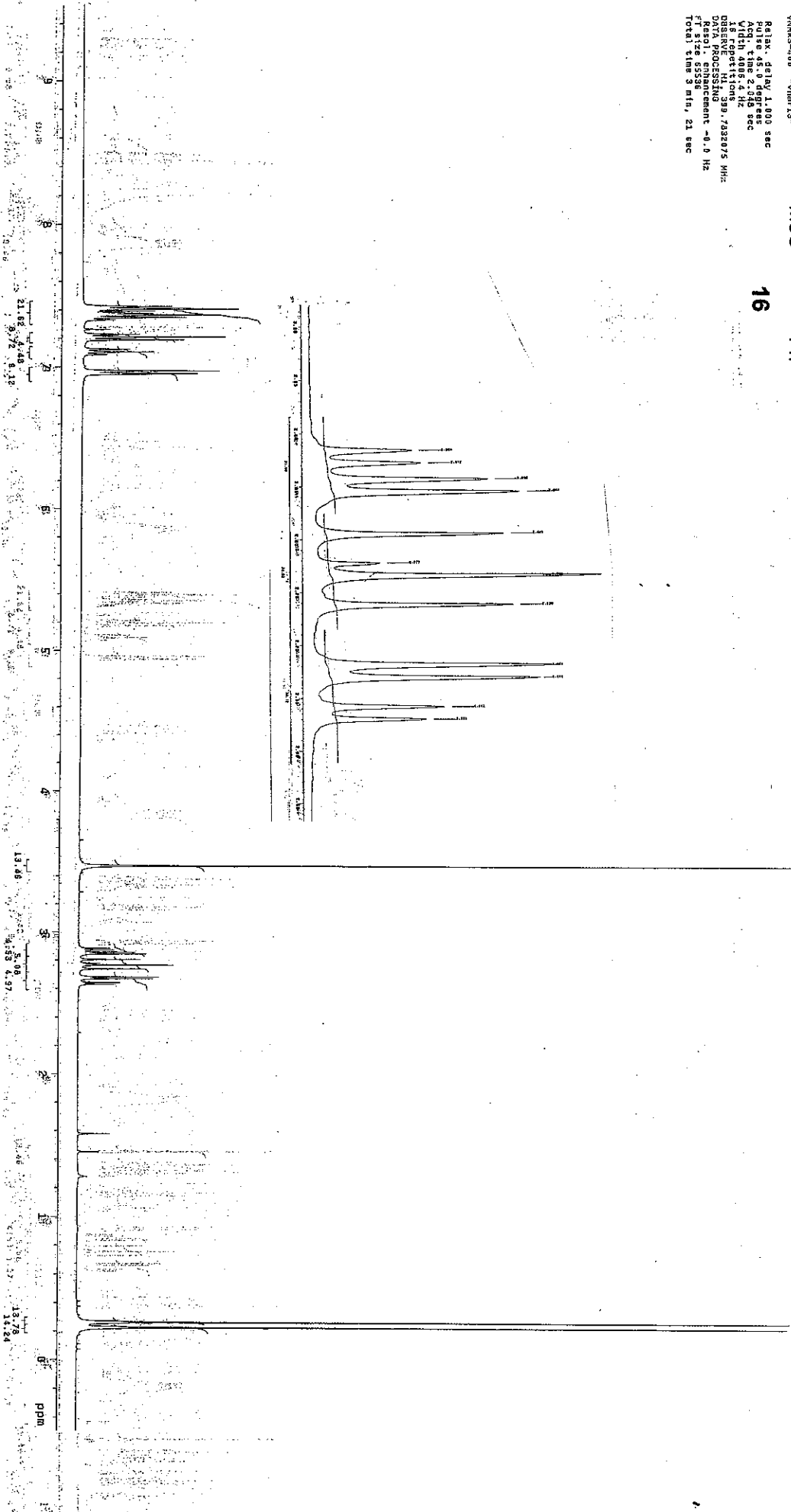
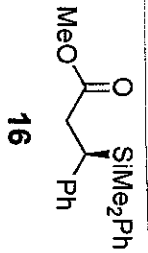
Sample: KL-IX-089-1H
 File: 0XP
 Pulse sequence: zgpg30
 Solvent: cdcl3
 Ambient temperature
 Operator: rkoz
 VNAME: 089 1HMR130
 Relax: delay 1.000 sec
 Pulse 45.0 degrees
 Width 4002.000 sec
 24 repetitions
 OBSERVE: H1, 399.7832141 MHz
 Presol: enhancement -0.0 Hz
 FT size 65528
 Total time 3 (min), 21 sec



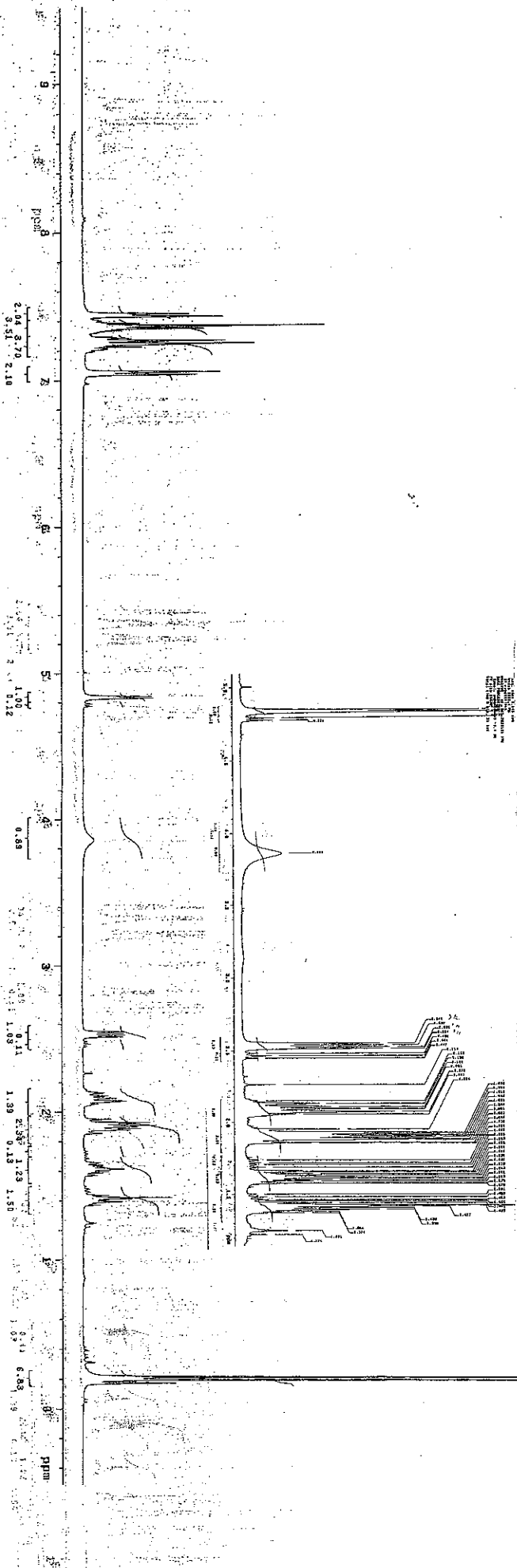
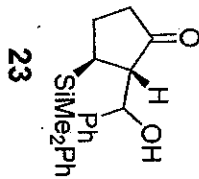
Sample: KL-15-189-1H
 File: 0XP
 Pulse sequence: zgpg30
 Solvent: cdcl3
 Temp: 25.0 C / 298.1 K
 Operator: 100WZ
 VNAME: 400 Vnm413
 Relax. delay: 1.000 sec
 Pulse: 45.0 Degrees
 Acq. time: 2.048 sec
 16 Repetitions
 OBSERVE: H1 N 399.7638073 MHz
 P1: 12.0000000 sec
 P2: 0.0000000 sec
 P3: 0.0000000 sec
 P4: 0.0000000 sec
 P5: 0.0000000 sec
 P6: 0.0000000 sec
 P7: 0.0000000 sec
 P8: 0.0000000 sec
 P9: 0.0000000 sec
 P10: 0.0000000 sec
 P11: 0.0000000 sec
 P12: 0.0000000 sec
 P13: 0.0000000 sec
 P14: 0.0000000 sec
 P15: 0.0000000 sec
 P16: 0.0000000 sec
 P17: 0.0000000 sec
 P18: 0.0000000 sec
 P19: 0.0000000 sec
 P20: 0.0000000 sec
 P21: 0.0000000 sec
 P22: 0.0000000 sec
 P23: 0.0000000 sec
 P24: 0.0000000 sec
 P25: 0.0000000 sec
 P26: 0.0000000 sec
 P27: 0.0000000 sec
 P28: 0.0000000 sec
 P29: 0.0000000 sec
 P30: 0.0000000 sec
 P31: 0.0000000 sec
 P32: 0.0000000 sec
 P33: 0.0000000 sec
 P34: 0.0000000 sec
 P35: 0.0000000 sec
 P36: 0.0000000 sec
 P37: 0.0000000 sec
 P38: 0.0000000 sec
 P39: 0.0000000 sec
 P40: 0.0000000 sec
 P41: 0.0000000 sec
 P42: 0.0000000 sec
 P43: 0.0000000 sec
 P44: 0.0000000 sec
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 P87: 0.0000000 sec
 P88: 0.0000000 sec
 P89: 0.0000000 sec
 P90: 0.0000000 sec
 P91: 0.0000000 sec
 P92: 0.0000000 sec
 P93: 0.0000000 sec
 P94: 0.0000000 sec
 P95: 0.0000000 sec
 P96: 0.0000000 sec
 P97: 0.0000000 sec
 P98: 0.0000000 sec
 P99: 0.0000000 sec
 P100: 0.0000000 sec
 Total time 3 min, 21 sec



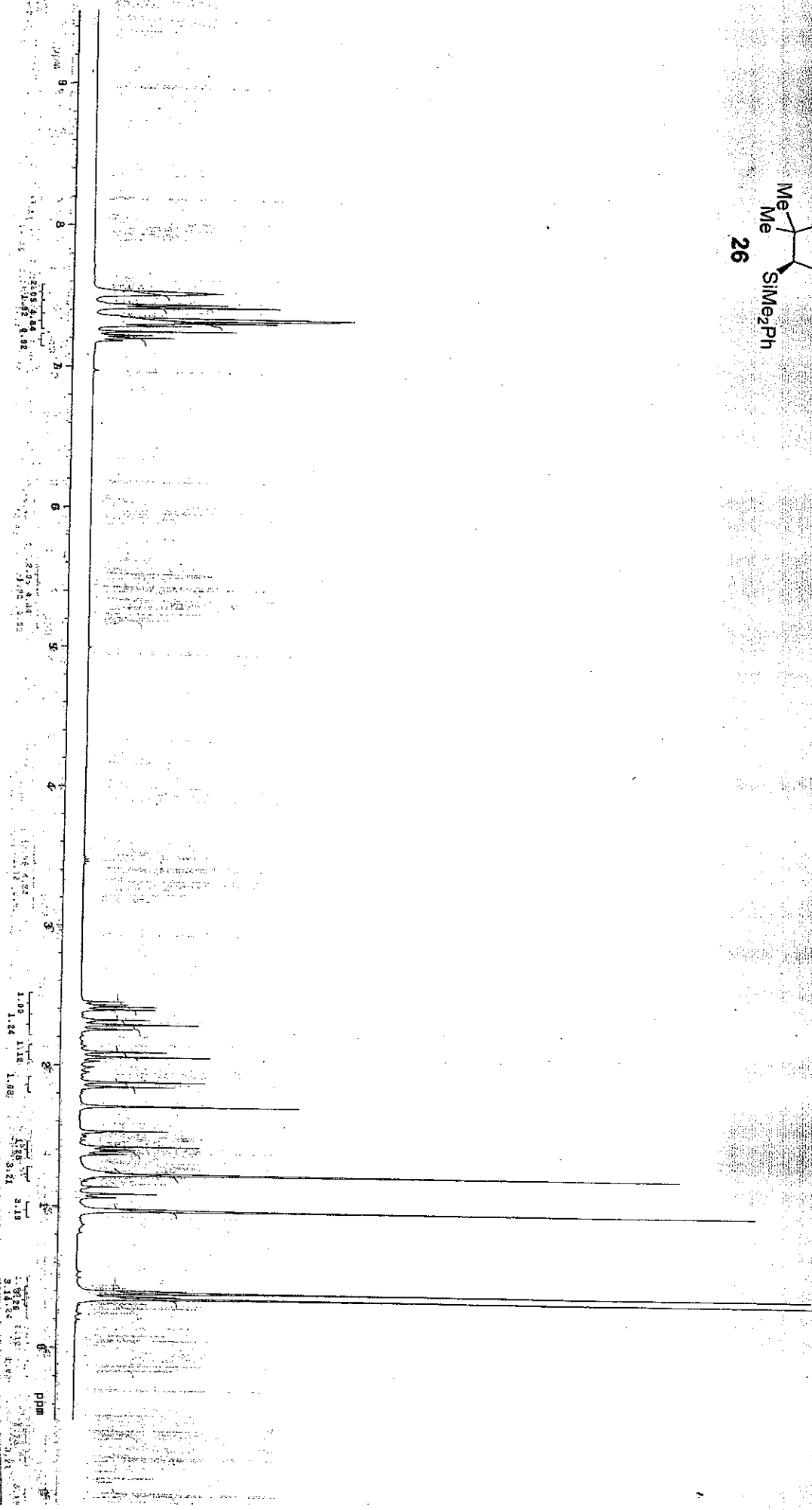
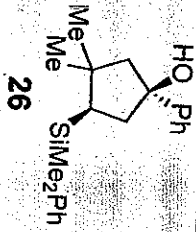
Sample: KL-IX-188-1H
F11r: cap
Pulse Sequence: sspu1
Solvent: cdcl3
Temp: 25.0 C / 298.1 K
QNP: 13C
VPP: 13.0 mm
VPPMS: 450.13 mm
Relax: delay 1.000 sec
Pulse 45.0 degrees
Pulse 45.0 degrees
Width 8005.4 Hz
18 repetitions
Data Processing
Resol: enhancement -0.0 Hz
FT size 55398
Total time 9 min, 21 sec



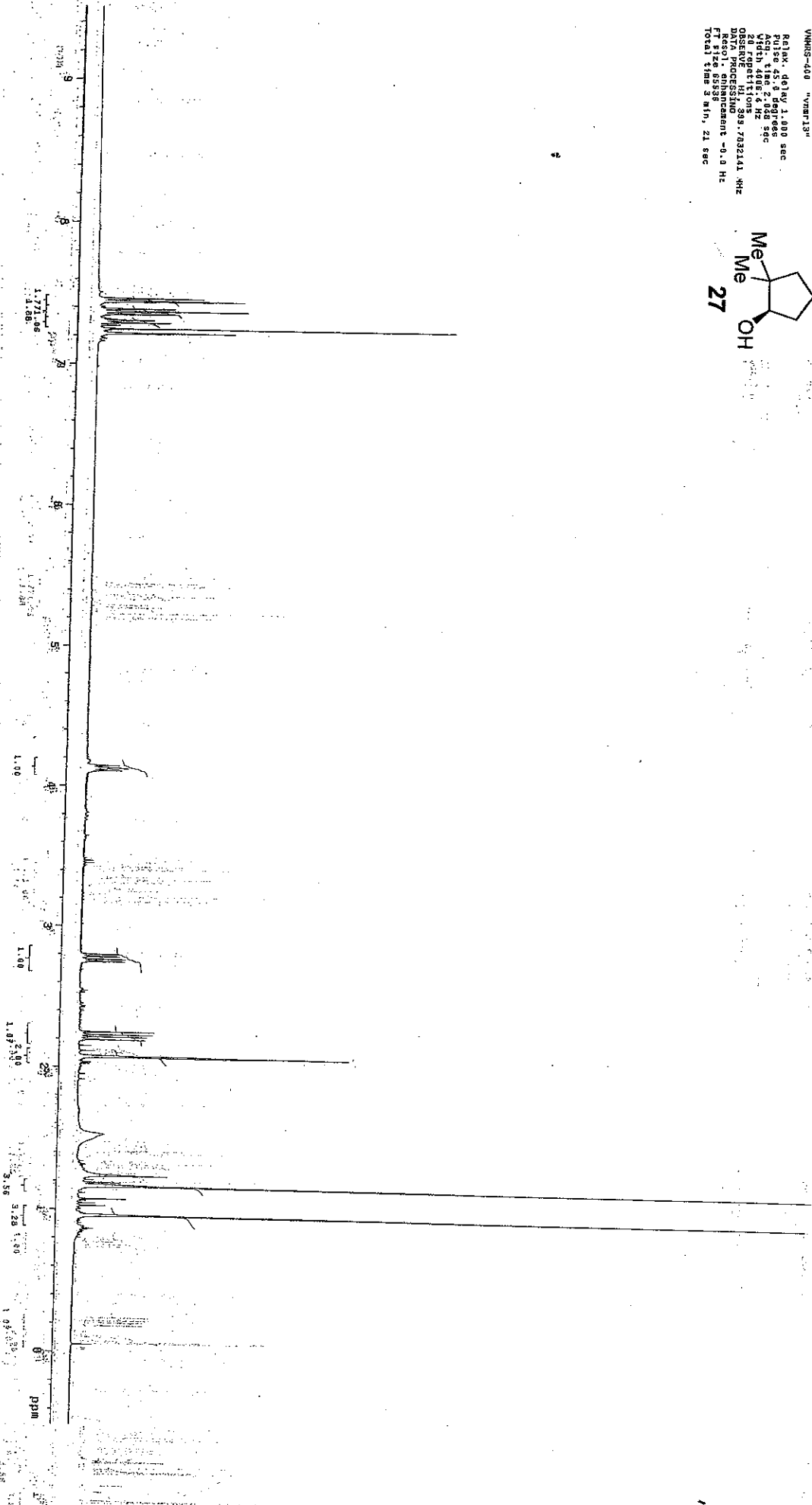
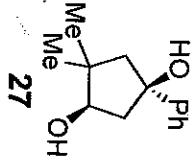
Sample: KI-IX-190-2H
 File: exp
 Pulse Sequence: zgpg30
 Solvent: cdcl3 / 298.1 K
 Temp: 25.0 C / 298.1 K
 Operator: leuw
 VNAME: 400 um13u
 Relax. delay: 1.000 sec
 Pulse: 45.0 degrees
 Acq. time: 2.048 sec
 24 repetitions
 OBSERVE: H1, 399.762141 MHz
 DATA PROCESSING: segment -8.0 Hz
 FT size 65536
 Total time 3 min, 21 sec



Sample: KL-27-125-1
Date: 10/19/99
Pulse Sequence: szpu1



Sample: KL-IX-189-1H
 File: exp
 Pulse Sequence: zgpg30
 Solvent: cdcl3
 Temp: 25.0 C / 298.1 K
 Operator: leuw
 VNAME: 300 Vnmr3
 Relax: delay 1.000 sec
 Pulse: 45.0 degrees
 Acq: time 2.043 sec
 24 repetitions
 OBSERVE: H1, 399.783244 MHz
 PROCSSING: F2 - 1
 Reference: solvent -0.0 Hz
 FT size: 6555
 Total time: 3 min, 21 sec



Sample: KL-1X-188-1H
 F18: exp
 Pulse Sequence: zgpg30
 Solvent: cdcl3
 Temp: 25.0 C / 298.1 K
 Operator: 18wz
 VNAME: 400
 VNAME: 130
 Relax: delay 1.000 sec
 Pulse: 45.0 degree
 Acq: time 2.048 sec
 24 Fspat: 1.000 Hz
 OBSERVE: 1H, 398.7882072 MHz
 DATA PROCESSING
 FT: size 65535
 Total time 3 min, 21 sec

