

Supporting Information

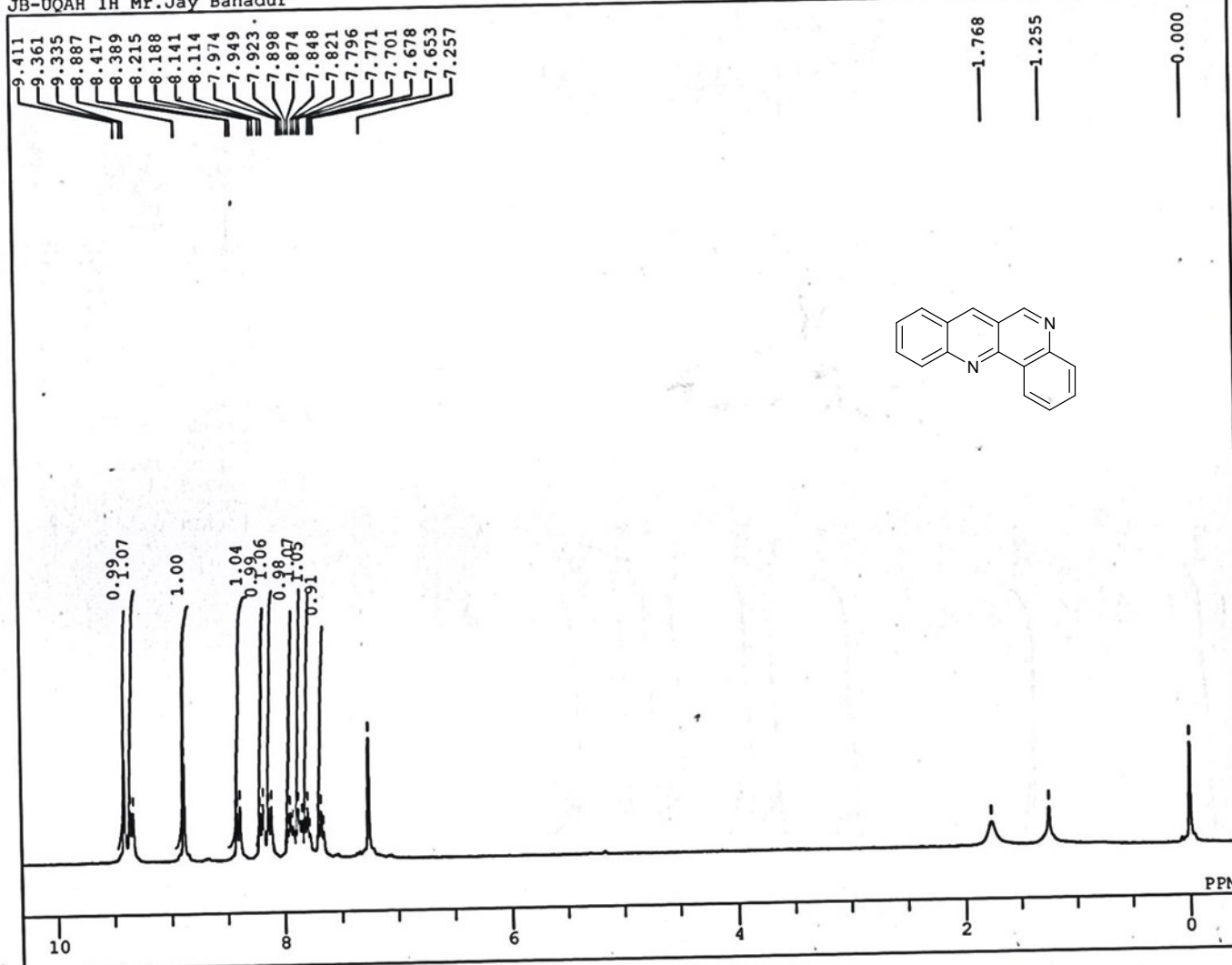
Ligand-free palladium catalyzed Facile construction of tetra cyclic dibenzo[*b,h*][1,6]naphthyridine derivatives: Domino sequence of intramolecular C-H bond arylation and oxidation reactions

Jay Bahadur Singh, Kishor Chandra Bharadwaj, Tanu Gupta and Radhey M. Singh*

Department of Chemistry, Center of Advanced study, Institute of Science, Banaras Hindu University,
Varanasi, 221005, India.

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¹ H NMR and ¹³ C NMR spectra of final compounds	2-35

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JB-UQAH 1H Mr. Jay Bahadur

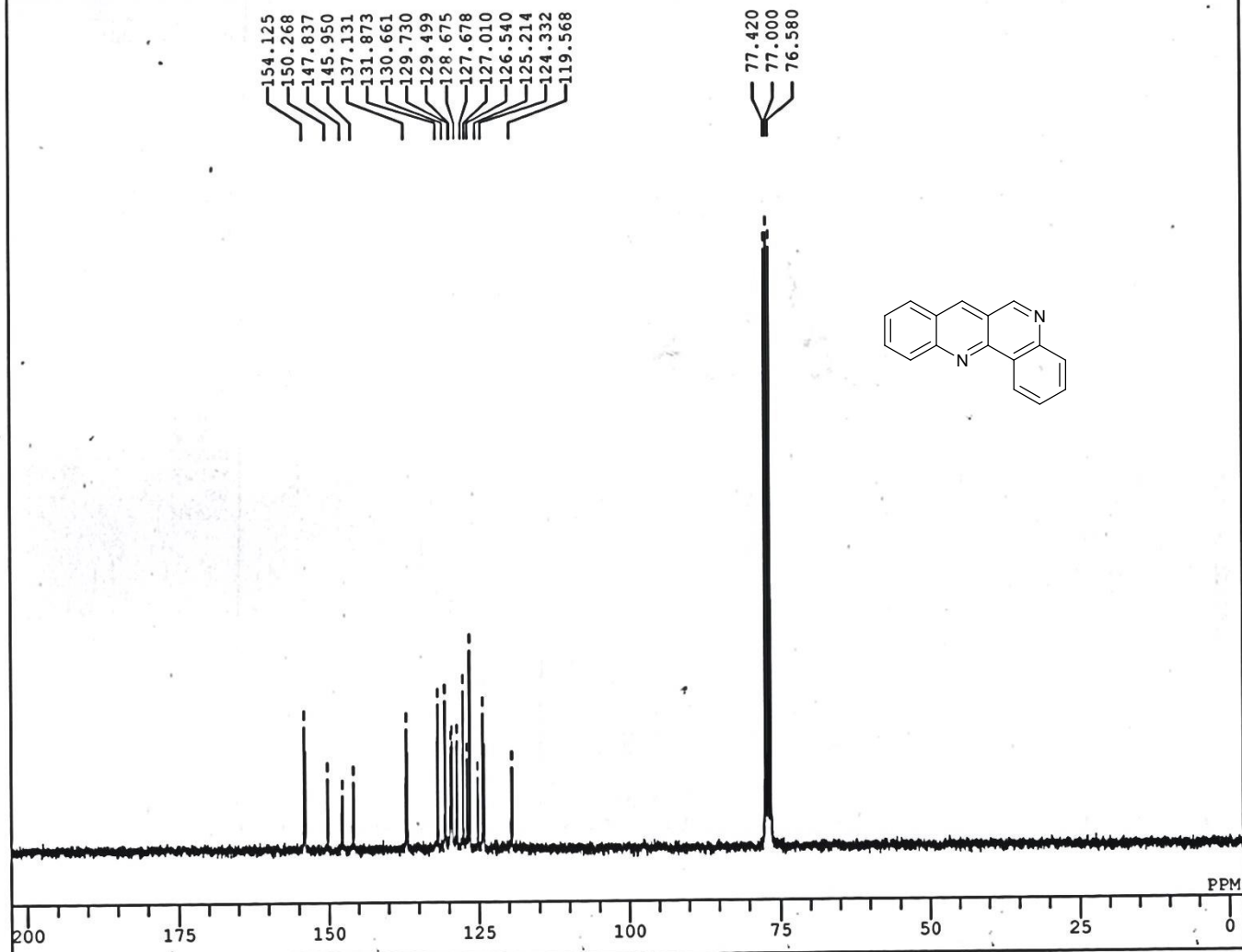


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin.

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OBFIN 1150.0 Hz
POINT 32768
FREQU 6016.8 Hz
SCANS 16
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PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
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RGAIN 23

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JB-UQA4 13C Mr. Jay Bahadur

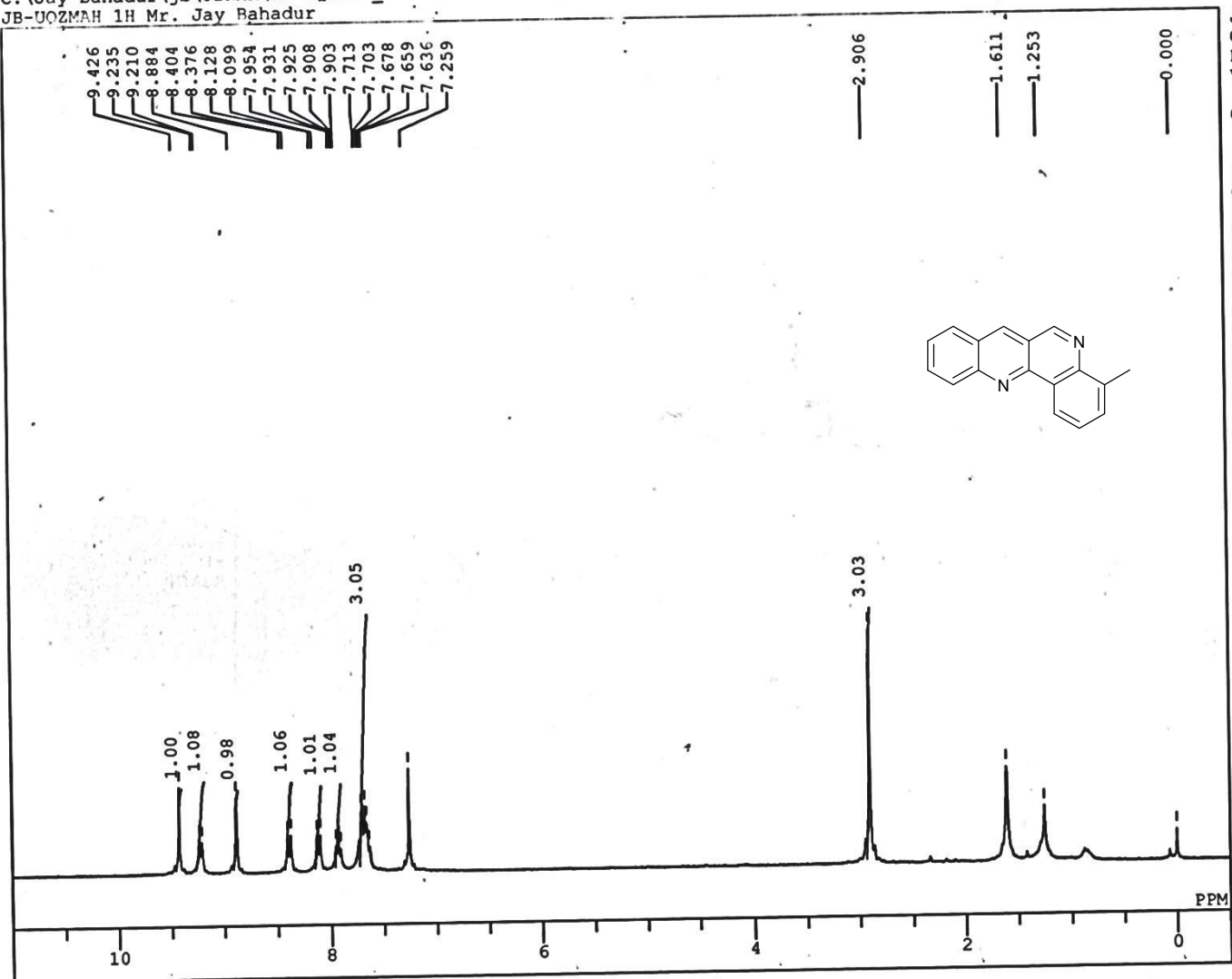


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin.

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POINT 32768
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SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 23.0 c
SLVNT CDCL3
EXREF 77.00 ppm
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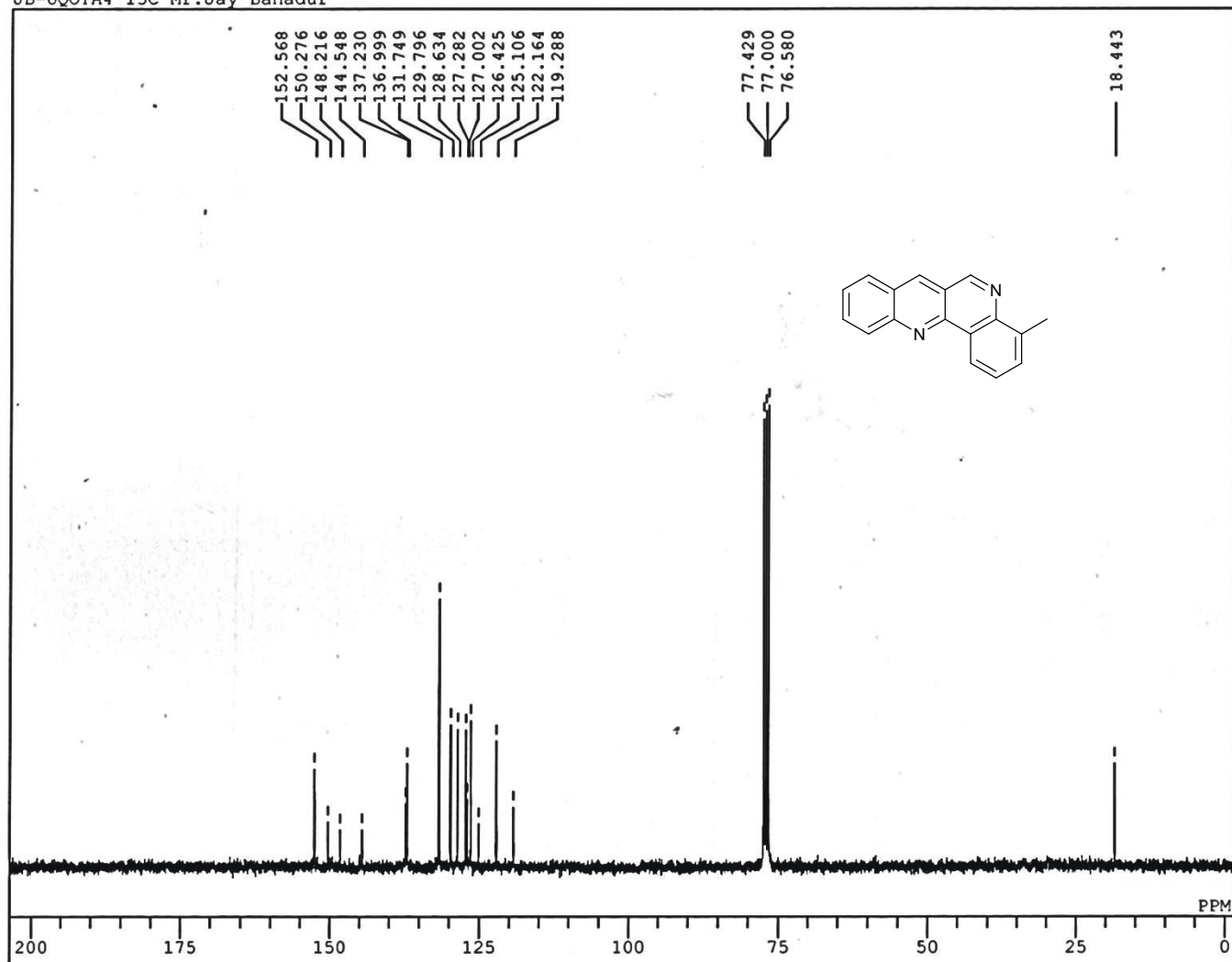


JEOL AL300 FTNMR
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VARANASI-221005

Operator : Nagendra Kumar
Shishir Sinha

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OBFIN 1150.0 Hz
POINT 32768
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PW1 5.2 us
IRNUC 1H
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SLVNT CDCL3
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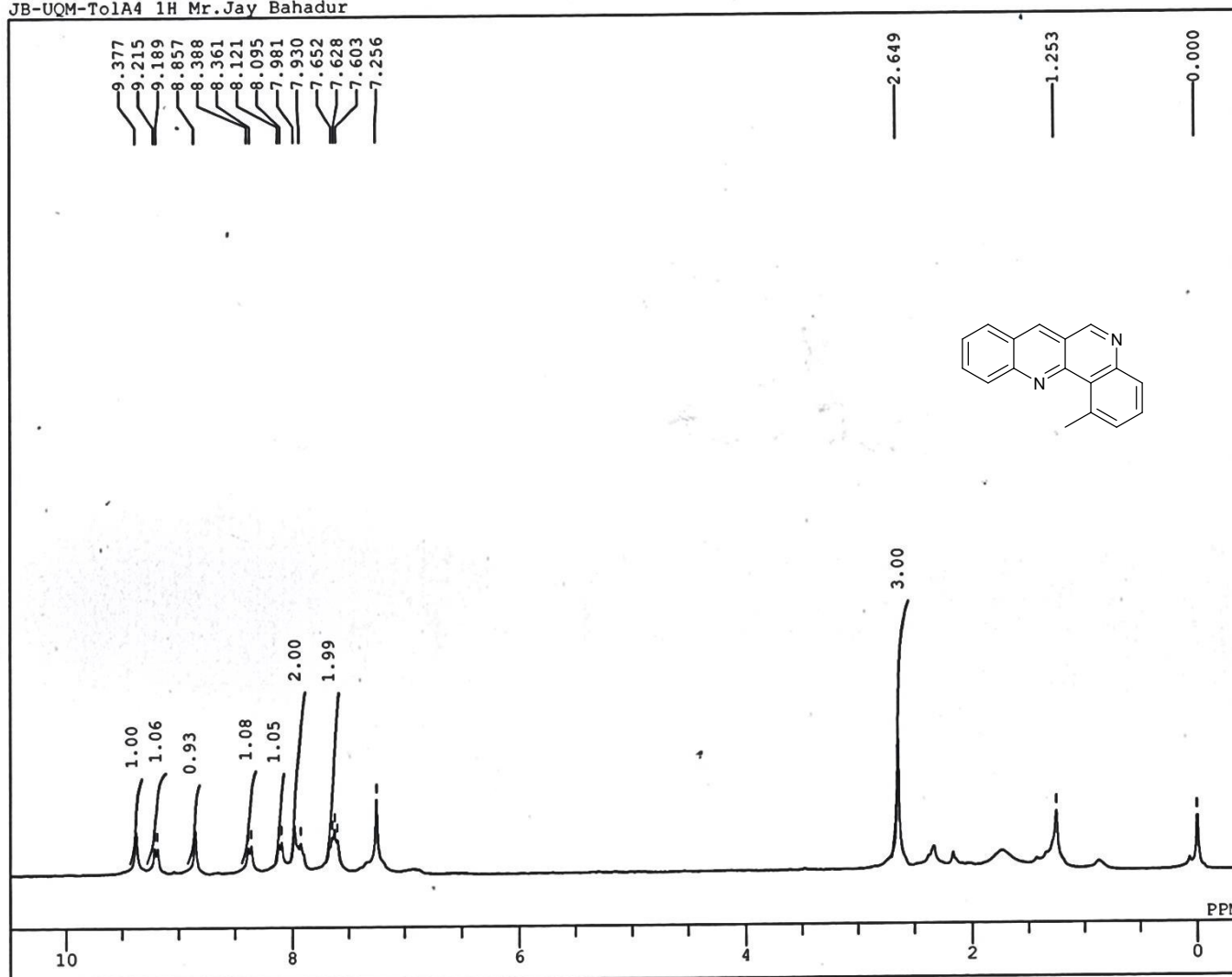


JEOL AL300 FTNMR
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VARANASI-221005

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Shishir Sinha

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OBNUC 13C
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OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2500
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PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 21.7 c
SLVNT CDCL3
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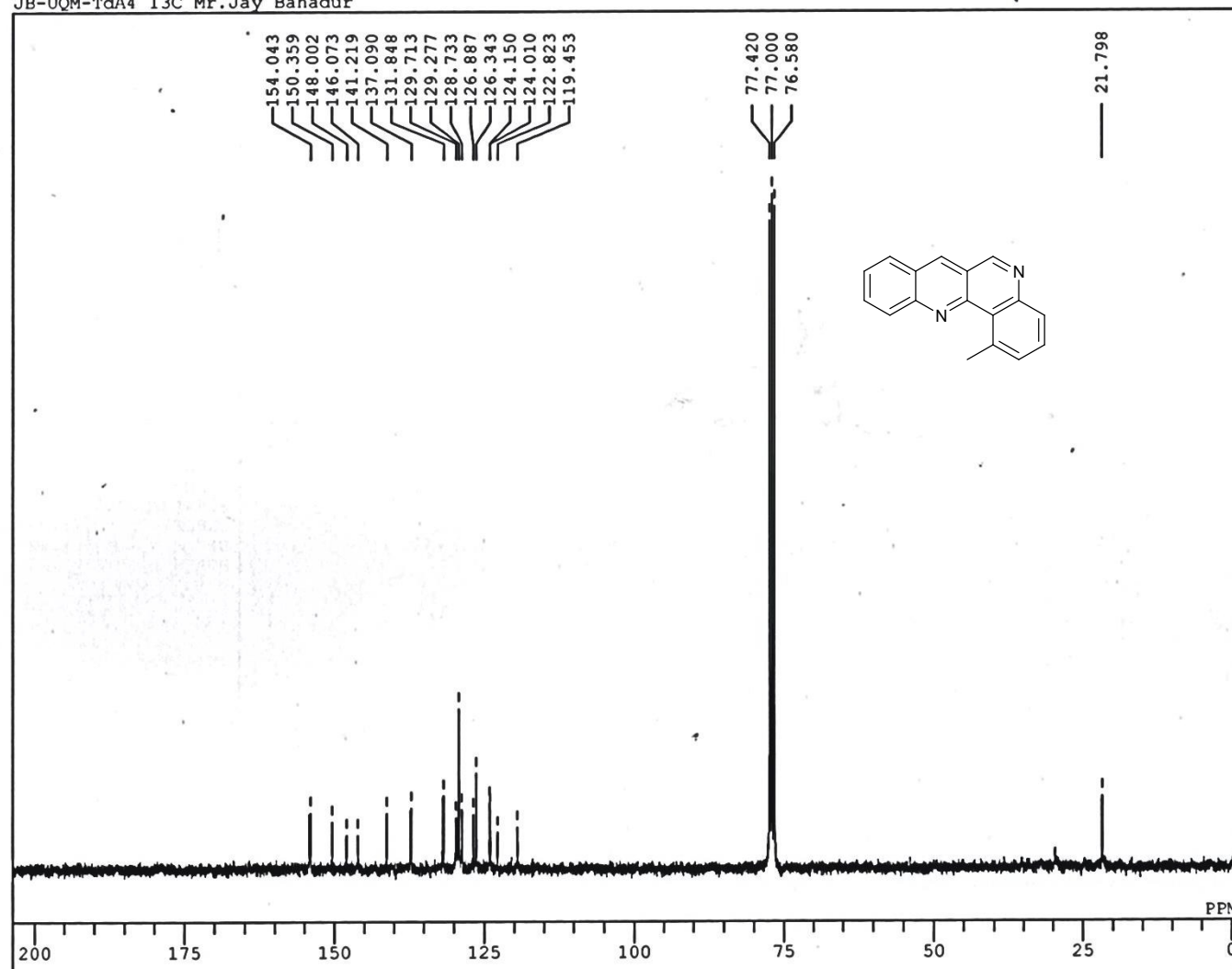


JEOL AL300 FTNMR
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VARANASI-221005

Operator : Nagendra Ku
Shishir Sin

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POINT 32768
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ACQTM 3.447 sec
PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 20.3 c
SLVNT CDCL3
EXREF 0.00 ppm
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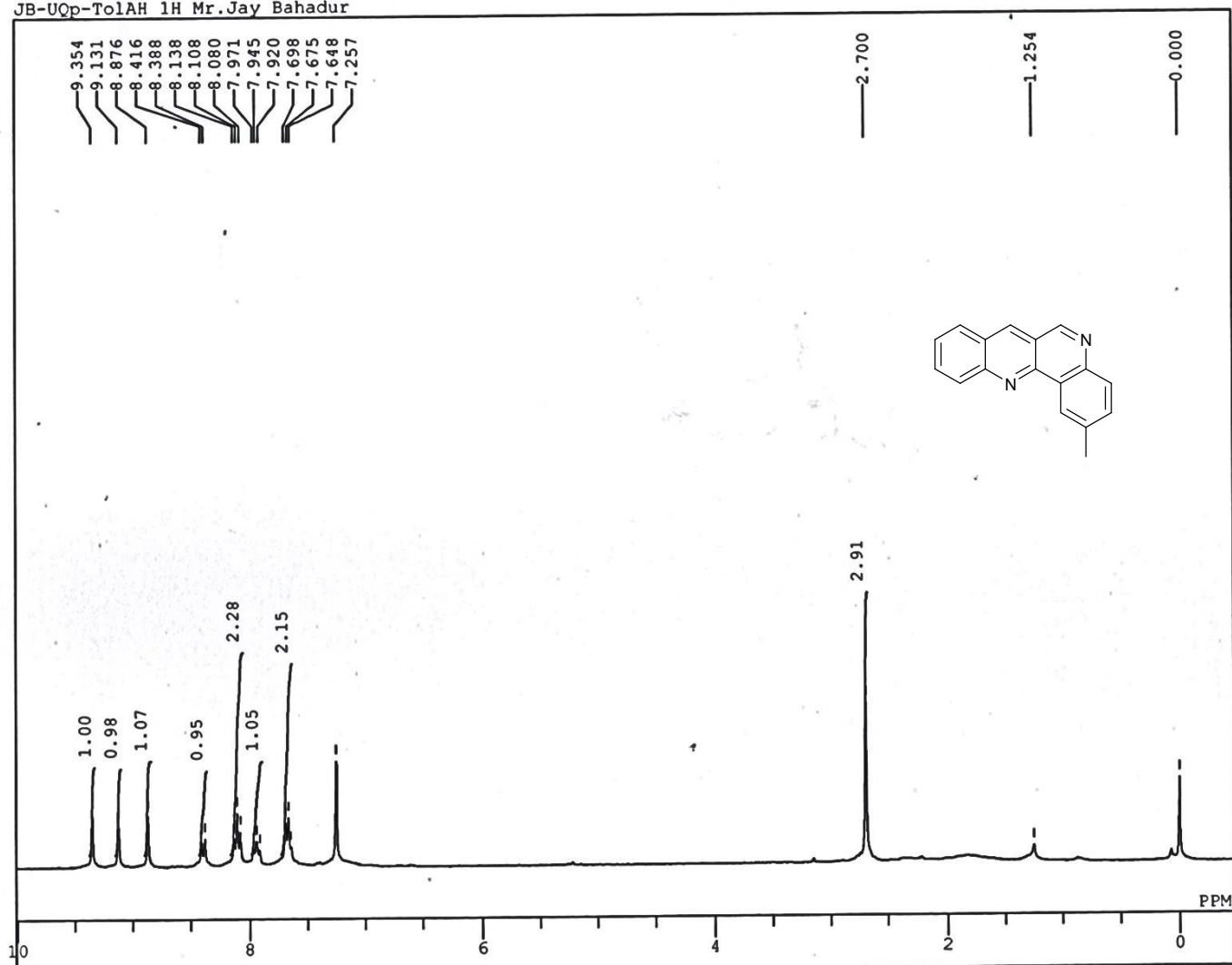


JEOL AL300-FTNMR
CHEMISTRY DEPARTMENT
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VARANASI-221005

Operator : Nagendra Ku
Shishir Sin

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SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 23.9 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.22 Hz
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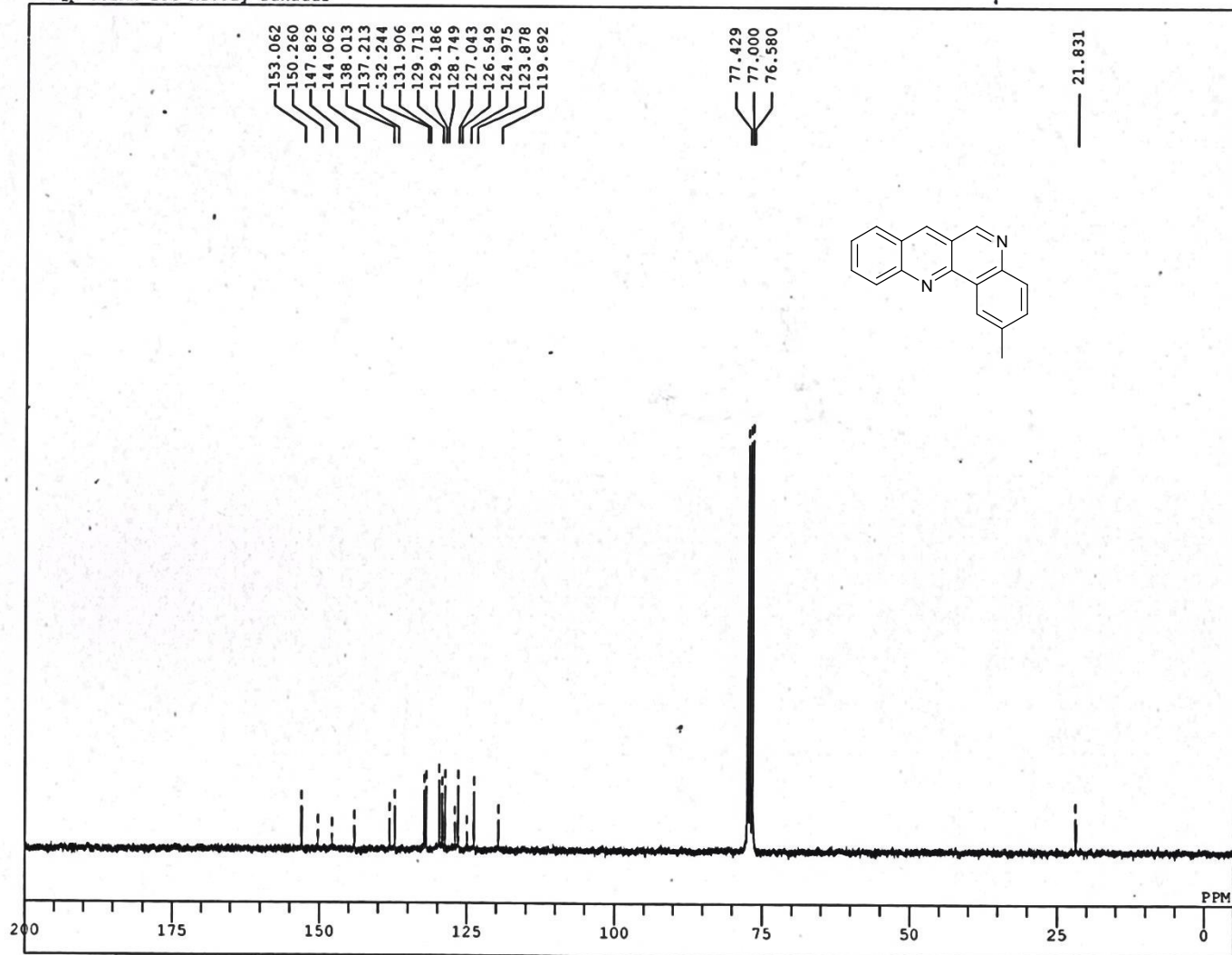


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Kw
Shishir Sin

DFILE C:\Jay Bahadur\
COMNT JB-UQp-TolAH_1H
DATIM Thu May 22 00:1
OBNUC 1H
EXMOD NON
OBFRQ 300.40 MHz
OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 6016.8 Hz
SCANS 16
ACQTM 5.446 sec
PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 23.5 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
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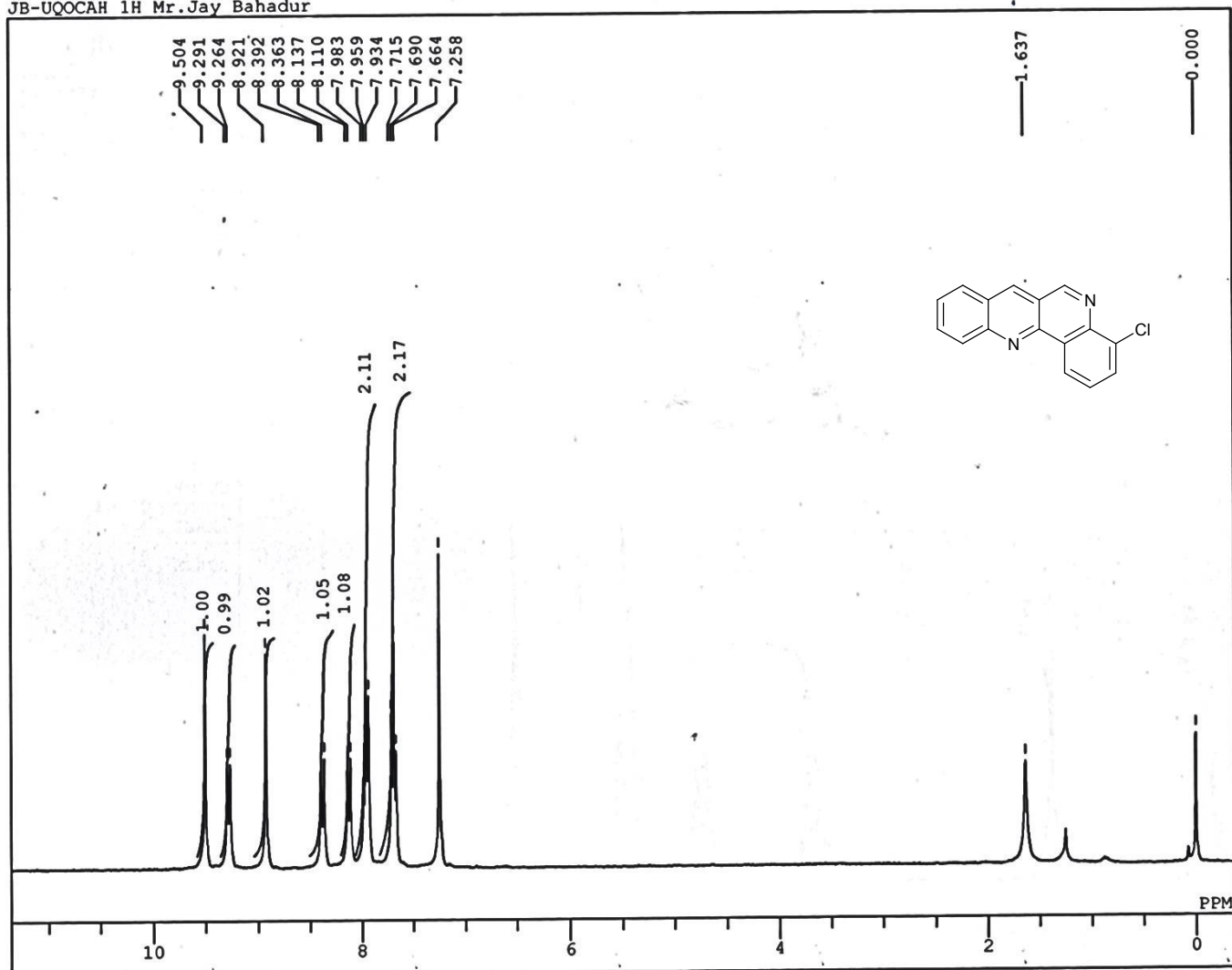


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Kuma
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OBNUC 13C
EXMOD BCM
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OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 6.0 us
IRNUC 1H
CTEMP 19.7 c
SLVNT CDCL3
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BF 1.20 Hz
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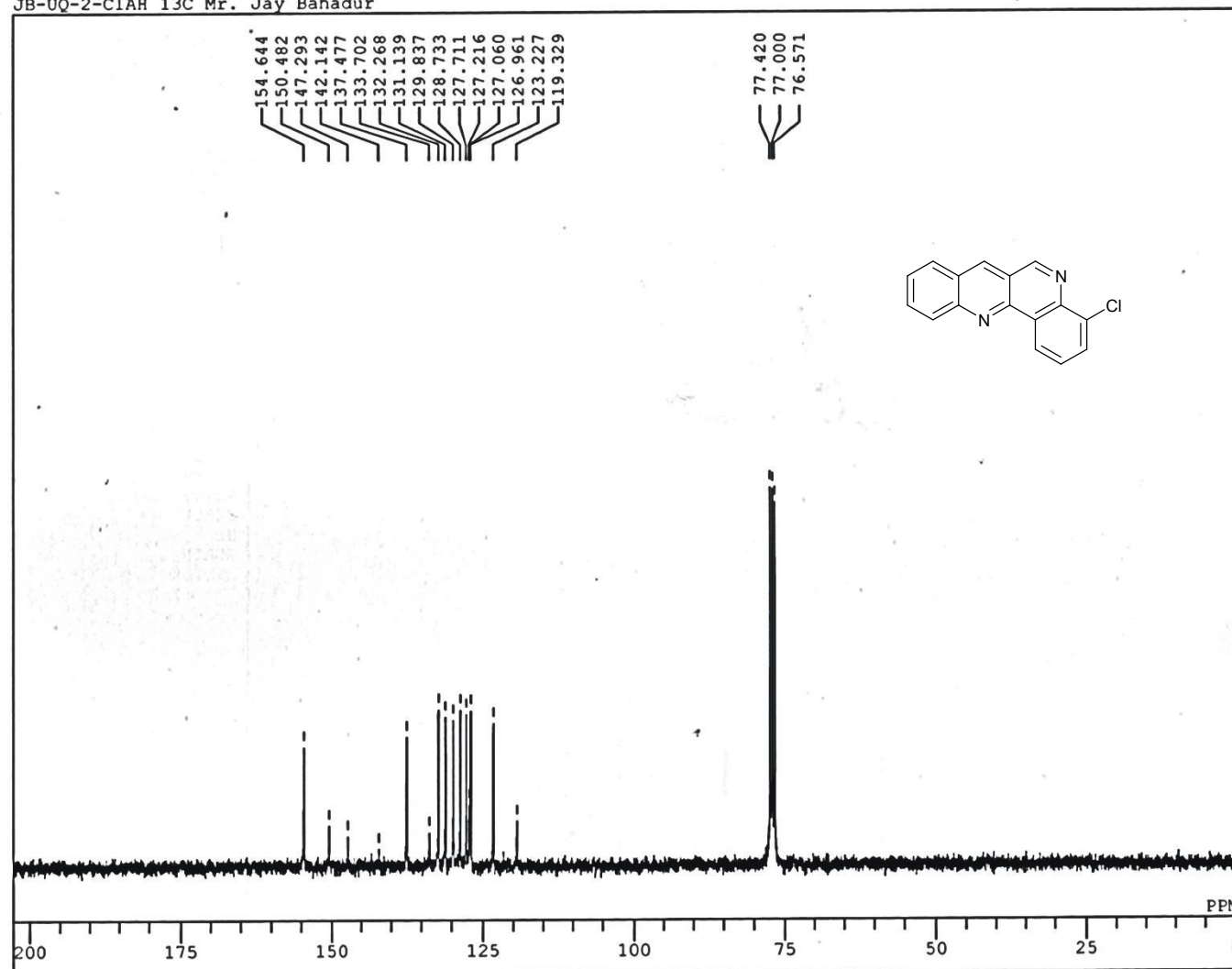


JEOL AL300 FTNMR
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Banaras Hindu University
VARANASI-221005

Operator : Nagendra Kumar
Shishir Sinha

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OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 9505.7 Hz
SCANS 16
ACQTM 3.447 sec
PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 20.5 c
SLVNT CDCL3
EXREF 0.00 ppm
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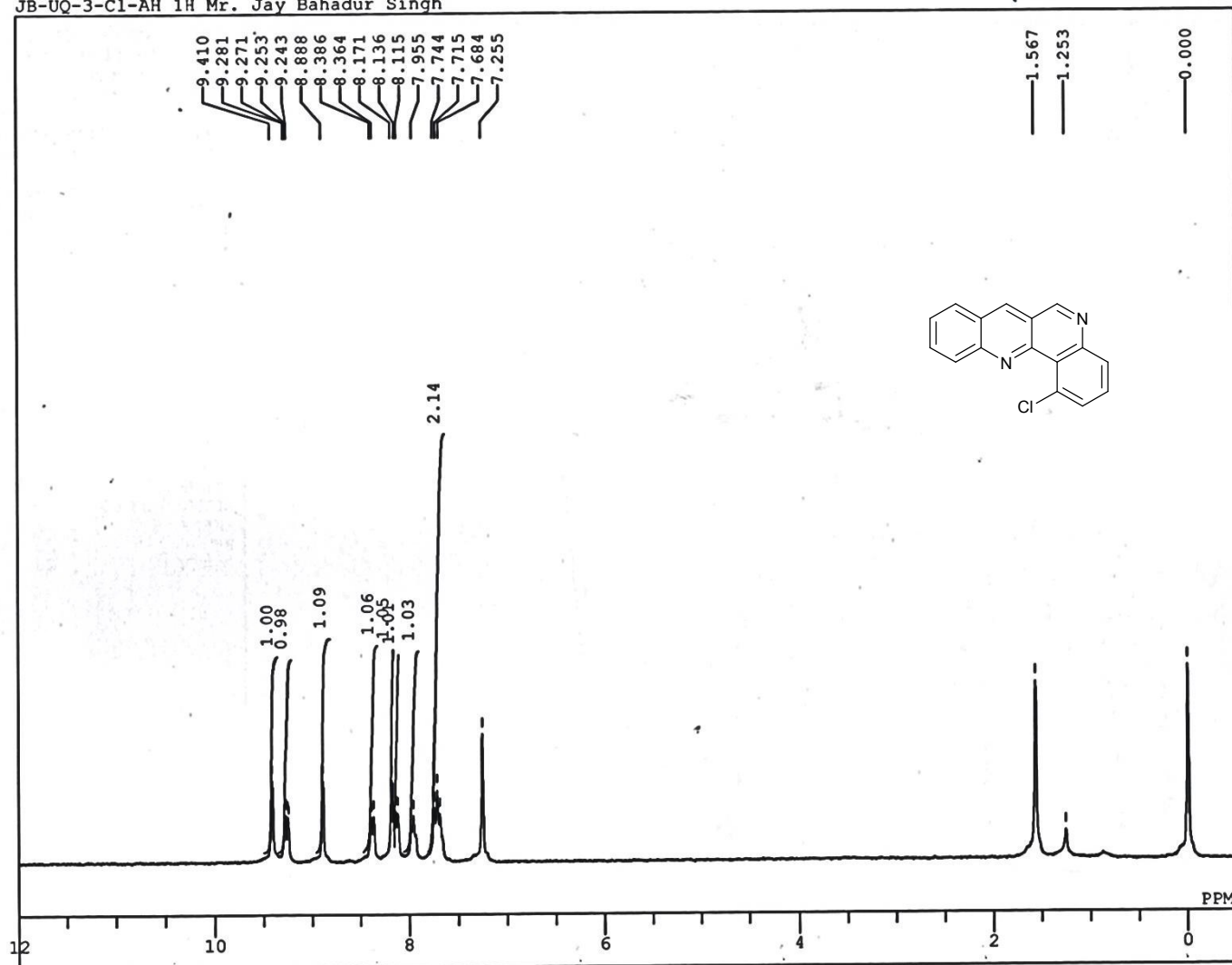


JEOL AL300 FTNMR
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Operator : Nagendra Kumar
Shishir Sinha

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POINT 32768
FREQU 20408.1 Hz
SCANS 2000
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PD 1.394 sec
PW1 6.0 us
IRNUC 1H
CTEMP 24.1 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
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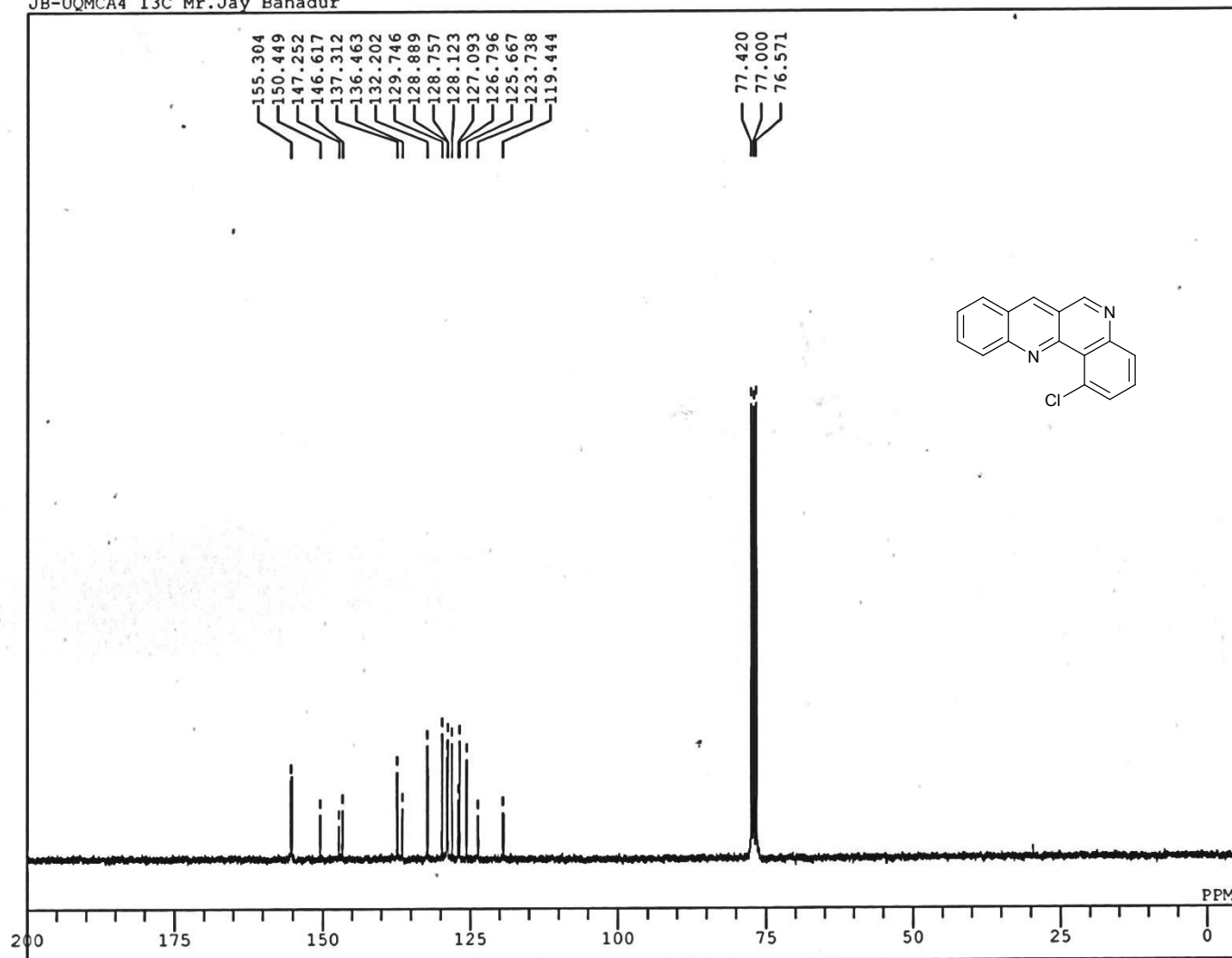


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Operator : Nagendra Ku
Shishir Sin

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OBNUC 1H
EXMOD NON
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OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 9505.7 Hz
SCANS 16
ACQTM 3.447 sec
PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 23.9 c
SLVNT CDCL3
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JB-UQMCA4 13C Mr.Jay Bahadur

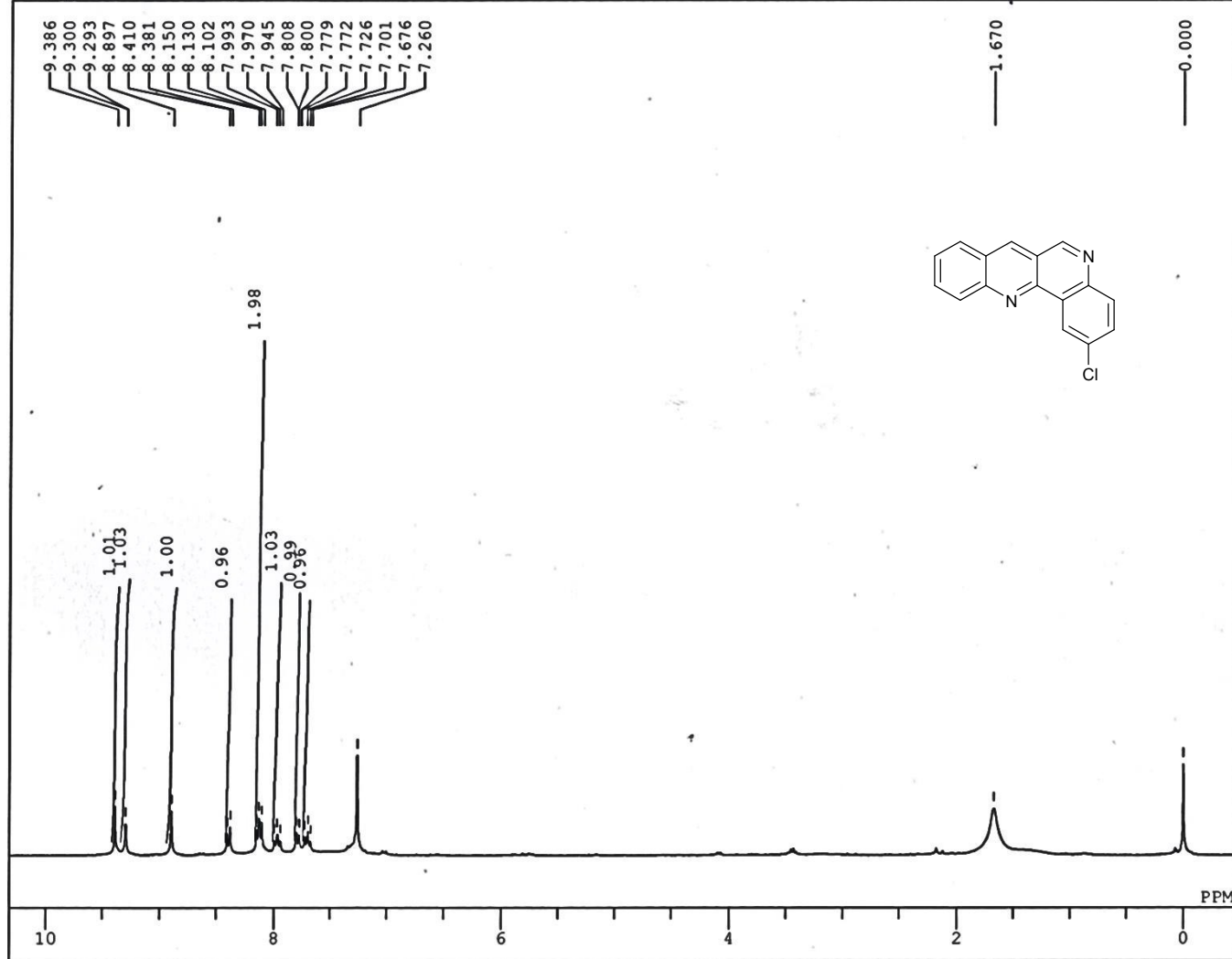


JEOL AL300 FTNMR
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Operator : Nagendra Kumar
Shishir Sinha

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OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2500
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 24.0 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
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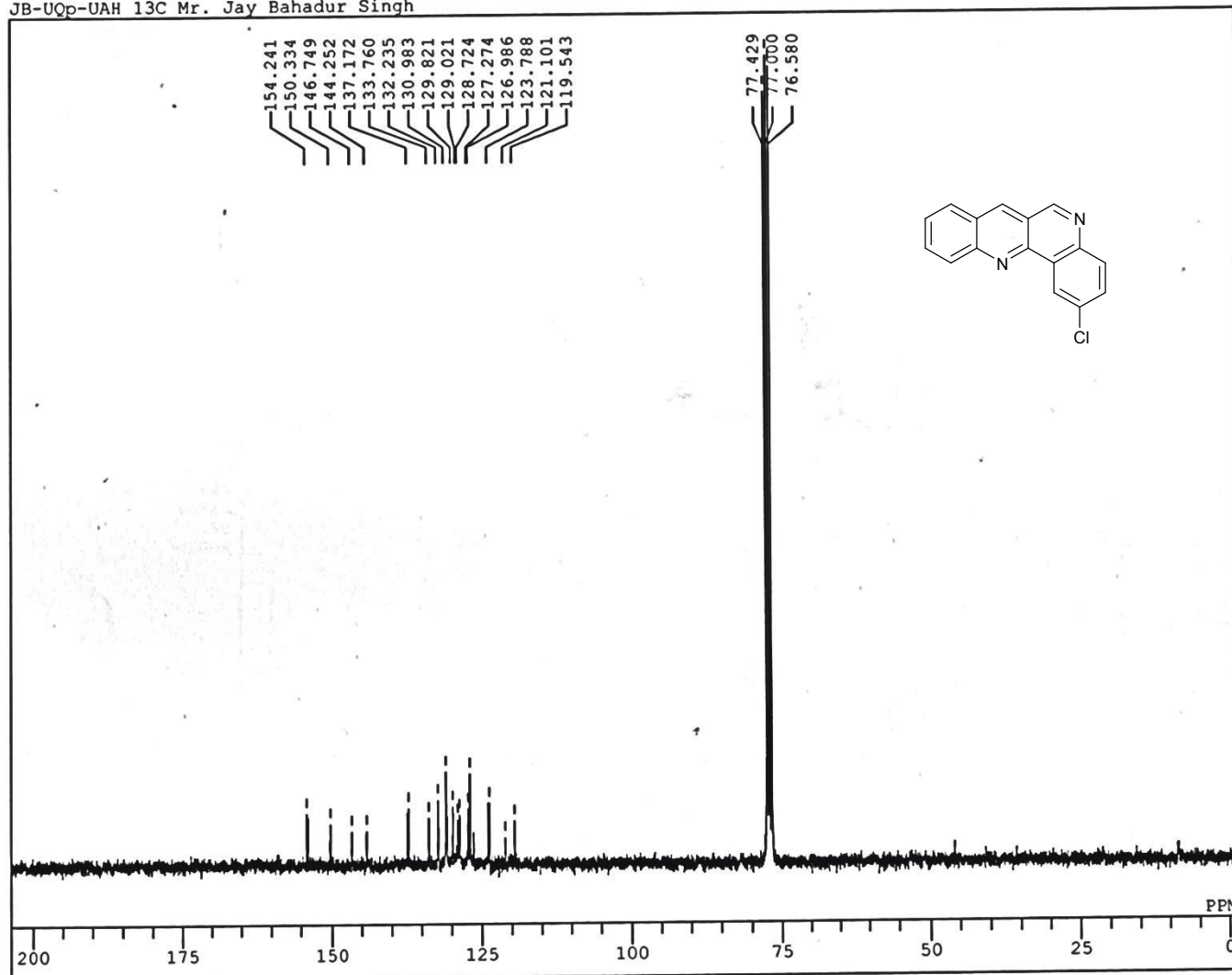


JEOL AL300 FTNMR
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Operator : Nagendra Kumar
Shishir Sin.

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DATIM Wed Jan 14 13:0
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EXMOD NON
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OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 6016.8 Hz
SCANS 16
ACQTM 5.446 sec
PD 1.547 sec
PW1 5.0 us
IRNUC 1H
CTEMP 20.9 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.22 Hz
RGAIN 23

C:\Jay Bahadur\jb\JBNMR\JB-UQPCAH 13C.als
JB-UQp-UAH 13C Mr. Jay Bahadur Singh

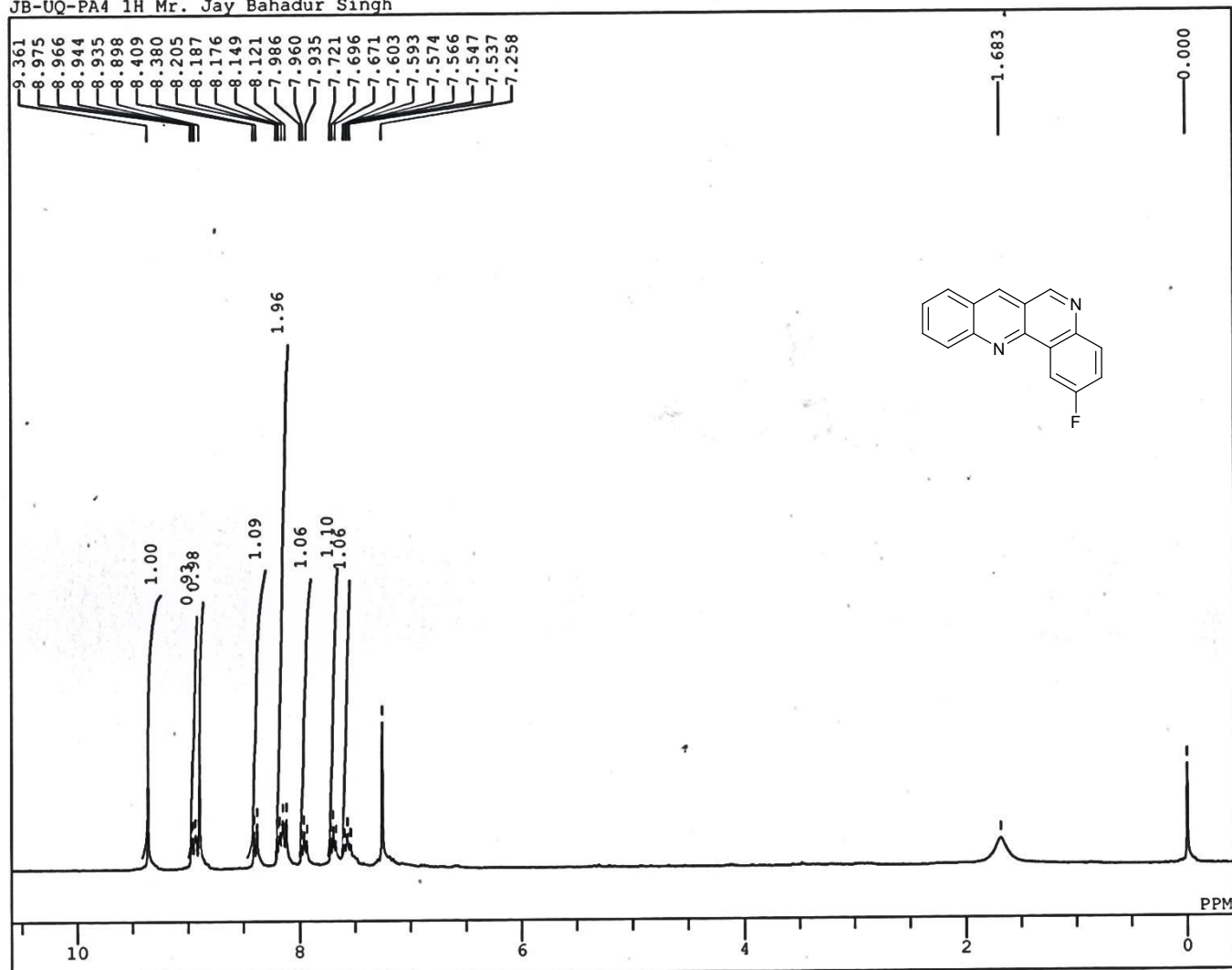


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin

DFILE C:\Jay Bahadur\
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DATIM Thu Jan 15 04:2
OBNUC 13C
EXMOD BCM
OBFRQ 75.45 MHz
OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 24.1 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.22 Hz
RGAIN 24

C:\Jay Bahadur\jb\JBNMR\JB-UQPFAH_1H.als
JB-UQ-PA4 1H Mr. Jay Bahadur Singh

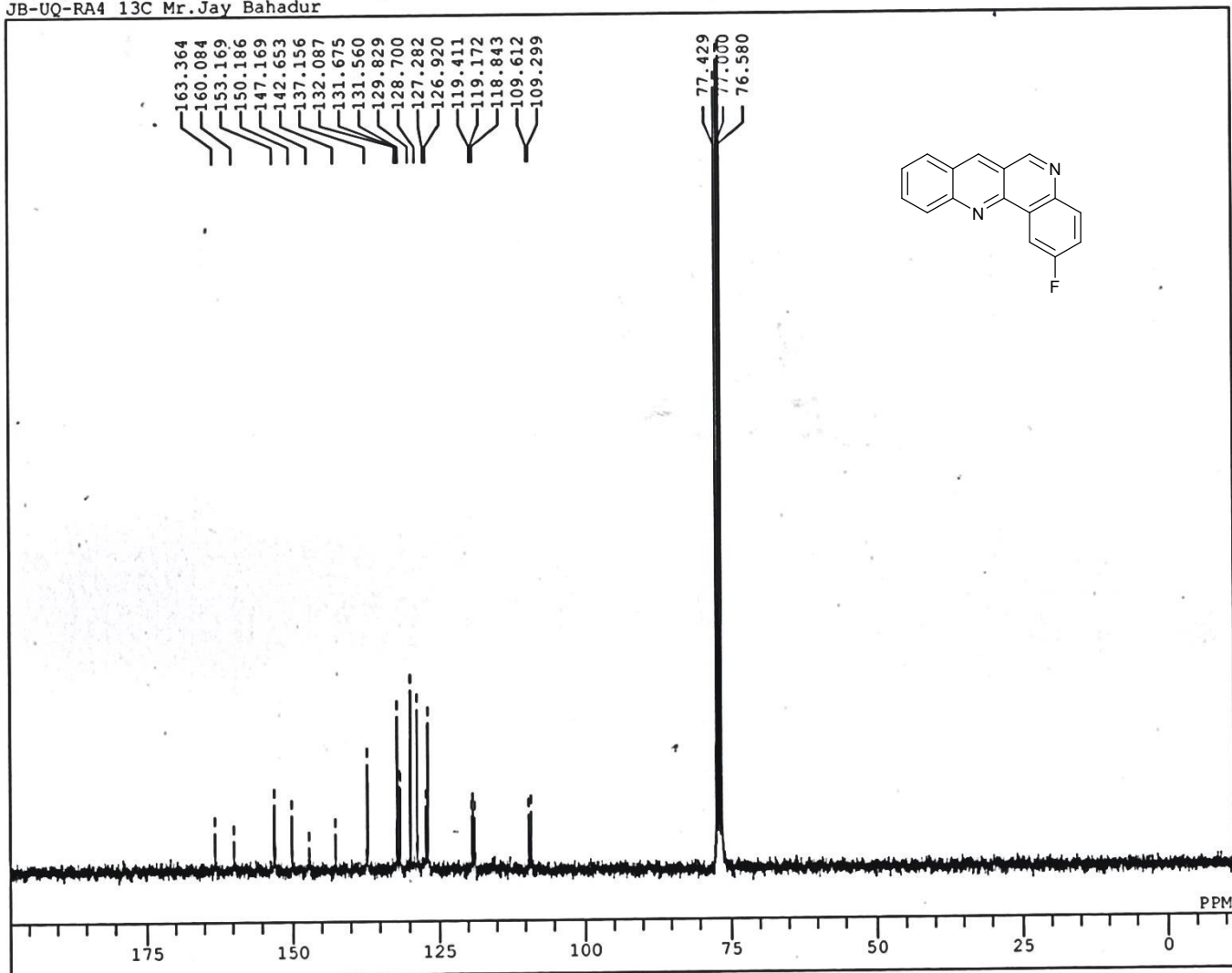


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin.

DFILE C:\Jay Bahadur\
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DATIM Mon Mar 02 13:0
OBNUC 1H
EXMOD NON
OBFRQ 300.40 MHz
OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 6016.8 Hz
SCANS 16
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PD 1.547 sec
PWL 5.0 us
IRNUC 1H
CTEMP 23.6 c
SLVNT CDCL3
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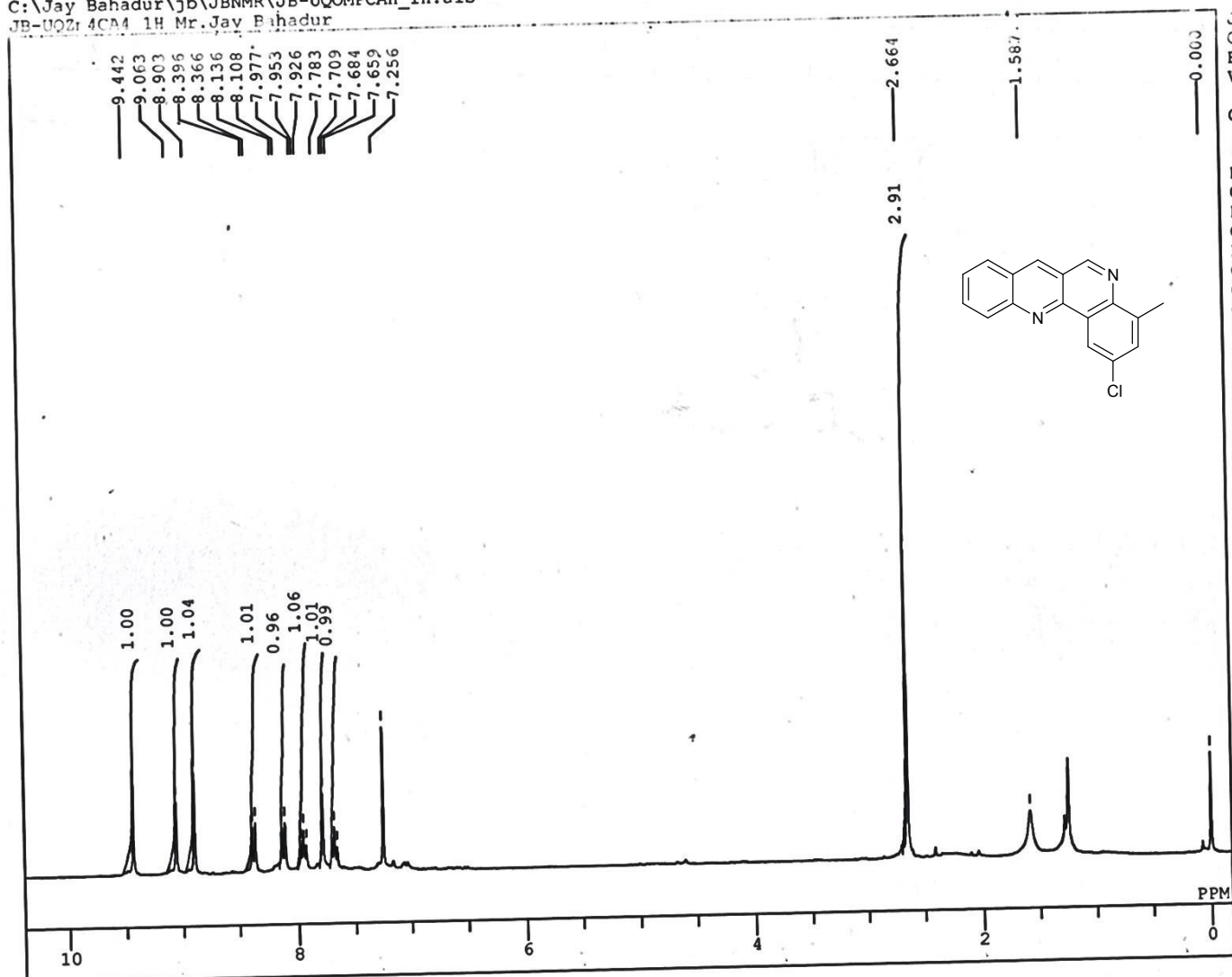


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
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VARANASI-221005

Operator : Nagendra Kumar
Shishir Sinha

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POINT 32768
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SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 22.1 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.22 Hz
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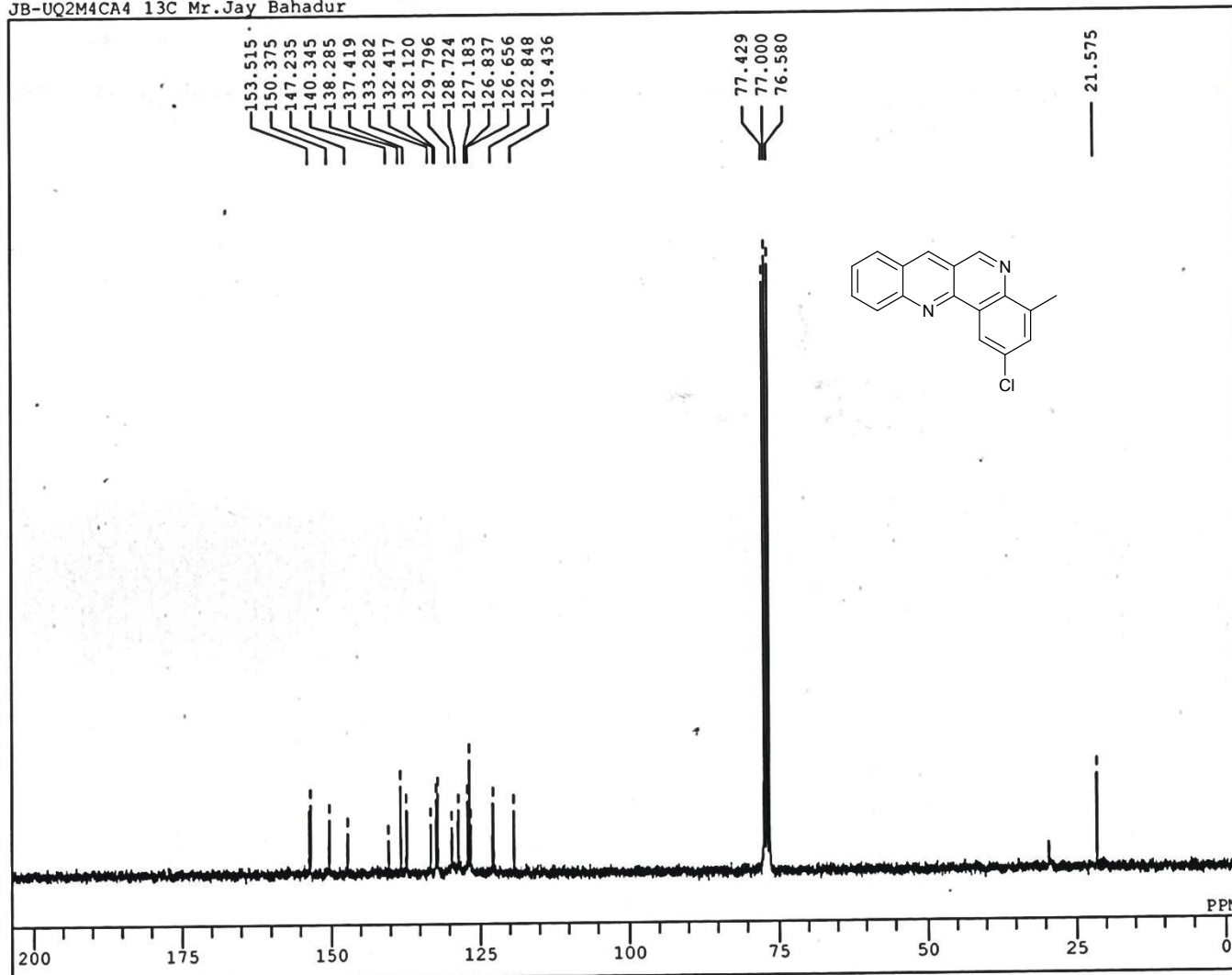


JEOL AL300 FTNMR
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Banaras Hindu University
VARANASI-221005

Operator : Nagendra Kumar
Shishir Sinha

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FREQU 6016.8 Hz
SCANS 16
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PD 1.547 sec
PWL 5.0 us
IRNUC 1H
CTEMP 26.3 c
SLVNT CDCL3
EXREF 0.00 ppm
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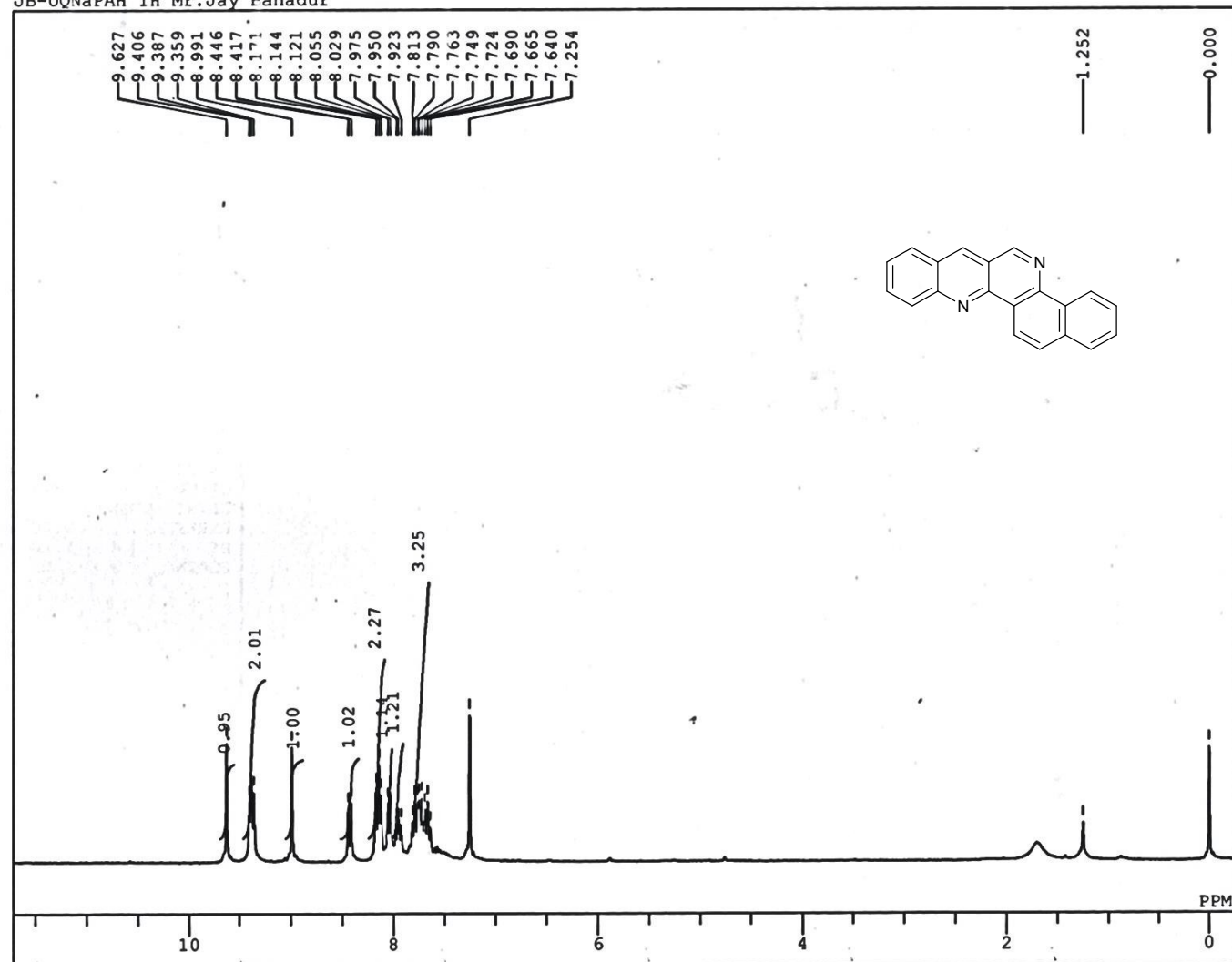


JEOL AL300 FTNMR
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VARANASI-221005

Operator : Nagendra Kumar
Shishir Sinha

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DATIM Wed Apr 22 19:51
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OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 27.9 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 23

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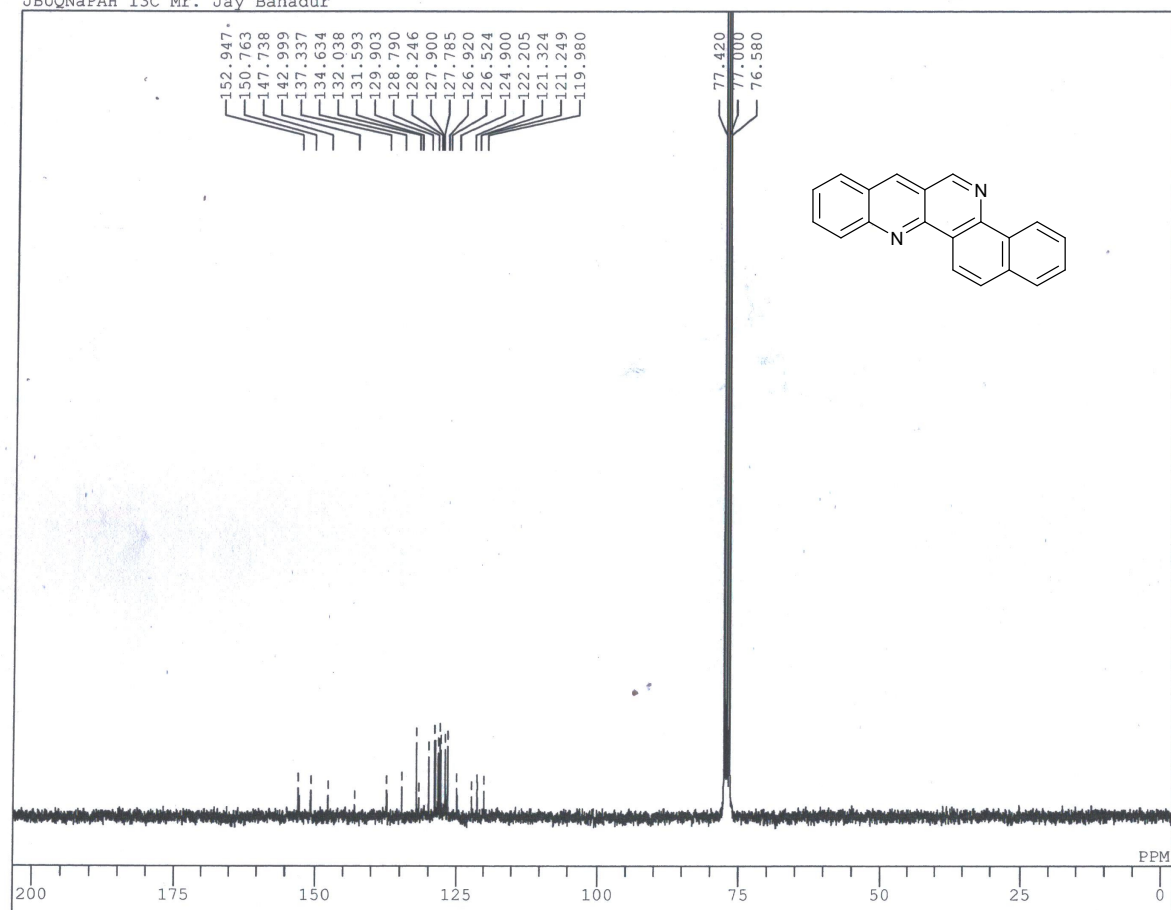


JEOL AL300 FTNMR
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Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin.

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OBNUC 1H
EXMOD NON
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OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 6016.8 Hz
SCANS 16
ACQTM 5.446 sec
PD 1.547 sec
PW1 5.0 us
IRNUC 1H
CTEMP 23.9 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
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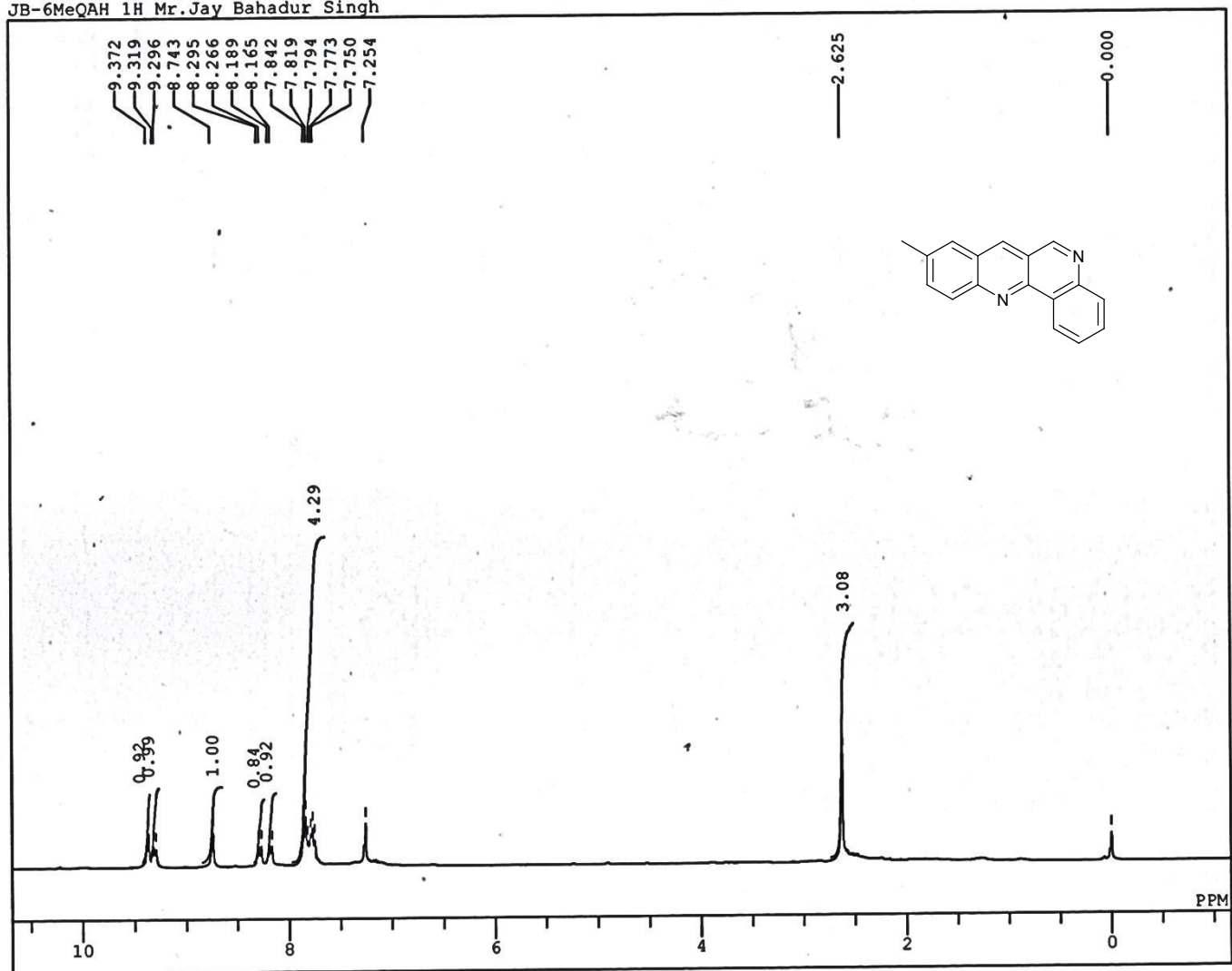


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin.

DFILE C:\Jay Bahadur\
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DATIM Tue Jul 14 00:1
OBNUC 13C
EXMOD BCM
OBFRQ 75.45 MHz
OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 25.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 23

C:\Jay Bahadur\jb\JBNMR\JB-6MQAH 1H.als
JB-6MeQAH 1H Mr. Jay Bahadur Singh

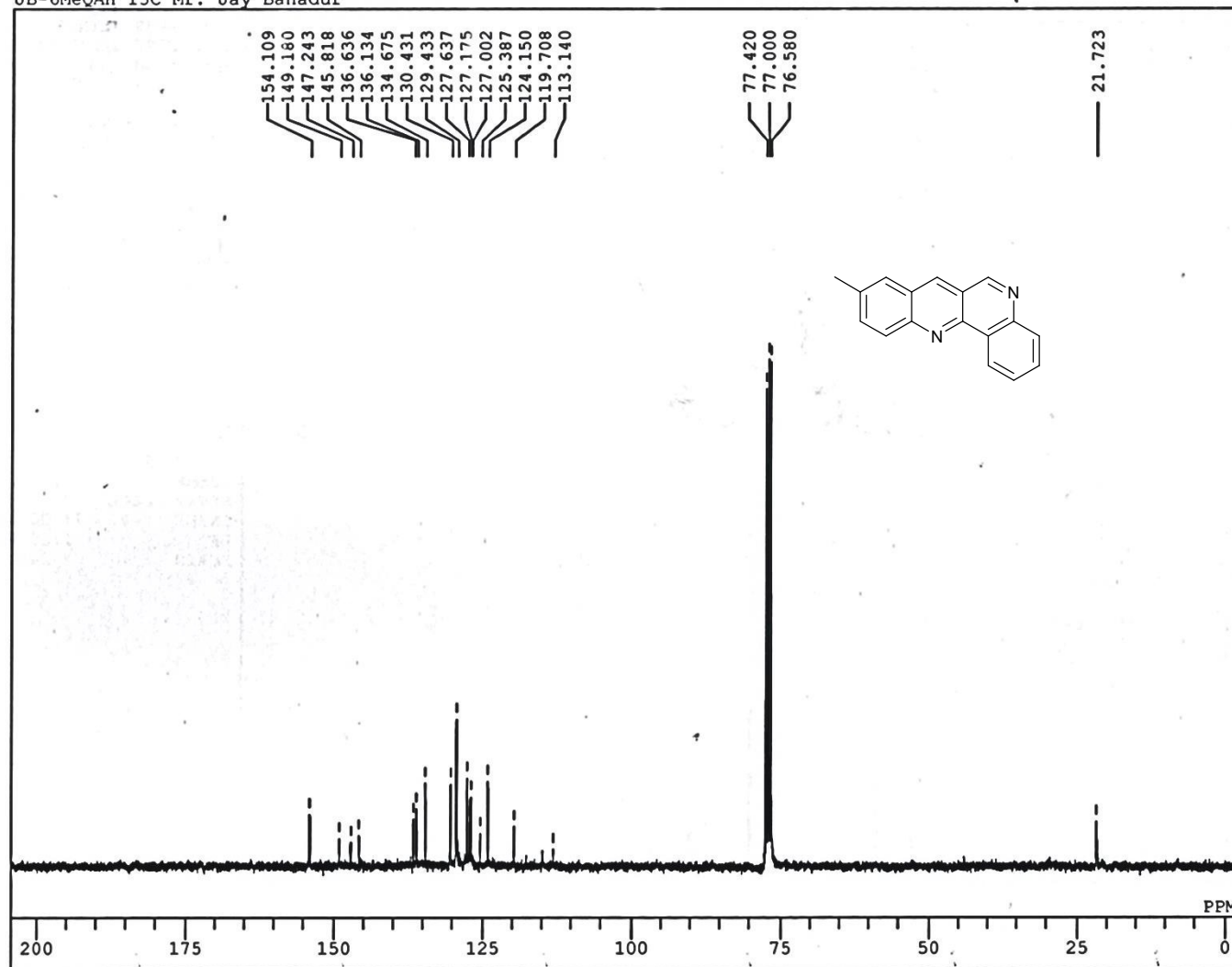


JEOL AL300 FTNMR
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VARANASI-221005

Operator : Nagendra Ku
Shishir Sin

DFILE C:\Jay Bahadur\
COMNT JB-6MeQAH 1H Mr
DATIM Tue Apr 22 17:3
OBNUC 1H
EXMOD NON
OBFRQ 300.40 MHz
OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 9505.7 Hz
SCANS 28
ACQTM 3.447 sec
PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 19.6 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
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JB-6MeQAH 13C Mr. Jay Bahadur

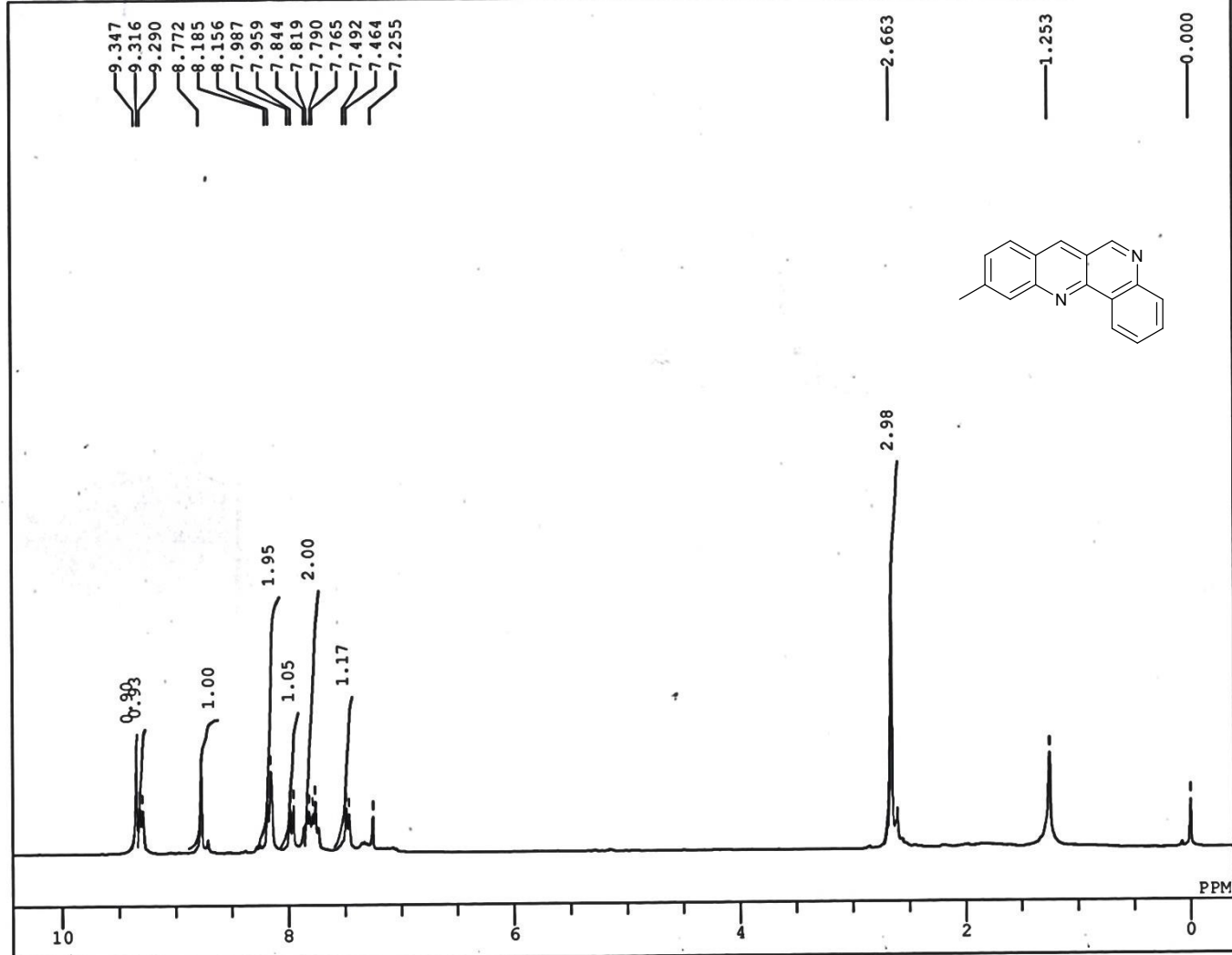


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin.

DFILE C:\Jay Bahadur\
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DATIM Wed Apr 23 20:1.
OBNUC 13C
EXMOD BCM
OBFRQ 75.45 MHz
OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 6.0 us
IRNUC 1H
CTEMP 20.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24

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JB-7MQAH 1H Mr.Jay Bahadur

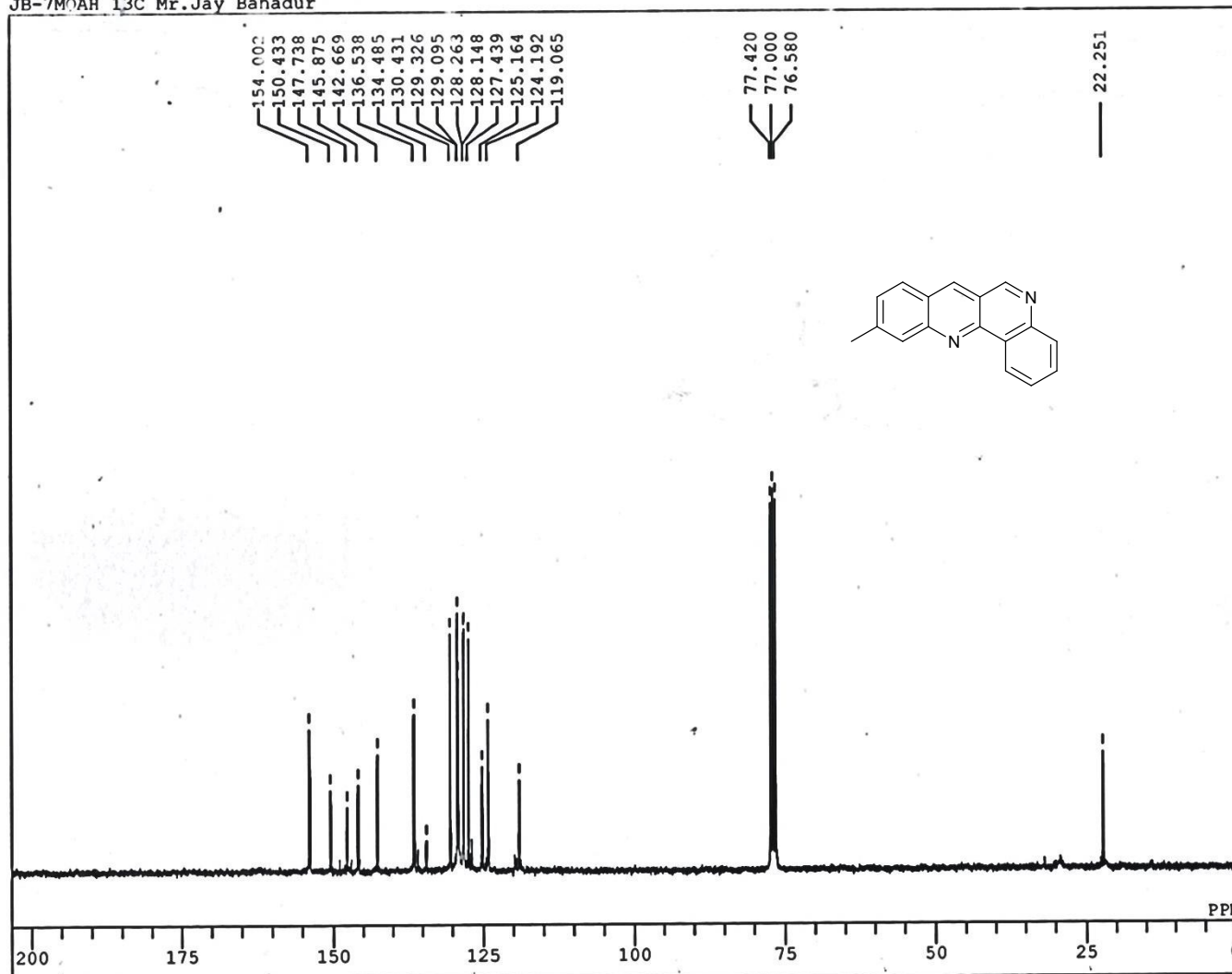


JEOL AL300 FTNMR
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Banaras Hindu University
VARANASI-221005

Operator : Nagendra Kumar
Shishir Sinha

DFILE C:\Jay Bahadur\JB-7MQAH_1H Mr.
COMNT JB-7MQAH_1H Mr.
DATIM Tue Aug 18 14:01
OBNUC 1H
EXMOD NON
OBFRQ 300.40 MHz
OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 6016.8 Hz
SCANS 16
ACQTM 5.446 sec
PD 1.547 sec
PW1 5.0 us
IRNUC 1H
CTEMP 24.9 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 20

C:\Jay Bahadur\jb\JBNMR\JB-7MQAH_13C.als
JB-7MQAH 13C Mr. Jay Bahadur

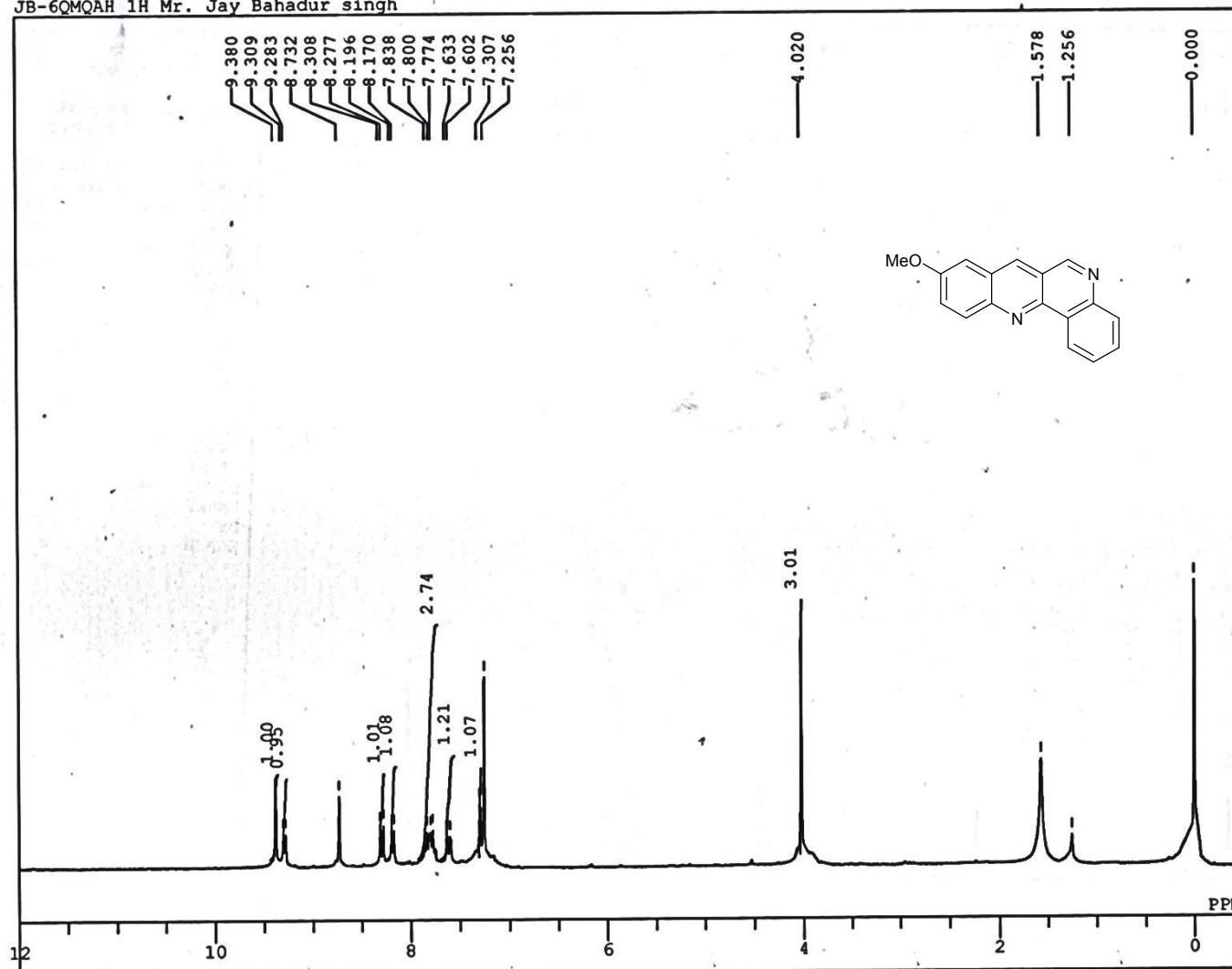


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Kw
Shishir Sin

DFILE C:\Jay Bahadur\
COMNT JB-7MQAH 13C Mr
DATIM Thu Aug 20 02:1
OBNUC 13C
EXMOD BCM
OBFRQ 75.45 MHz
OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2500
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 26.3 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 23

C:\Jay Bahadur\jb\JBNMR\JB-60MQAH 1H.als
JB-60MQAH 1H Mr. Jay Bahadur singh

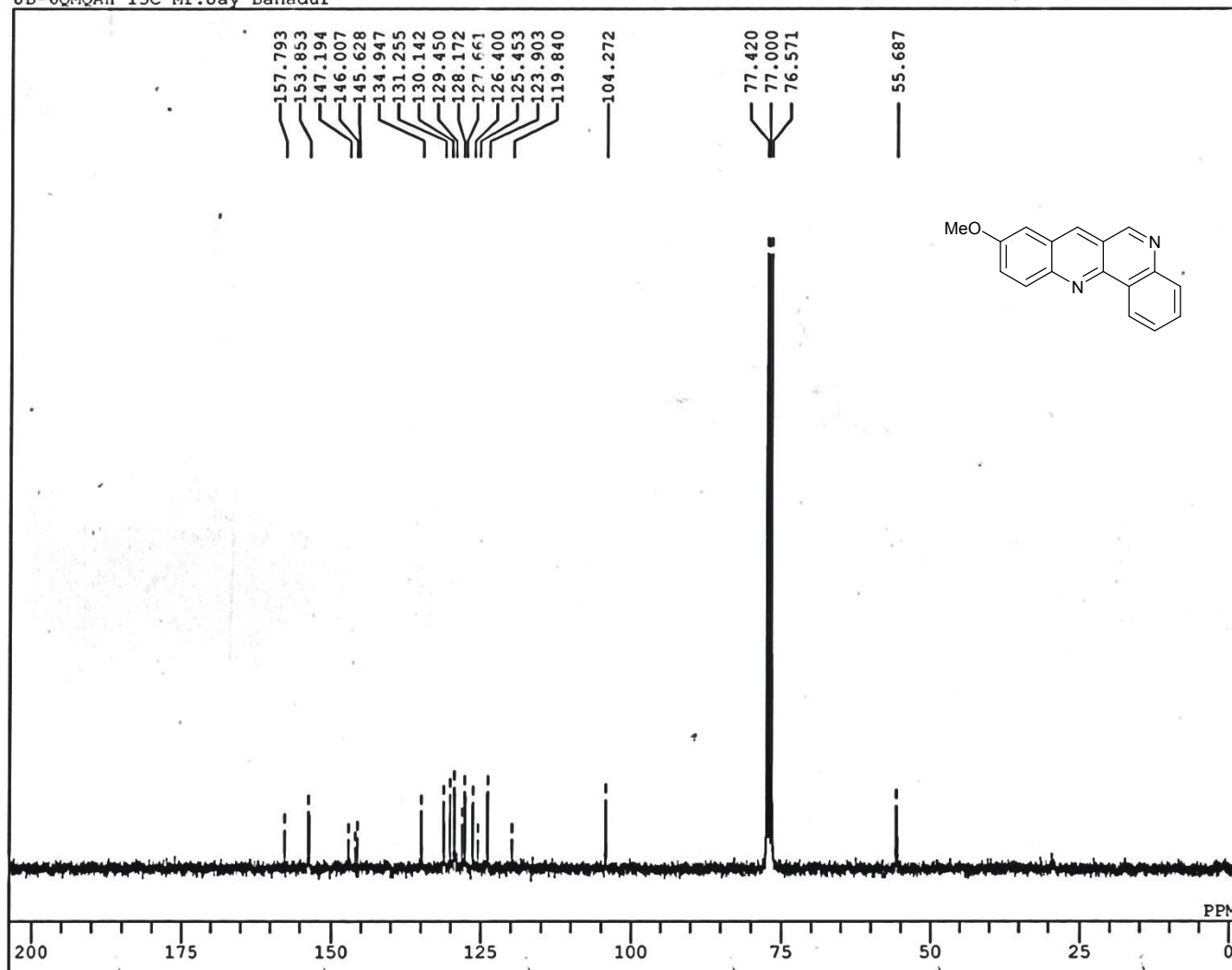


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin

DFILE C:\Jay Bahadur\
COMNT JB-60MQAH 1H Mr
DATIM Wed Jul 16 13:51
OBNUC 1H
EXMOD NON
OBFRQ 300.40 MHz
OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 6016.8 Hz
SCANS 32
ACQTM 5.446 sec
PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 24.5 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 25

C:\Jay Bahadur\jb\JBNMR\JB-6OMQAH_13C.als
JB-6OMQAH 13C Mr.Jay Bahadur

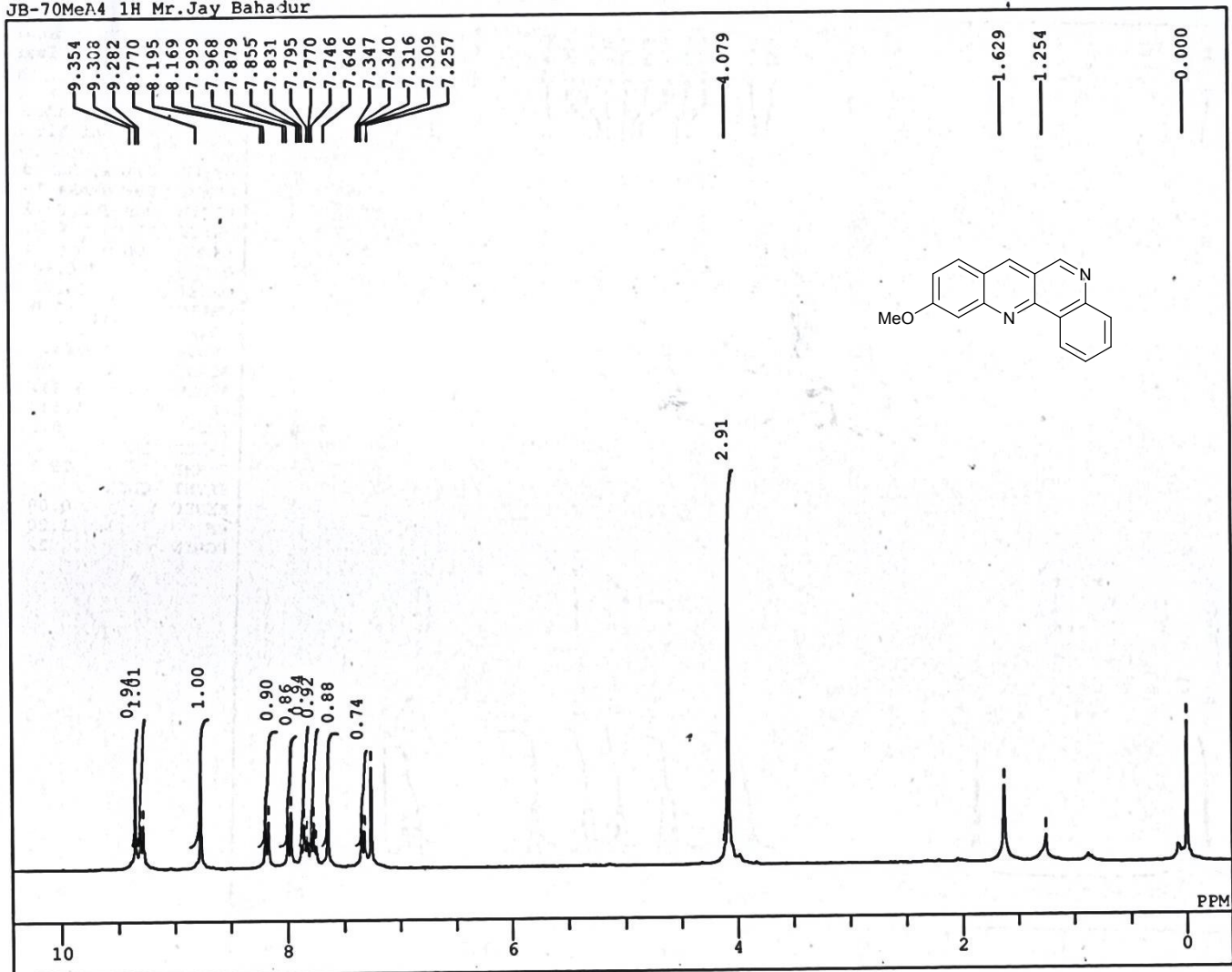


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin

DFILE C:\Jay Bahadur\
COMNT JB-6OMQAH 13C M:
DATIM Thu Jul 24 05:0:
OBNUC 13C
EXMOD BCM
OBFRQ 75.45 MHz
OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 6.0 us
IRNUC 1H
CTEMP 22.8 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24

C:\Jay Bahadur\jb\JBNMR\JB-70MQAH_1H.als
JB-70MeA4 1H Mr. Jay Bahadur

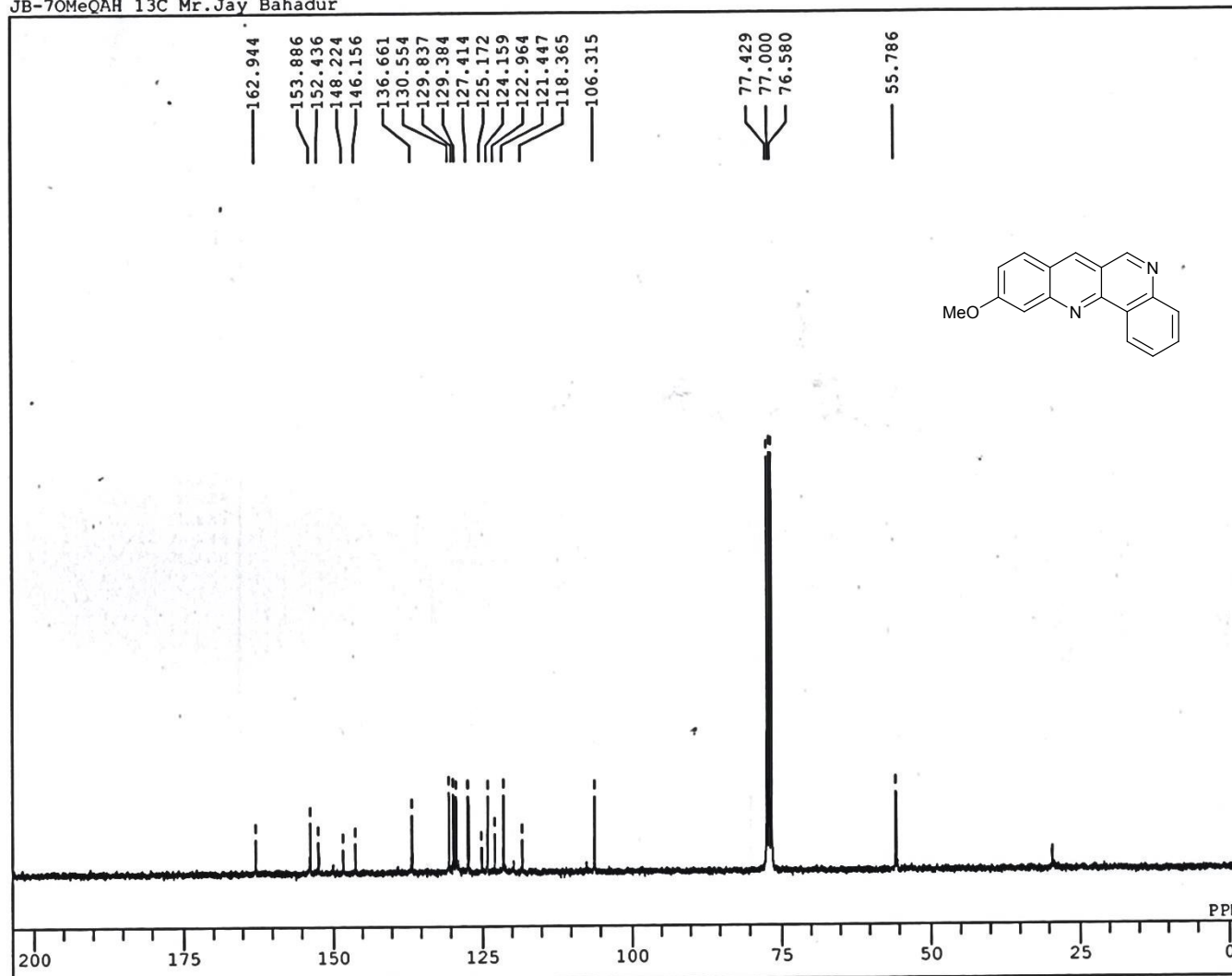


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin

DFILE C:\Jay Bahadur\
COMNT JB-70MeA4 1H Mr
DATIM Mon Feb 03 16:5
OBNUC 1H
EXMOD NON
OBFRQ 300.40 MHz
OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 9505.7 Hz
SCANS 66
ACQTM 3.447 sec
PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 20.1 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 22

C:\Jay Bahadur\JB-7OMeQAH_13C.als
JB-7OMeQAH 13C Mr.Jay Bahadur

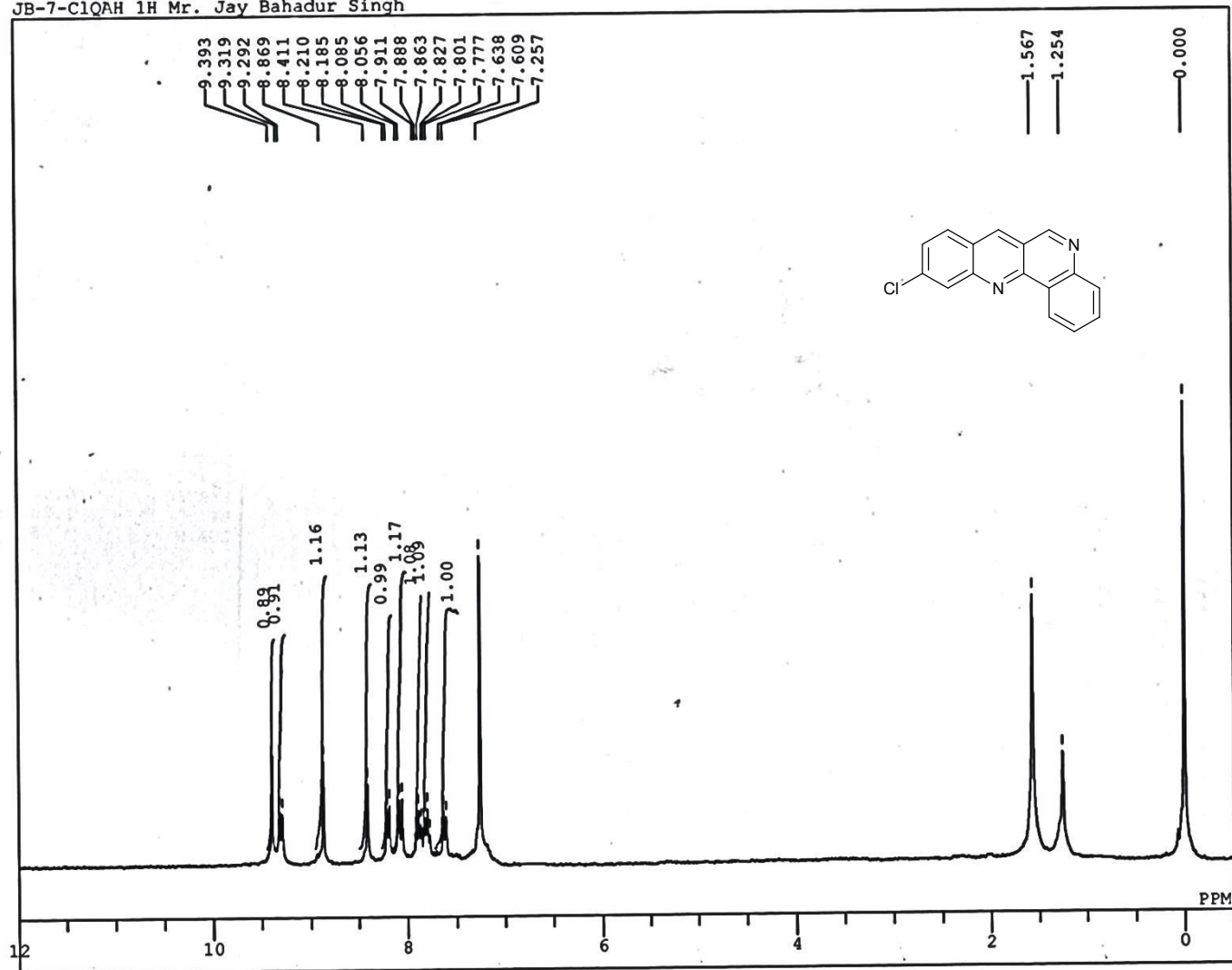


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin

DFILE C:\Jay Bahadur\
COMNT JB-7OMeQAH_13C I
DATIM Fri Nov 06 04:5
OBNUC 13C
EXMOD BCM
OBFRQ 75.45 MHz
OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 3500
ACQTM 1.606 sec
PD 1.394 sec
PW1 5.0 us
IRNUC 1H
CTEMP 23.7 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24

C:\Jay Bahadur\jb\JBNMR\JB-7CQAH 1H.als
JB-7-ClQAH 1H Mr. Jay Bahadur Singh

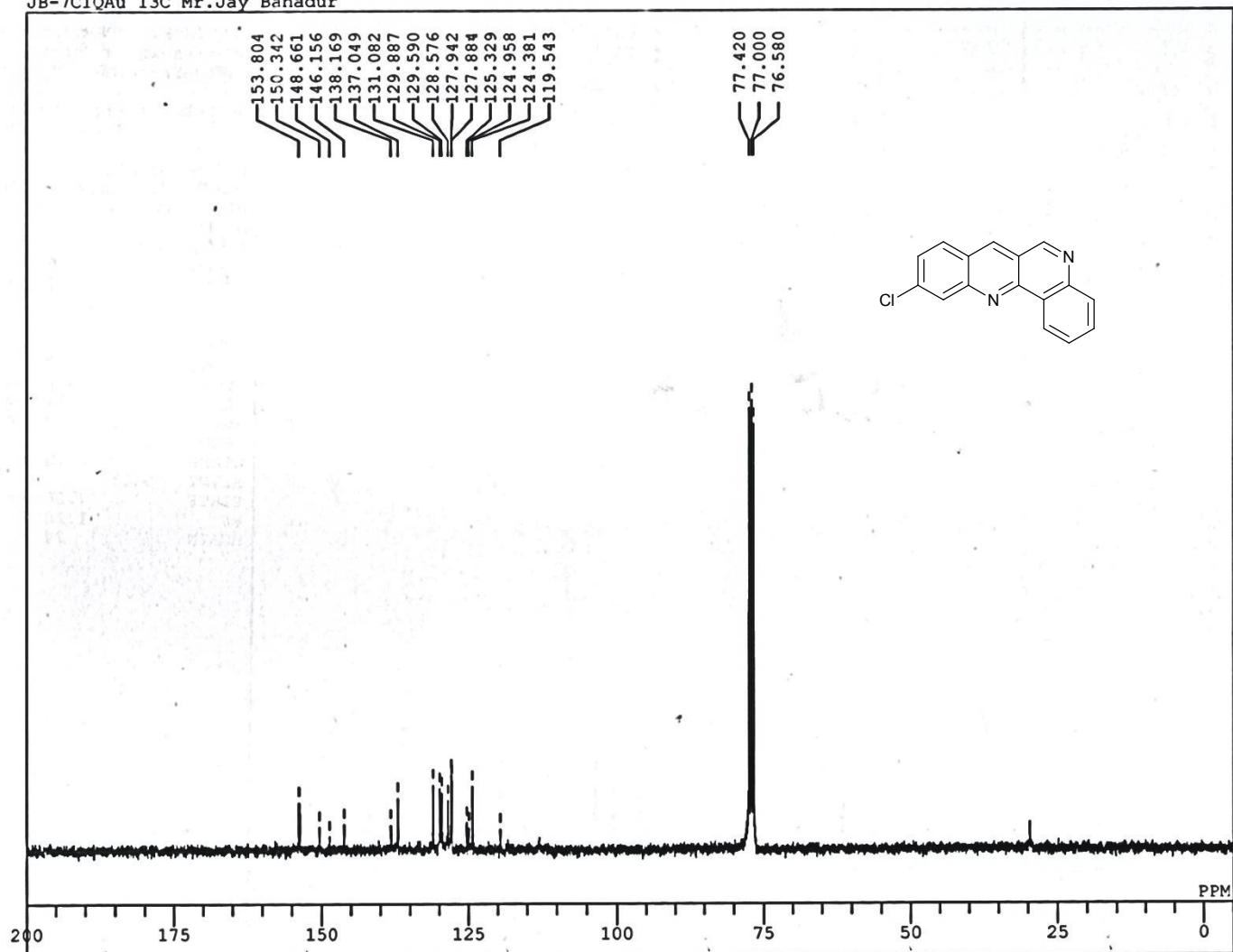


JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Kumar
Shishir Sinha

DFILE C:\Jay Bahadur\JB-7-ClQAH 1H M:
COMNT Thu Jul 03 11:20
OBNUC 1H
EXMOD NON
OBFRQ 300.40 MHz
OBSET 130.00 KHz
OBFIN 1150.0 Hz
POINT 32768
FREQU 6016.8 Hz
SCANS 16
ACQTM 5.446 sec
PD 1.547 sec
PW1 5.2 us
IRNUC 1H
CTEMP 22.8 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 25

C:\Jay Bahadur\jb\JBNMR\JB-7CQAH_13C.als
JB-7ClQAu 13C Mr. Jay Bahadur



JEOL AL300 FTNMR
CHEMISTRY DEPARTMENT
Banaras Hindu University
VARANASI-221005

Operator : Nagendra Ku
Shishir Sin.

DFILE C:\Jay Bahadur\
COMNT JB-7ClQAu 13C M
DATIM Mon Jul 07 23:3
OBNUC 13C
EXMOD BCM
OBFRQ 75.45 MHz
OBSET 124.00 KHz
OBFIN 1840.0 Hz
POINT 32768
FREQU 20408.1 Hz
SCANS 2000
ACQTM 1.606 sec
PD 1.394 sec
PW1 6.0 us
IRNUC 1H
CTEMP 22.8 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24

