

Electronic Supplementary Information

Ligand-Free Suzuki–Miyaura Coupling Using Ruthenium(0) Nanoparticles and a Continuously Irradiating Microwave System

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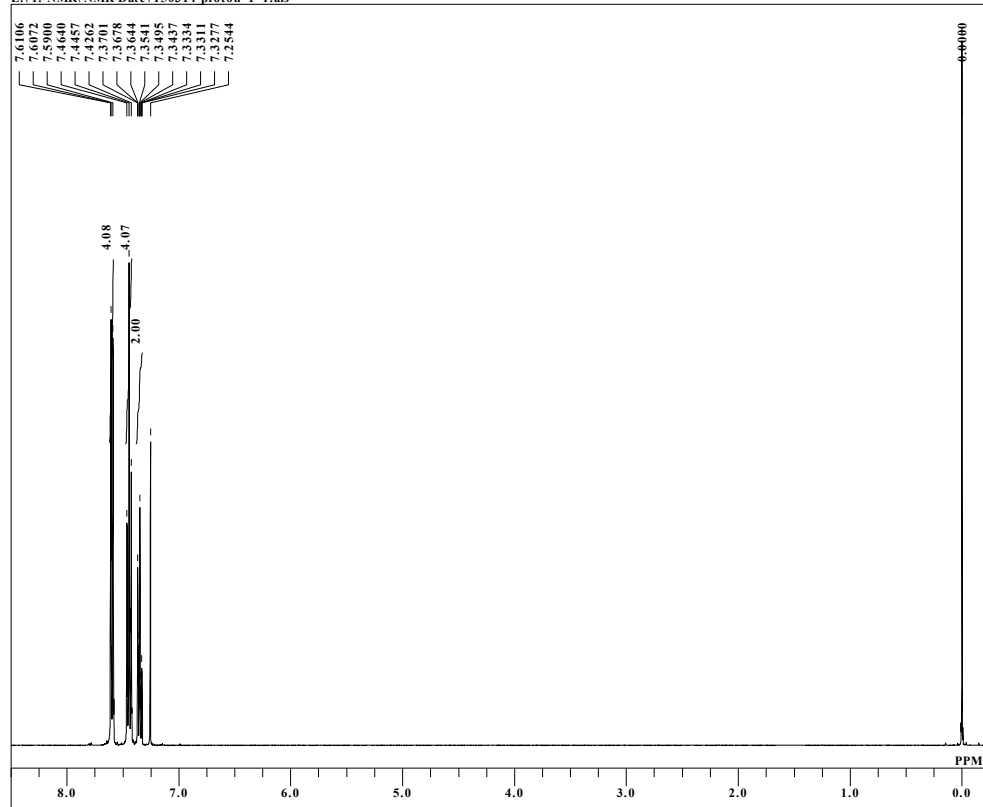
[#] Tokyo Rikakikai Co., Ltd. (Brand: EYELA), TN Koishikawa Bldg. 1-15-17 Koishikawa Bunkyo-ku, Tokyo 112-0002 Japan

*Corresponding Author. Phone: +81-6-6879-8226, Fax: +81-6-6879-8229, E-mail: arisaw@phs.osaka-u.ac.jp

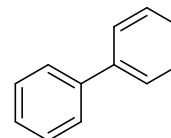
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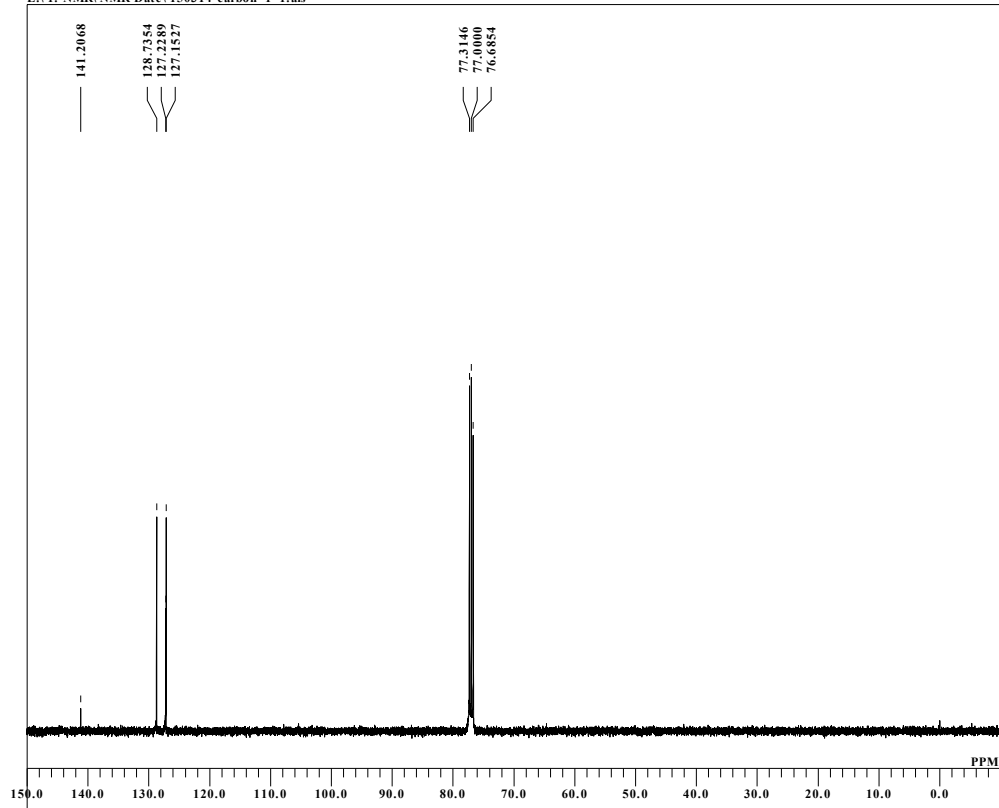


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 RGAIN 50

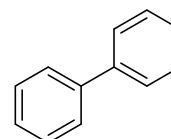


3a

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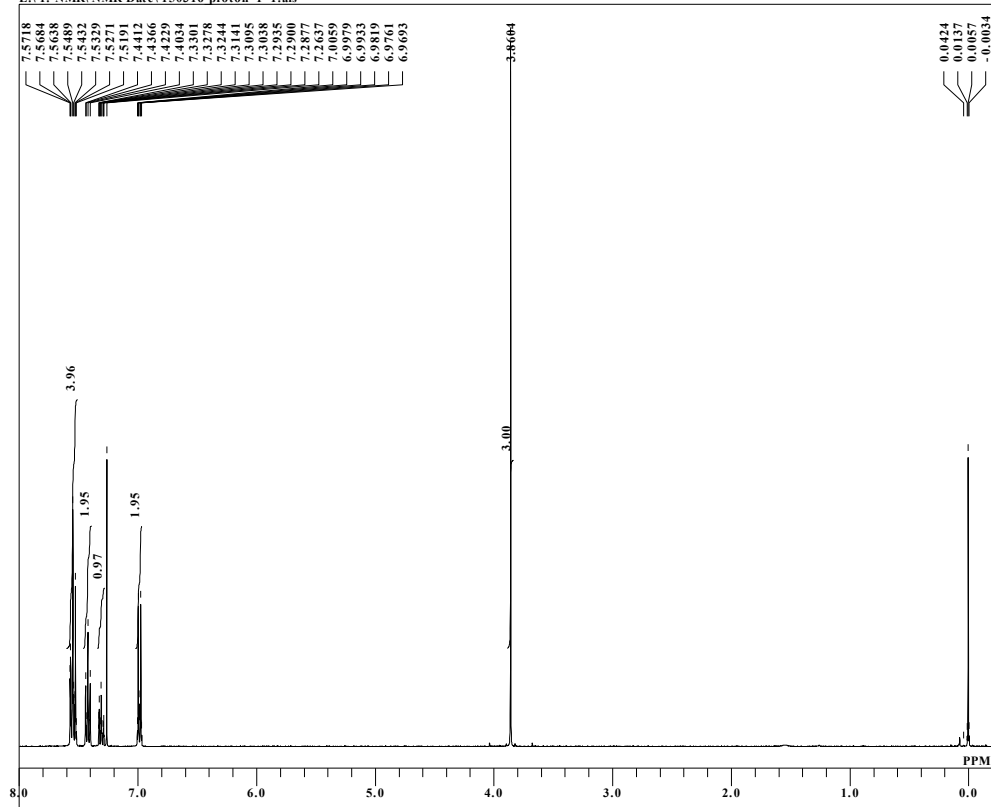


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 IRNUC 1H
 CTEMP 20.9 c
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 EXREF 77.00 ppm
 BF 0.12 Hz
 RGAIN 60

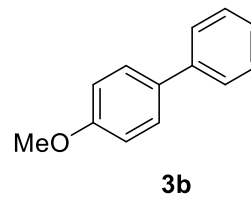


3a

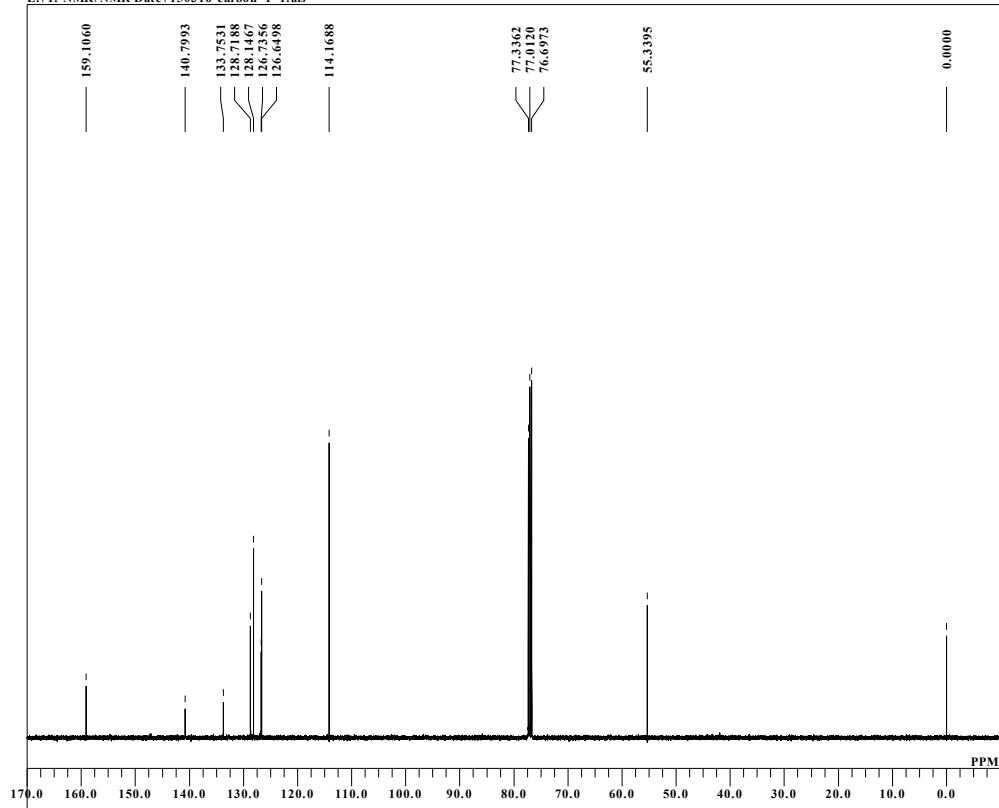
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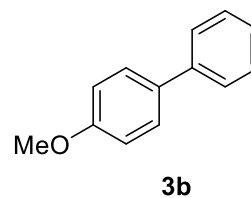
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 SCANS 16
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 BF 0.12 Hz
 RGAIN 50



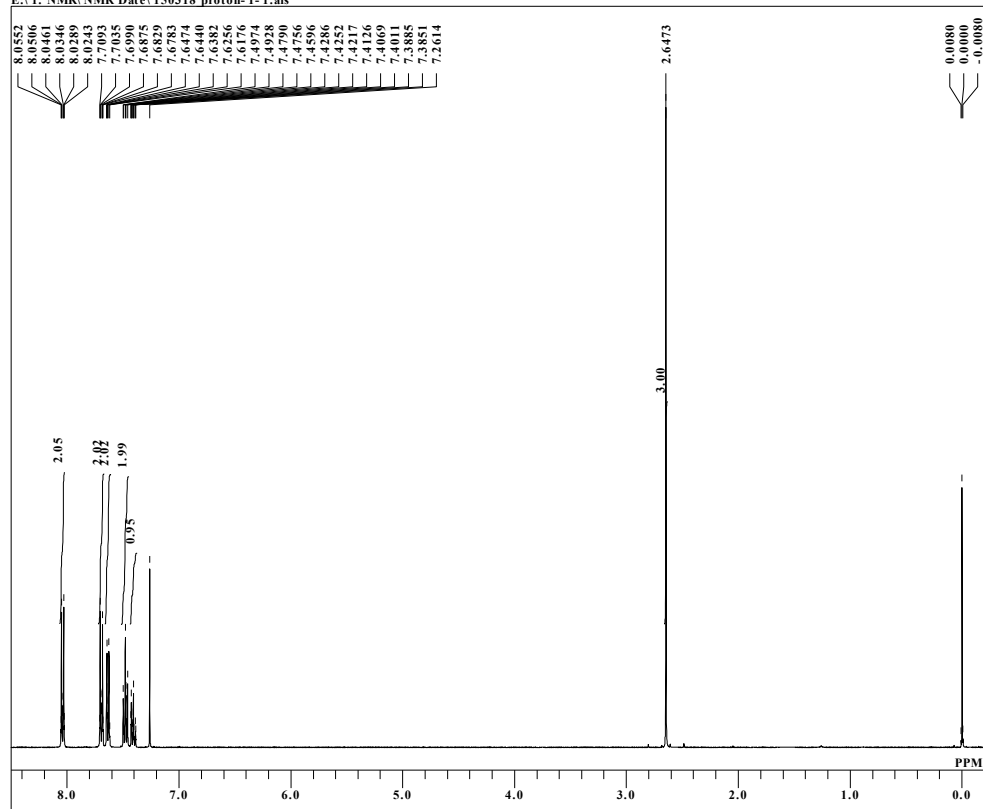
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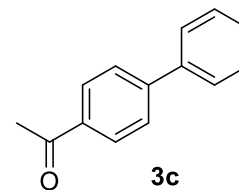
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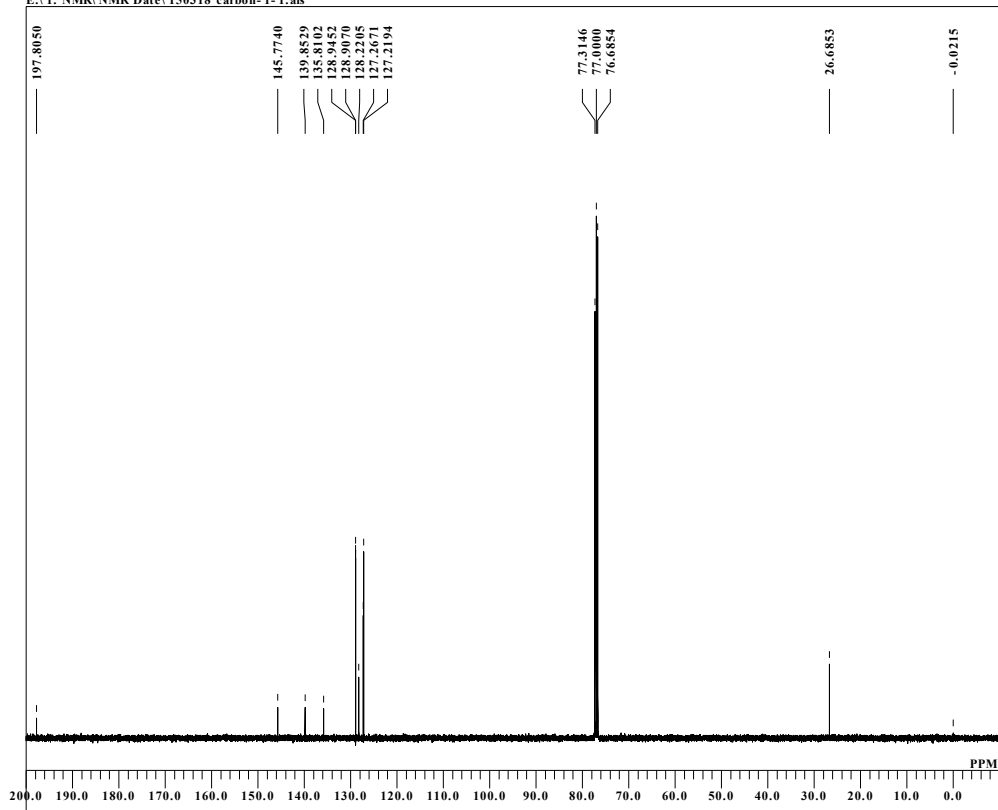
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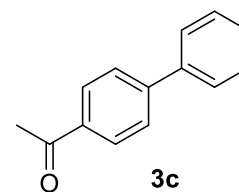
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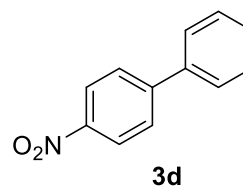
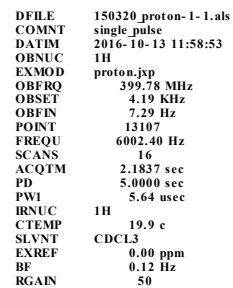
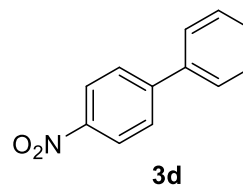
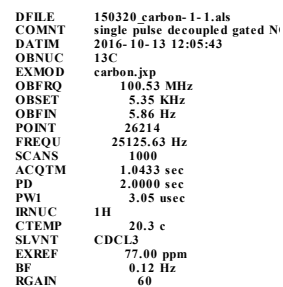


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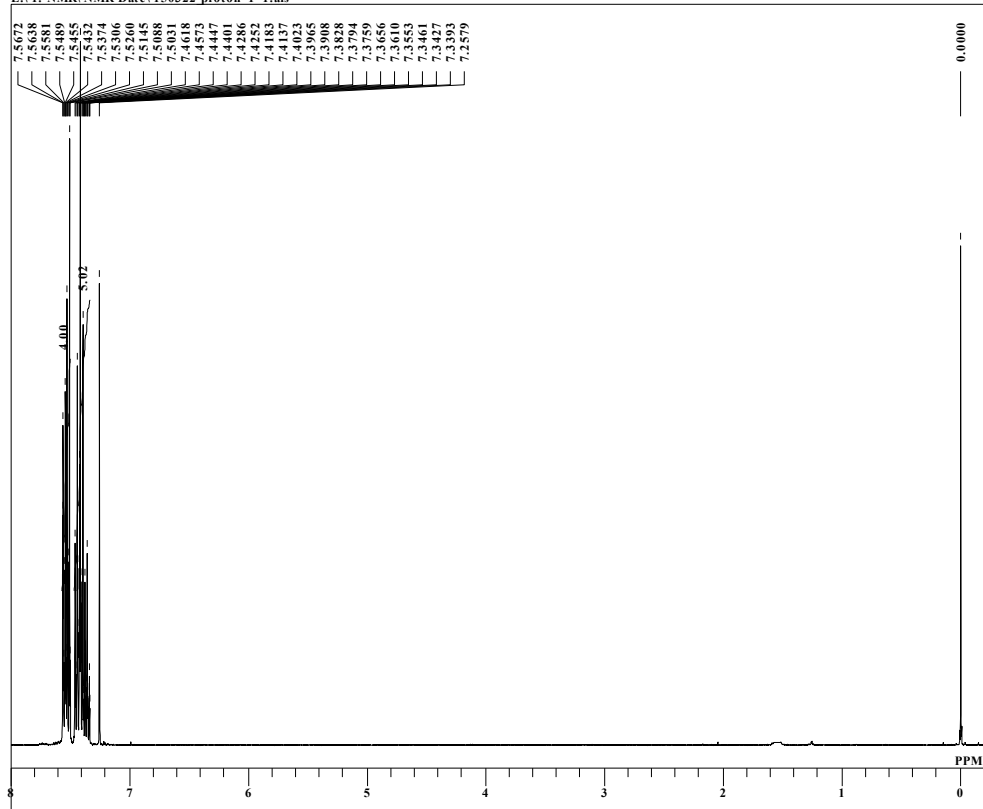


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 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
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 PW1 3.05 usec
 IRNUC 1H
 CTEMP 20.8 c
 SLVNT CDCL3
 EXREF 77.00 ppm
 BF 0.12 Hz
 RGAIN 60

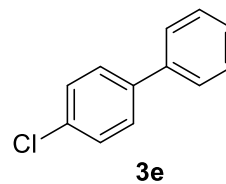




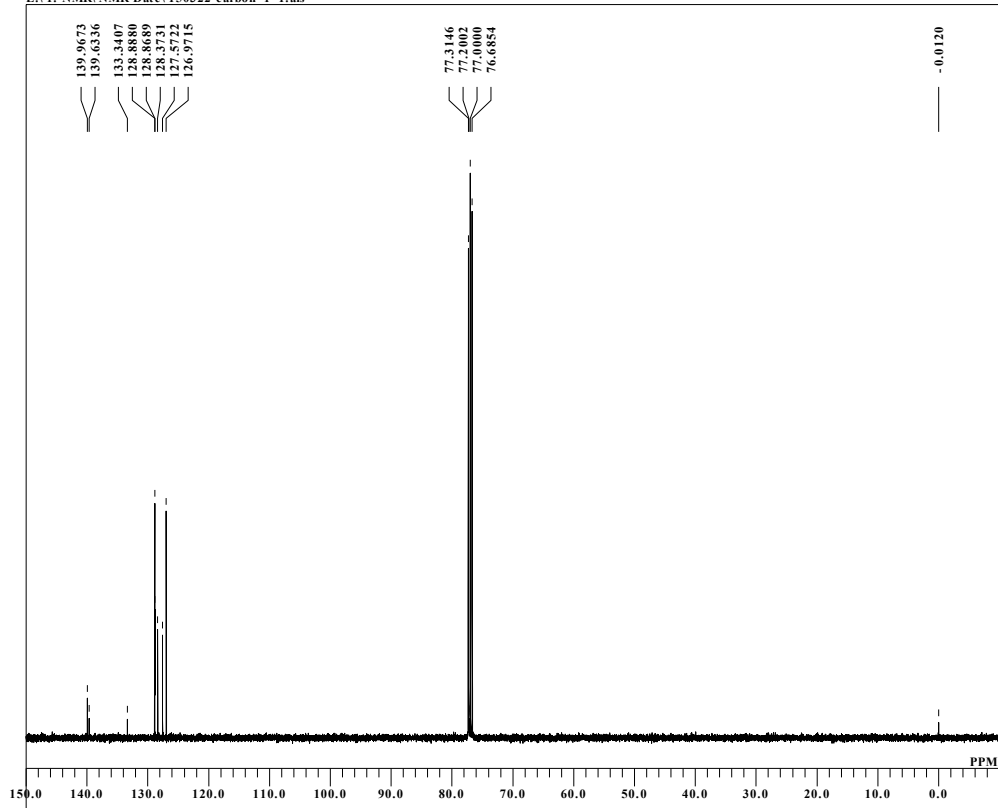
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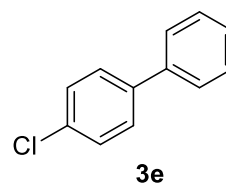
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 OBFIN 7.29 Hz
 POINT 13107
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 SCANS 16
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 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 50



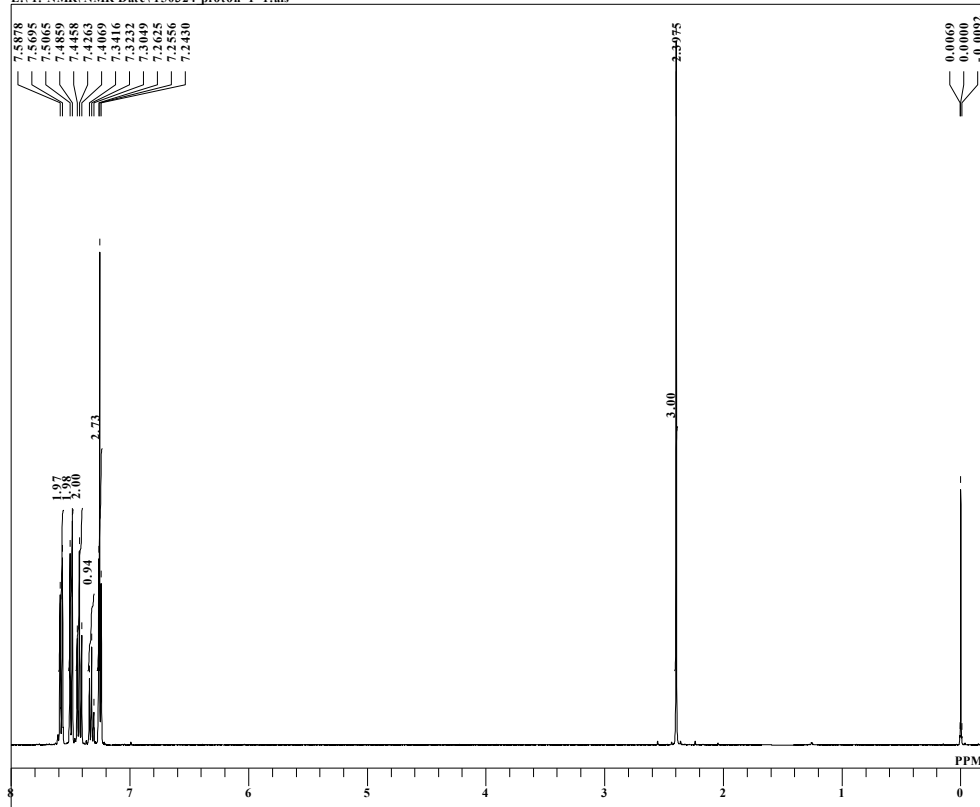
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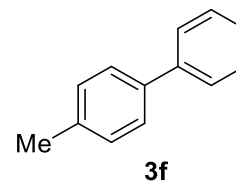
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 EXREF 77.00 ppm
 BF 0.12 Hz
 RGAIN 60



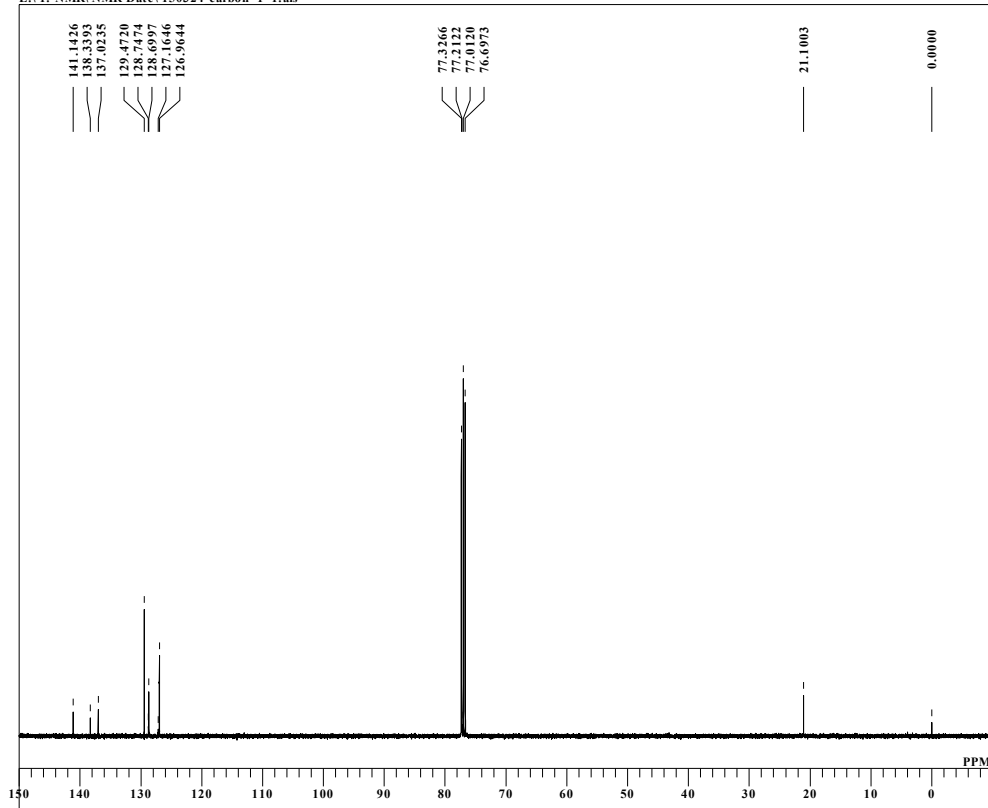
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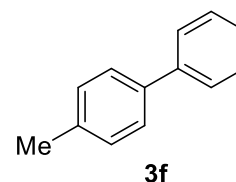
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 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 50



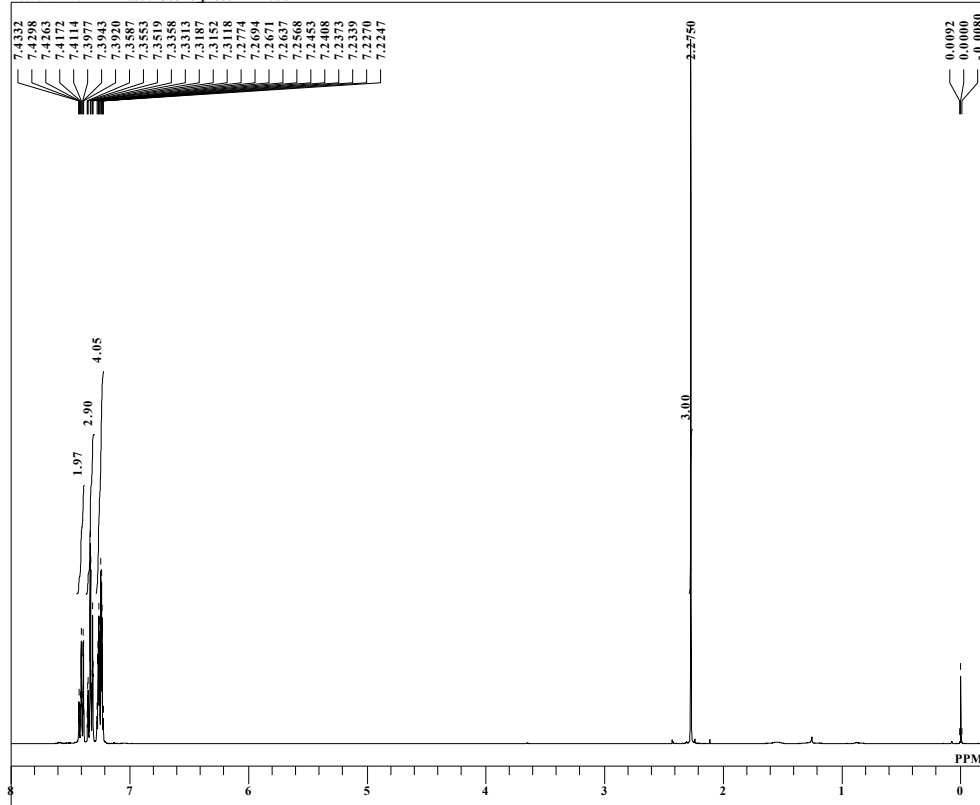
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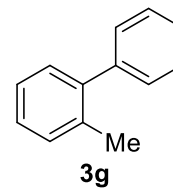
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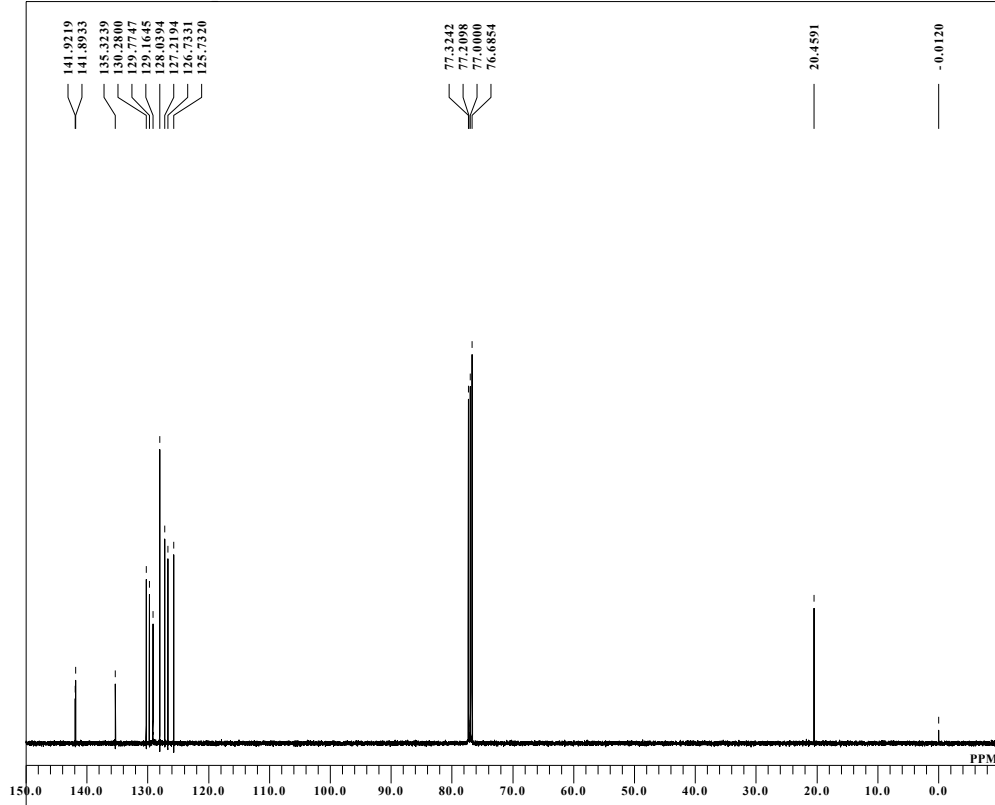
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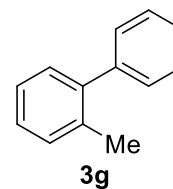
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 BF 0.12 Hz
 RGAIN 42



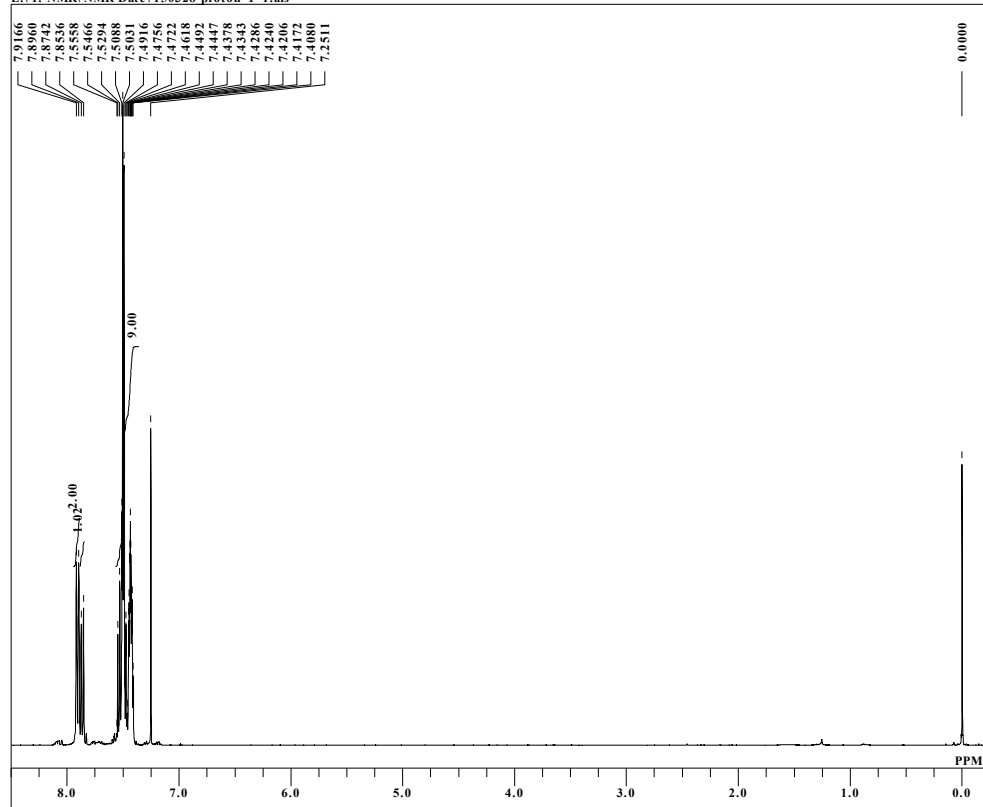
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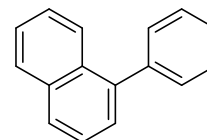
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 POINT 26214
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 PW1 3.05 usec
 IRNUC 1H
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 BF 0.12 Hz
 RGAIN 60



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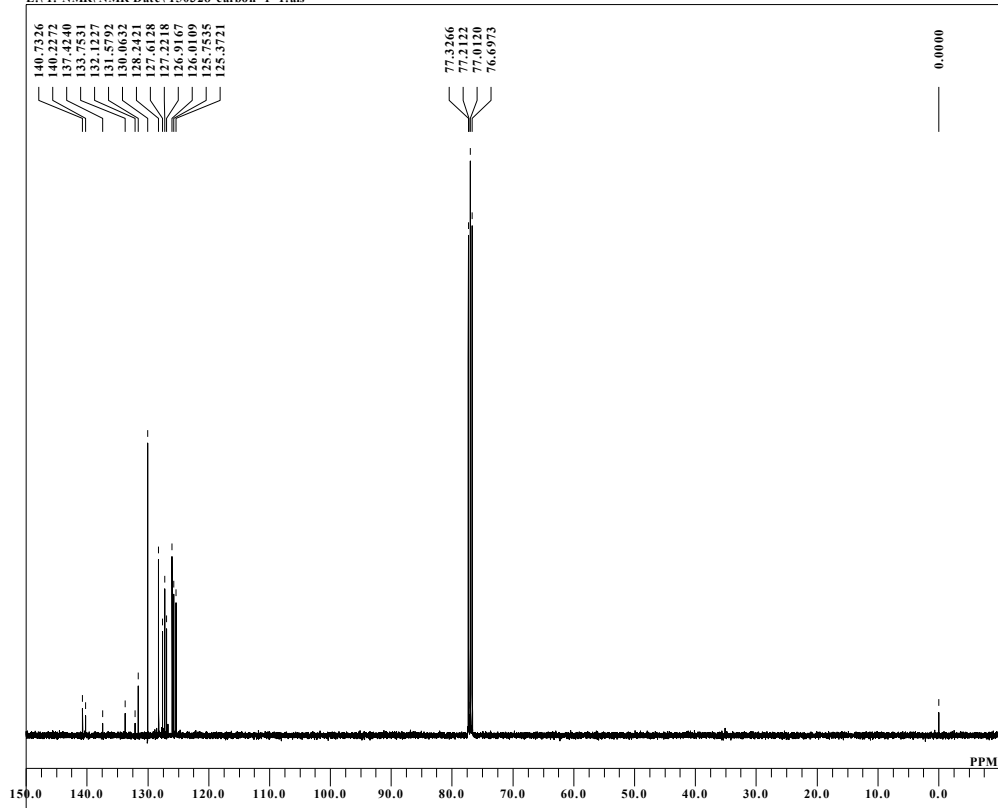


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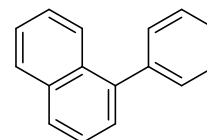


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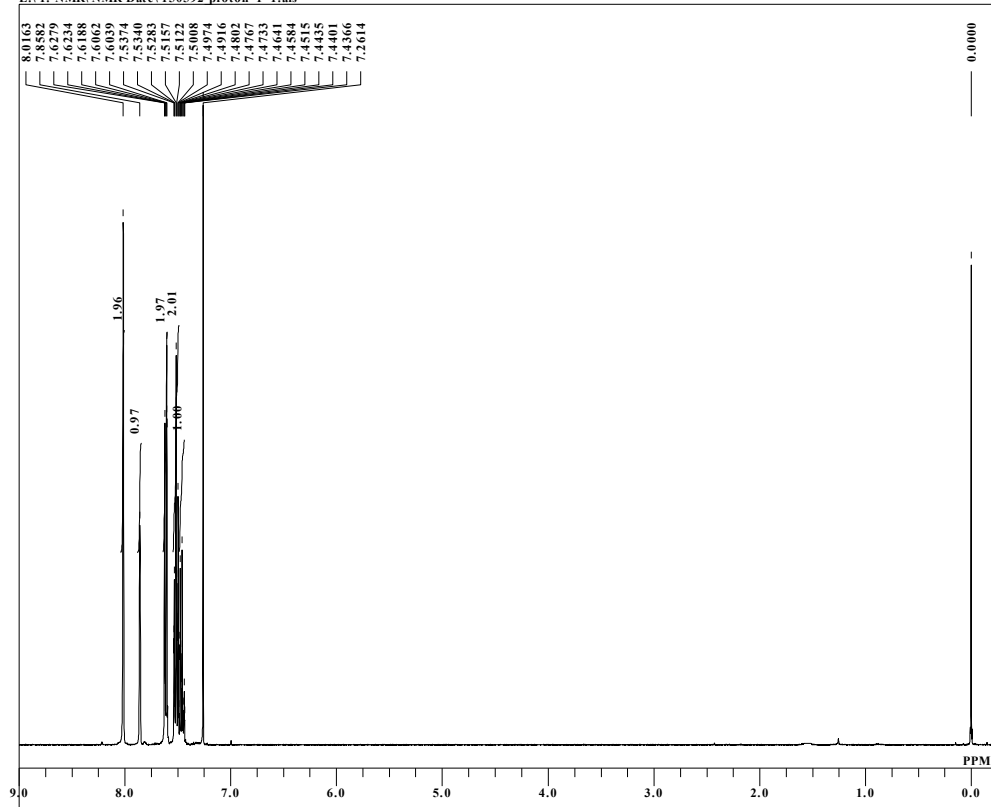


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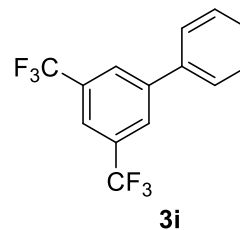


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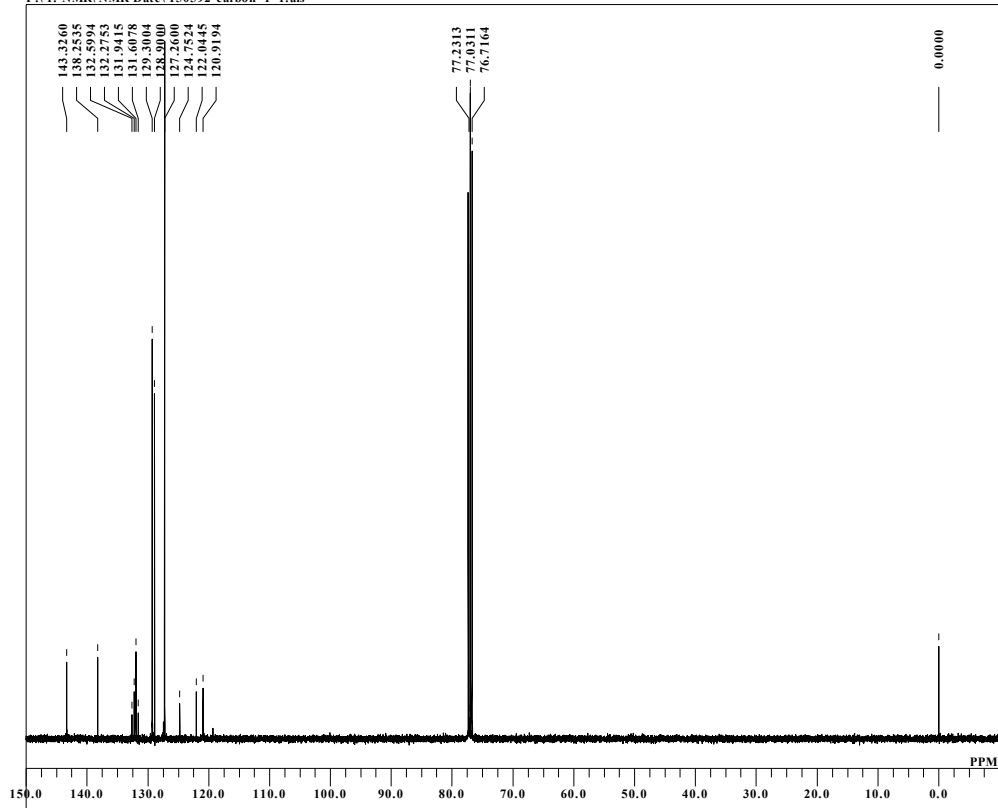
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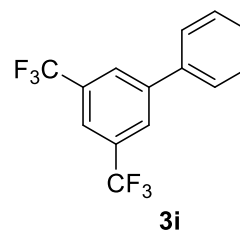
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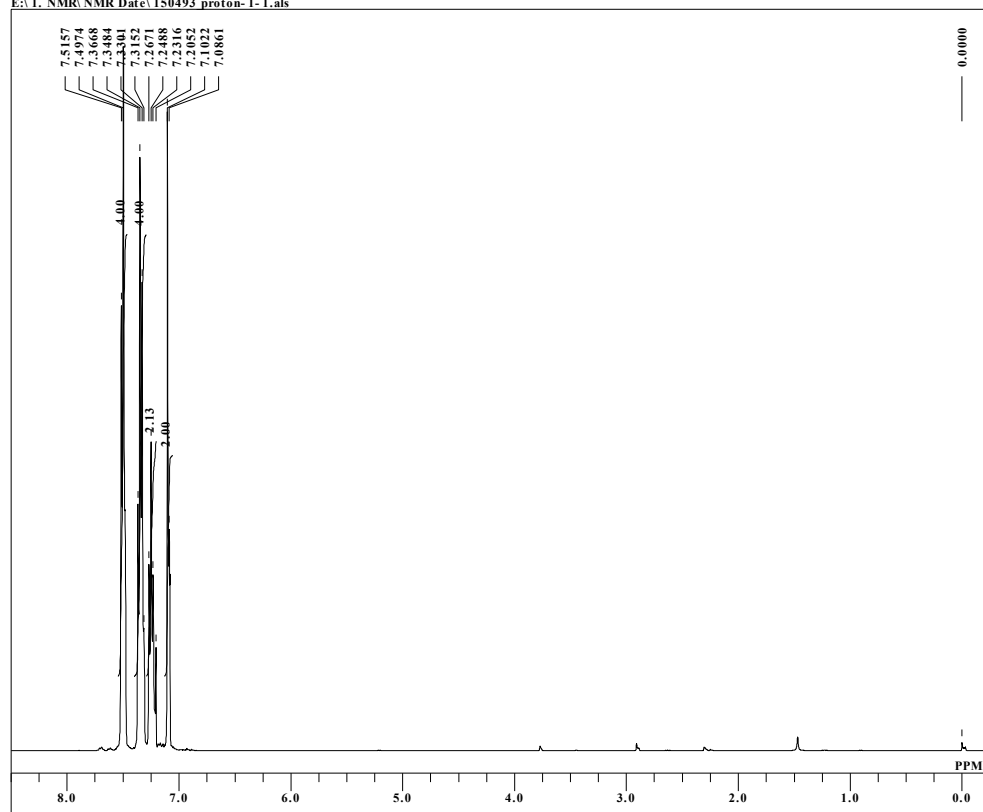
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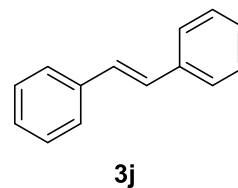
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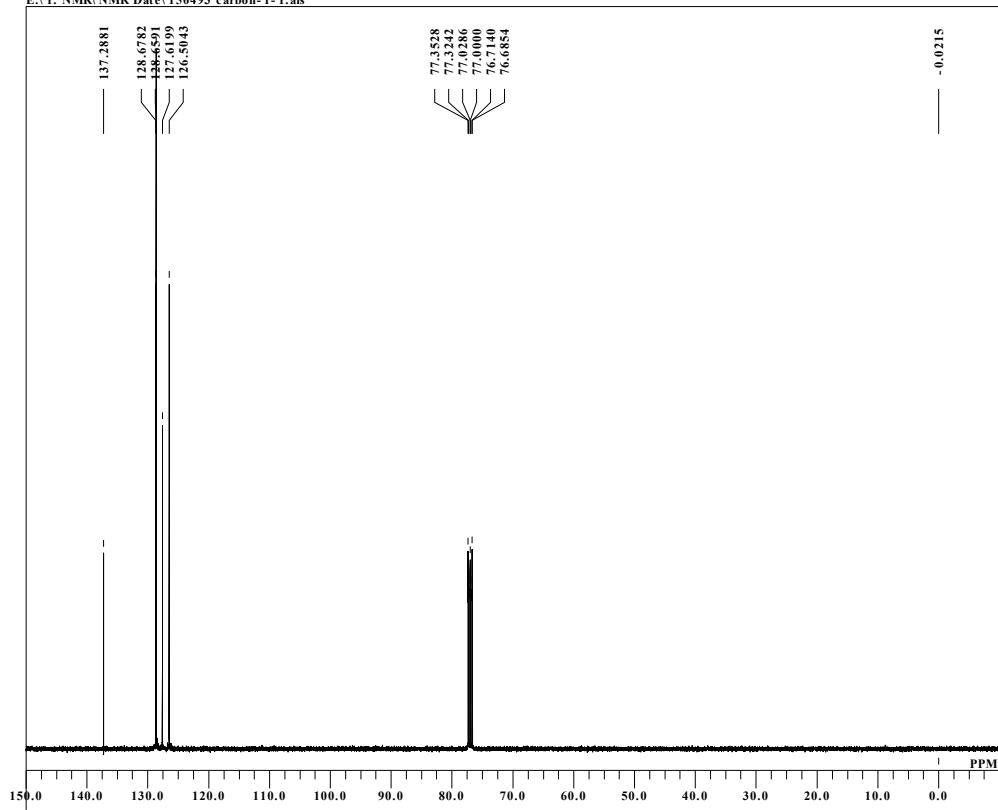
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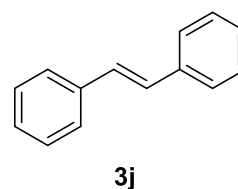
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 POINT 13107
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 BF 0.12 Hz
 RGAIN 34



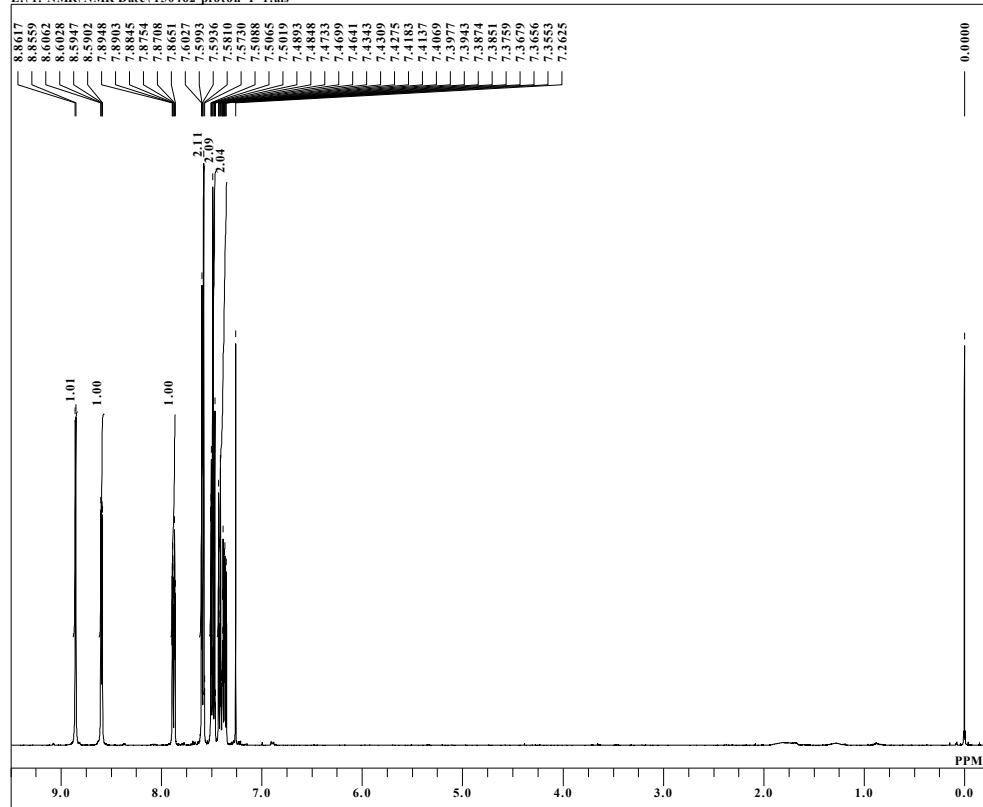
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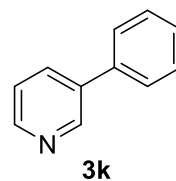
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 BF 0.12 Hz
 RGAIN 60



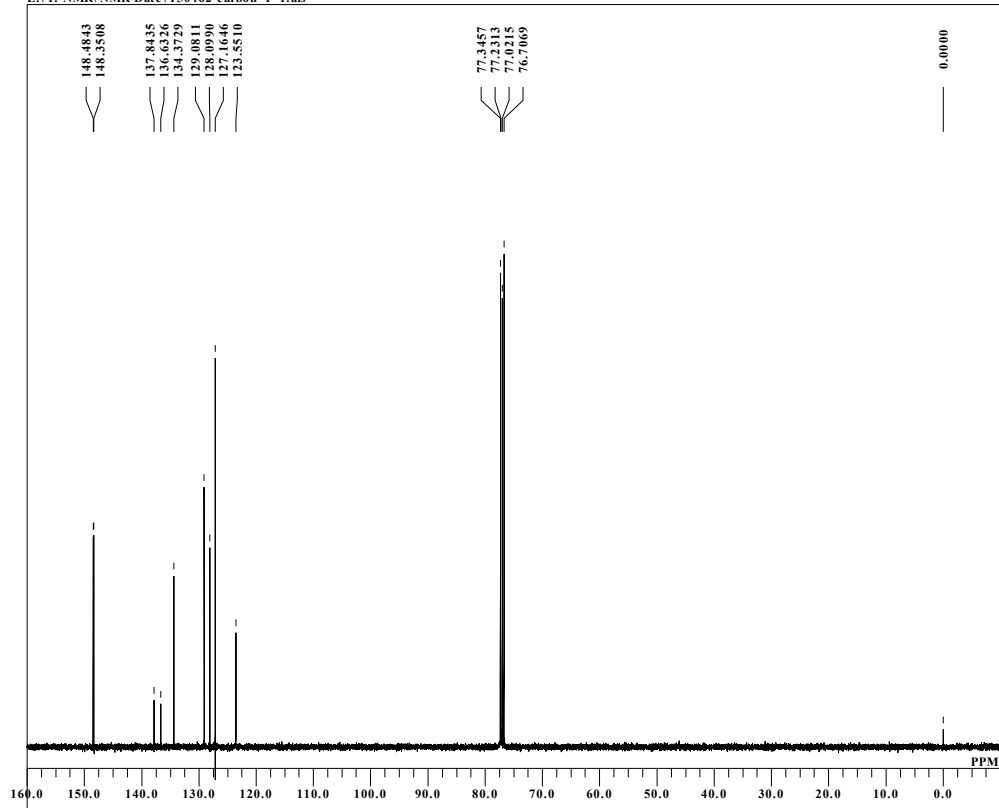
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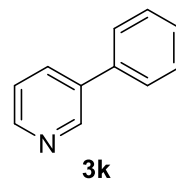
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 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
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 IRNUC 1H
 CTEMP 19.5 c
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 BF 0.12 Hz
 RGAIN 44



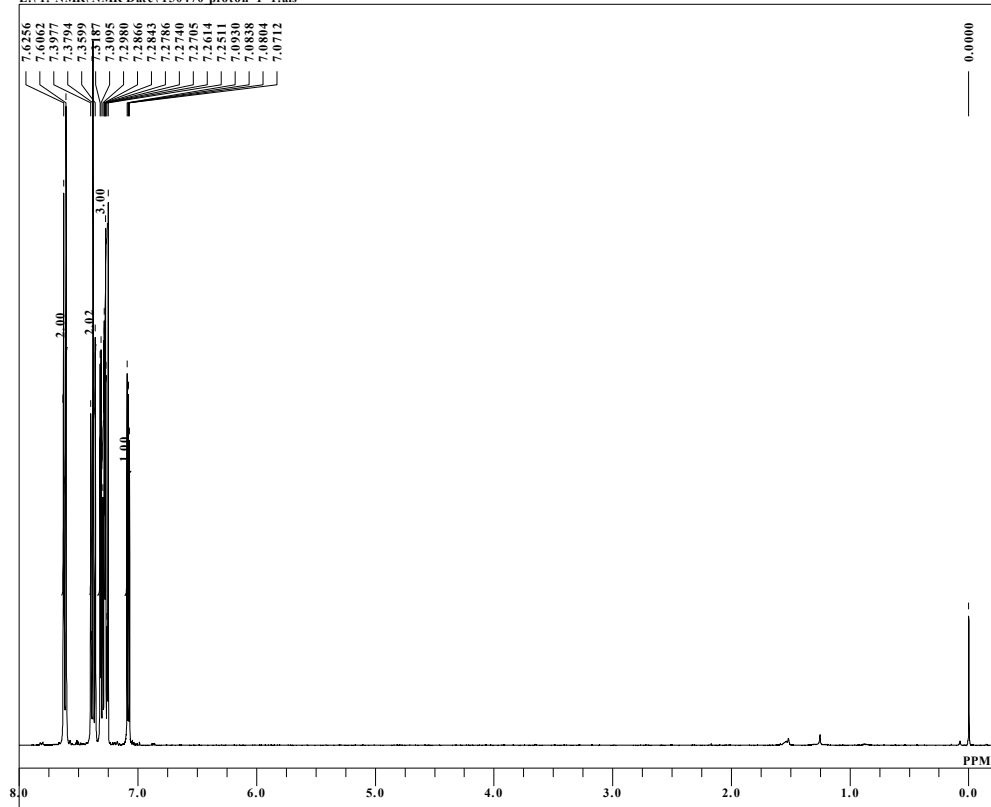
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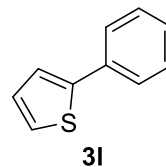
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 OBSET 5.35 KHz
 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.0000 sec
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 IRNUC 1H
 CTEMP 19.5 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 60



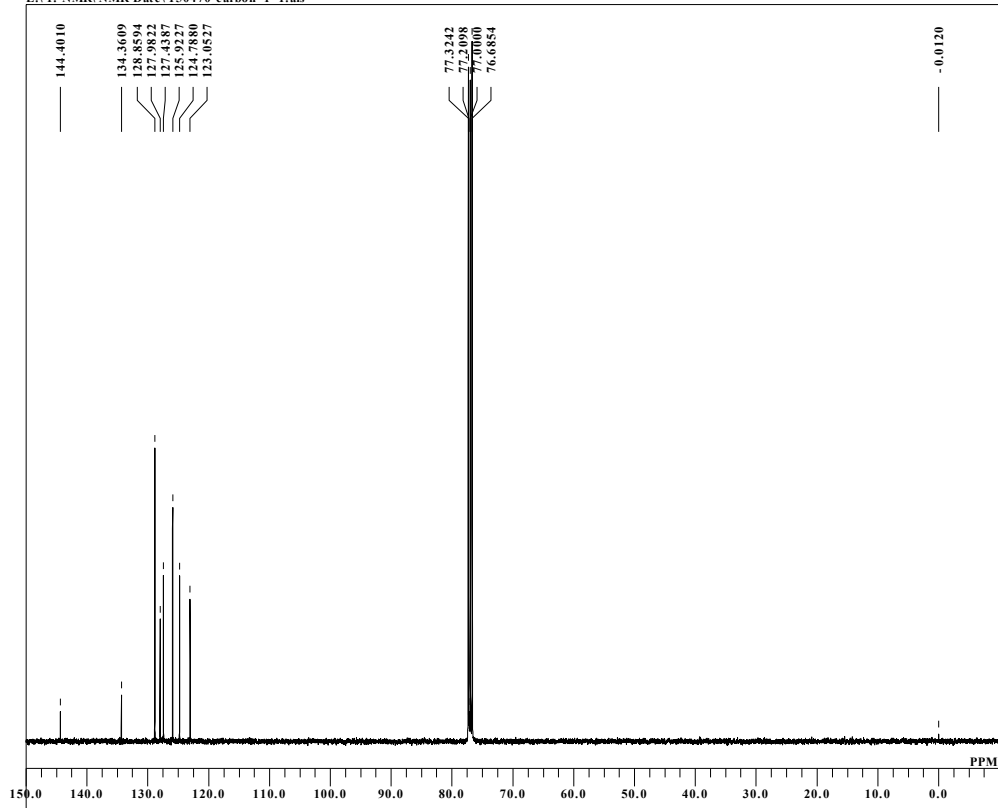
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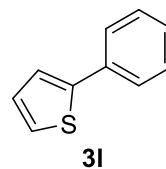
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 EXMOD proton.jsp
 OBFRQ 399.78 MHz
 OBSET 4.19 KHz
 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
 PD 5.0000 sec
 PW1 5.64 usec
 IRNUC 1H
 CTEMP 18.6 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 44



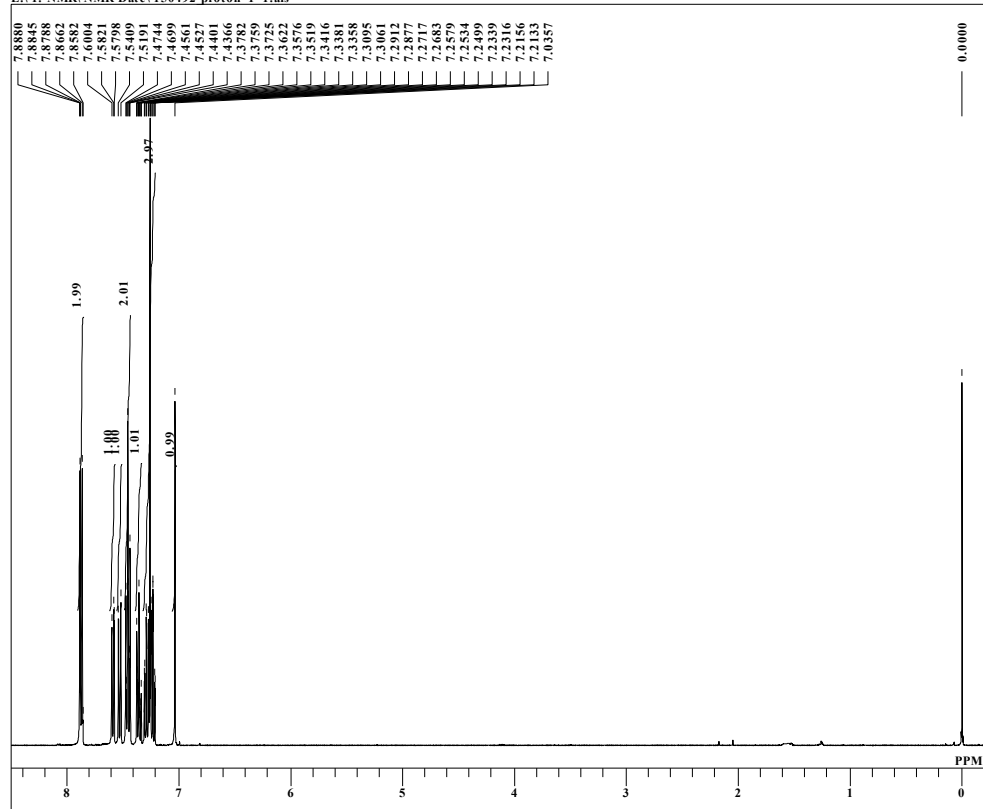
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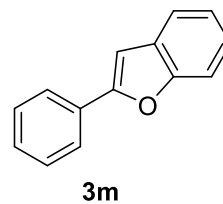
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 OBFRQ 100.53 MHz
 OBSET 5.35 KHz
 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.0000 sec
 PW1 3.05 usec
 IRNUC 1H
 CTEMP 19.1 c
 SLVNT CDCL3
 EXREF 77.00 ppm
 BF 1.20 Hz
 RGAIN 60



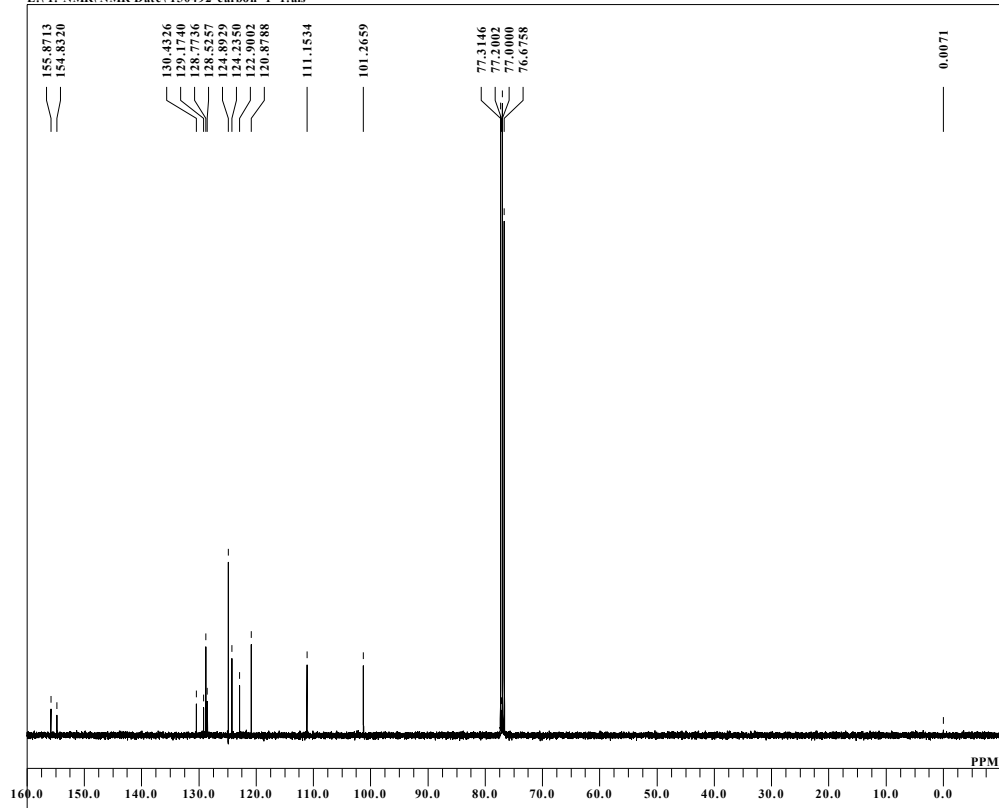
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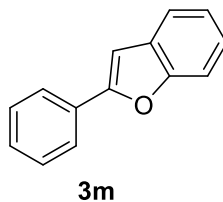
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 OBNUC 1H
 EXMOD proton.jsp
 OBFREQ 399.78 MHz
 OBSET 4.19 KHz
 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
 PD 5.0000 sec
 PW1 5.64 usec
 IRNUC 1H
 CTEMP 18.4 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 50



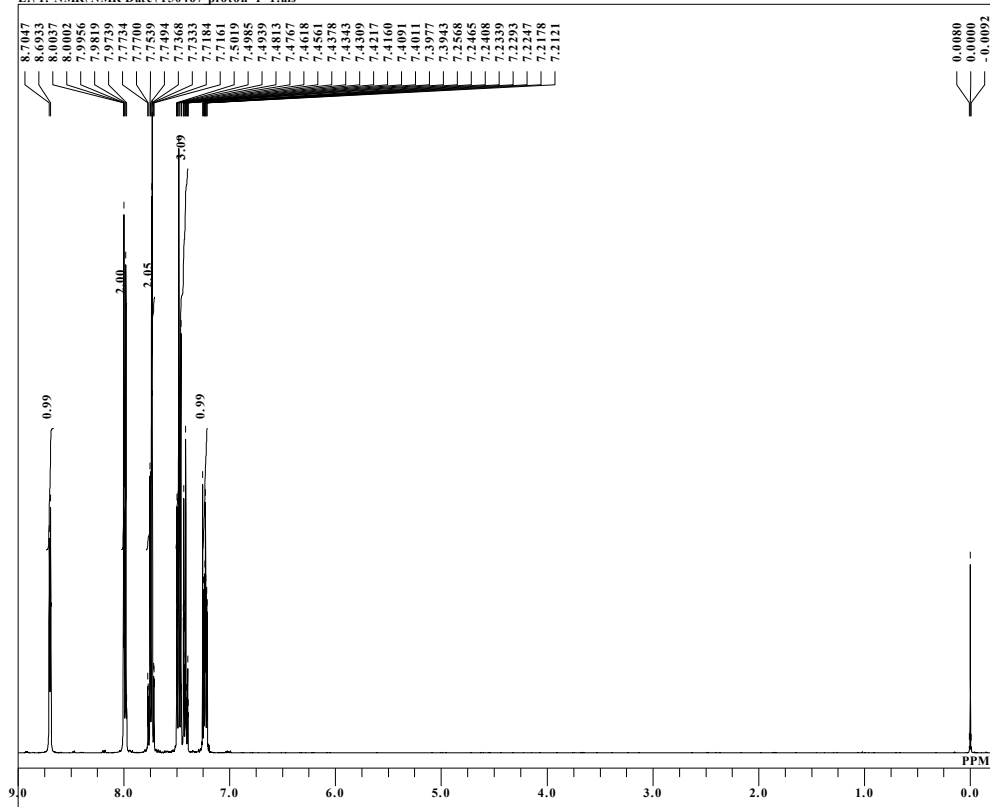
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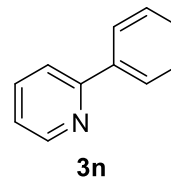
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 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.5000 sec
 PW1 3.05 usec
 IRNUC 1H
 CTEMP 18.4 c
 SLVNT CDCL3
 EXREF 77.00 ppm
 BF 0.12 Hz
 RGAIN 60



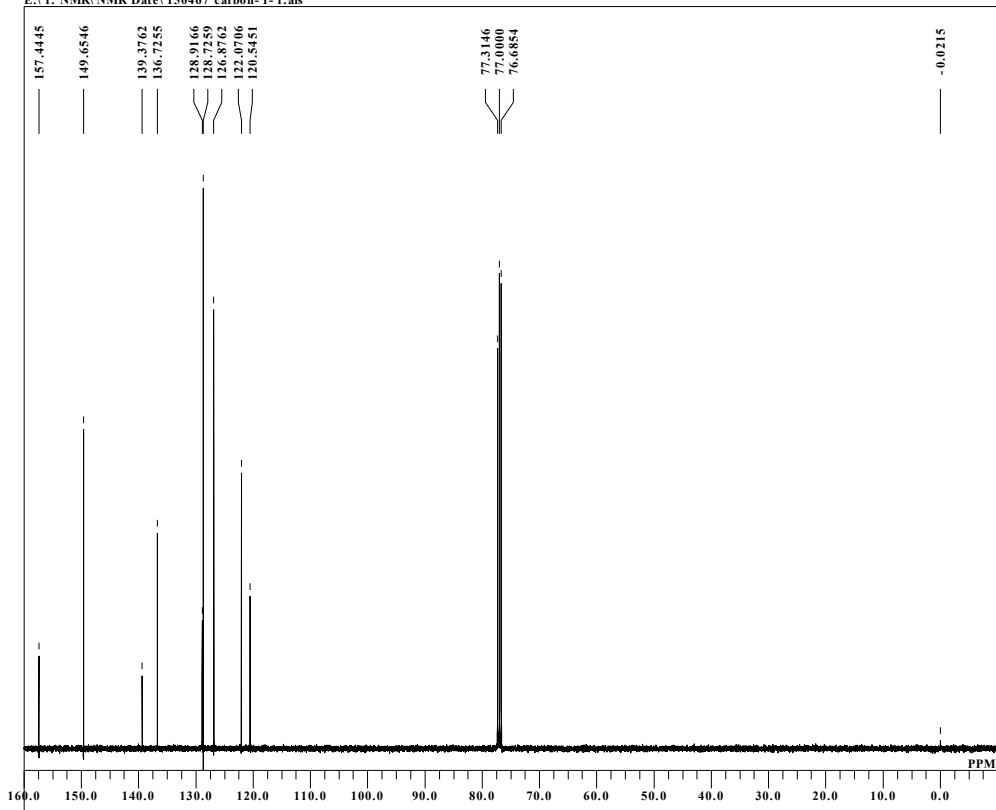
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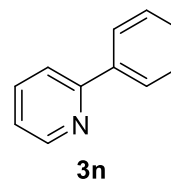
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 EXMOD proton.jsp
 OBFRQ 399.78 MHz
 OBSET 4.19 KHz
 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
 PD 5.0000 sec
 PW1 5.64 usec
 IRNUC 1H
 CTEMP 19.4 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 42



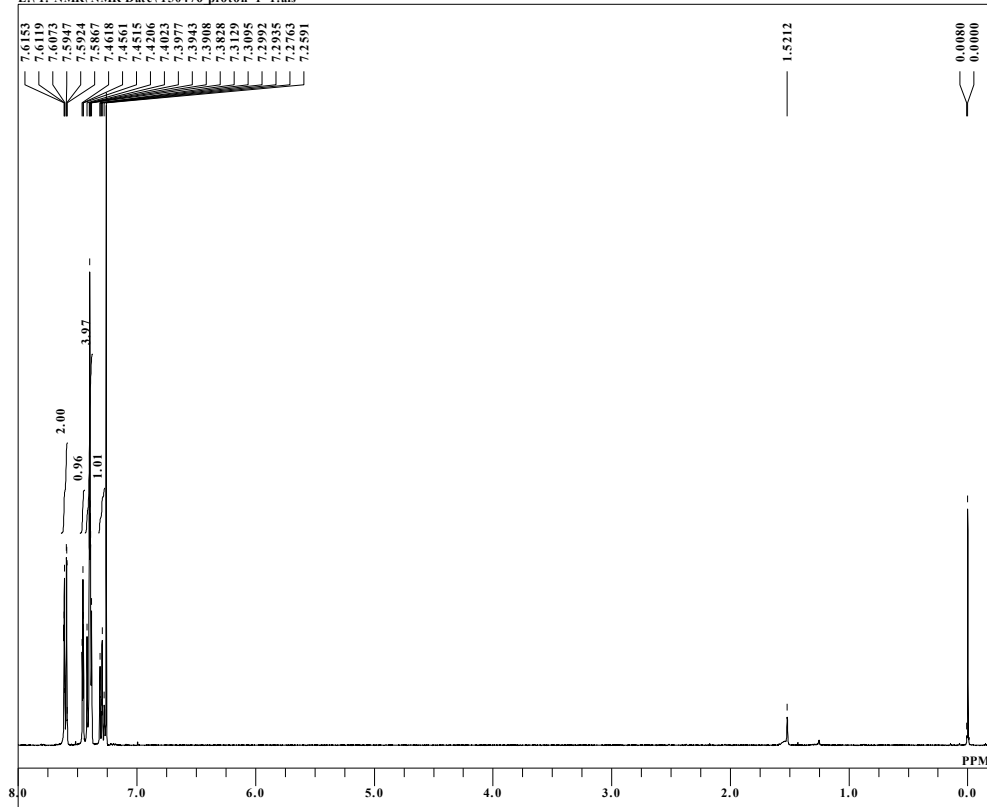
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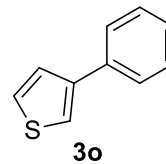
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 EXMOD carbon.jsp
 OBFRQ 100.53 MHz
 OBSET 5.35 KHz
 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.0000 sec
 PW1 3.05 usec
 IRNUC 1H
 CTEMP 19.6 c
 SLVNT CDCL3
 EXREF 77.00 ppm
 BF 0.12 Hz
 RGAIN 60



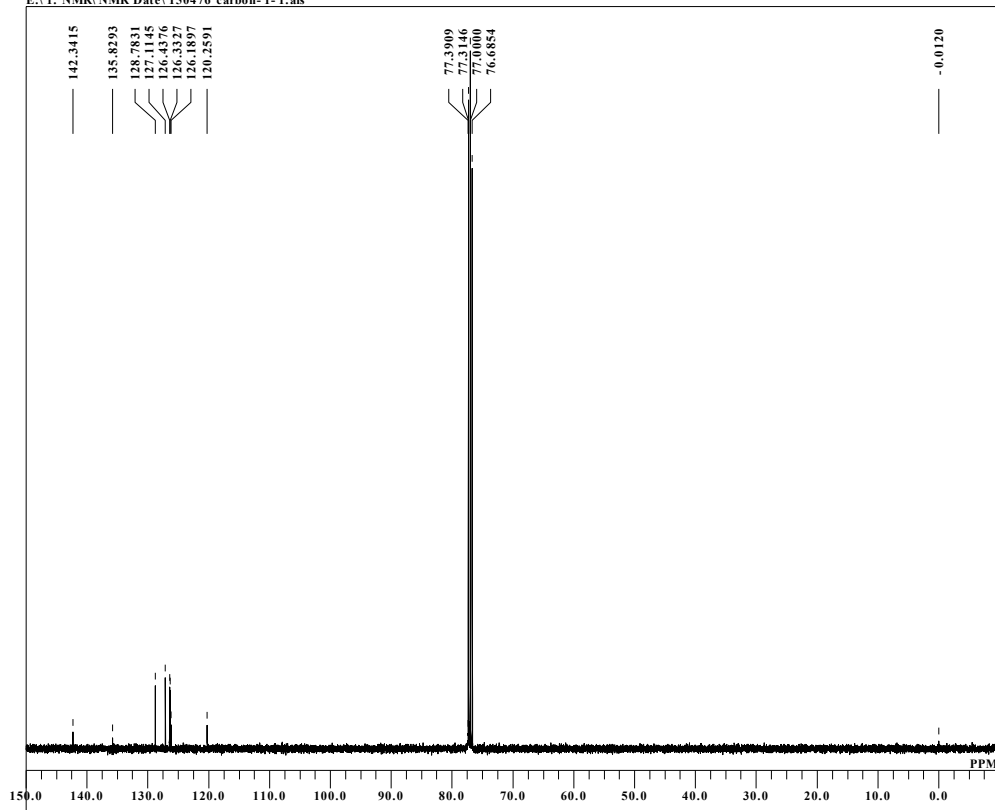
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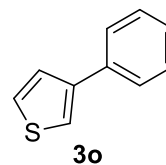
DFILE 150476 proton-1-1.als
 COMNT single pulse
 DATIM 2016-11-21 12:17:04
 OBNUC 1H
 EXMOD proton.jsp
 OBFRO 399.78 MHz
 OBSET 4.19 KHz
 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
 PD 5.0000 sec
 PW1 5.64 usec
 IRNUC 1H
 CTEMP 19.4 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 52



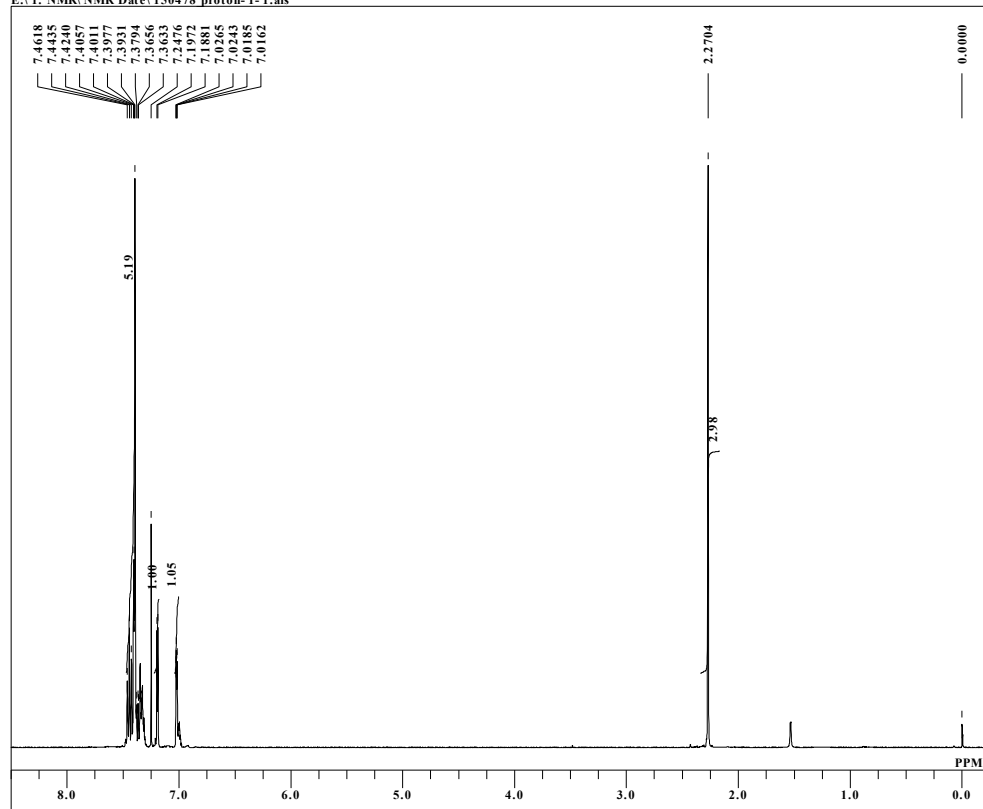
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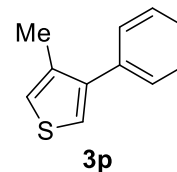
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 EXMOD carbon.jsp
 OBFRO 100.53 MHz
 OBSET 5.35 KHz
 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.0000 sec
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 SLVNT CDCL3
 EXREF 77.00 ppm
 BF 0.12 Hz
 RGAIN 60



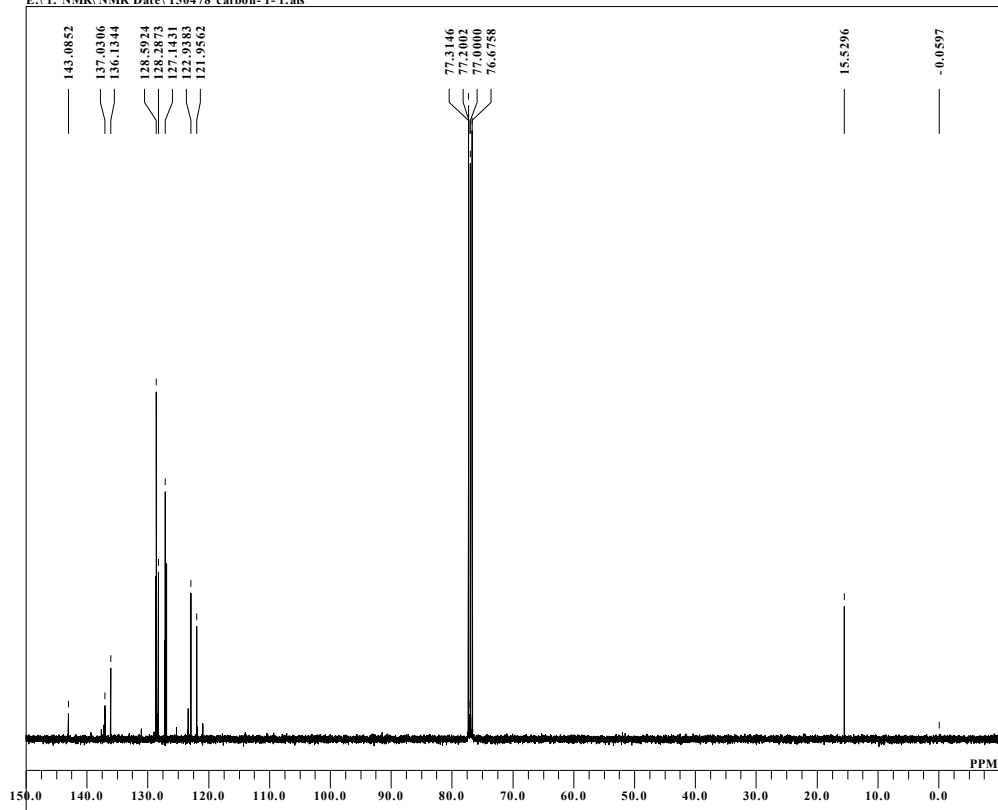
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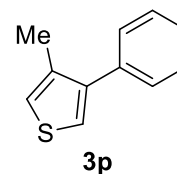
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EXMOD proton.jsp
OBFRQ 399.78 MHz
OBSET 4.19 KHz
OBFIN 7.29 Hz
POINT 13107
FREQU 6002.40 Hz
SCANS 16
ACQTM 2.1837 sec
PD 5.0000 sec
PW1 5.64 usec
IRNUC 1H
CTEMP 460.0 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 44



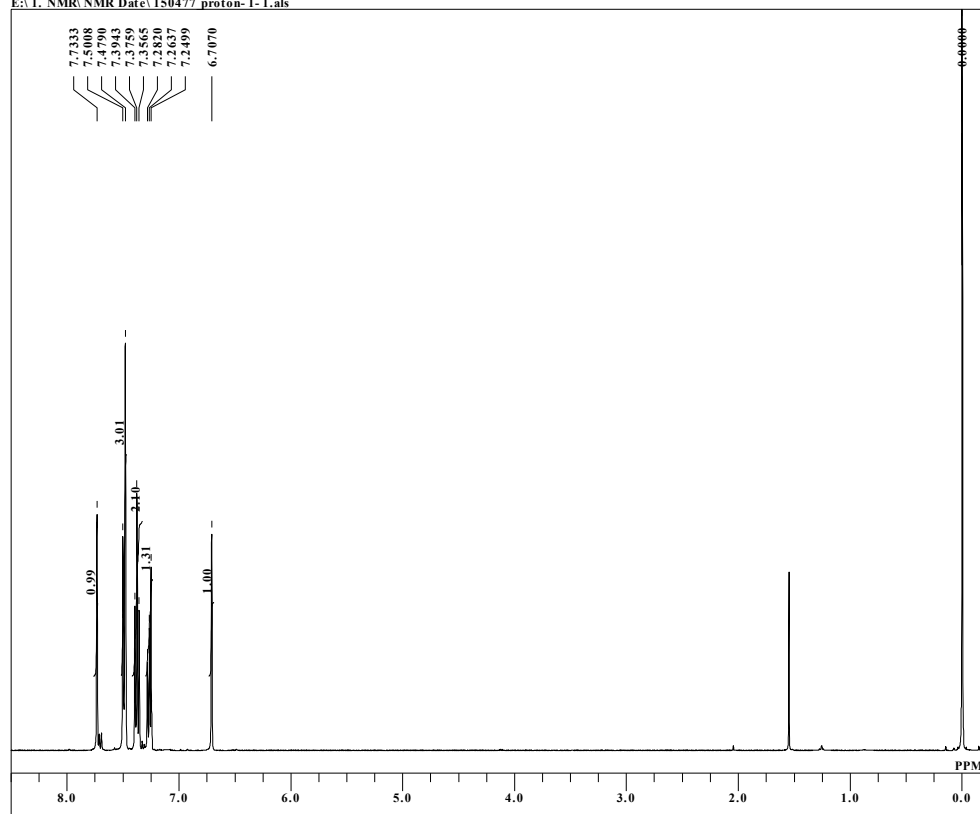
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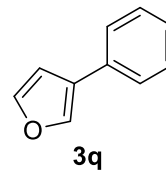
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OBSET 5.35 KHz
OBFIN 5.86 Hz
POINT 26214
FREQU 25125.63 Hz
SCANS 1000
ACQTM 1.0433 sec
PD 2.0000 sec
PW1 3.05 usec
IRNUC 1H
CTEMP 460.0 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 60



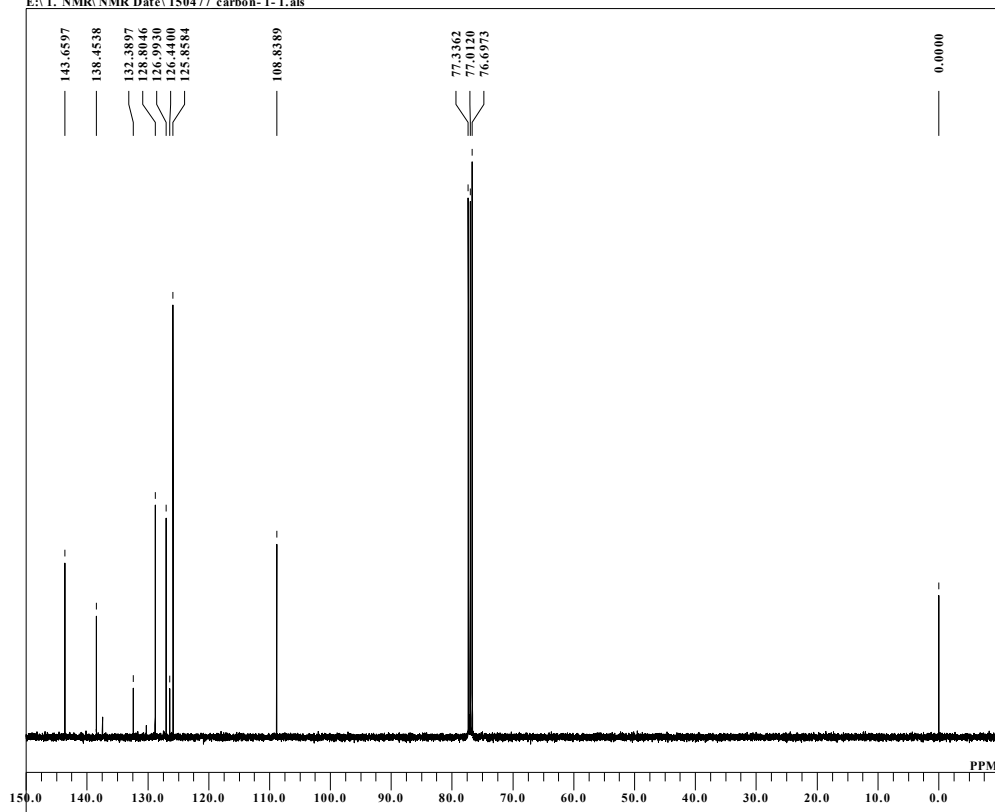
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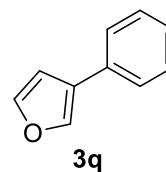
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 OBNUC 1H
 EXMOD proton.jsp
 OBFREQ 399.78 MHz
 OBSET 4.19 KHz
 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
 PD 5.0000 sec
 PW1 5.64 usec
 IRNUC 1H
 CTEMP 460.0 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 42



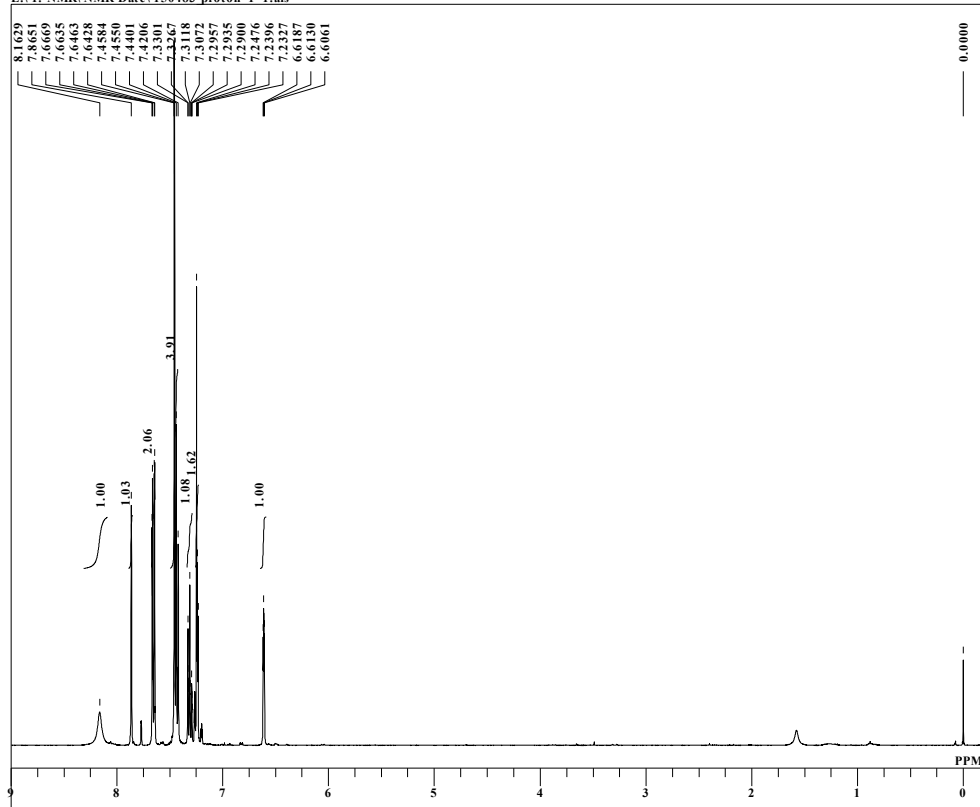
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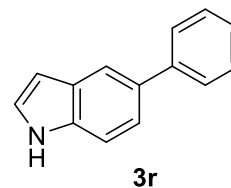
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 EXMOD carbon.jsp
 OBFREQ 100.53 MHz
 OBSET 5.35 KHz
 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.0000 sec
 PW1 3.05 usec
 IRNUC 1H
 CTEMP 19.6 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 60



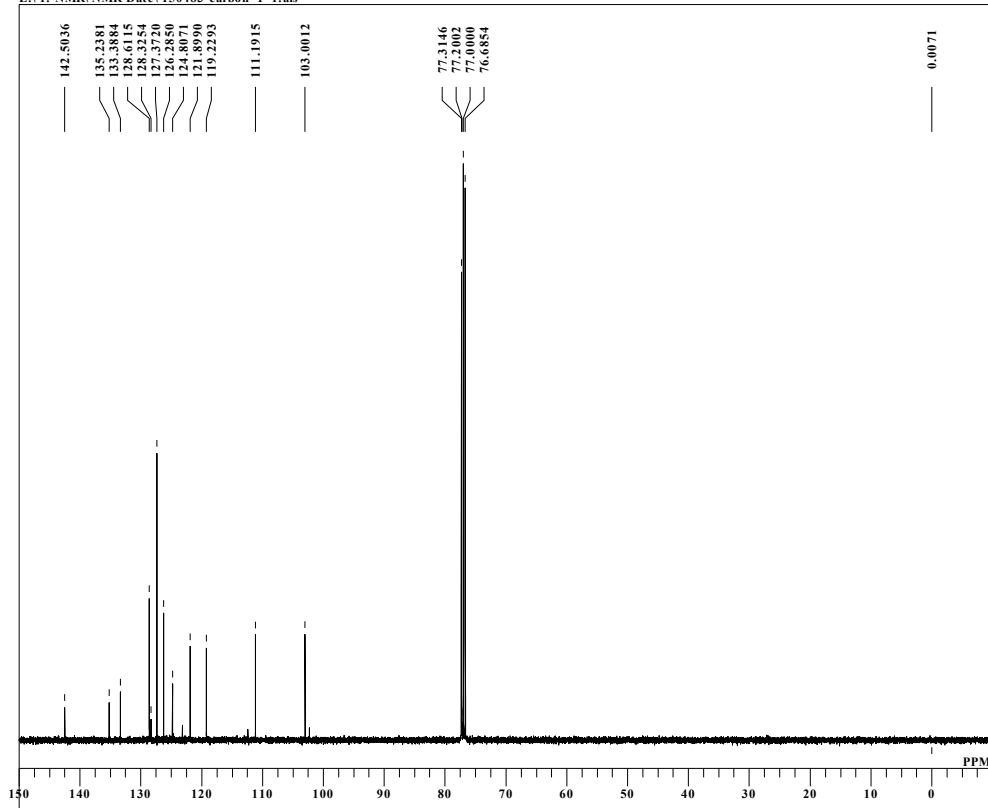
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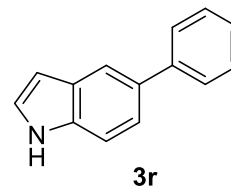
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 OBNUC 1H
 EXMOD proton.jsp
 OBFREQ 399.78 MHz
 OBSET 4.19 KHz
 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
 PD 5.0000 sec
 PW1 5.64 usec
 IRNUC 1H
 CTEMP 18.2 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 44



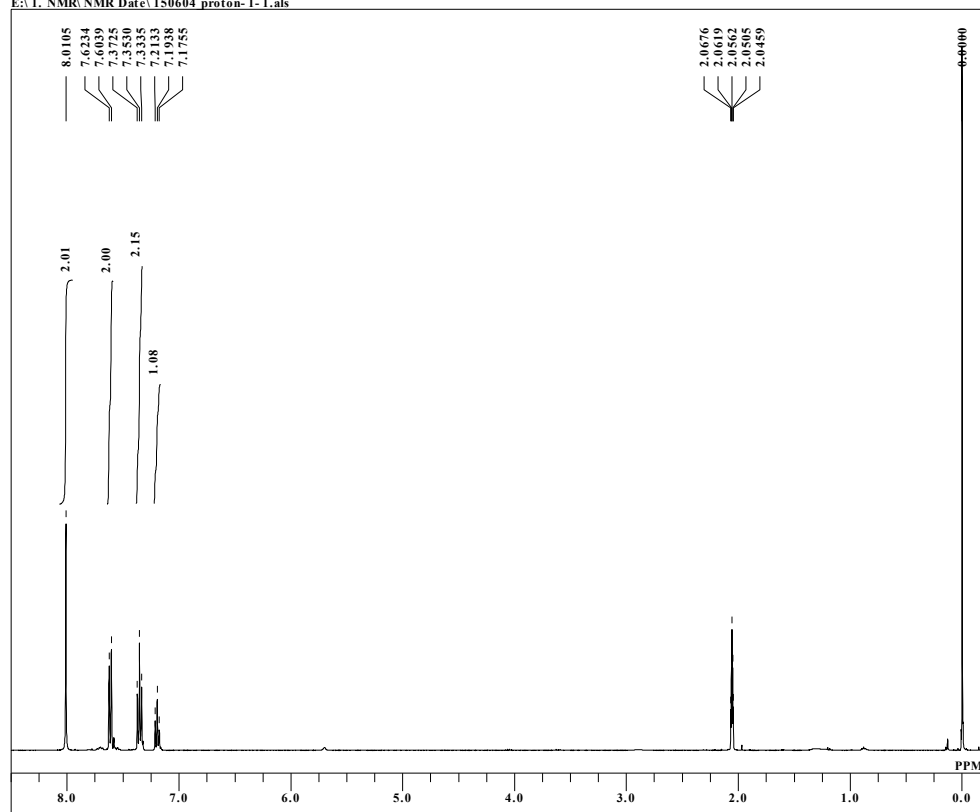
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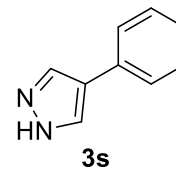
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 OBFREQ 100.53 MHz
 OBSET 5.35 KHz
 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.0000 sec
 PW1 3.05 usec
 IRNUC 1H
 CTEMP 18.8 c
 SLVNT CDCL3
 EXREF 77.00 ppm
 BF 0.12 Hz
 RGAIN 60



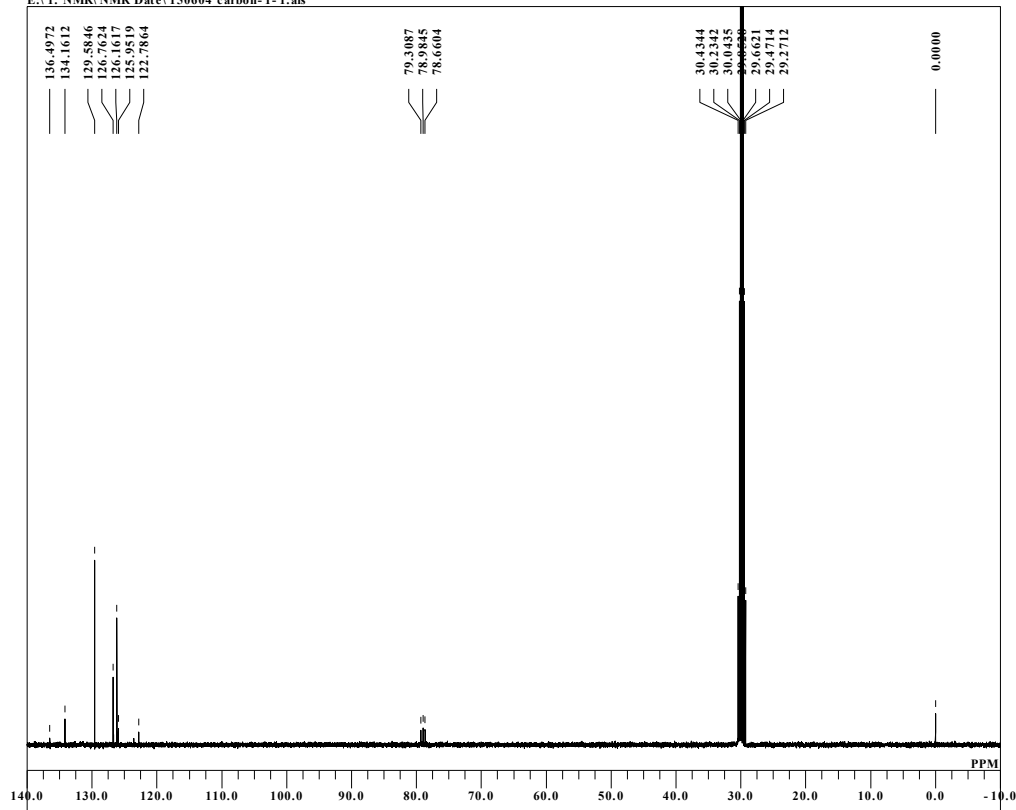
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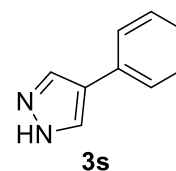
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COMNT single pulse
DATIM 2017-03-23 15:31:29
OBNUC 1H
EXMOD proton.jsp
OBFRO 399.78 MHz
OBSET 4.19 KHz
OBFIN 7.29 Hz
POINT 13107
FREQU 6002.40 Hz
SCANS 16
ACQTM 2.1837 sec
PD 5.0000 sec
PW1 5.64 usec
IRNUC 1H
CTEMP 18.4 c
SLVNT ACETN
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 46



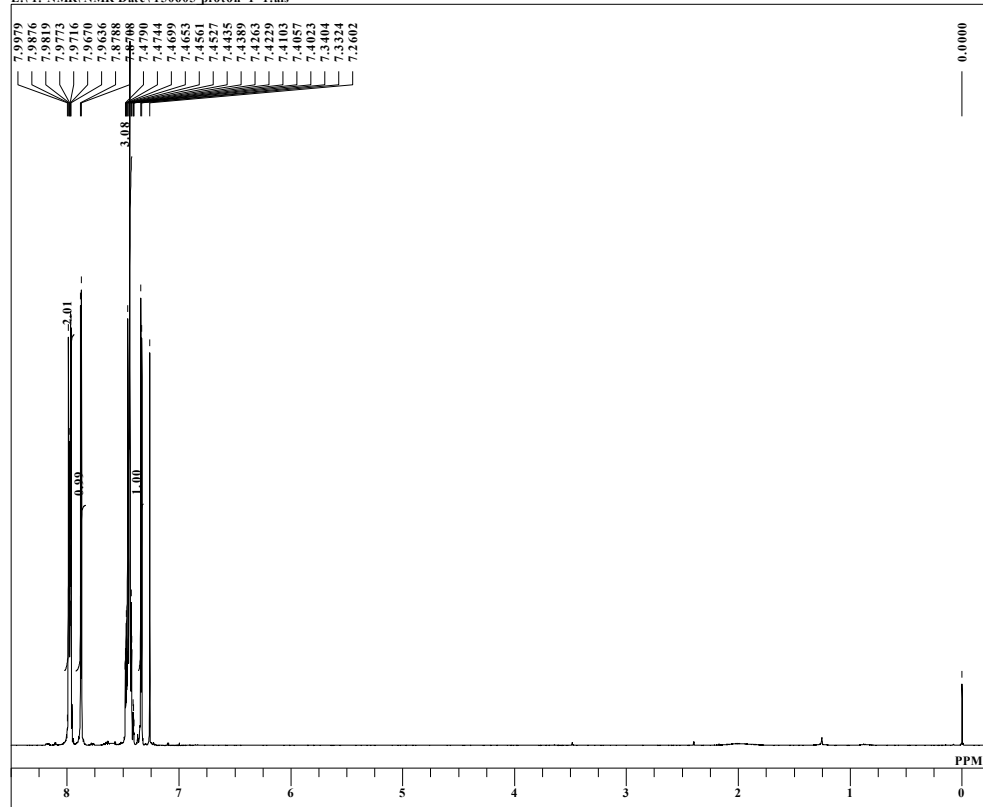
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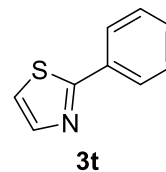
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OBSET 5.35 KHz
OBFIN 5.86 Hz
POINT 32767
FREQU 31407.04 Hz
SCANS 2000
ACQTM 1.0433 sec
PD 2.0000 sec
PW1 3.05 usec
IRNUC 1H
CTEMP 19.0 c
SLVNT ACETN
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 60



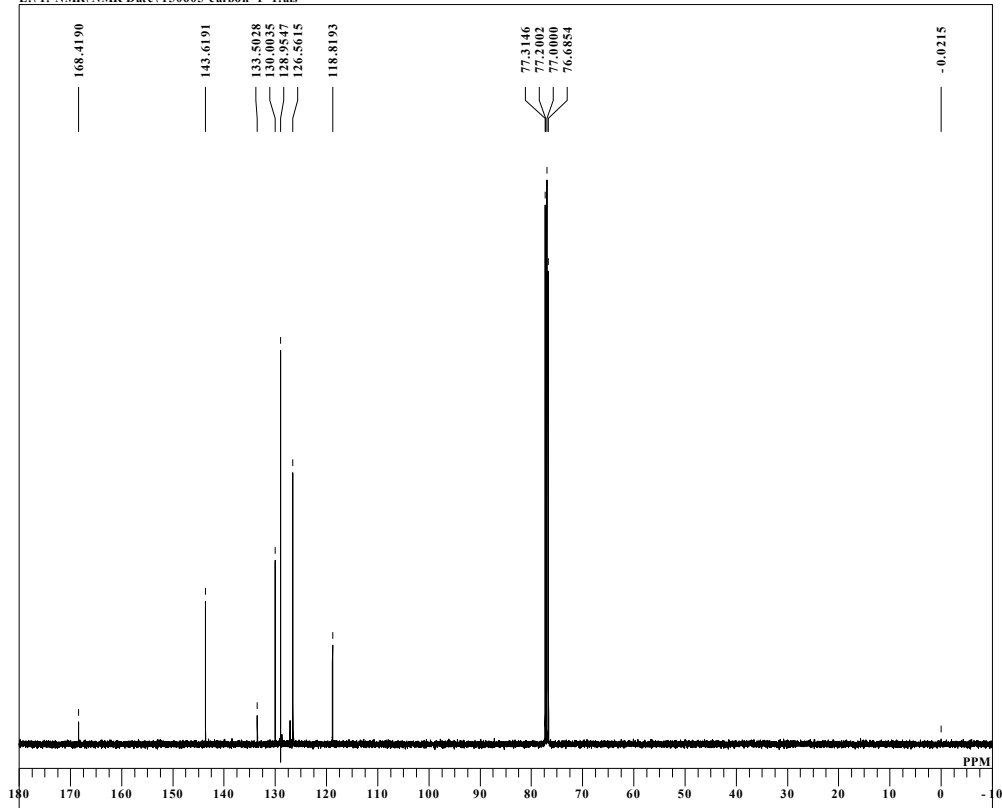
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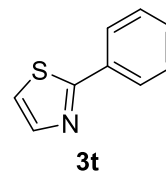
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 EXMOD proton.jsp
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 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
 PD 5.0000 sec
 PW1 5.64 usec
 IRNUC 1H
 CTEMP 460.0 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 44



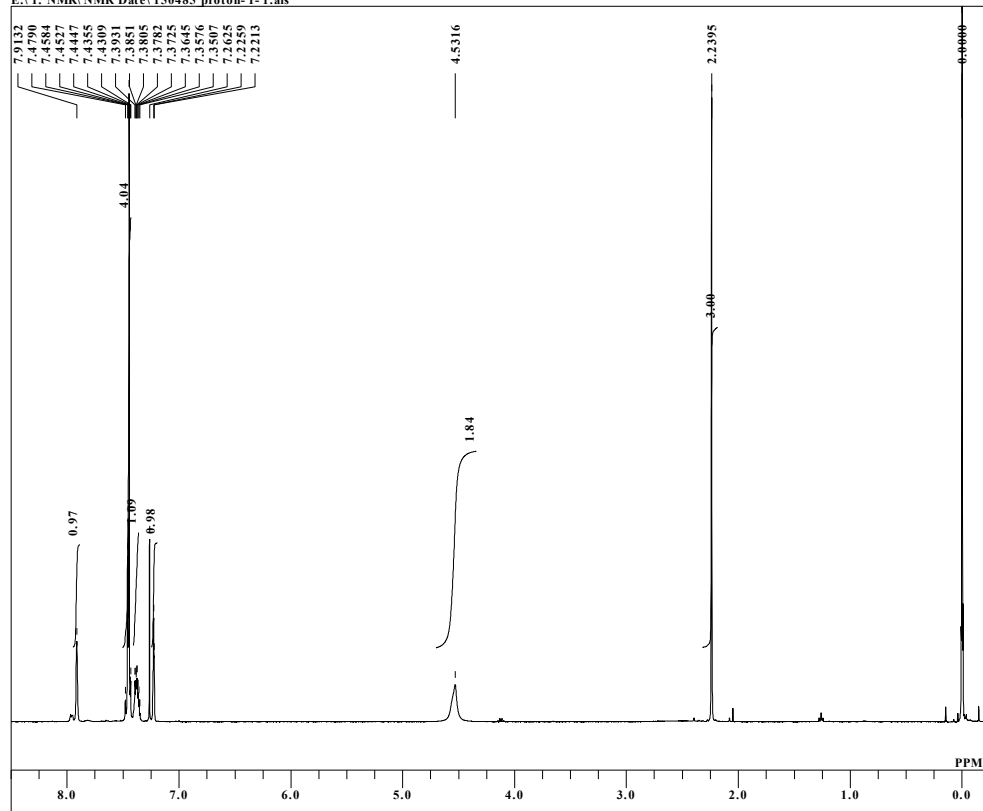
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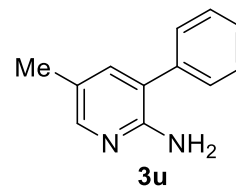
DFILE 150605 carbon-1-1.als
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 OBNUC 13C
 EXMOD carbon.jsp
 OBFRQ 100.53 MHz
 OBSET 5.35 KHz
 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.0000 sec
 PW1 3.05 usec
 IRNUC 1H
 CTEMP 460.0 c
 SLVNT CDCL3
 EXREF 77.00 ppm
 BF 0.12 Hz
 RGAIN 60



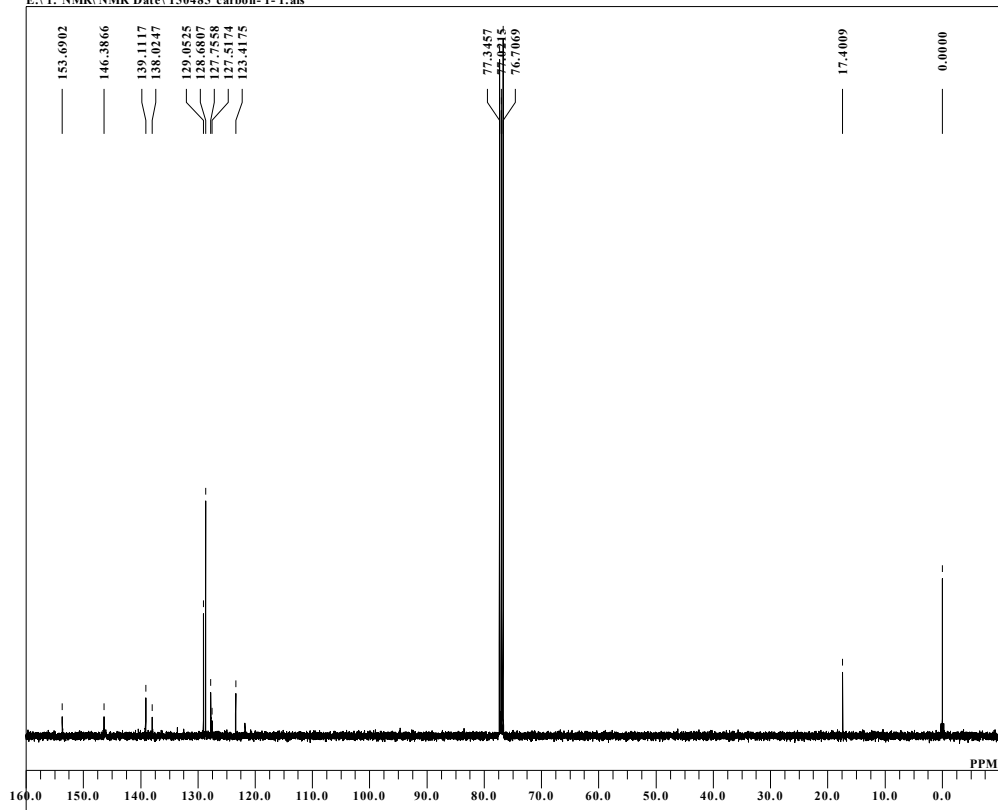
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DFILE 150485 proton-1-1.als
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 OBNUC 1H
 EXMOD proton.jsp
 OBFRQ 399.78 MHz
 OBSET 4.19 KHz
 OBFIN 7.29 Hz
 POINT 13107
 FREQU 6002.40 Hz
 SCANS 16
 ACQTM 2.1837 sec
 PD 5.0000 sec
 PW1 5.64 usec
 IRNUC 1H
 CTEMP 460.0 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 42



E:\1. NMR\NMR Date\150485 carbon-1-1.als



DFILE 150485 carbon-1-1.als
 COMNT single pulse decoupled gated N
 DATIM 2017-01-26 12:32:49
 OBNUC 13C
 EXMOD carbon.jsp
 OBFRQ 100.53 MHz
 OBSET 5.35 KHz
 OBFIN 5.86 Hz
 POINT 26214
 FREQU 25125.63 Hz
 SCANS 1000
 ACQTM 1.0433 sec
 PD 2.0000 sec
 PW1 3.05 usec
 IRNUC 1H
 CTEMP 460.0 c
 SLVNT CDCL3
 EXREF 0.00 ppm
 BF 0.12 Hz
 RGAIN 60

