

Supporting Information

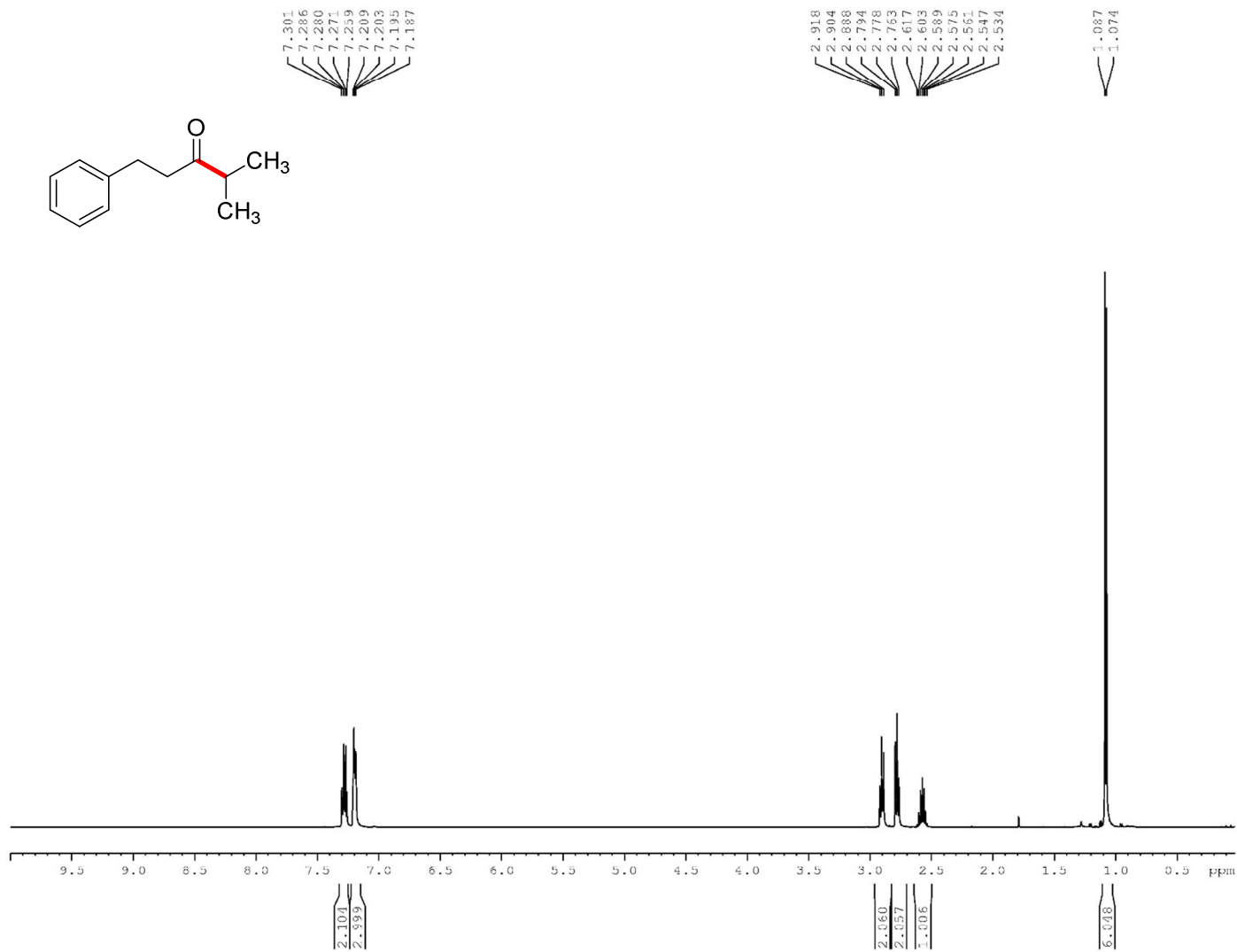
Synergistic Photoredox/Nickel Coupling of Acyl Chlorides with Secondary Alkyltrifluoroborates: Dialkyl ketone Synthesis

Javad Amani and Gary A. Molander*

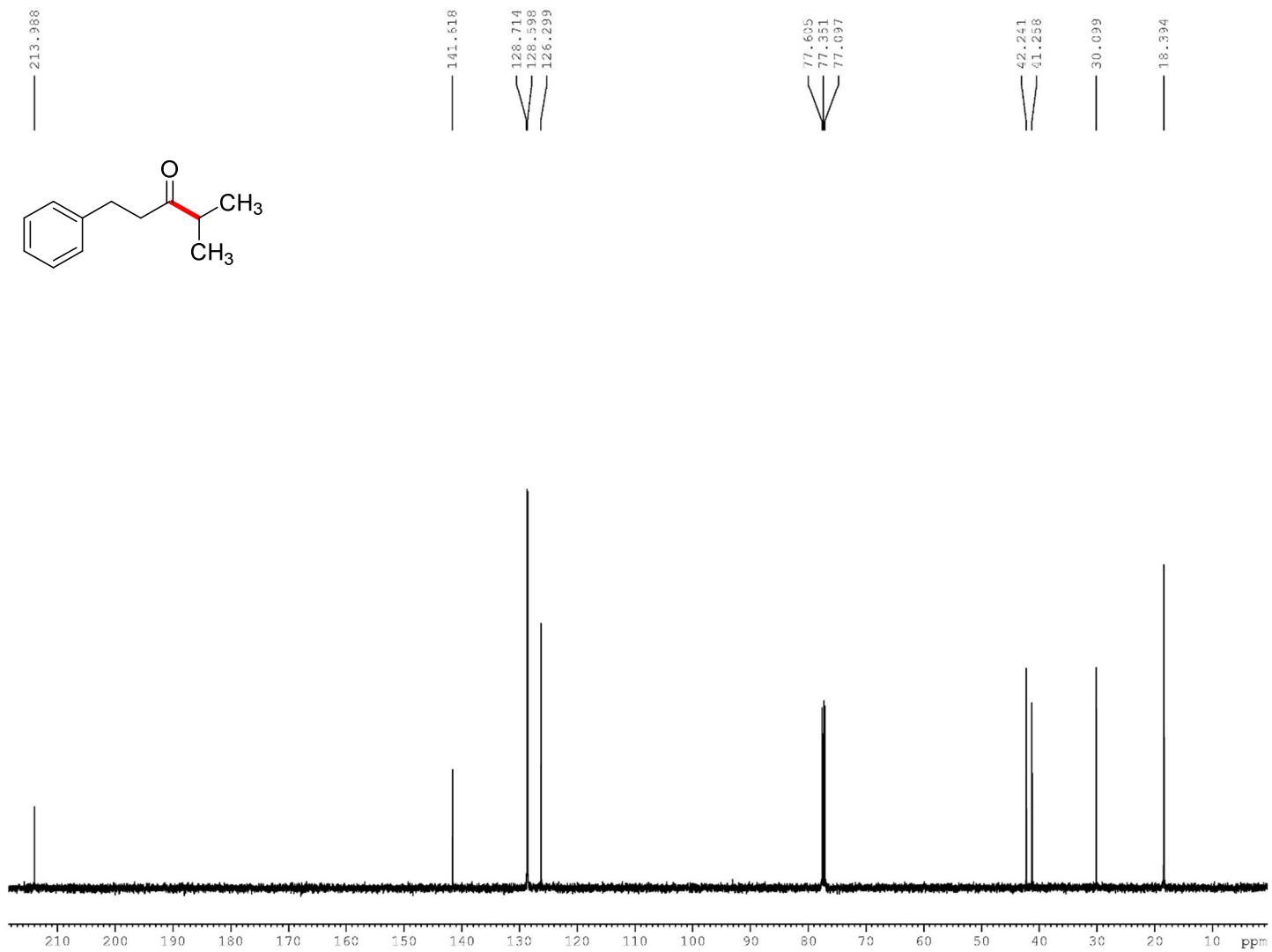
Roy and Diana Vagelos Laboratories, Department of Chemistry, University of Pennsylvania, 231
South 34th Street, Philadelphia, Pennsylvania 19104-6323, United States

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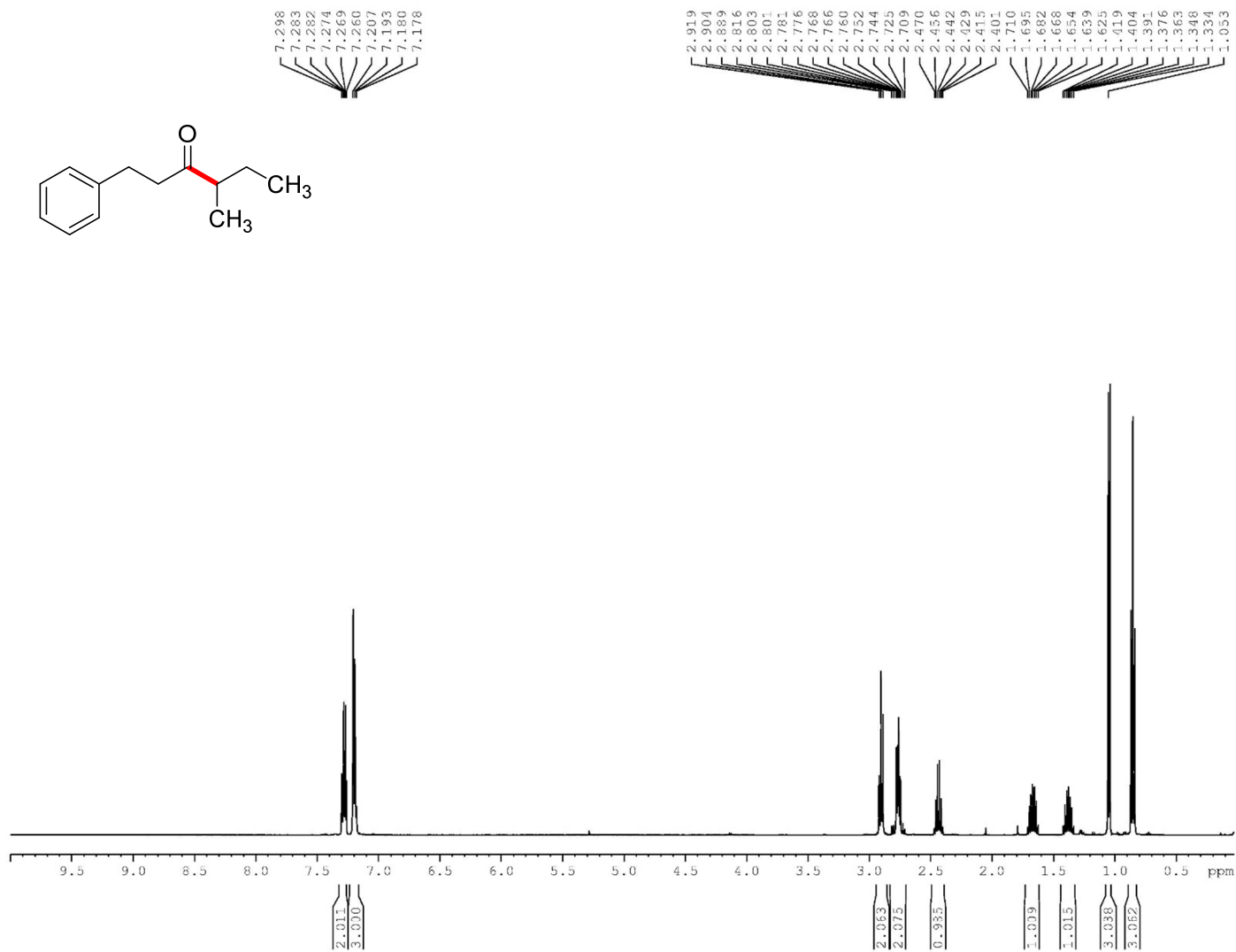
NMR Spectra.....	S1-S60
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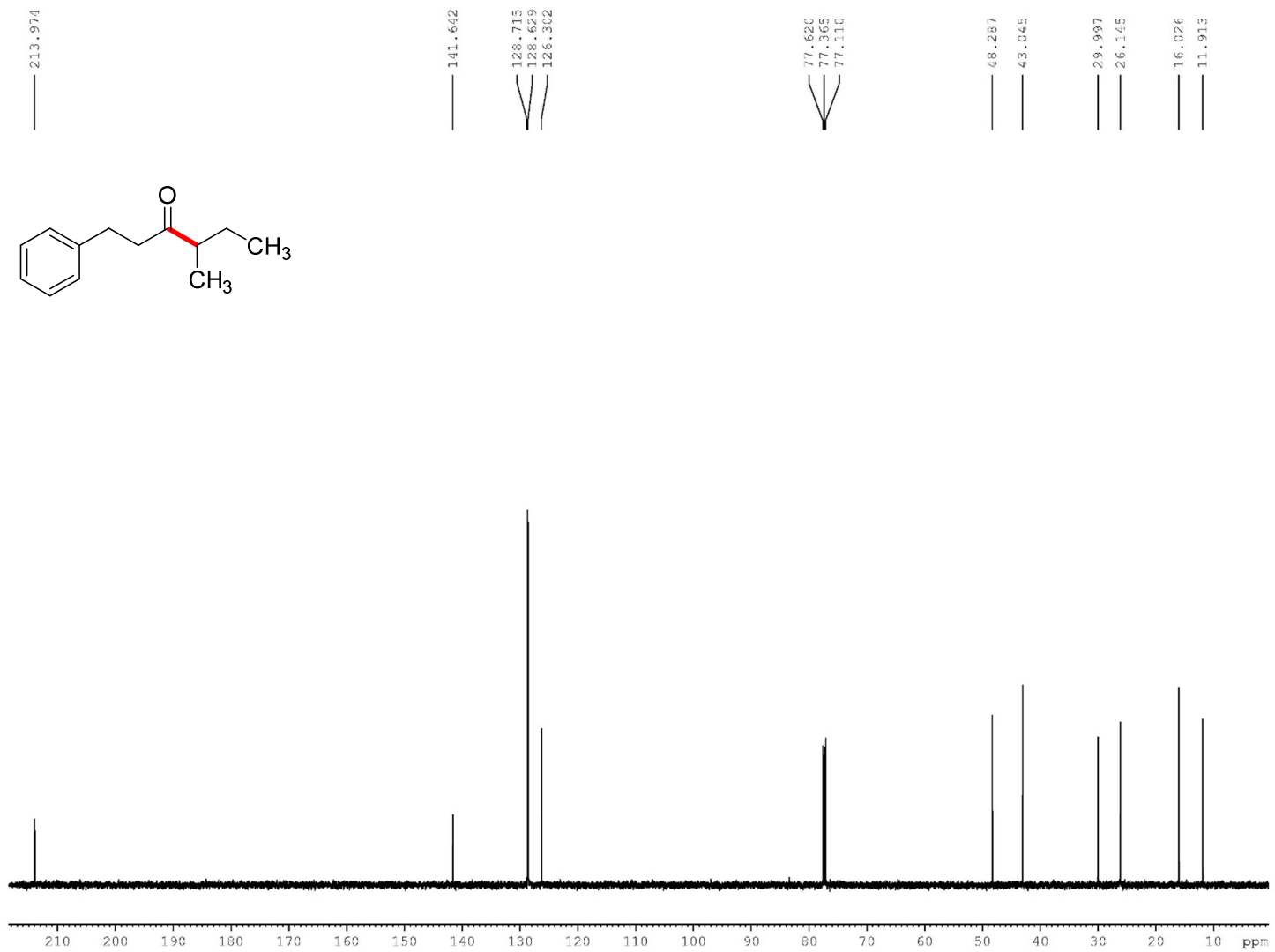
¹H NMR (500 MHz, CDCl₃) Spectrum of 4-Methyl-1-phenylpentan-3-one (1a)



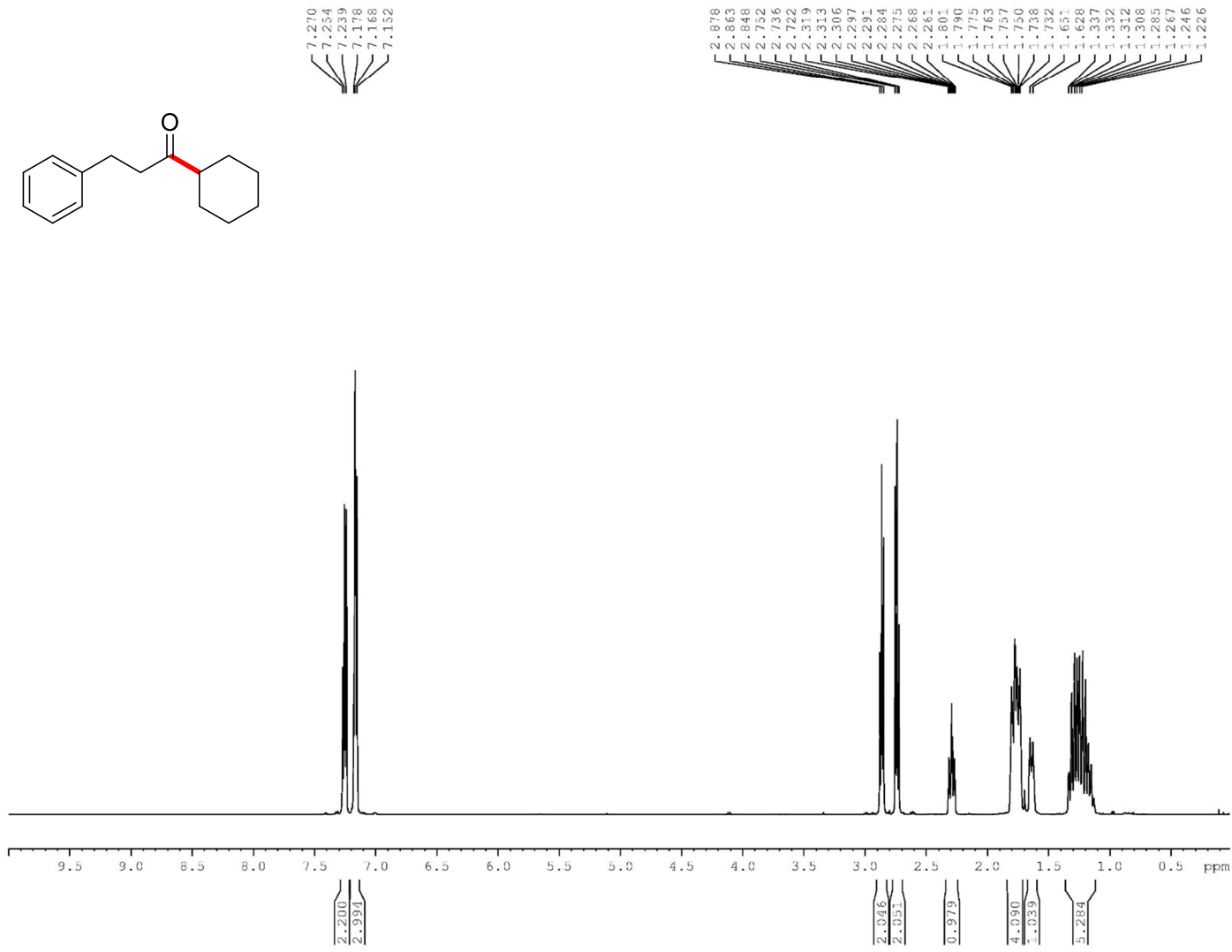
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of 4-Methyl-1-phenylpentan-3-one (1a)



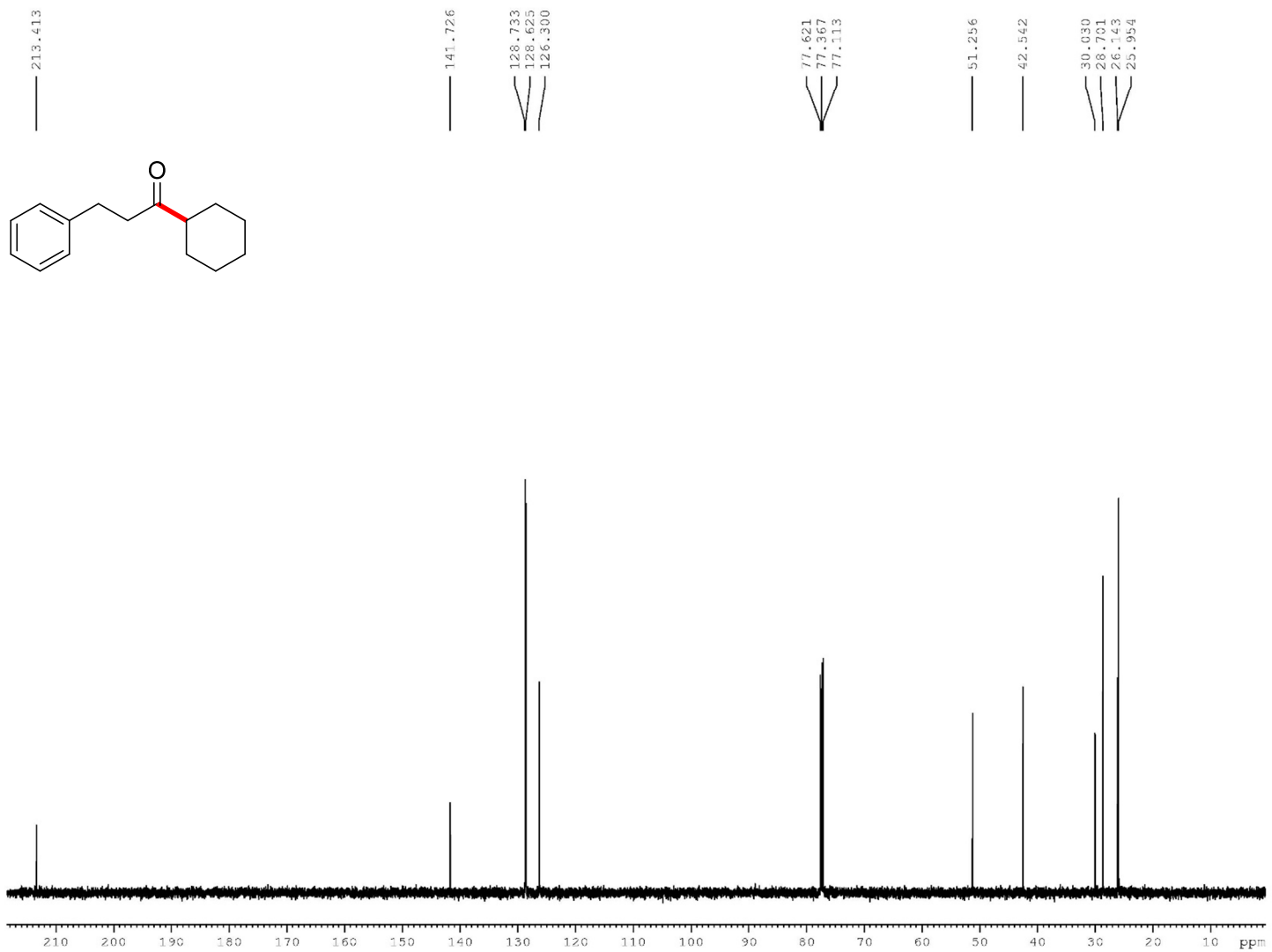
¹H NMR (500 MHz, CDCl₃) Spectrum of 4-Methyl-1-phenylhexan-3-one (1b)



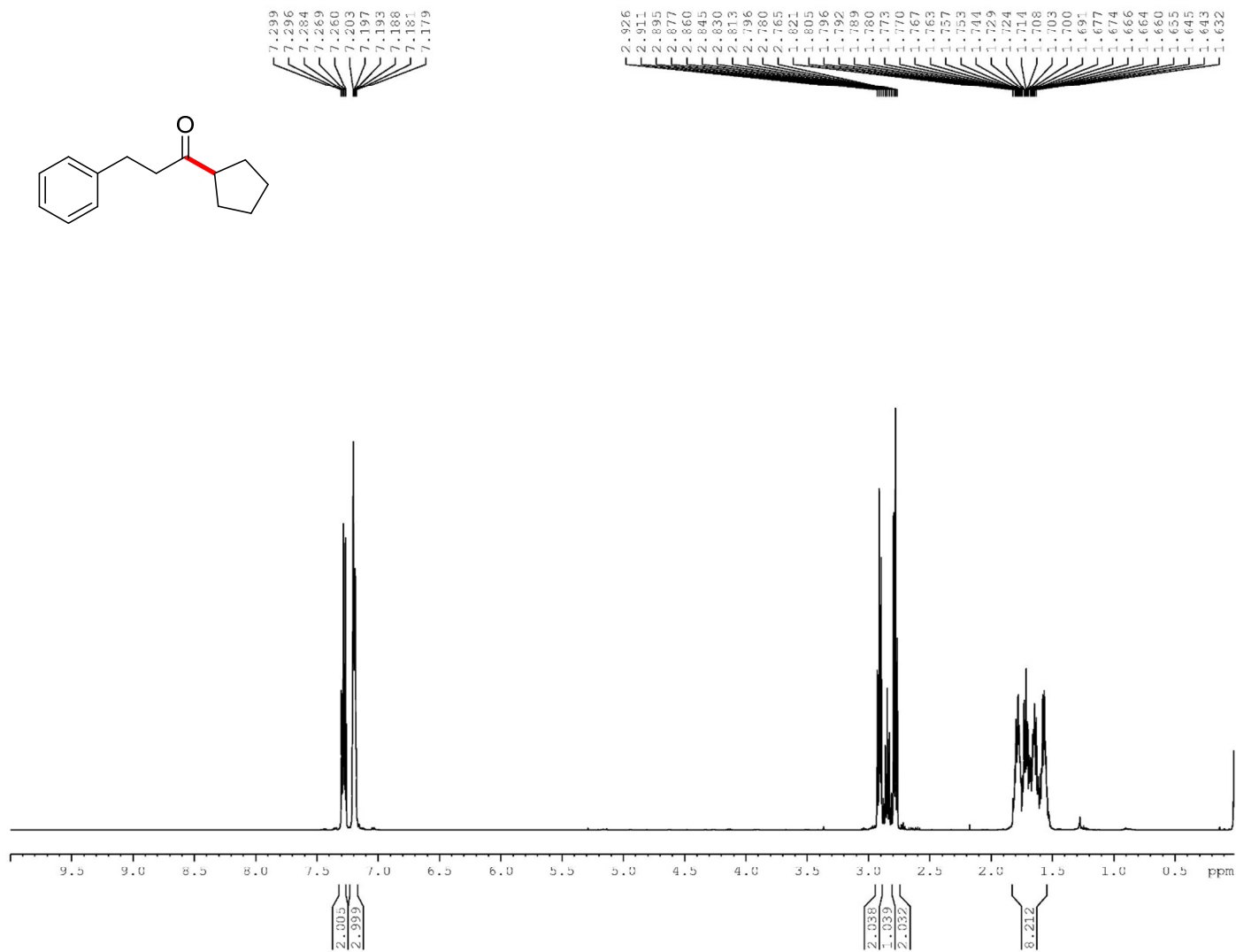
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of 4-Methyl-1-phenylhexan-3-one (1b)



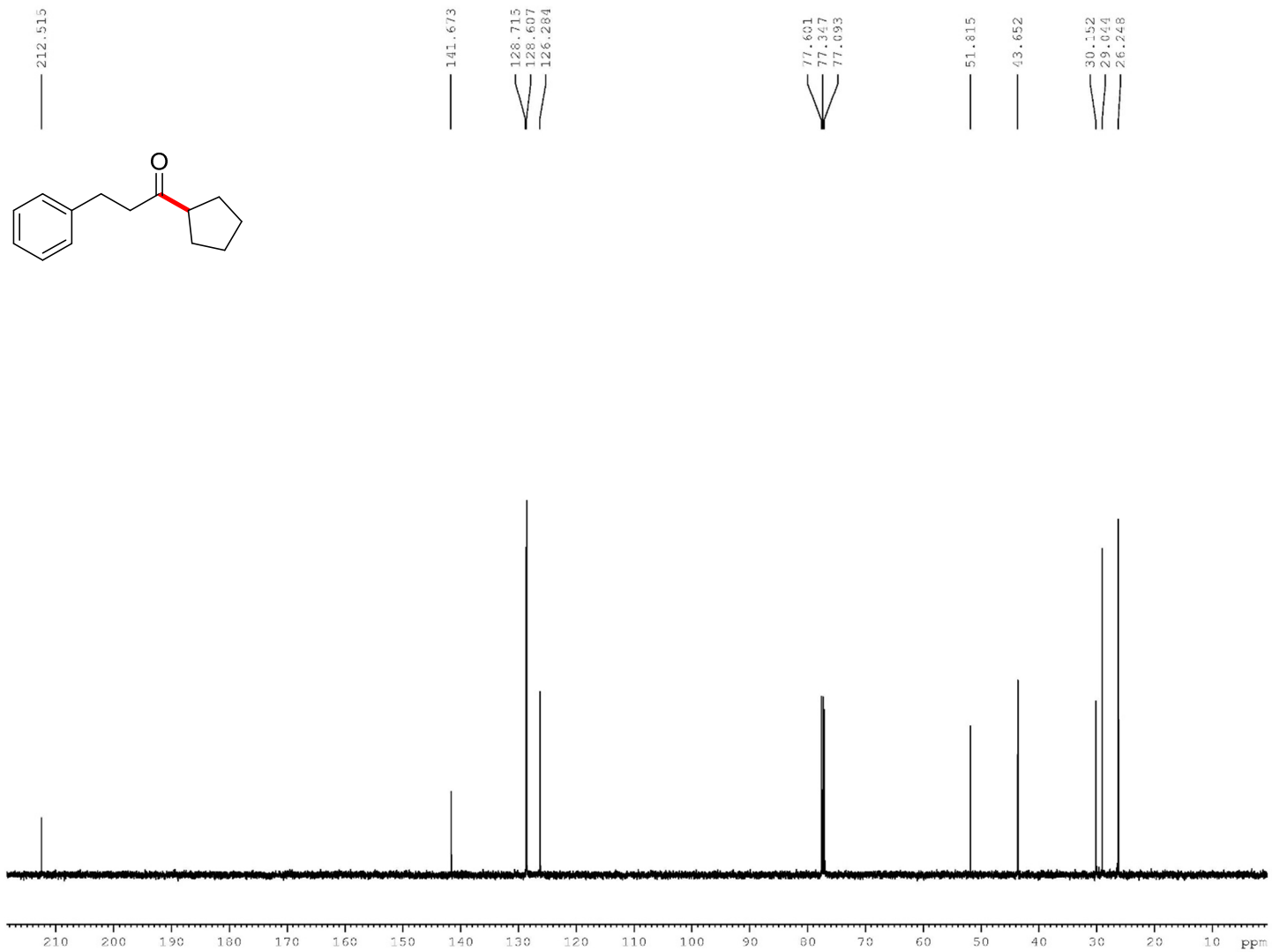
¹H NMR (500 MHz, CDCl₃) Spectrum of 1-Cyclohexyl-3-phenylpropan-1-one (1c)



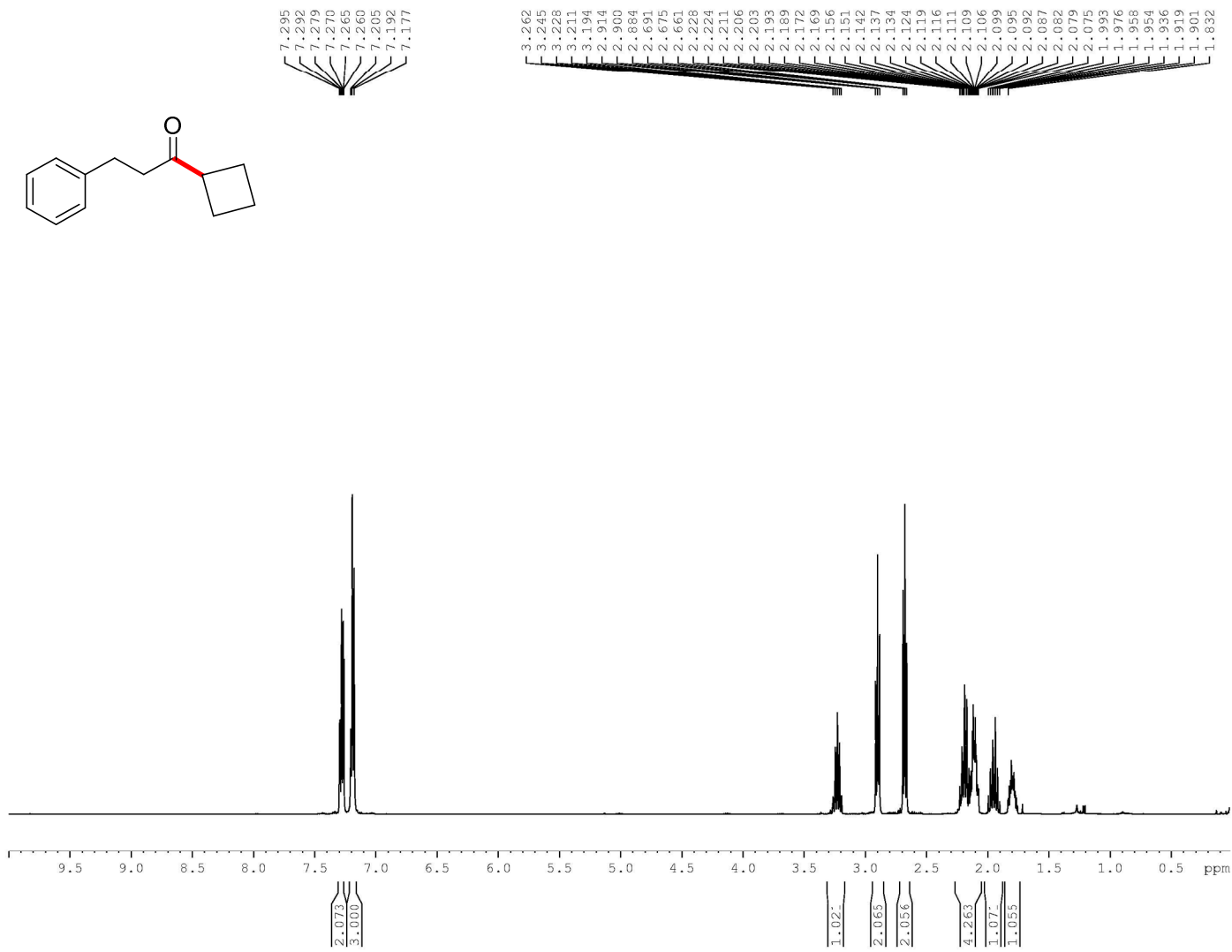
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of 1-Cyclohexyl-3-phenylpropan-1-one (1c)



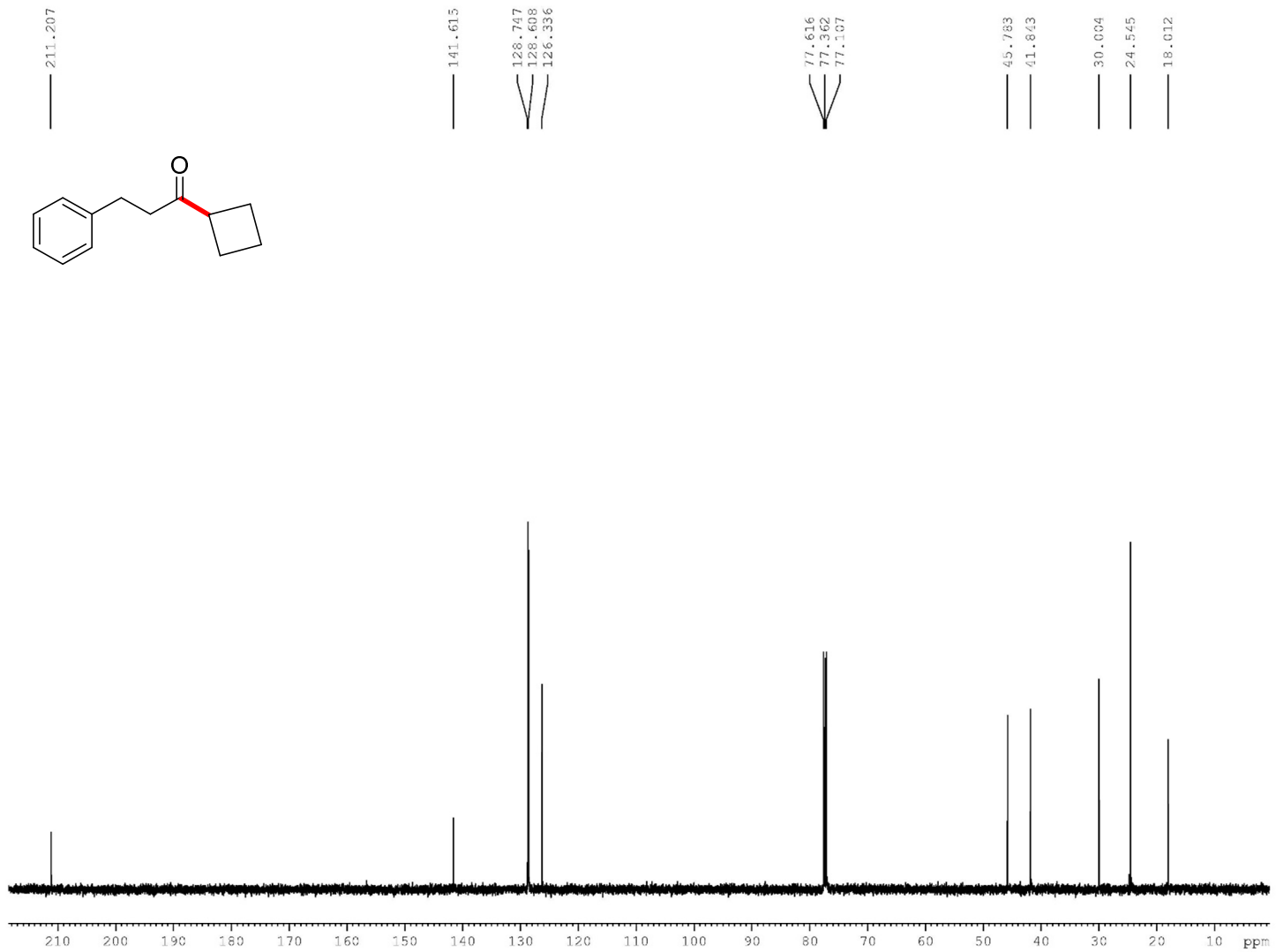
¹H NMR (500 MHz, CDCl₃) Spectrum of 1-Cyclopentyl-3-phenylpropan-1-one (1d)



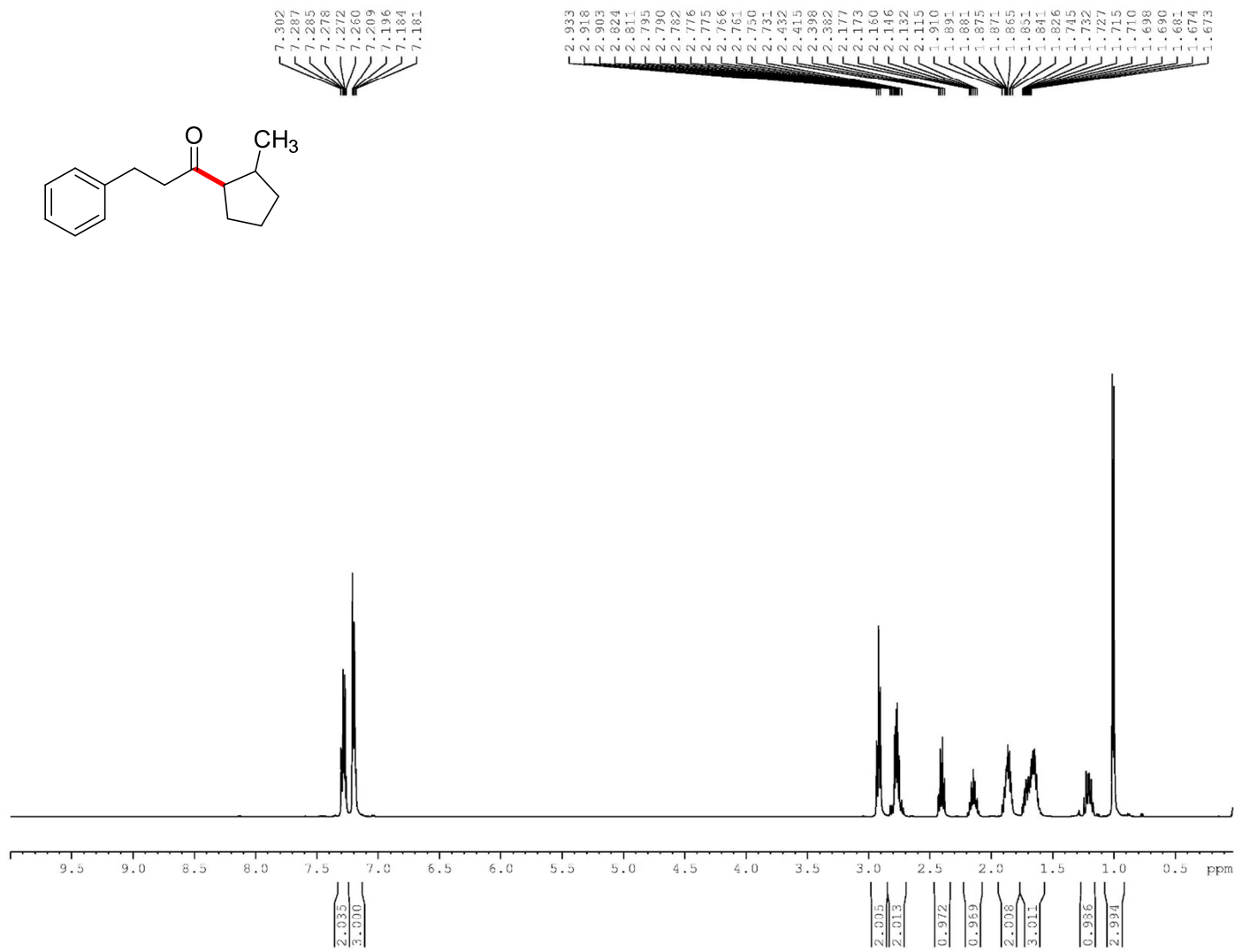
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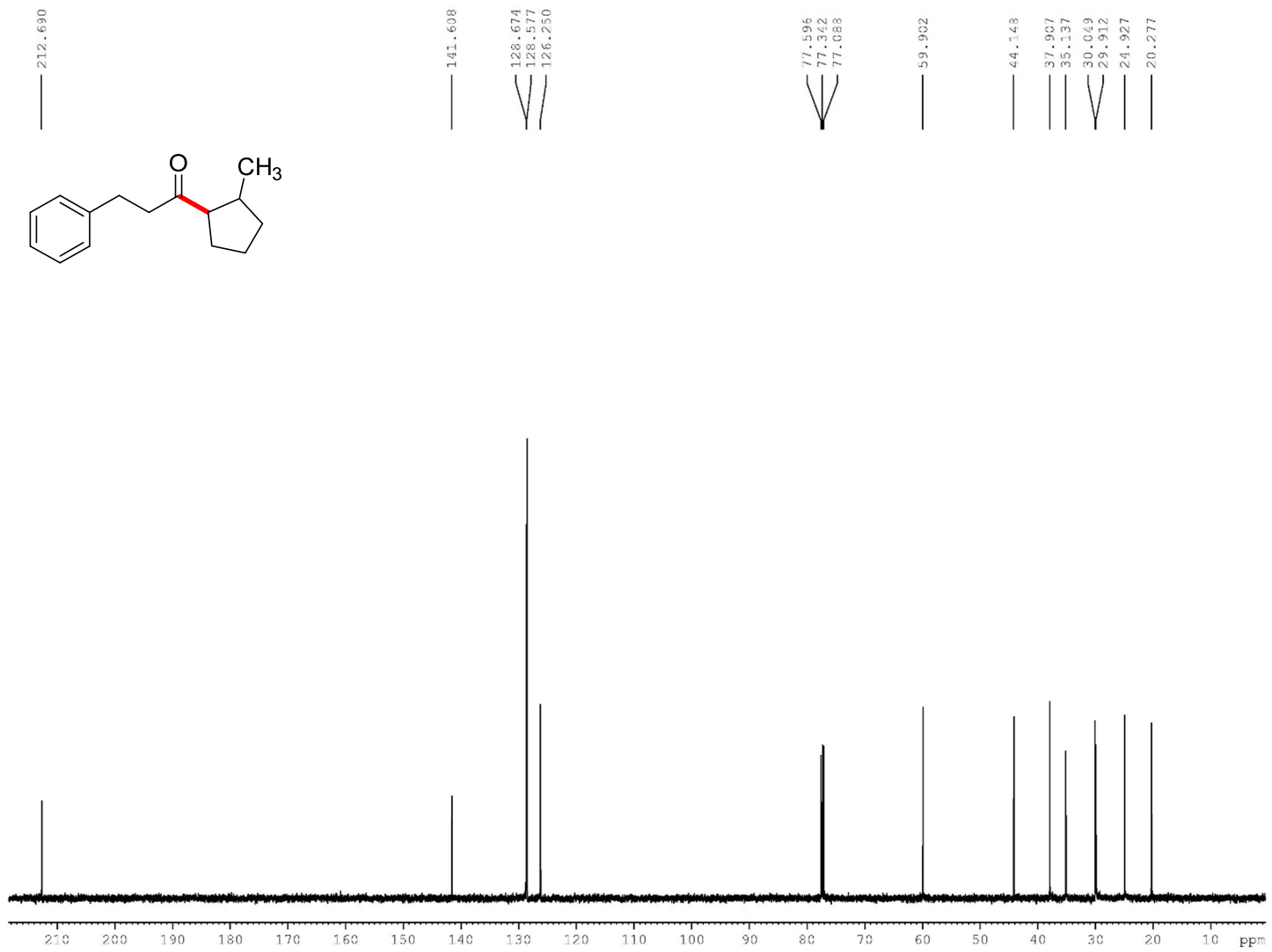
¹H NMR (500 MHz, CDCl₃) Spectrum of 1-Cyclobutyl-3-phenylpropan-1-one (1e)



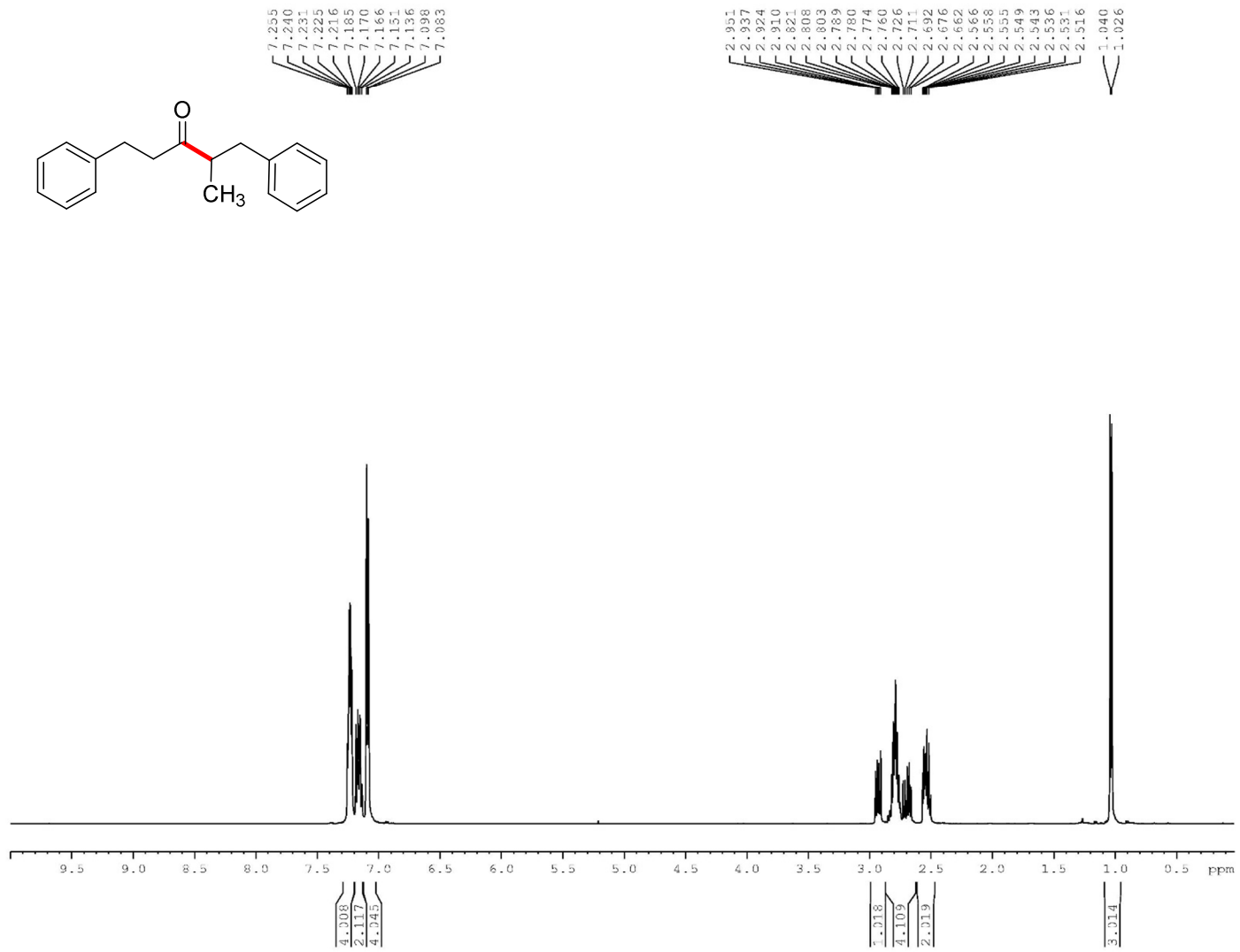
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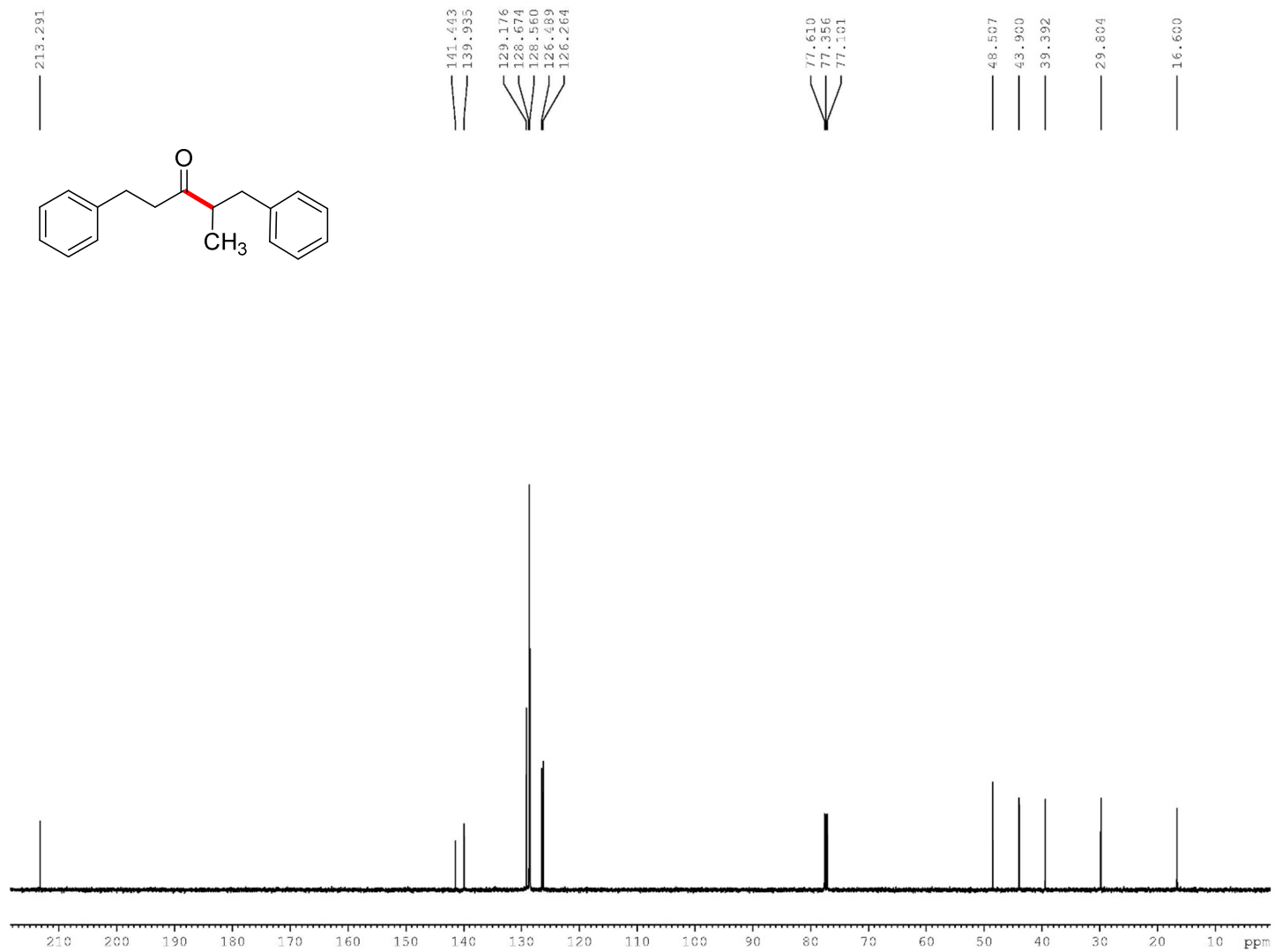
¹H NMR (500 MHz, CDCl₃) Spectrum of 1-(2-Methylcyclopentyl)-3-phenylpropan-1-one (1f)



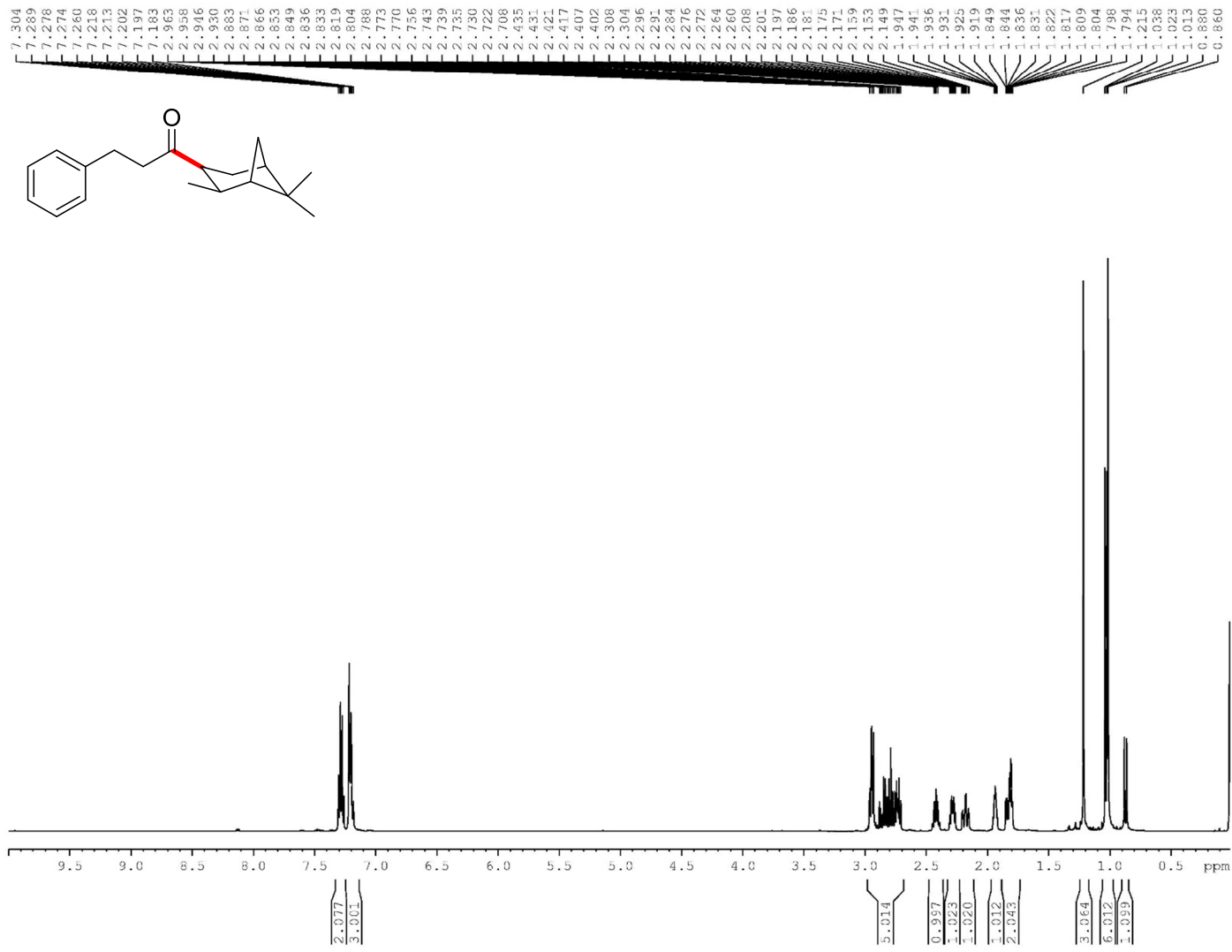
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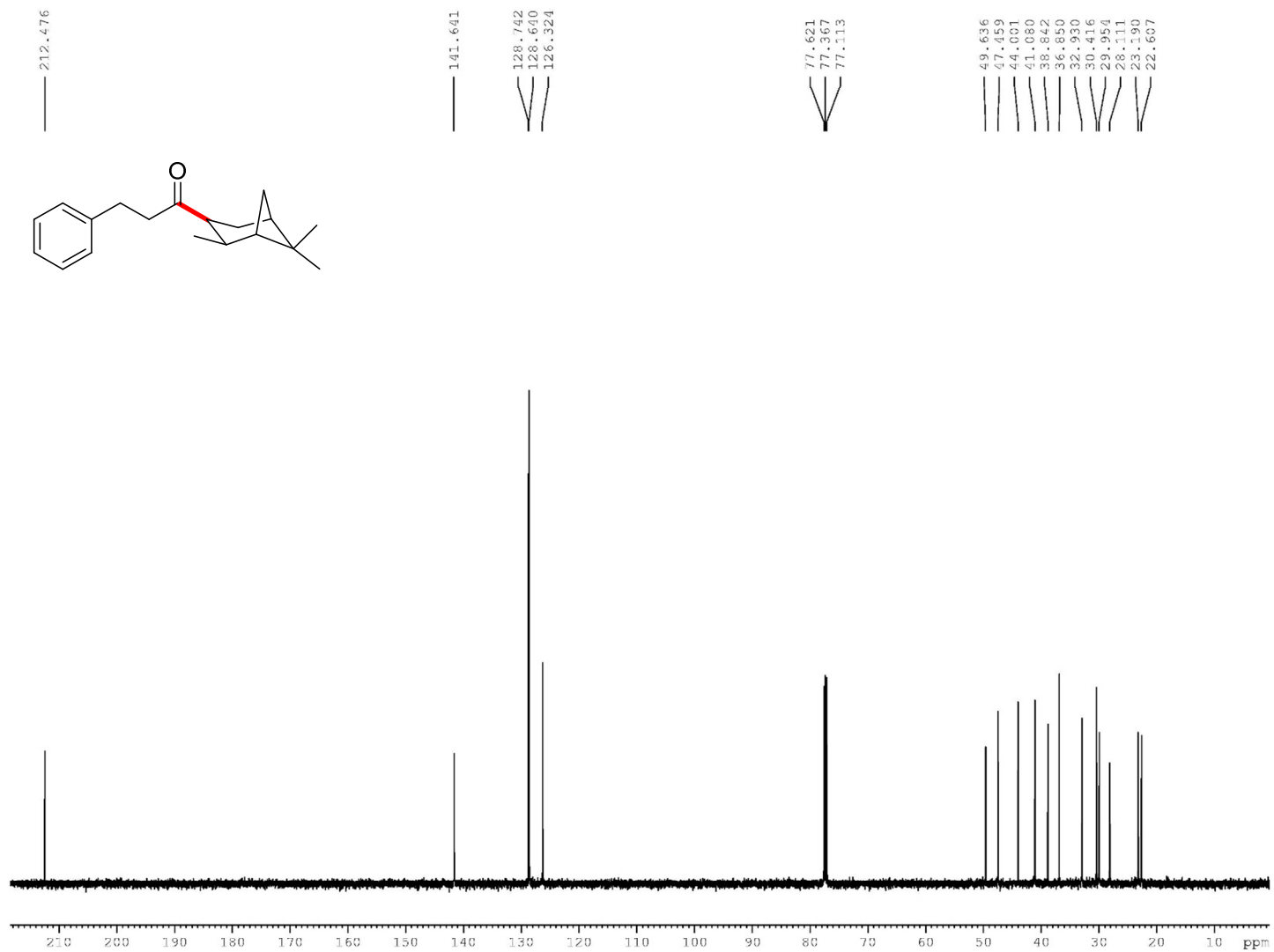
¹H NMR (500 MHz, CDCl₃) Spectrum of 2-Methyl-1,5-diphenylpentan-3-one (1g)



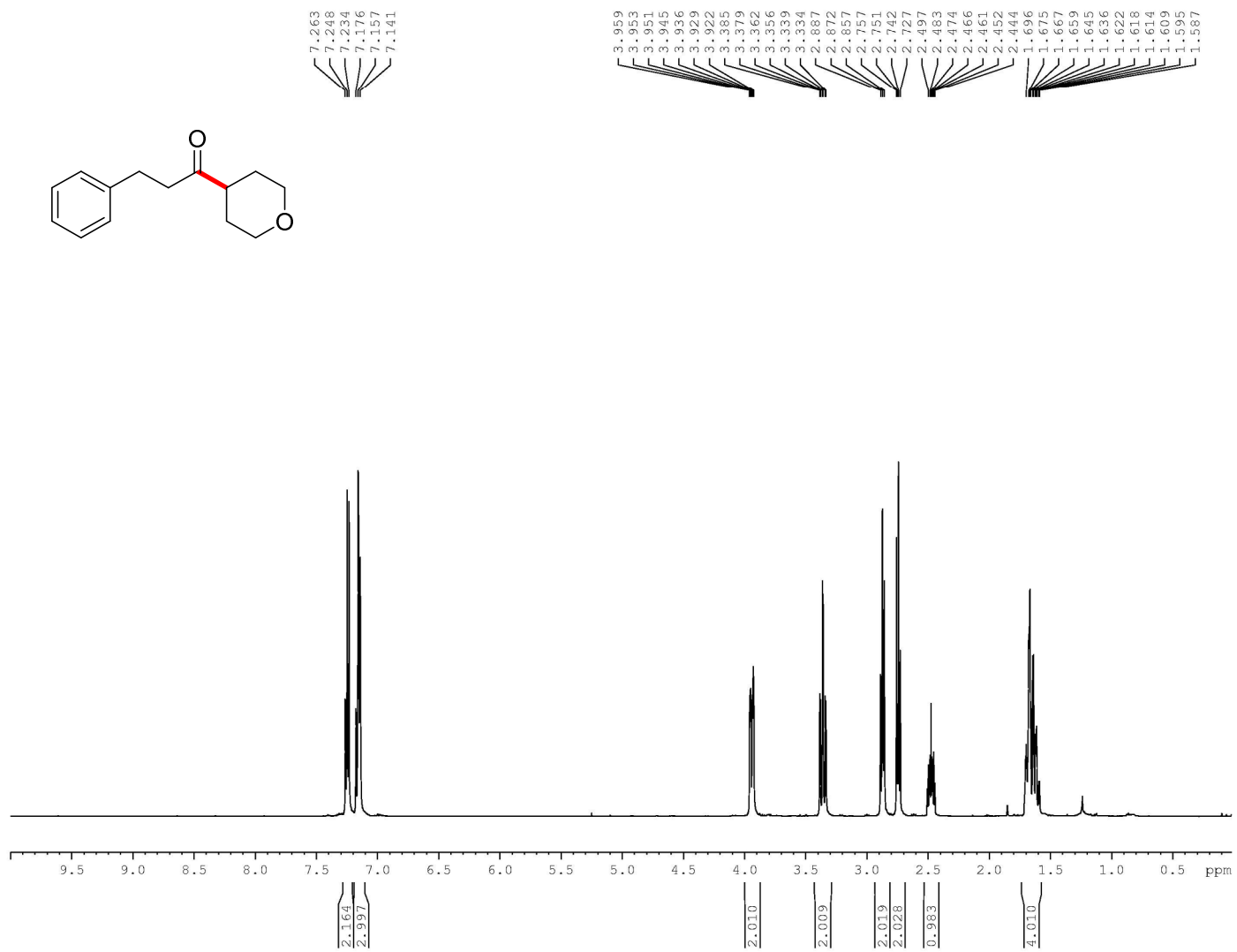
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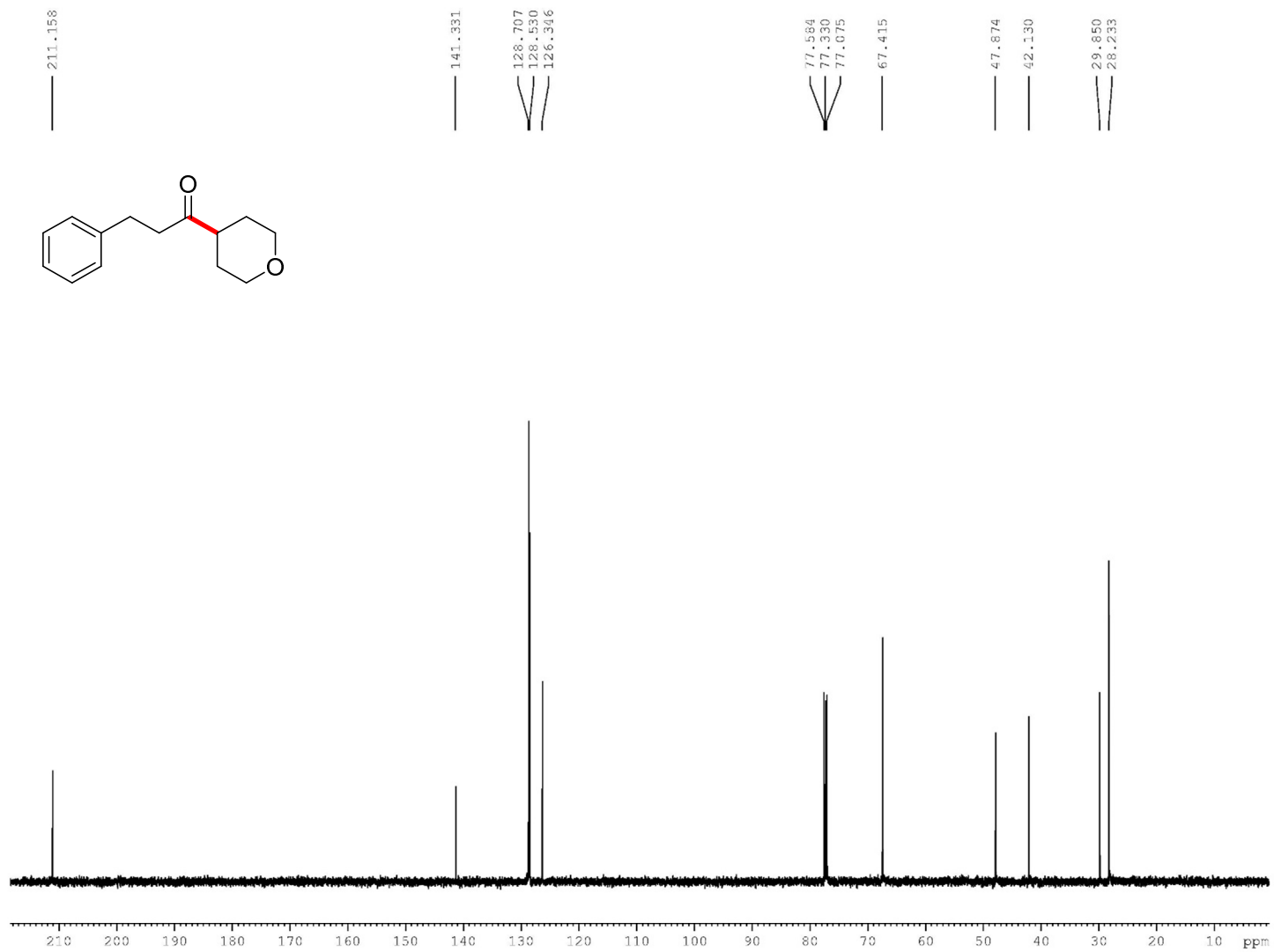
¹H NMR (500 MHz, CDCl₃) Spectrum of 3-Phenyl-1-(2,6,6-trimethylbicyclo[3.1.1]heptan-3-yl)propan-1-one (1h)



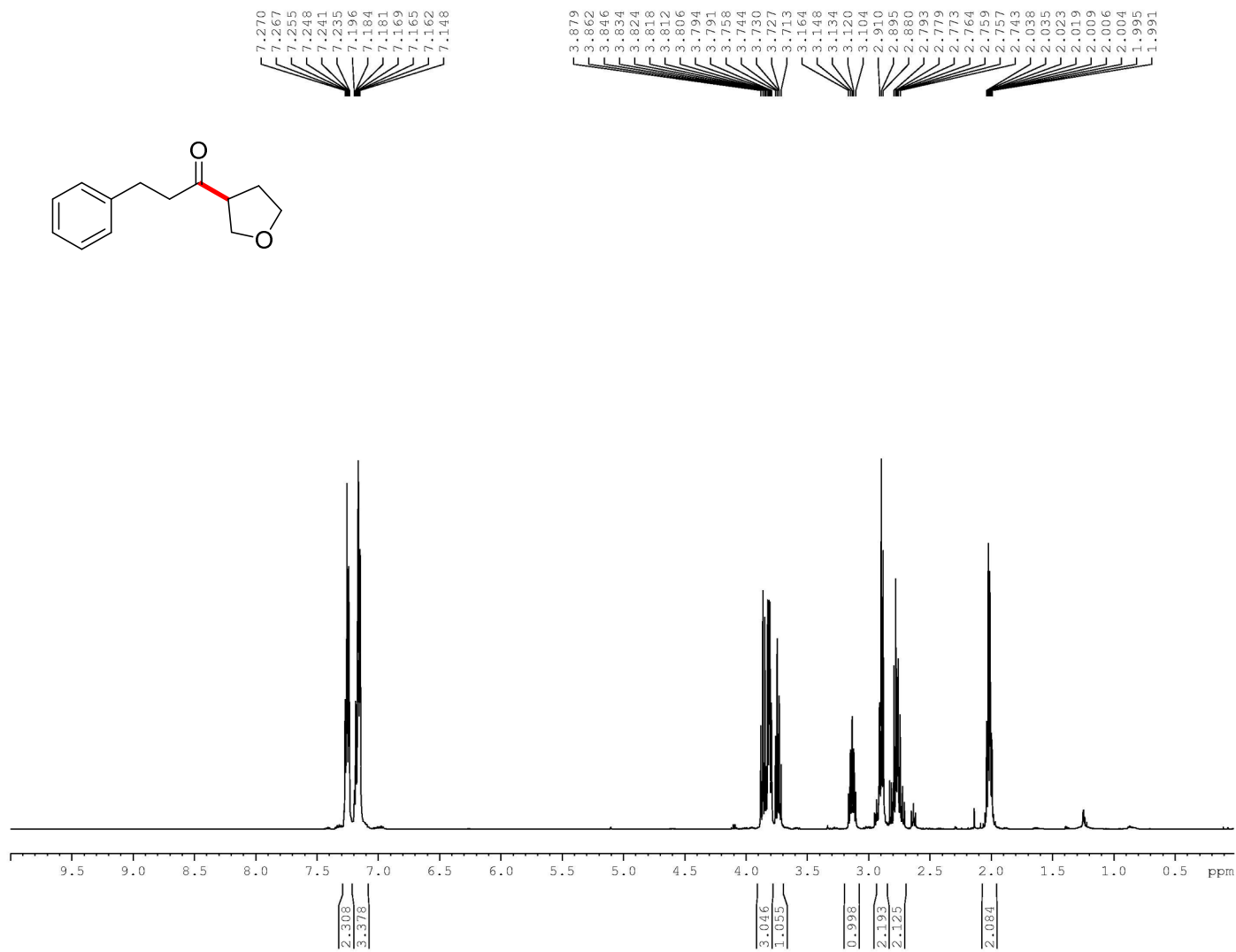
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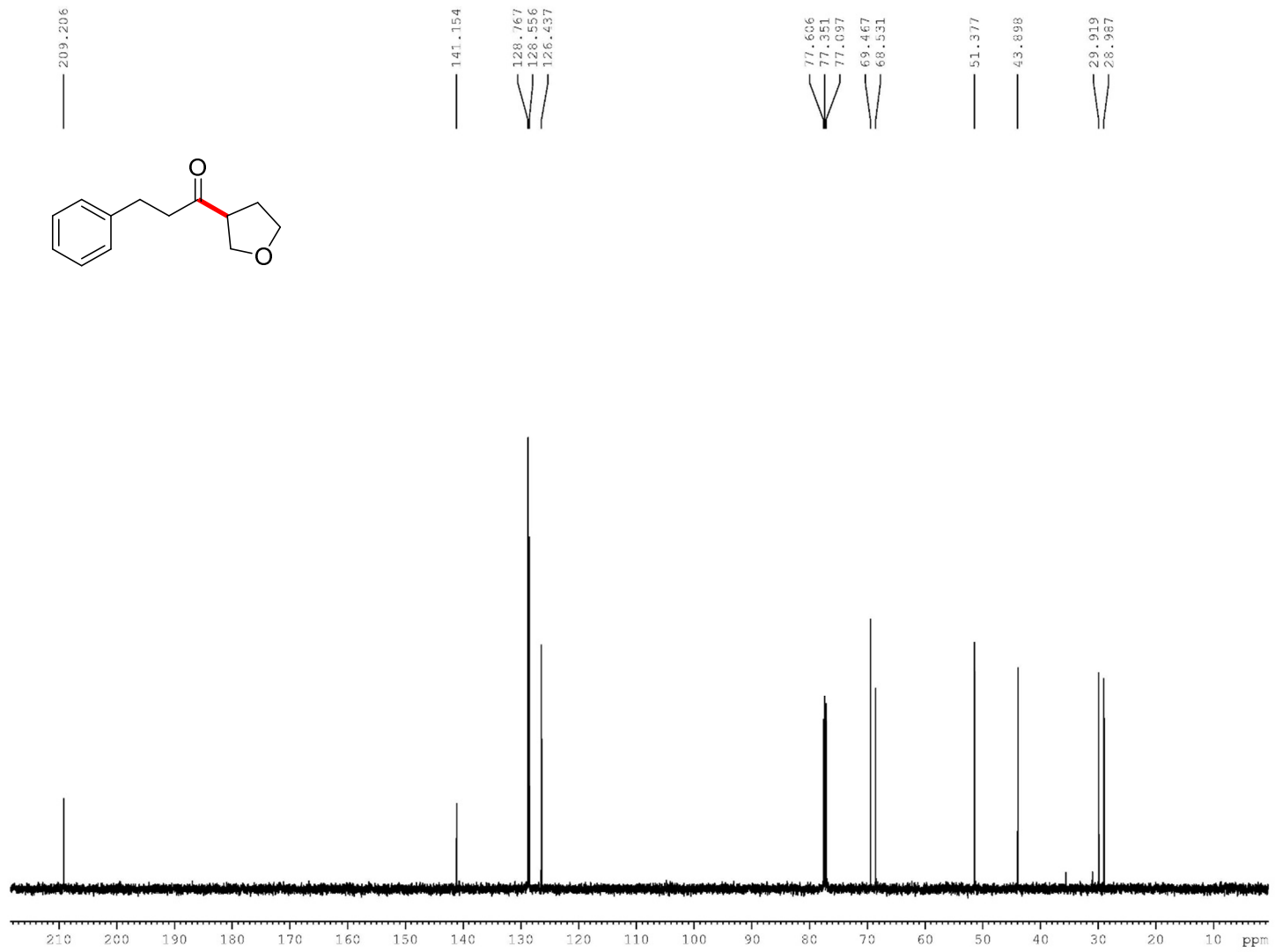
¹H NMR (500 MHz, CDCl₃) Spectrum of 3-Phenyl-1-(tetrahydro-2H-pyran-4-yl)propan-1-one (1i)



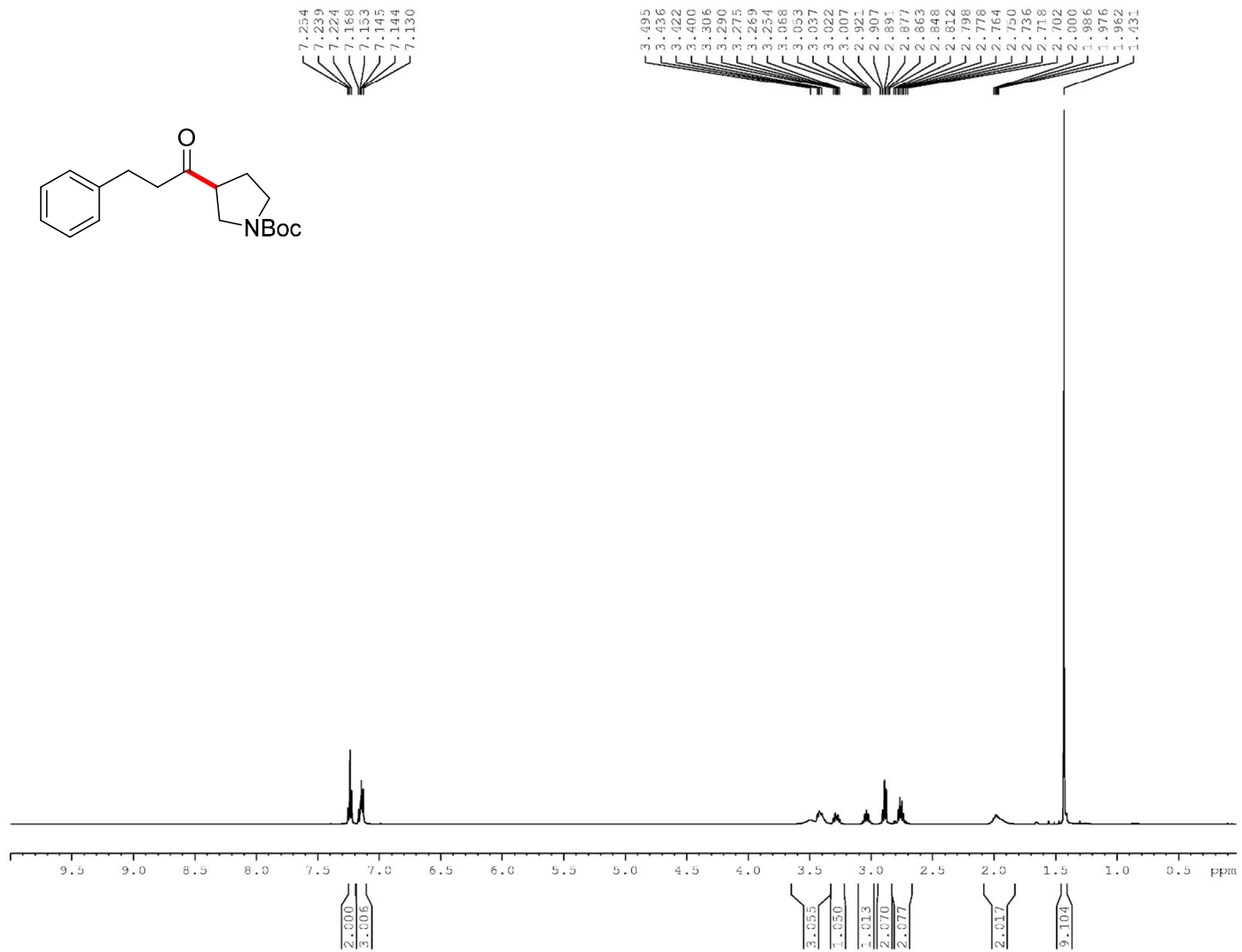
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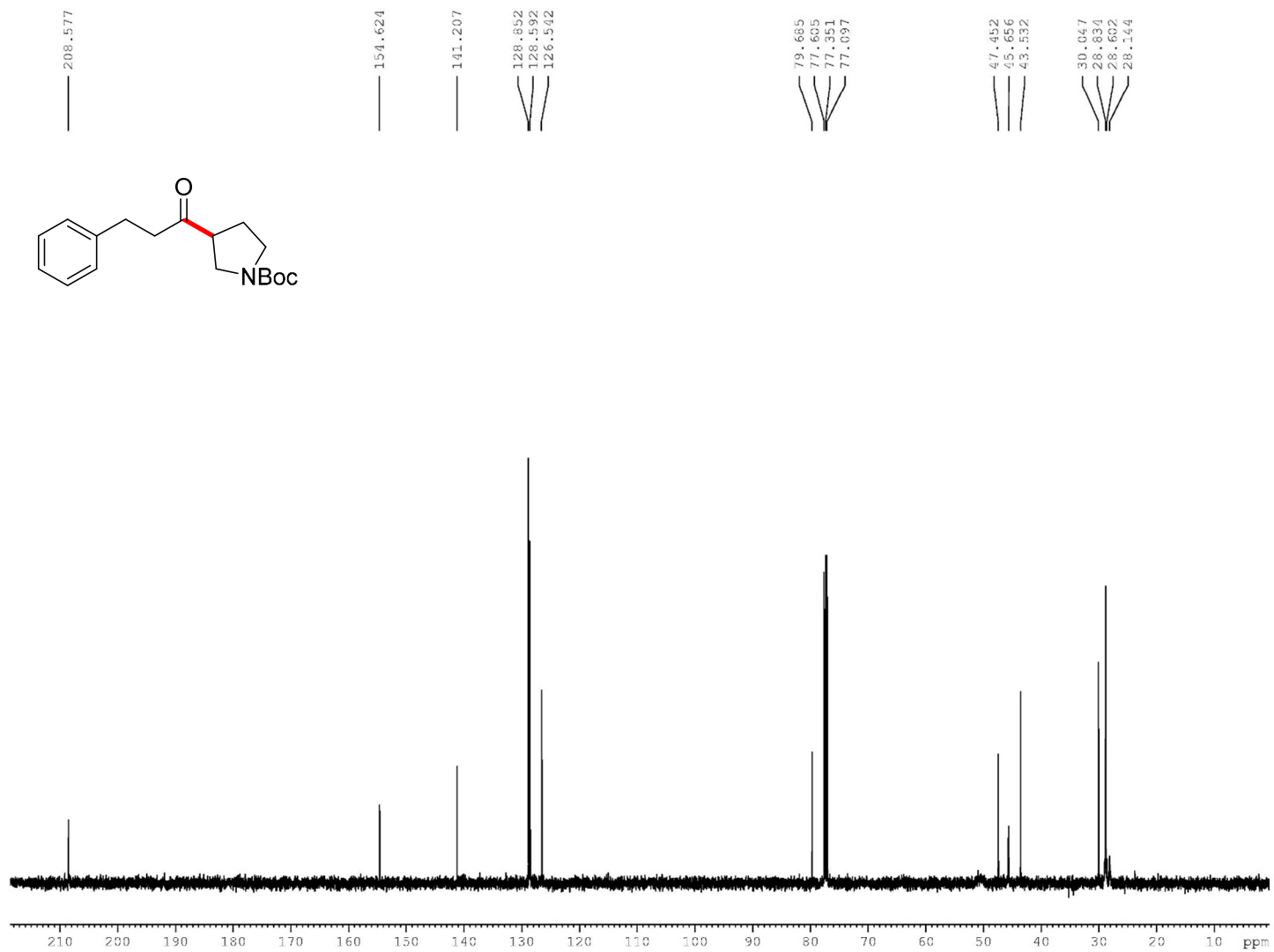
¹H NMR (500 MHz, CDCl₃) Spectrum of 3-Phenyl-1-(tetrahydrofuran-3-yl)propan-1-one (1j)



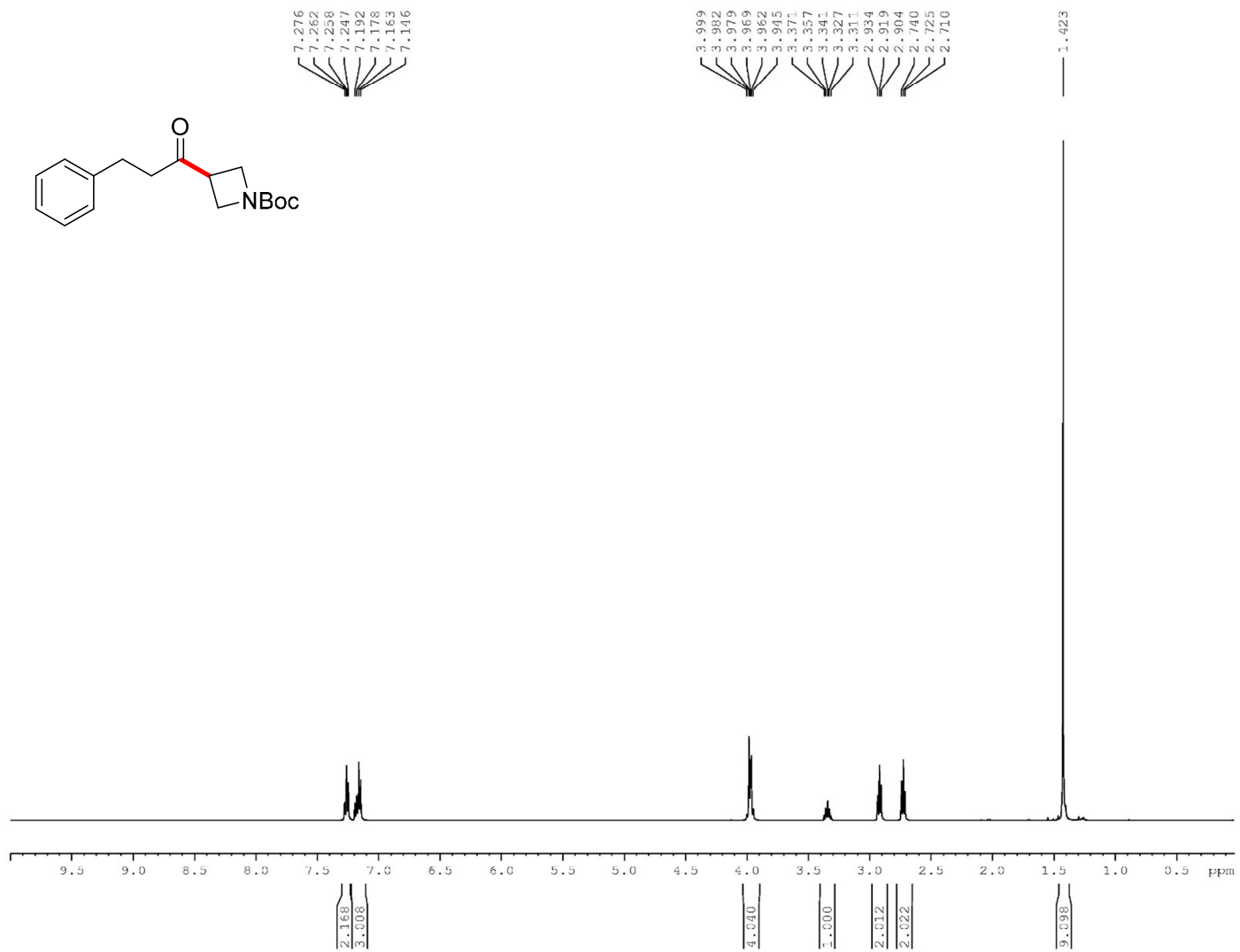
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of 3-Phenyl-1-(tetrahydrofuran-3-yl)propan-1-one (1j)



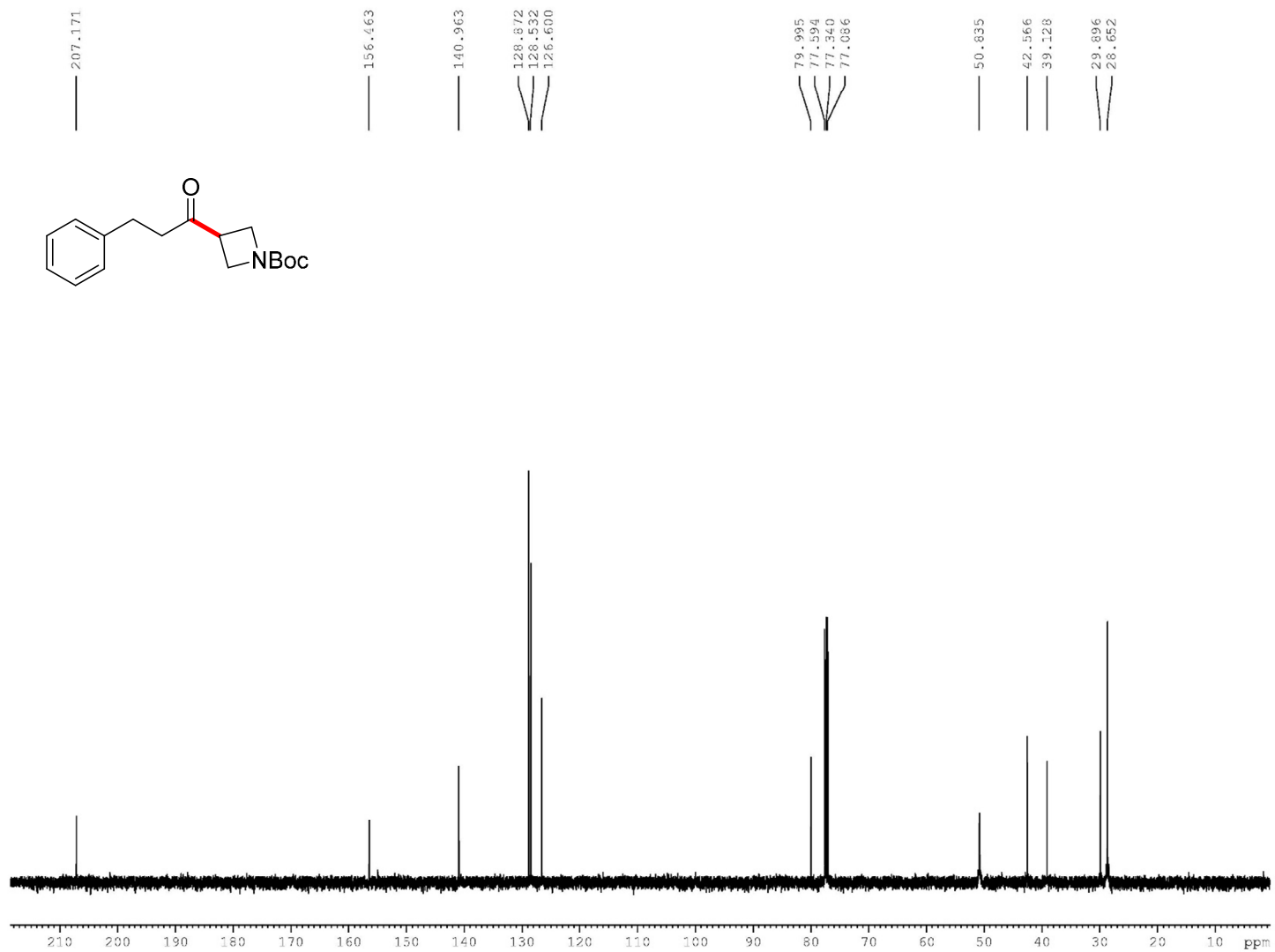
¹H NMR (500 MHz, CDCl₃) Spectrum of *tert*-Butyl 3-(3-phenylpropanoyl)pyrrolidine-1-carboxylate (1k)



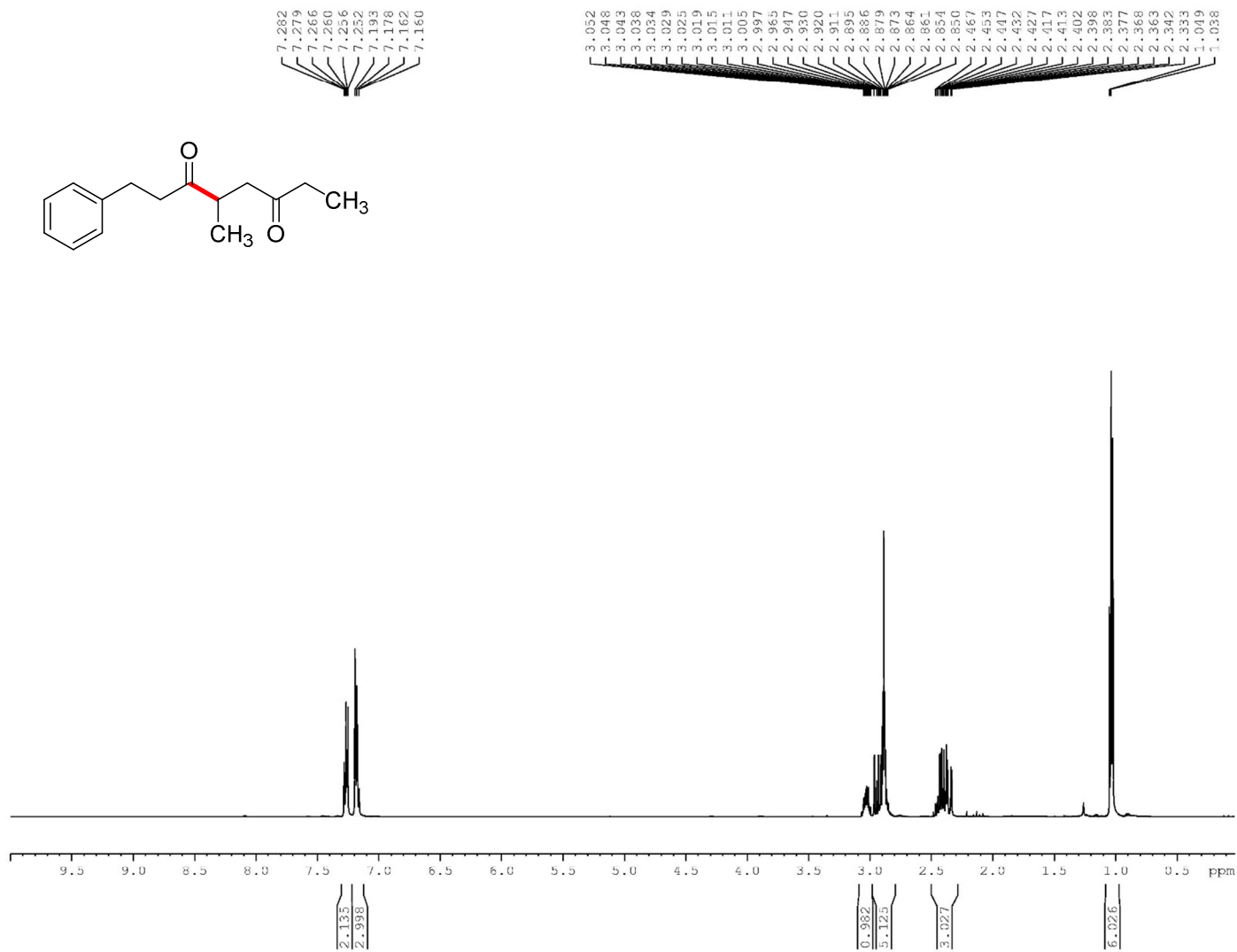
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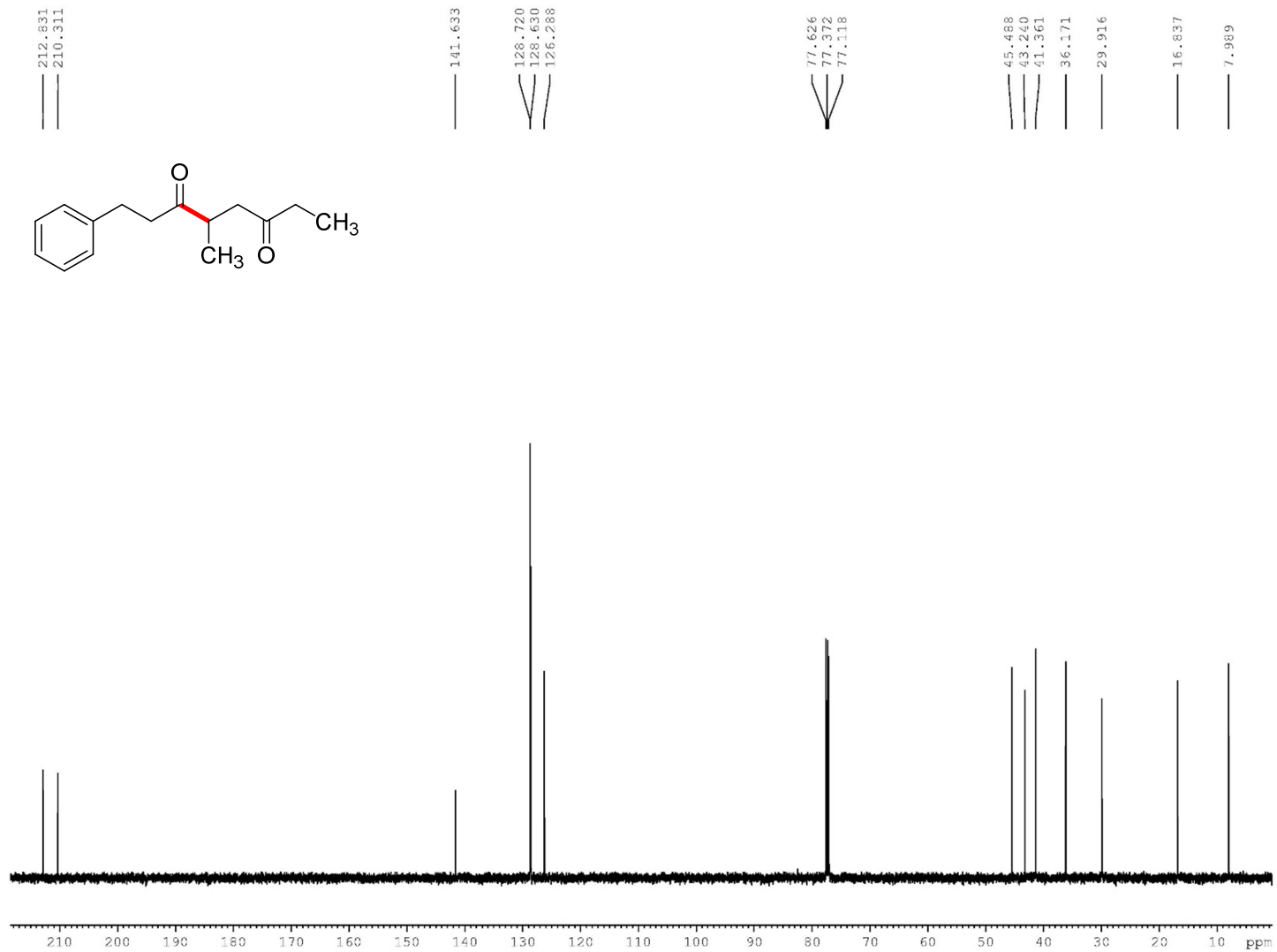
¹H NMR (500 MHz, CDCl₃) Spectrum of *tert*-Butyl 3-(3-phenylpropanoyl)azetidine-1-carboxylate (11)



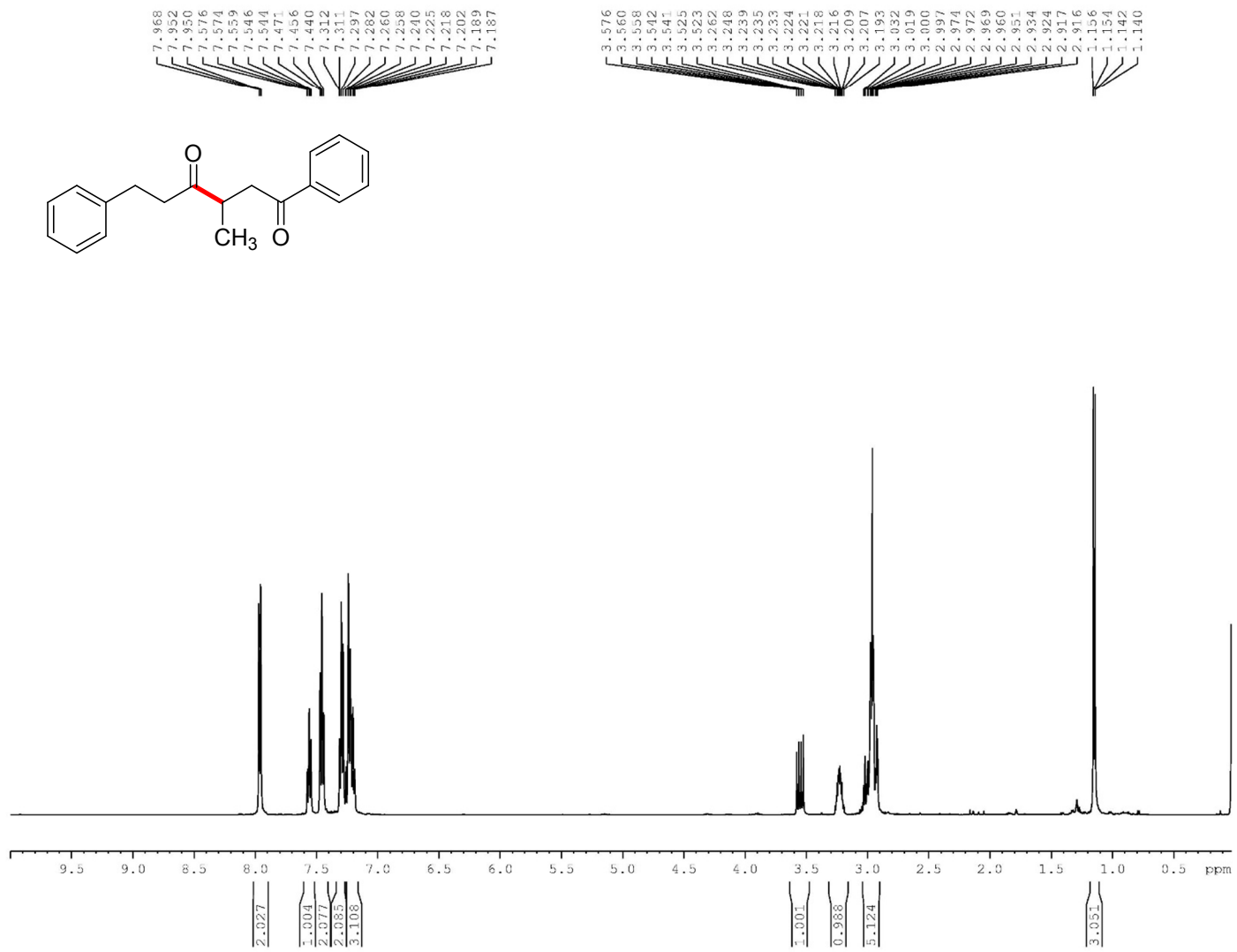
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of *tert*-Butyl 3-(3-phenylpropanoyl)azetidine-1-carboxylate (II)



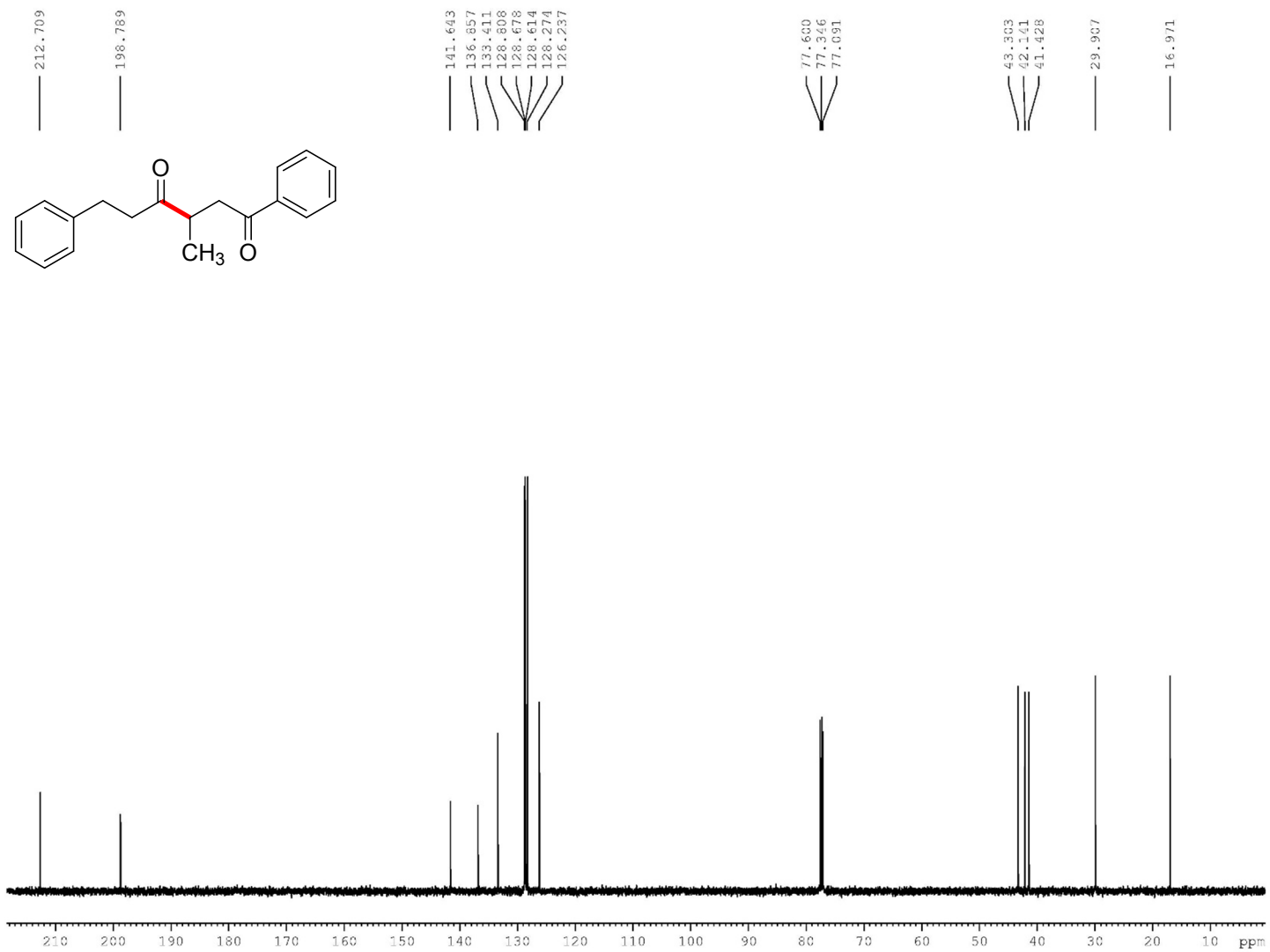
¹H NMR (500 MHz, CDCl₃) Spectrum of 4-Methyl-1-phenyloctane-3,6-dione (1m)



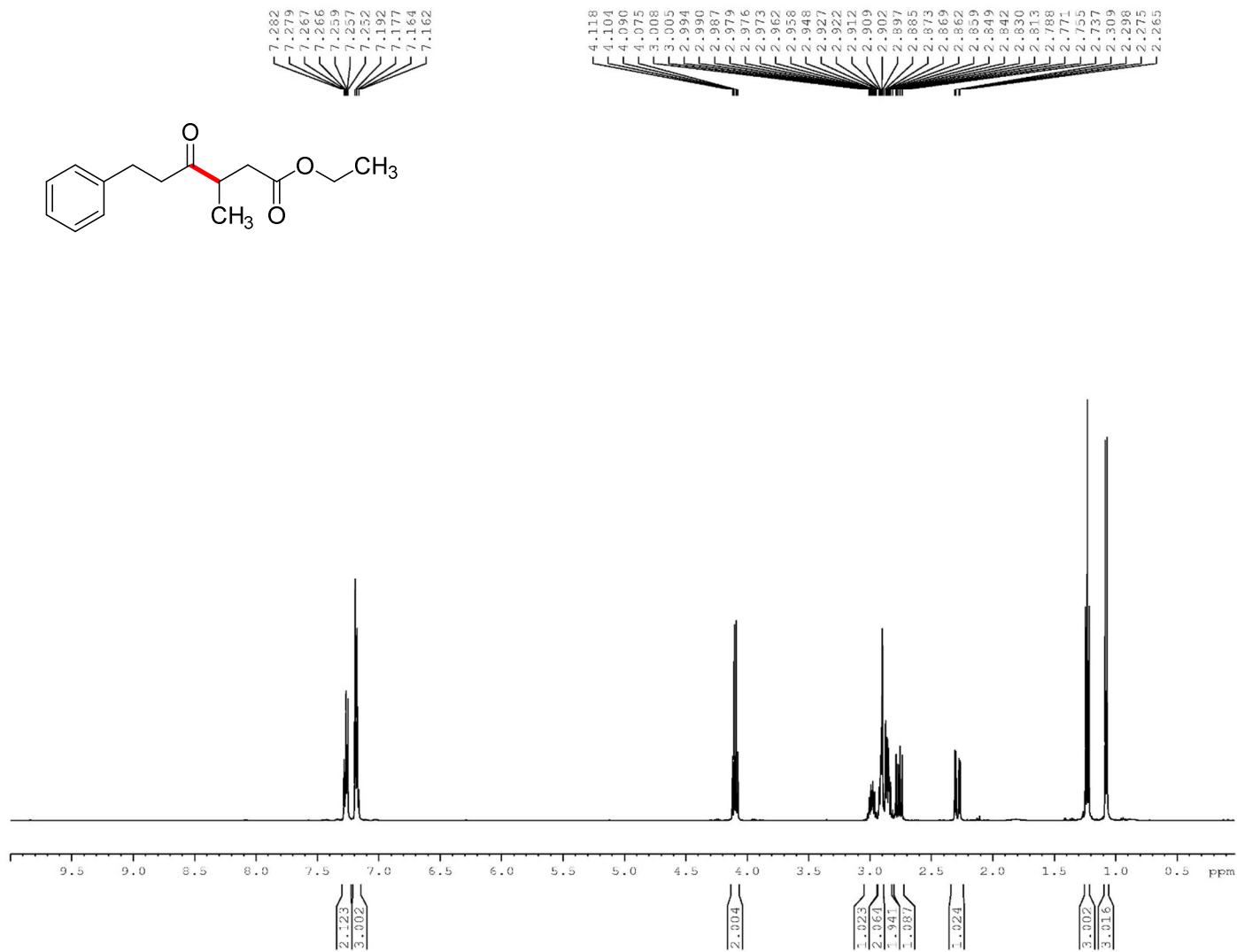
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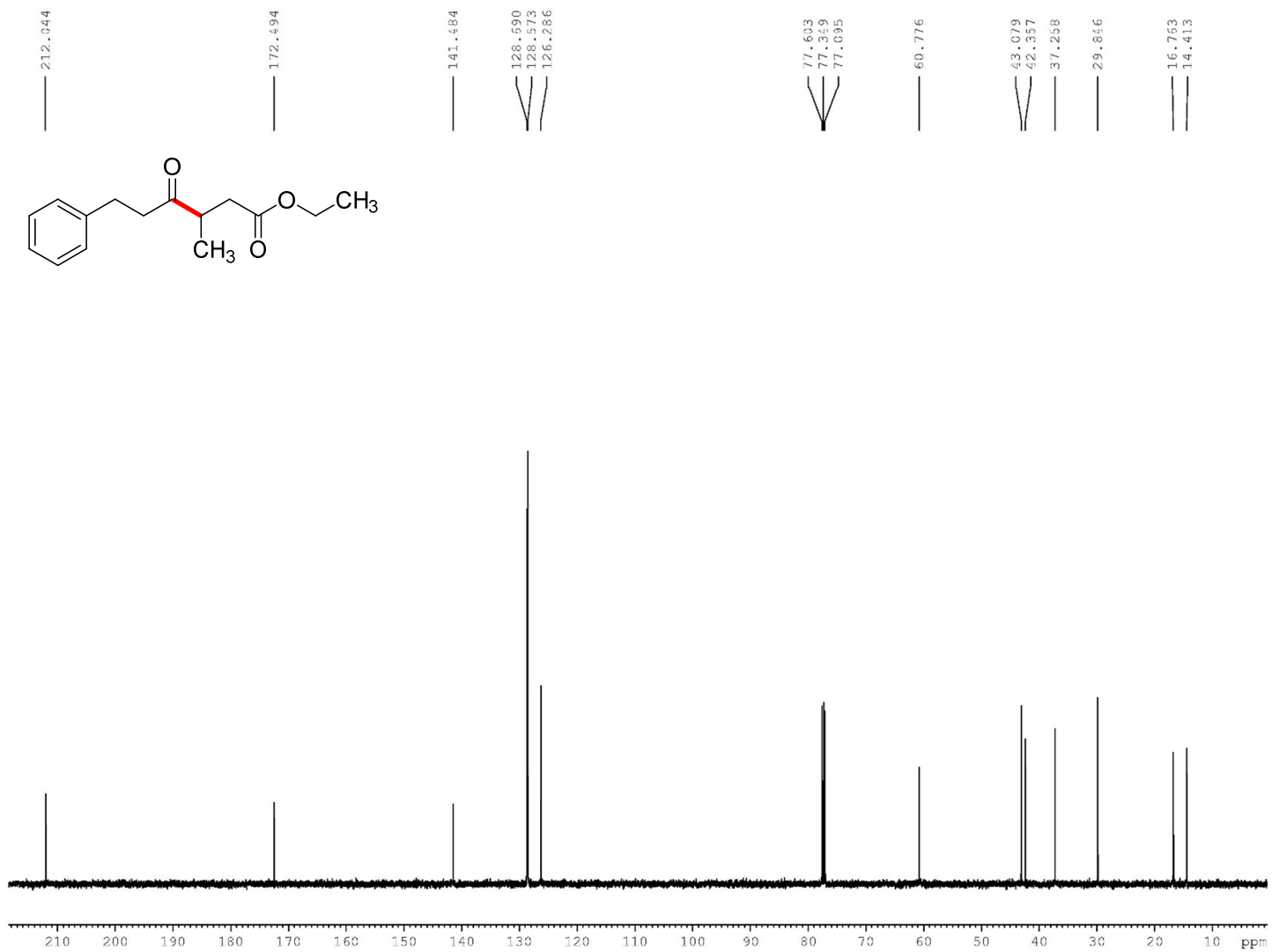
^1H NMR (500 MHz, CDCl_3) Spectrum of 3-Methyl-1,6-diphenylhexane-1,4-dione (1n)



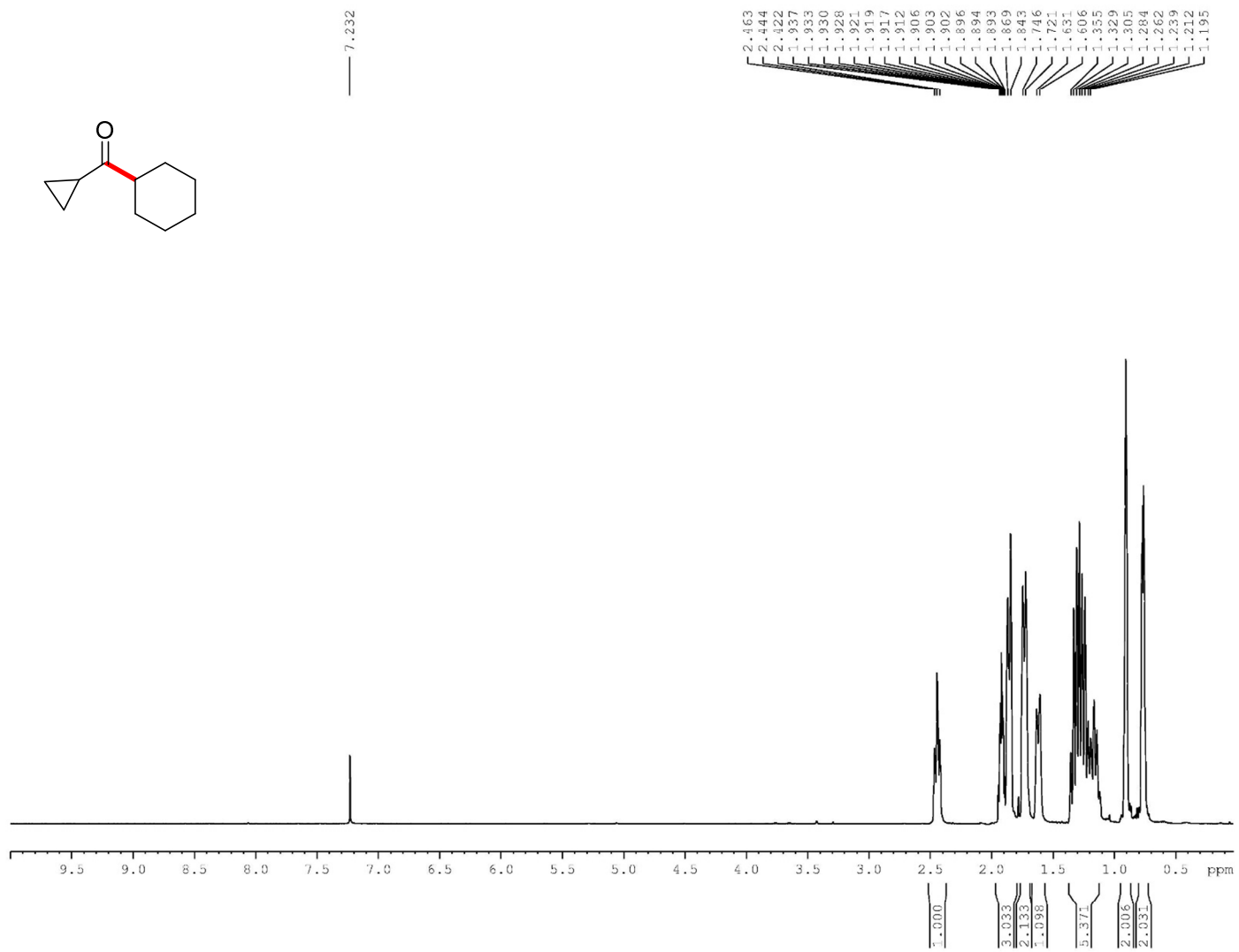
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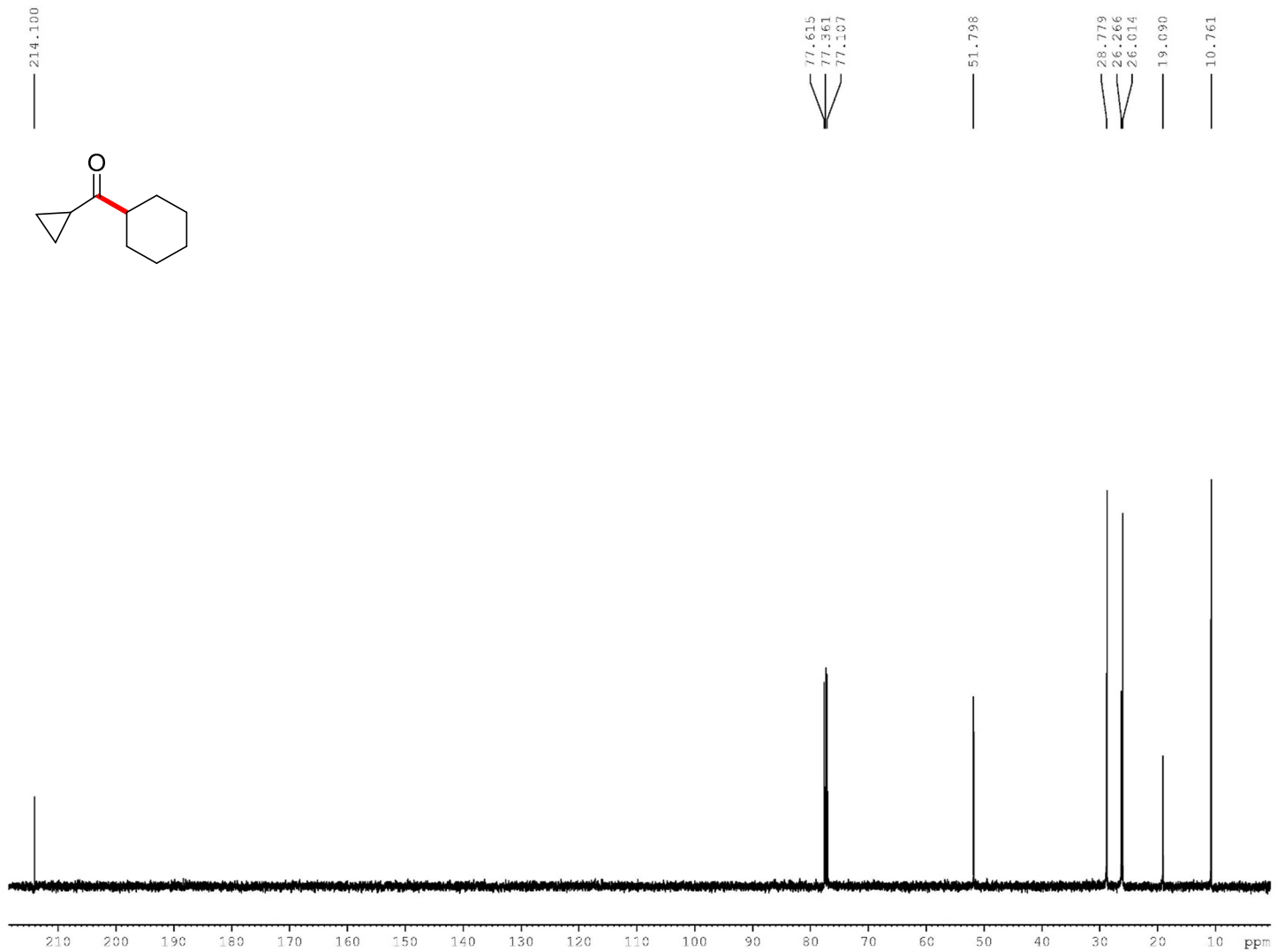
¹H NMR (500 MHz, CDCl₃) Spectrum of Ethyl 3-methyl-4-oxo-6-phenylhexanoate (10)



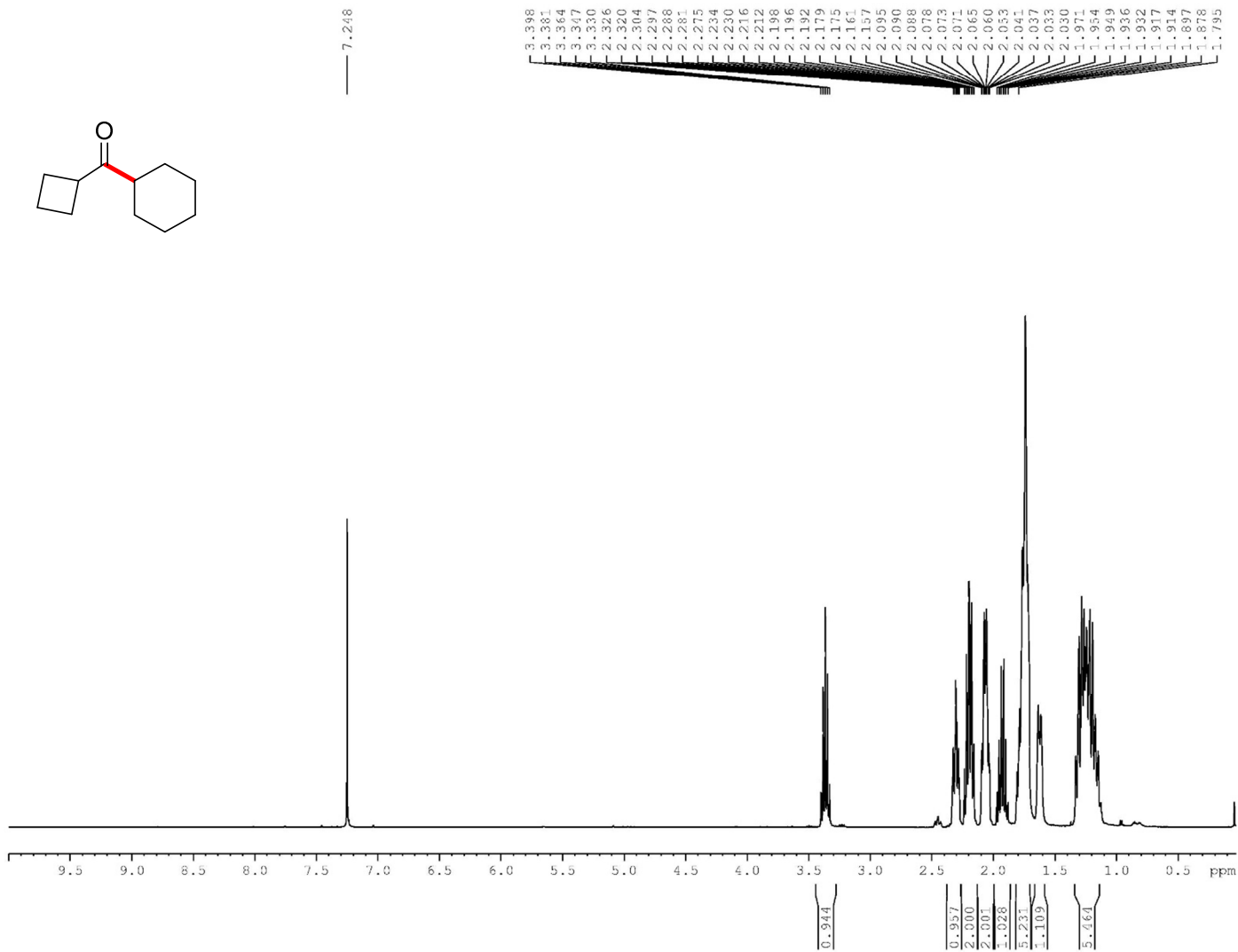
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of Ethyl 3-methyl-4-oxo-6-phenylhexanoate (1o)



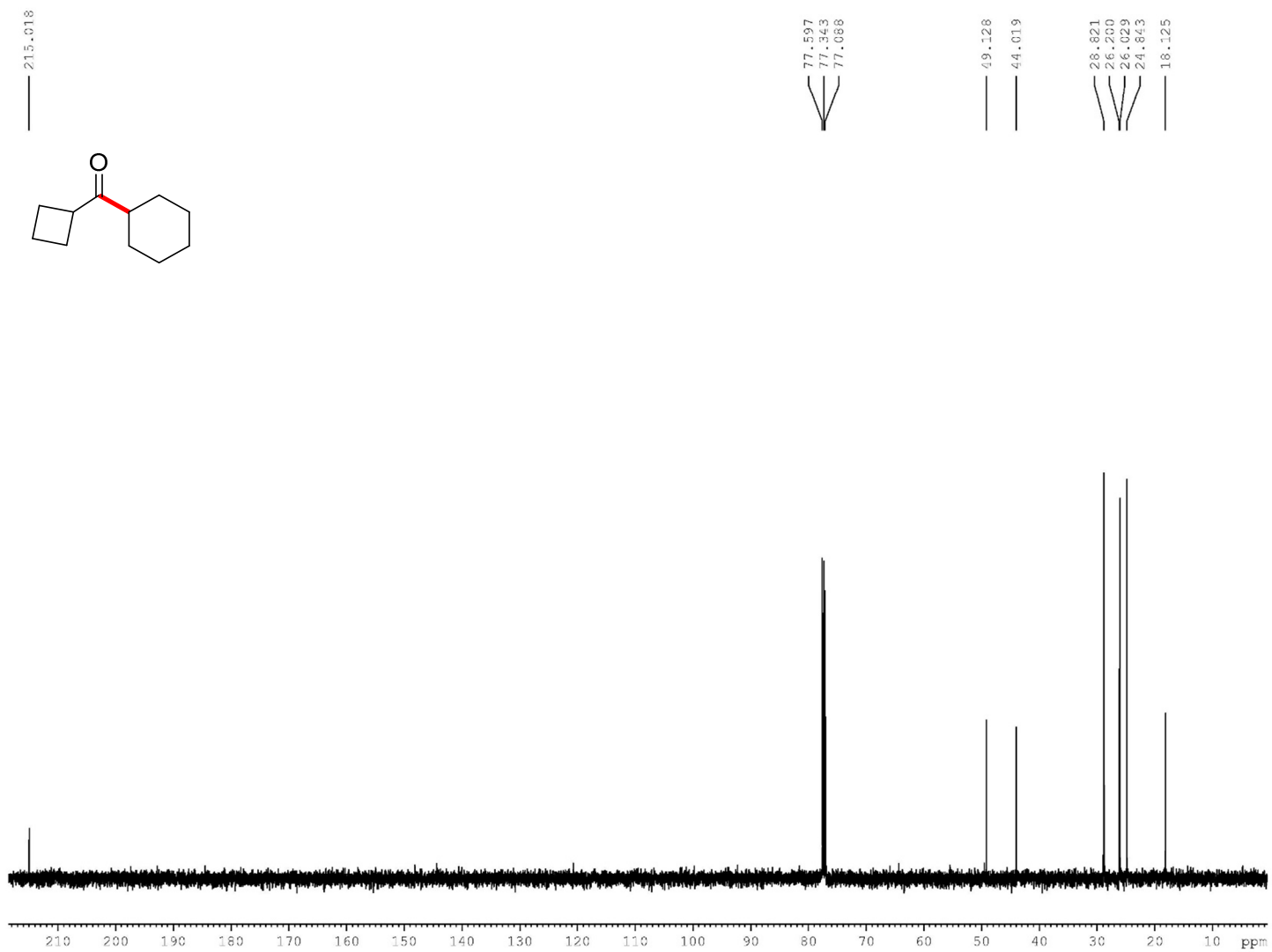
¹H NMR (500 MHz, CDCl₃) Spectrum of Cyclohexyl(cyclopropyl)methanone (2a)



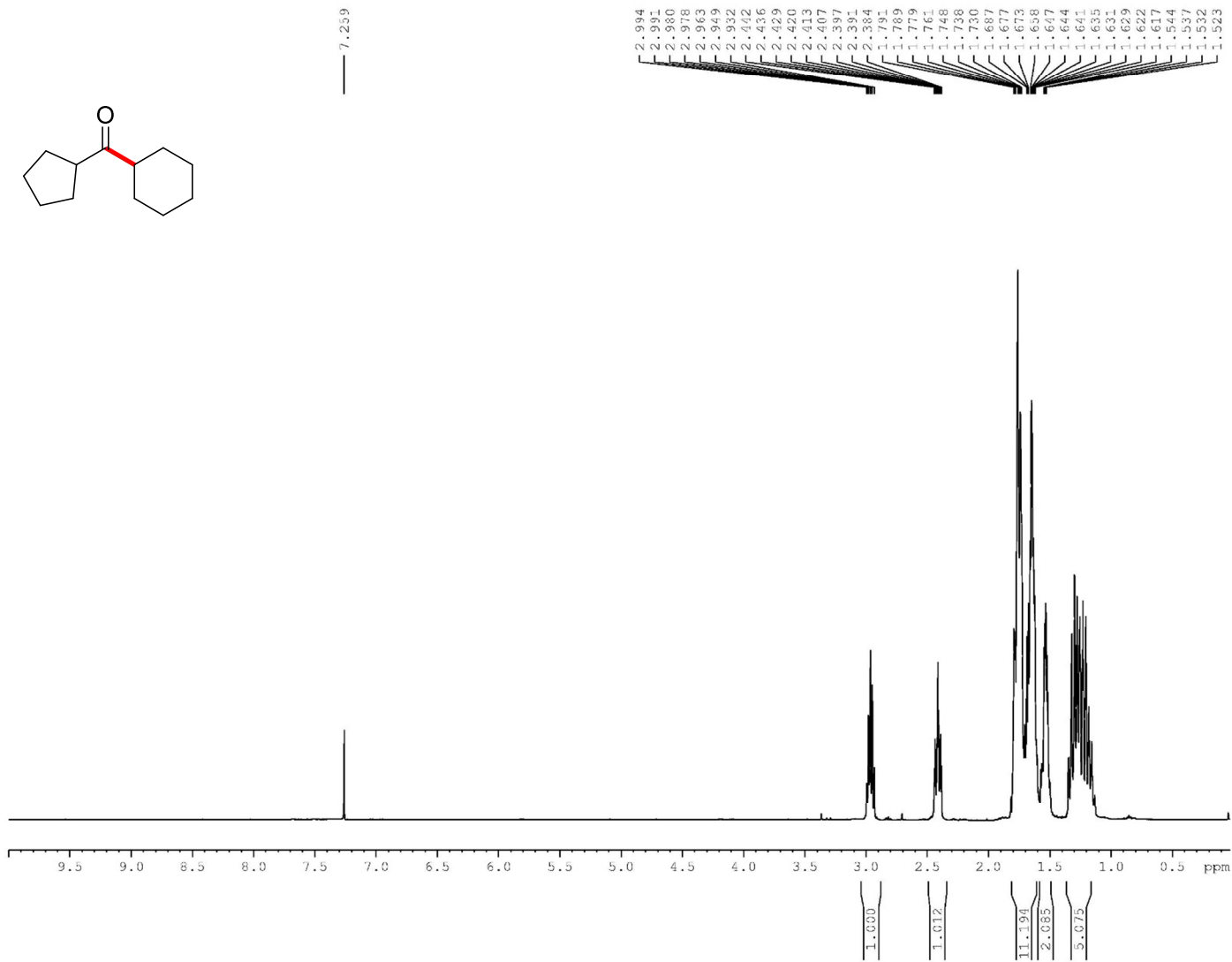
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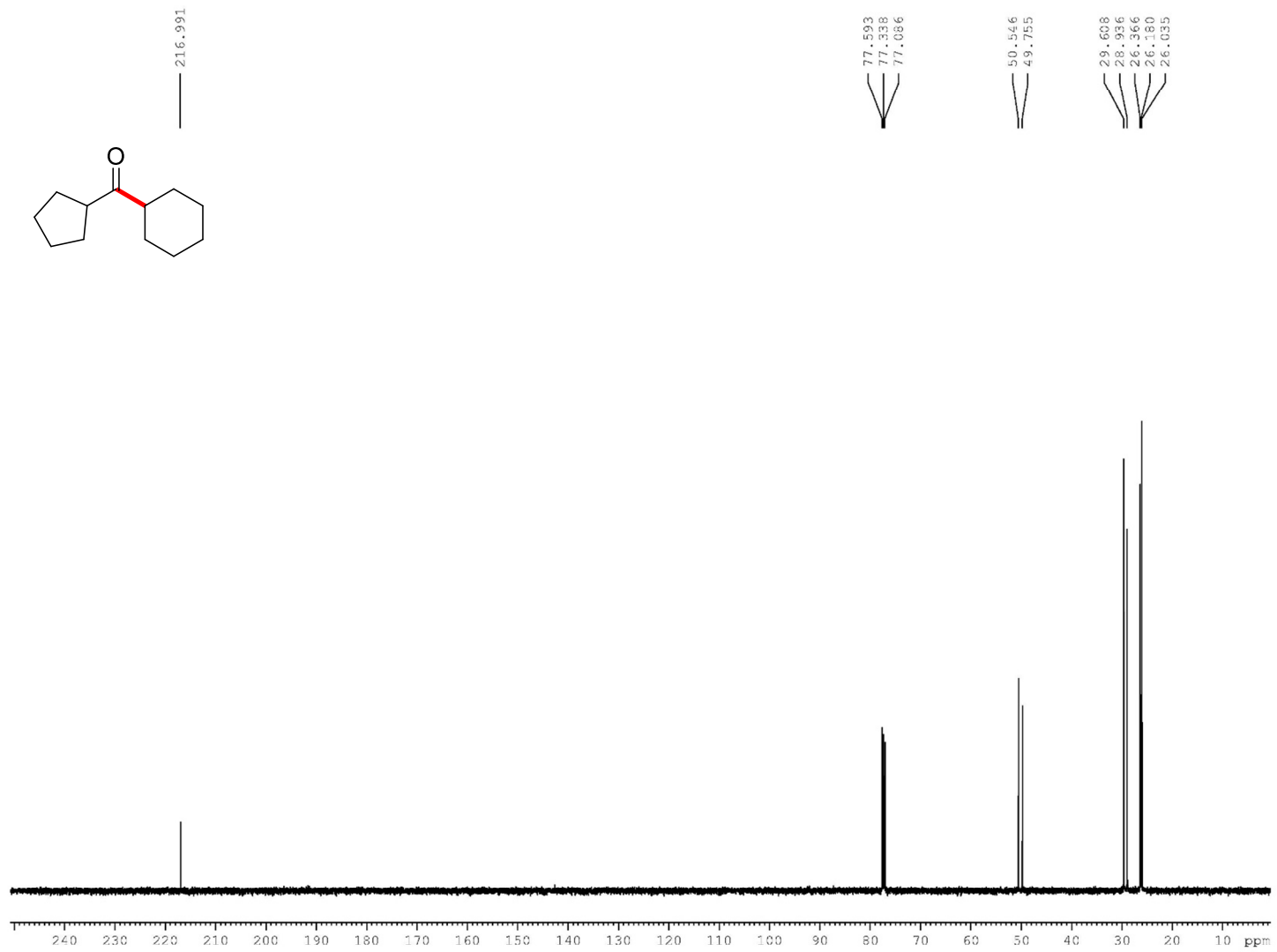
¹H NMR (500 MHz, CDCl₃) Spectrum of Cyclobutyl(cyclohexyl)methanone (2b)



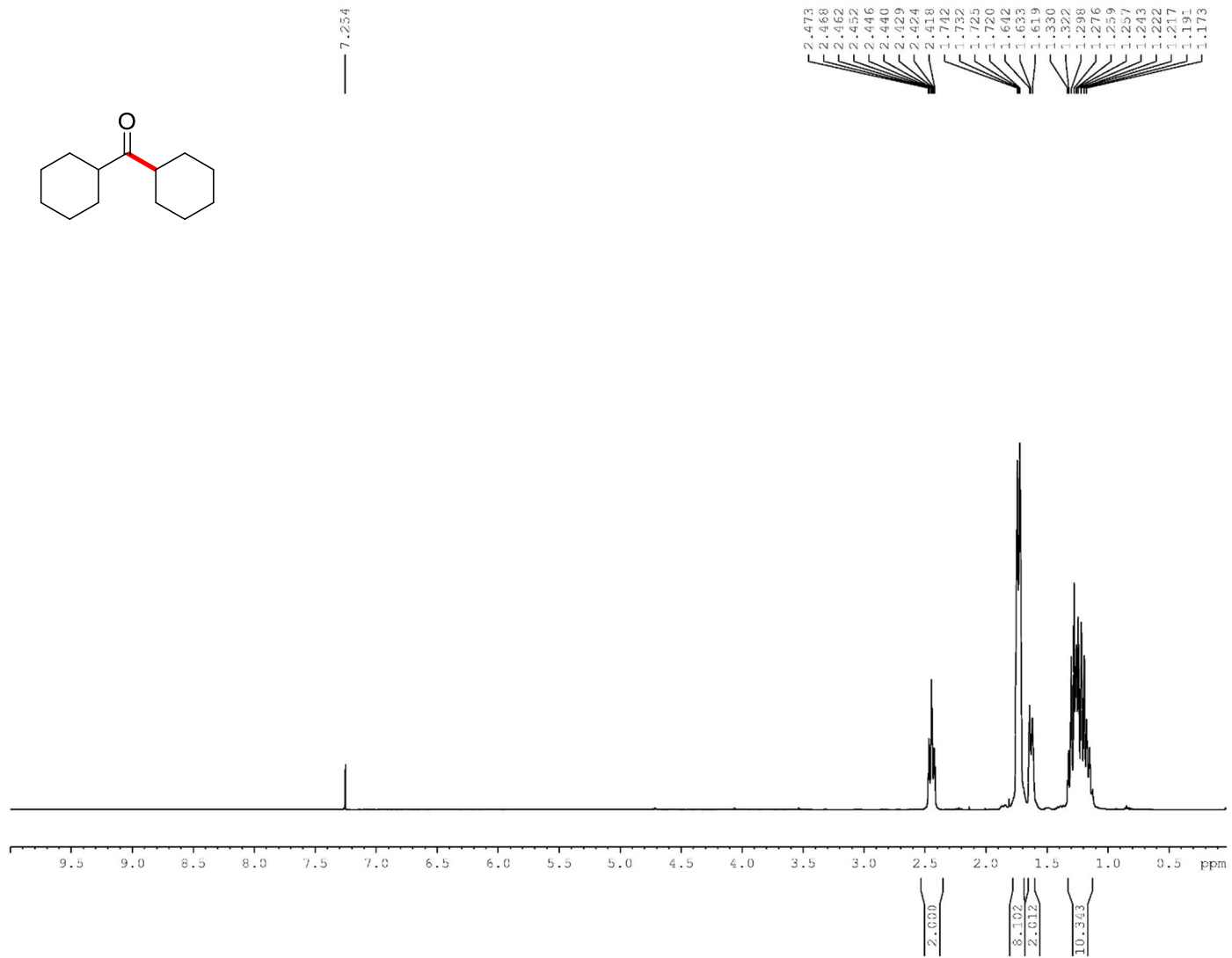
^{13}C NMR (125.8 MHz, CDCl_3) Spectrum of Cyclobutyl(cyclohexyl)methanone (2b)



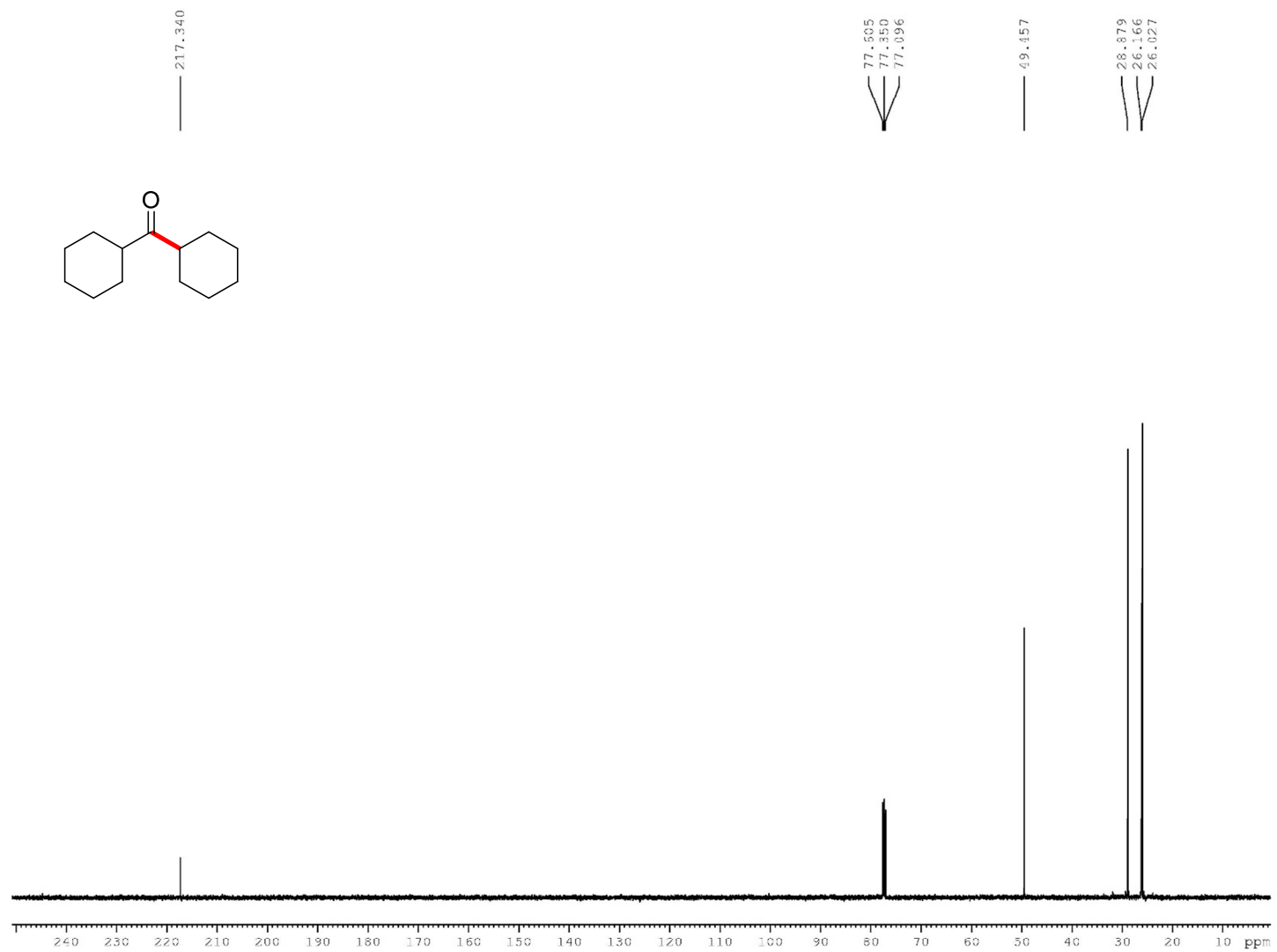
¹H NMR (500 MHz, CDCl₃) Spectrum of Cyclohexyl(cyclopentyl)methanone (2c)



^{13}C NMR (125.8 MHz, CDCl_3) Spectrum of Cyclohexyl(cyclopentyl)methanone (2c)



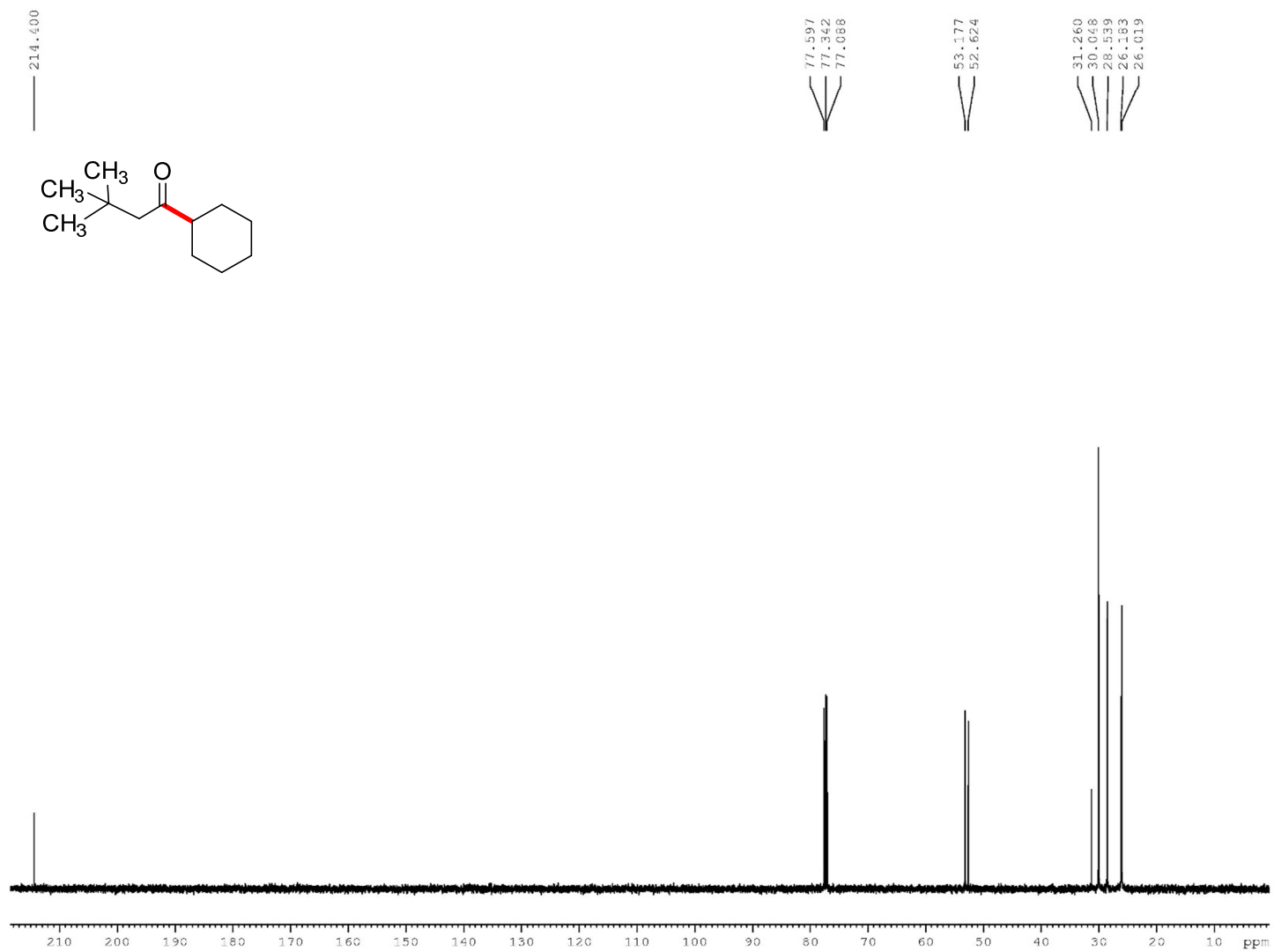
¹H NMR (500 MHz, CDCl₃) Spectrum of Dicyclohexylmethanone (2d)



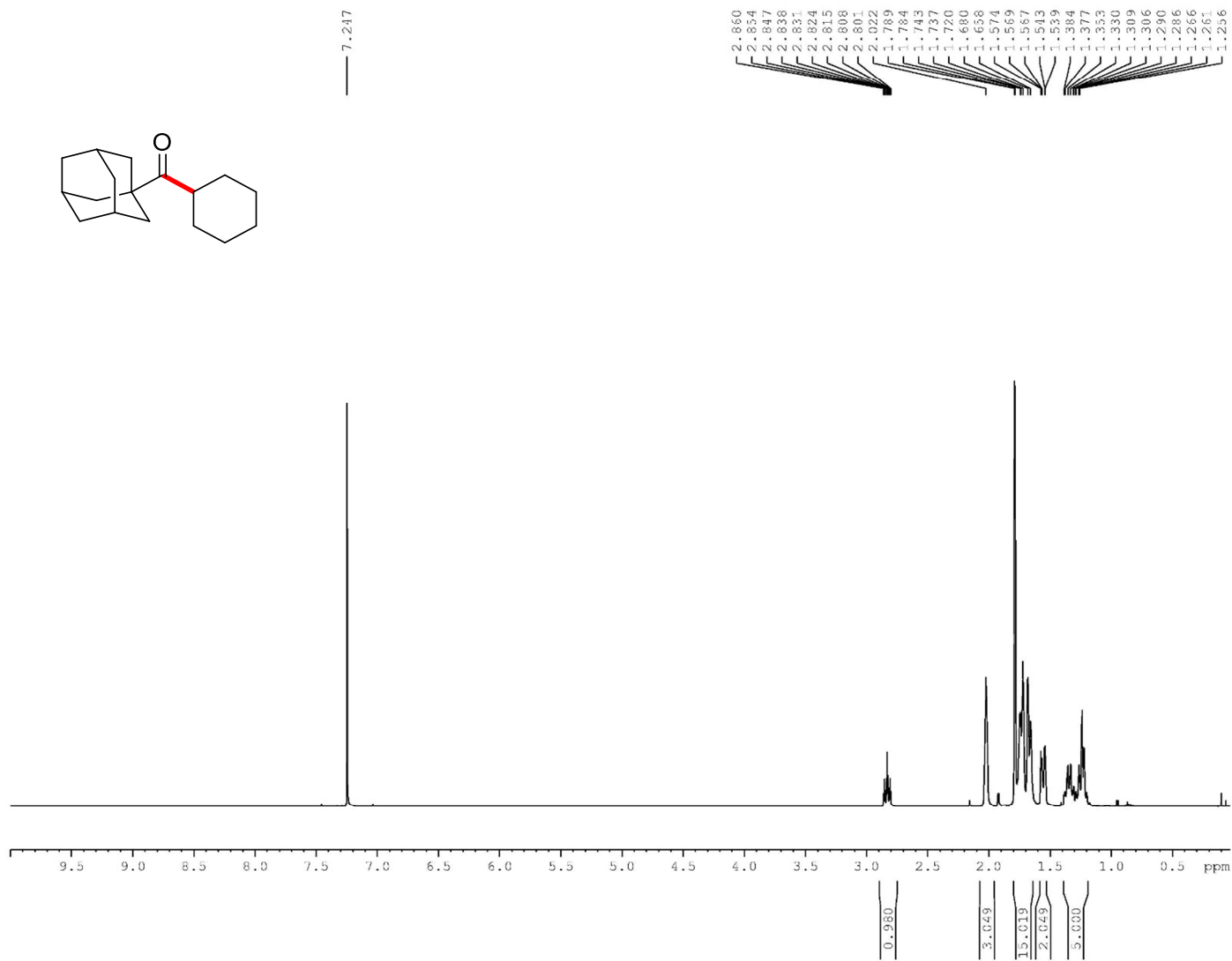
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of Dicyclohexylmethanone (2d)



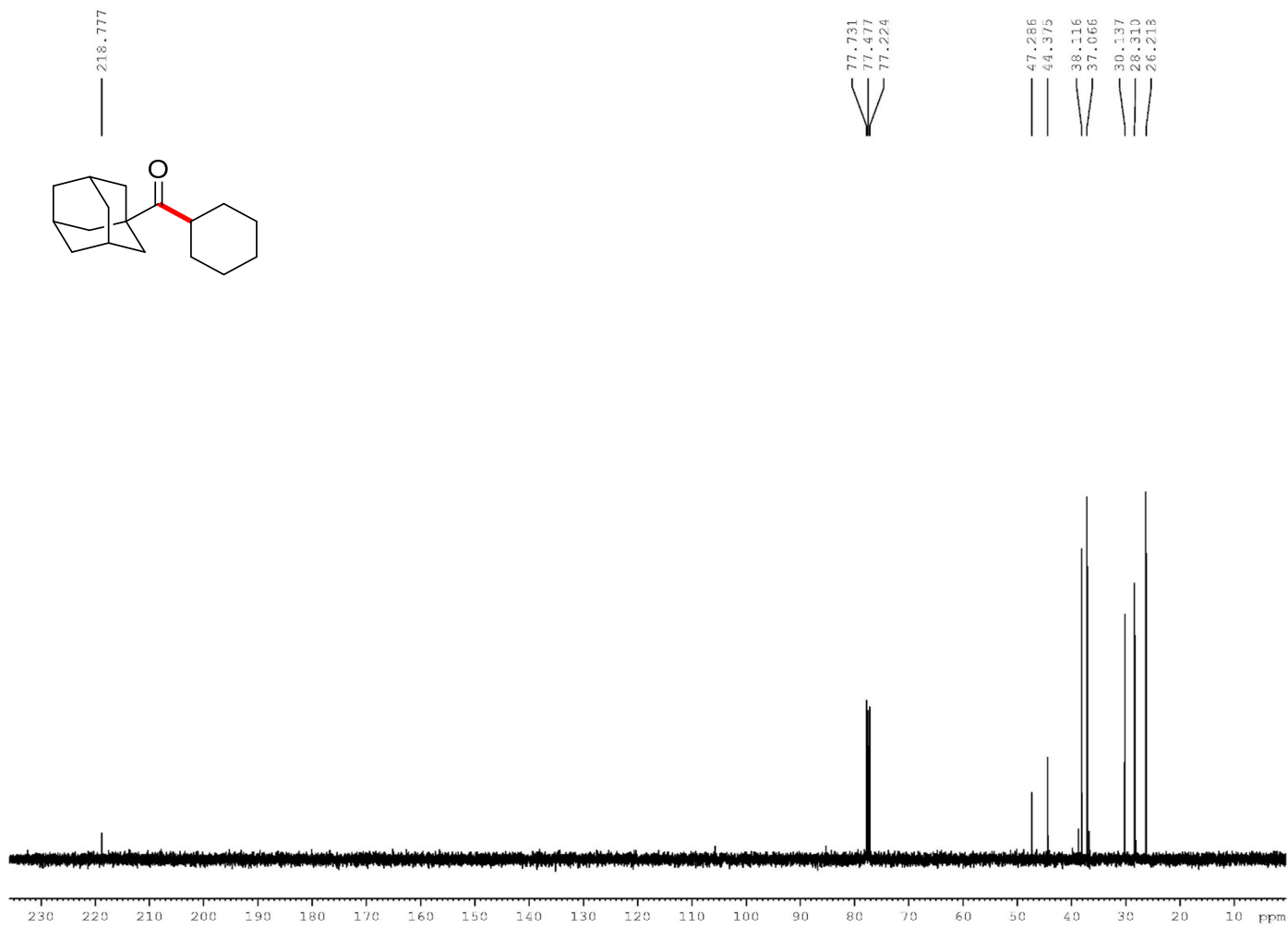
¹H NMR (500 MHz, CDCl₃) Spectrum of 1-Cyclohexyl-3,3-dimethylbutan-1-one (2e)



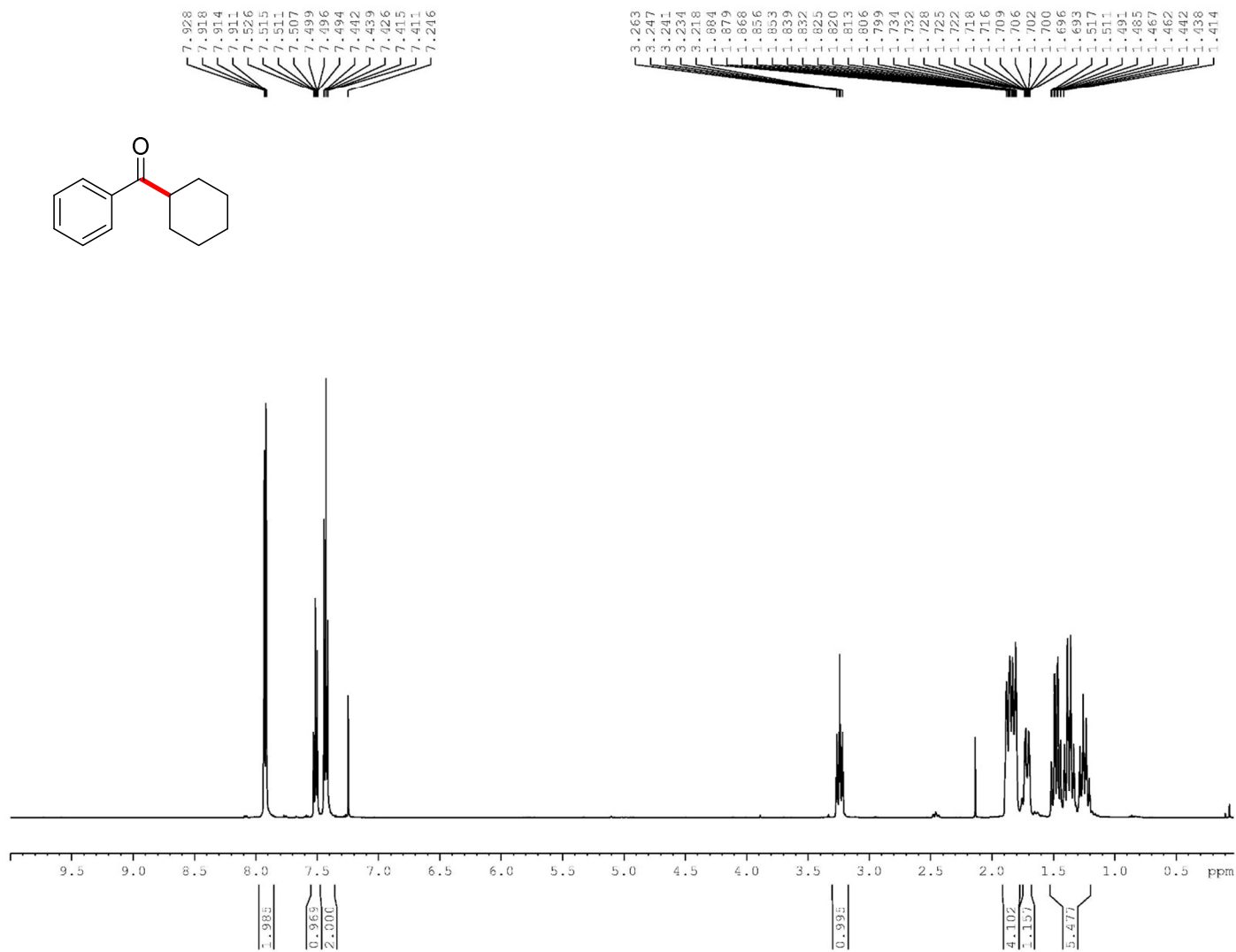
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of 1-Cyclohexyl-3,3-dimethylbutan-1-one (2e)



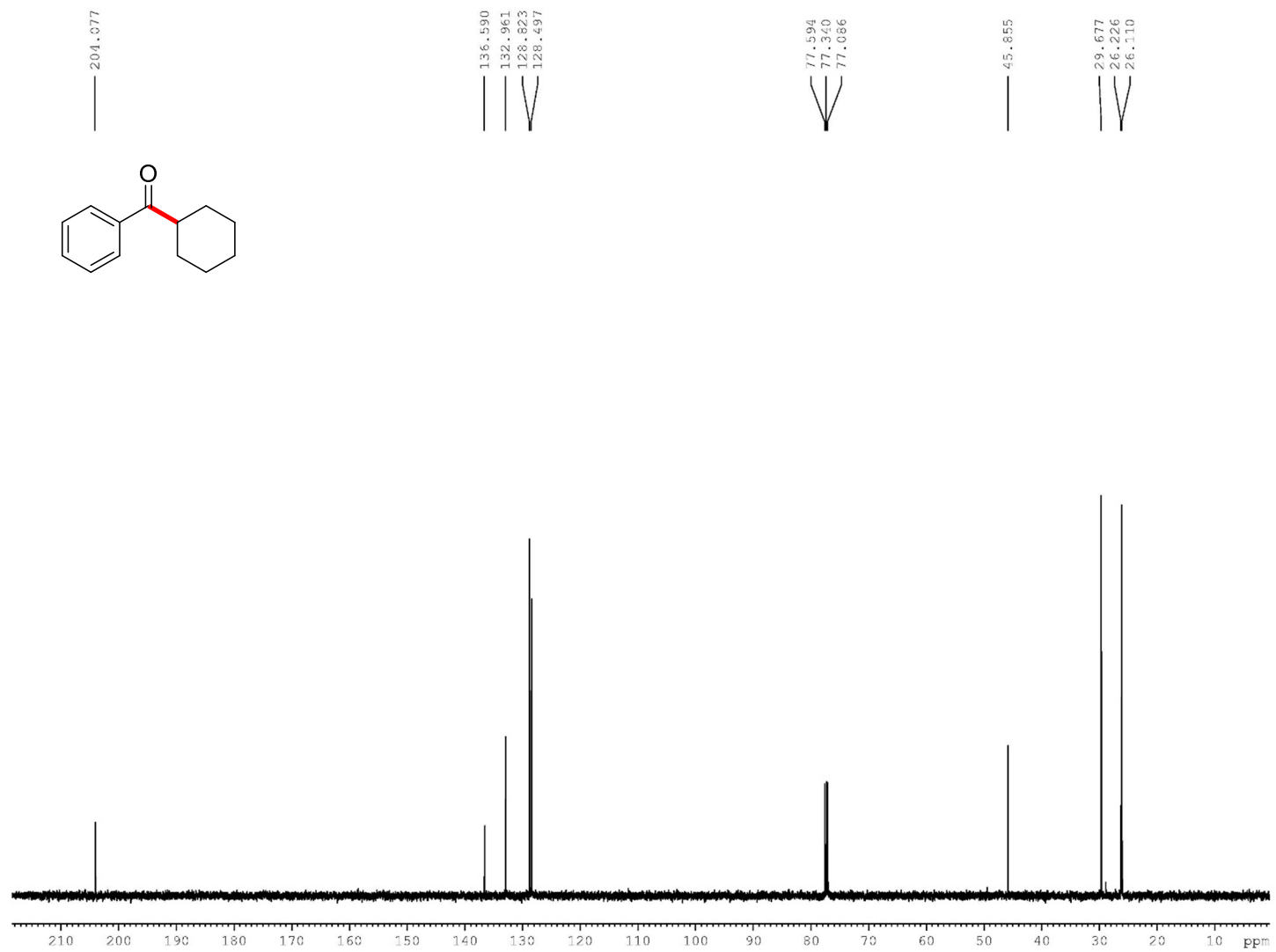
¹H NMR (500 MHz, CDCl₃) Spectrum of (Adamantan-1-yl)(cyclohexyl)methanone (2f)



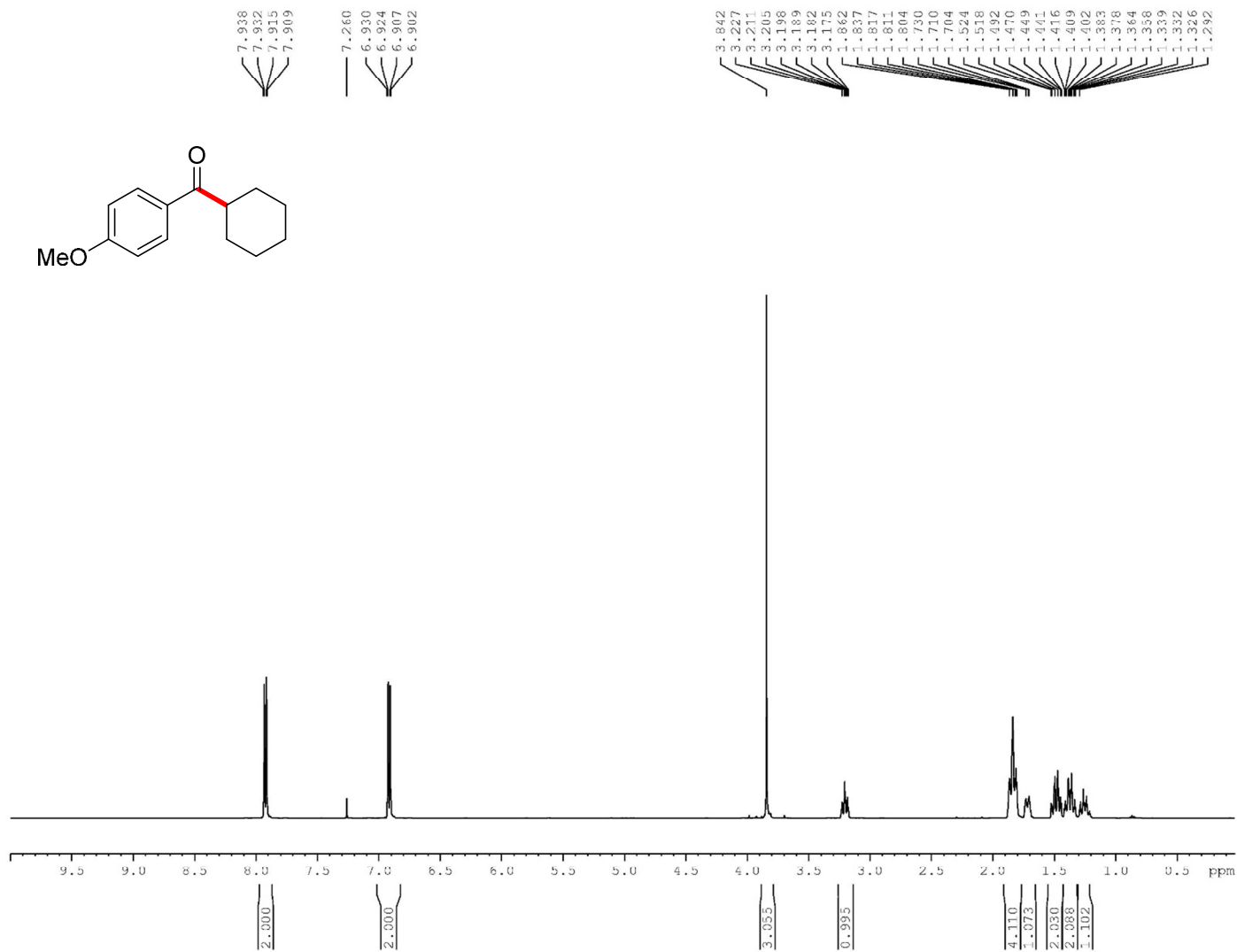
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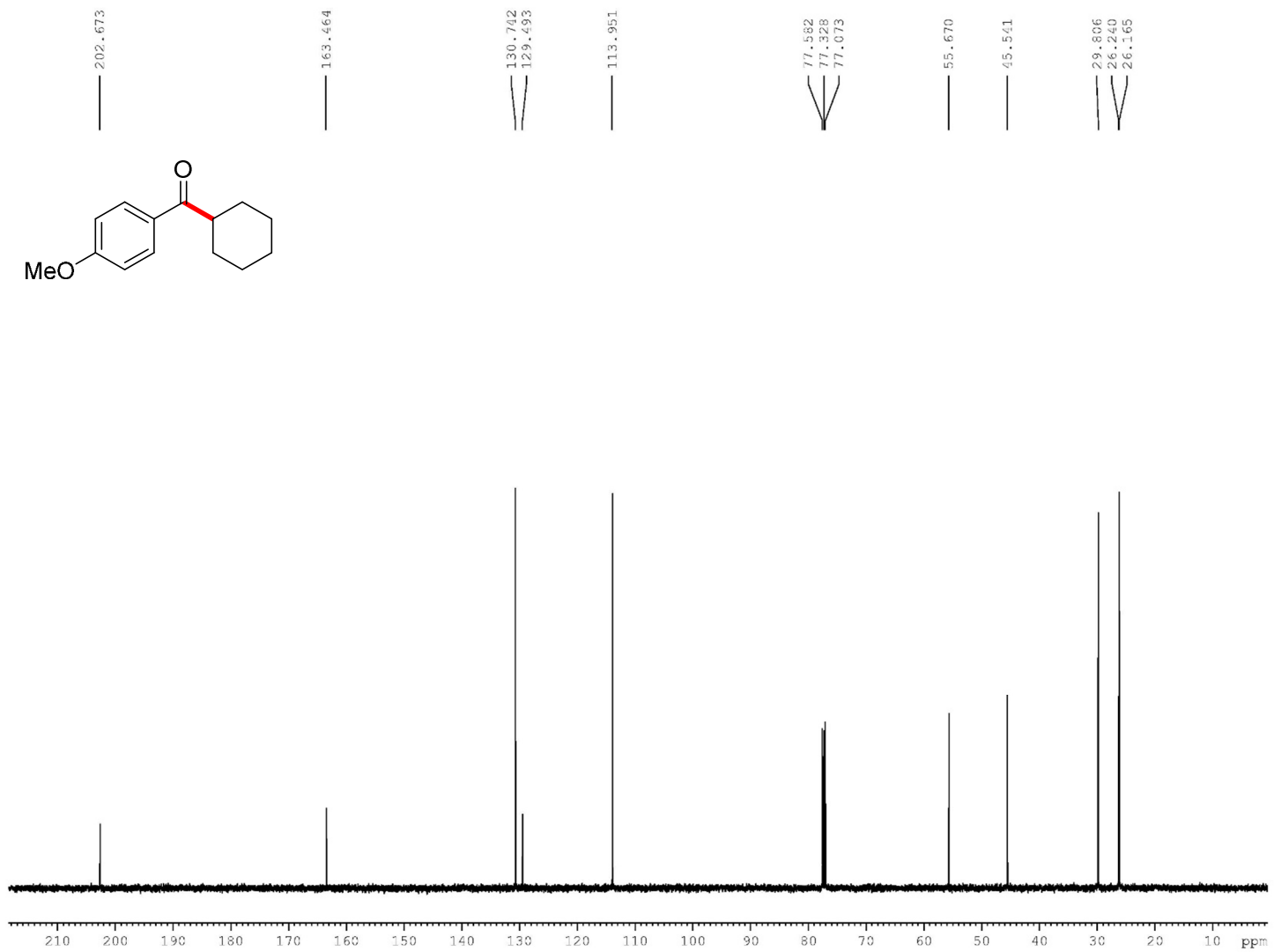
¹H NMR (500 MHz, CDCl₃) Spectrum of Cyclohexyl(phenyl)methanone (2g)



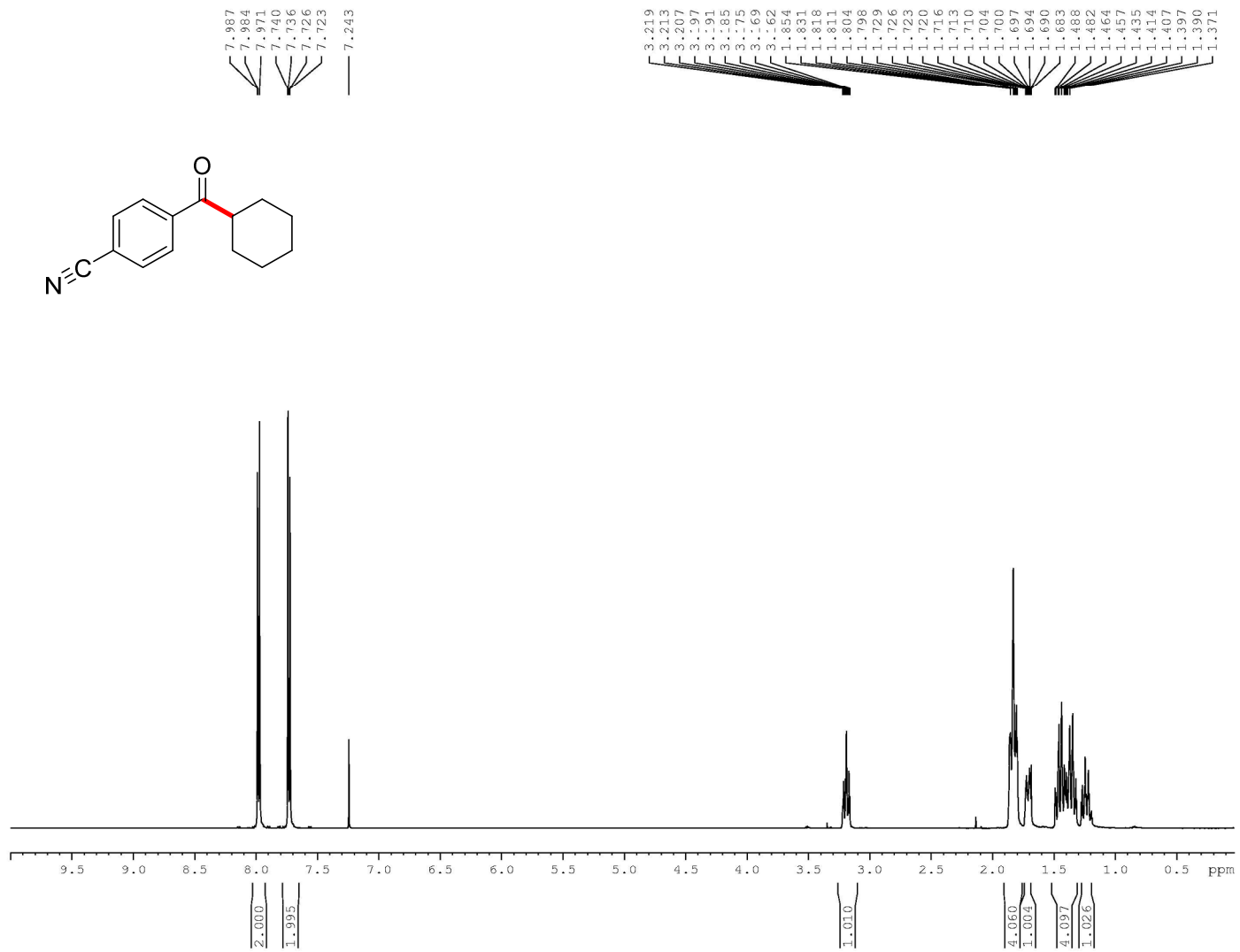
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of Cyclohexyl(phenyl)methanone (2g)



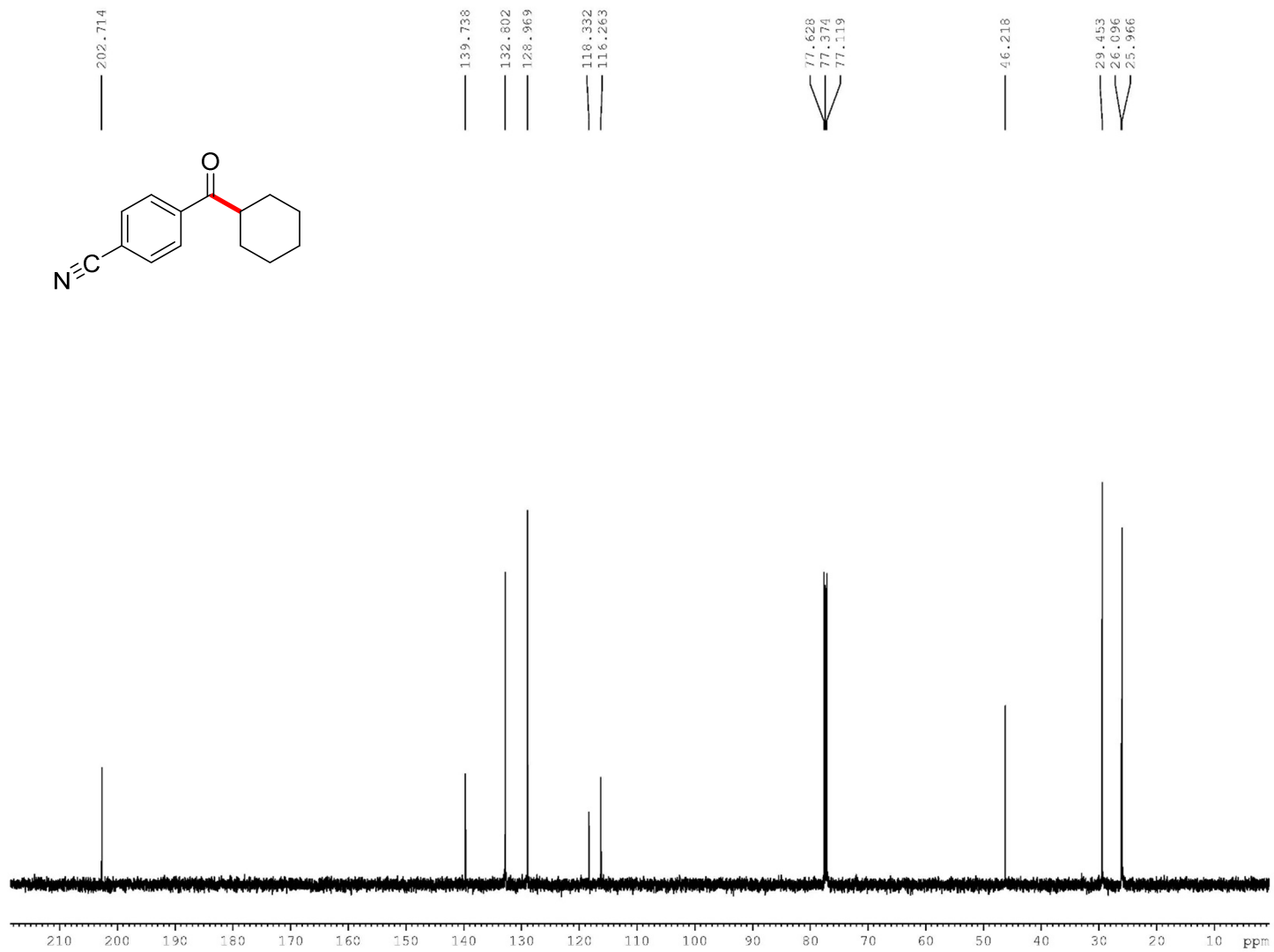
¹H NMR (500 MHz, CDCl₃) Spectrum of Cyclohexyl(4-methoxyphenyl)methanone (2h)



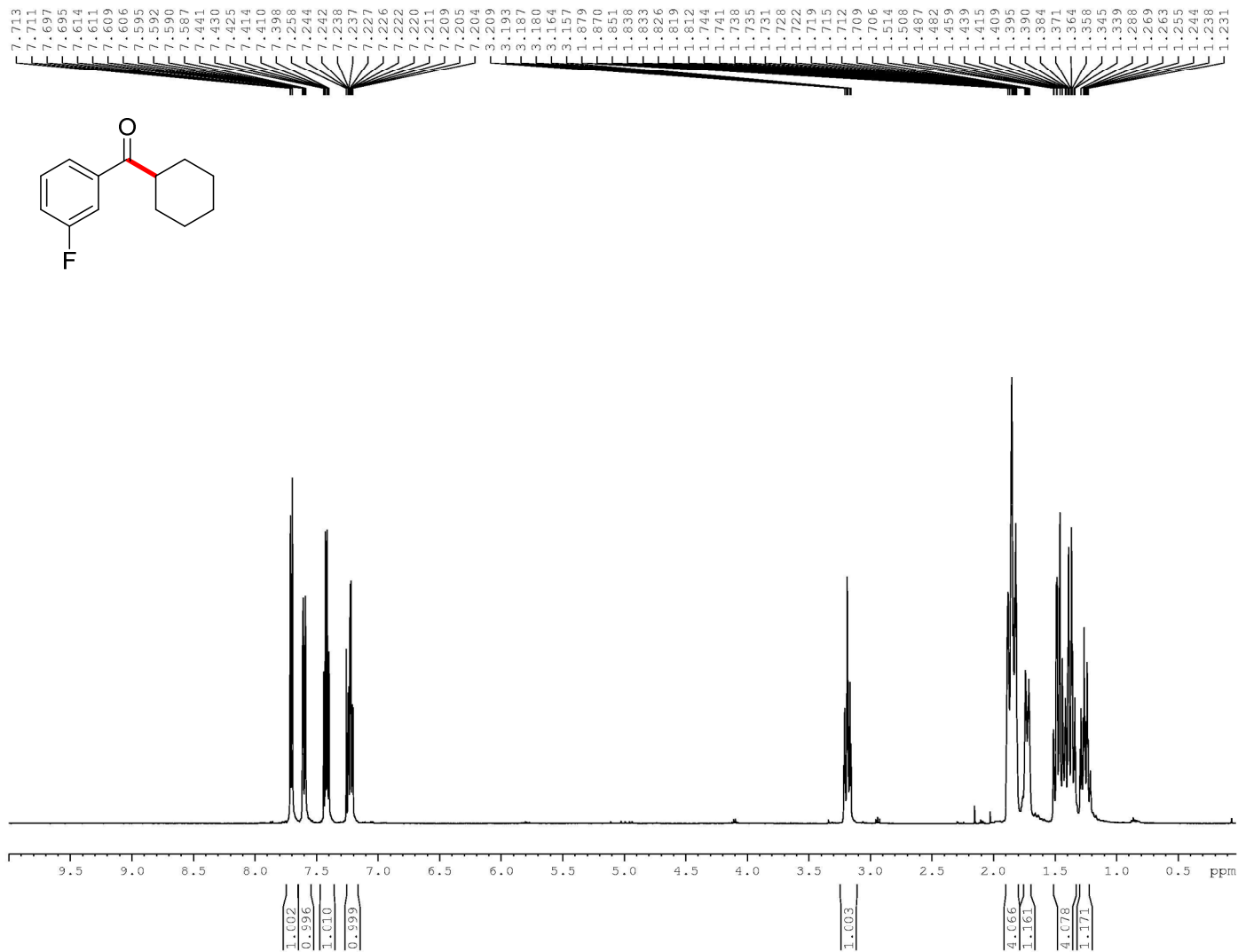
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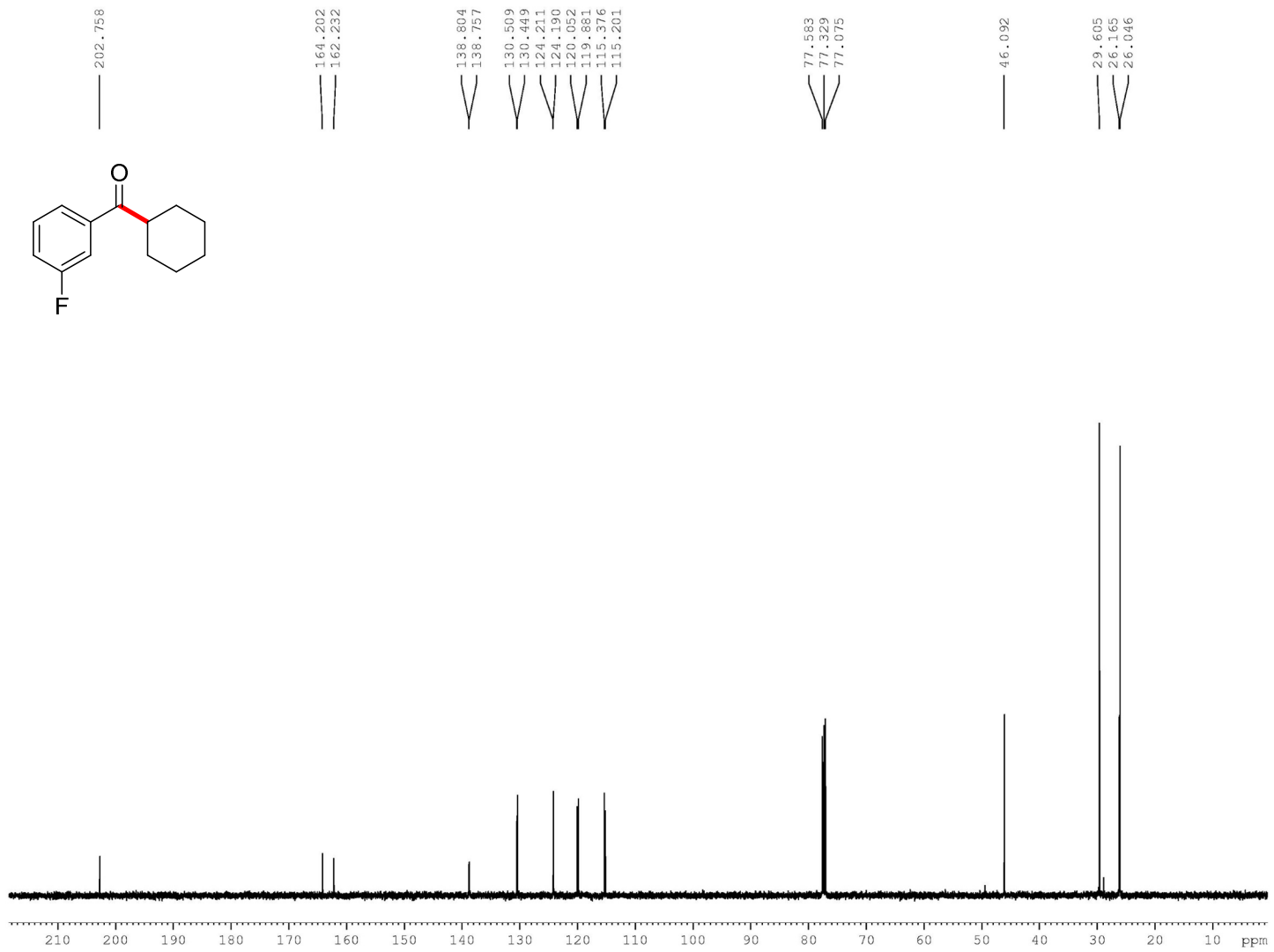
¹H NMR (500 MHz, CDCl₃) Spectrum of 4-(Cyclohexanecarbonyl)benzonitrile (2i)



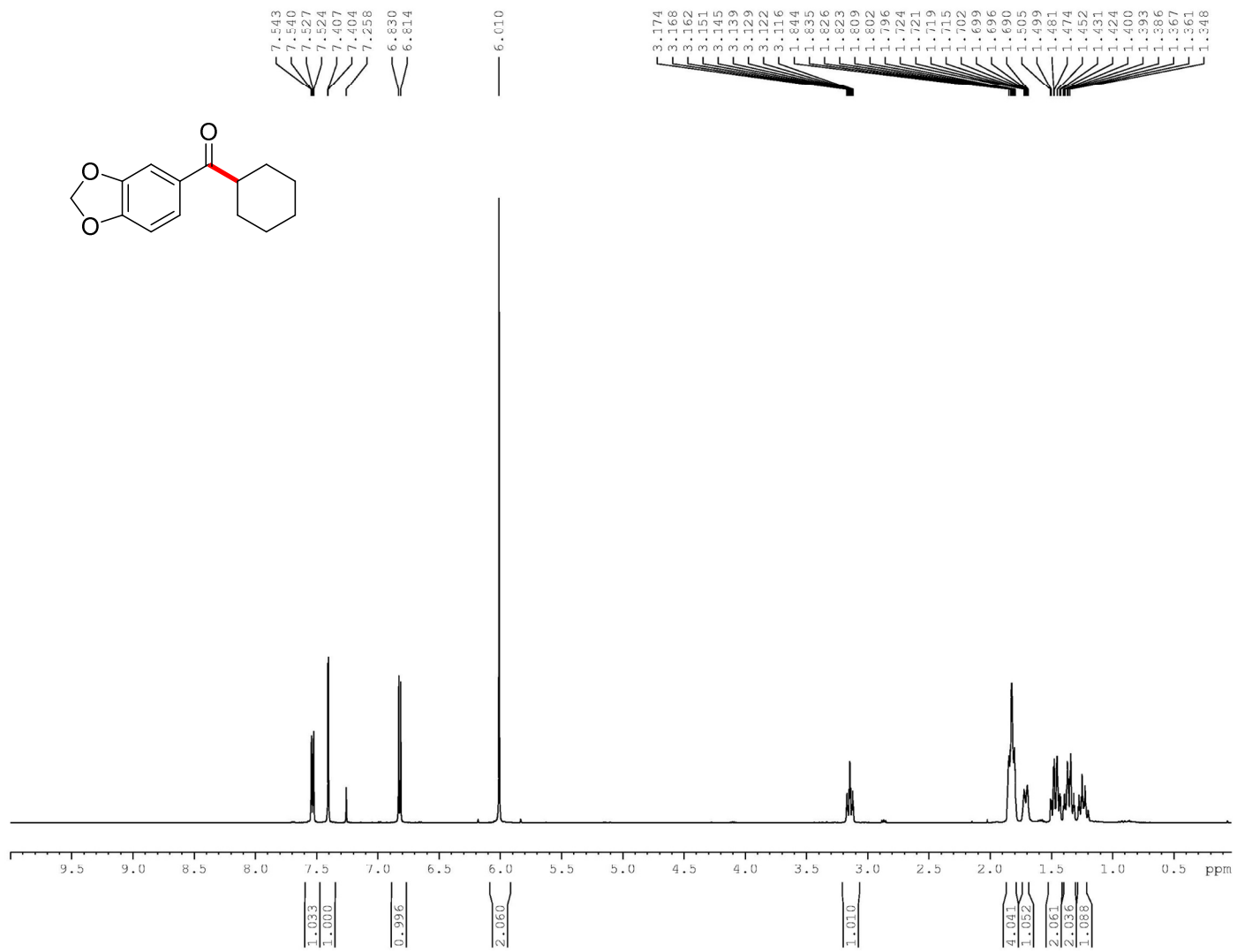
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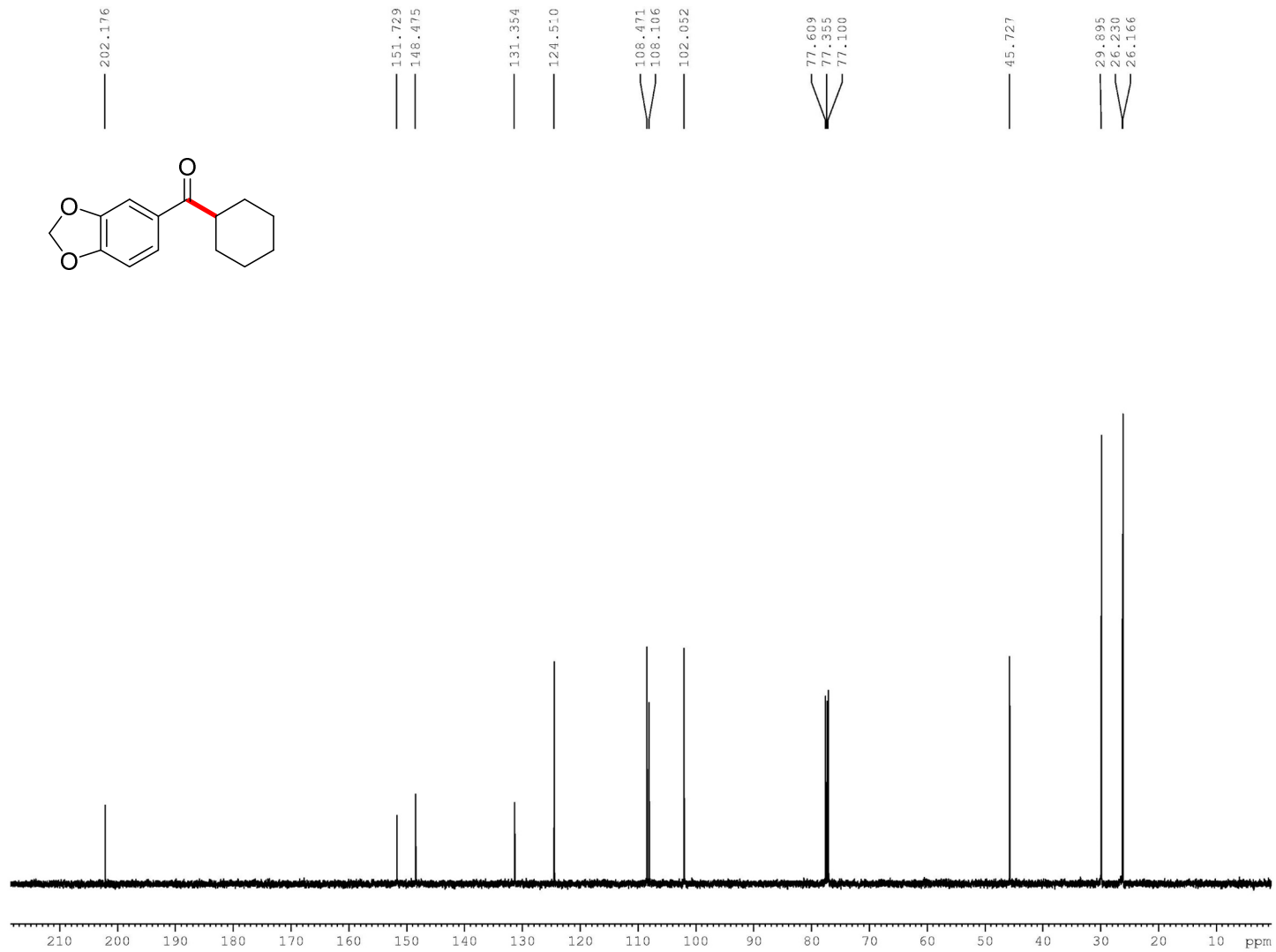
¹H NMR (500 MHz, CDCl₃) Spectrum of Cyclohexyl(3-fluorophenyl)methanone (2j)



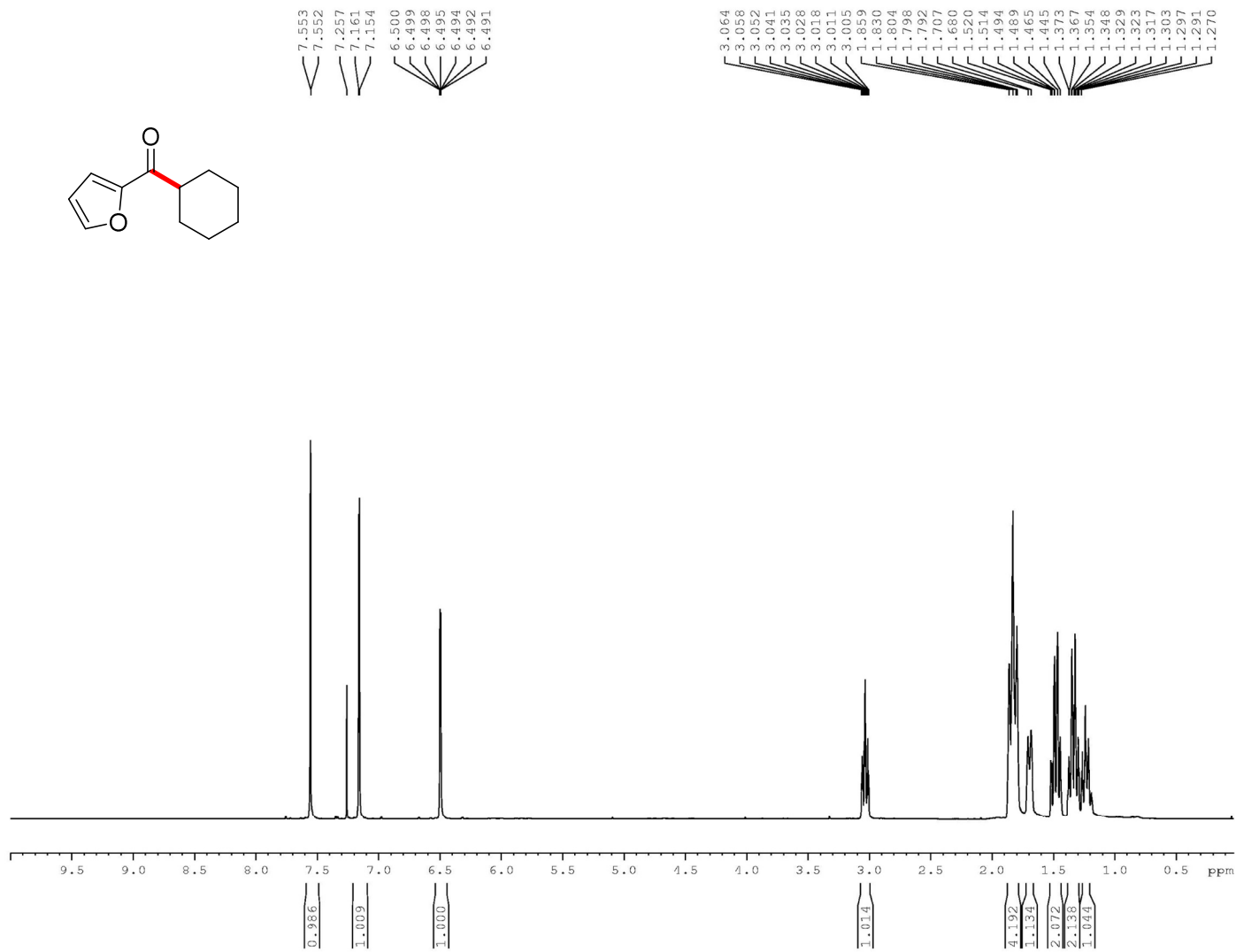
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of Cyclohexyl(3-fluorophenyl)methanone (2j)



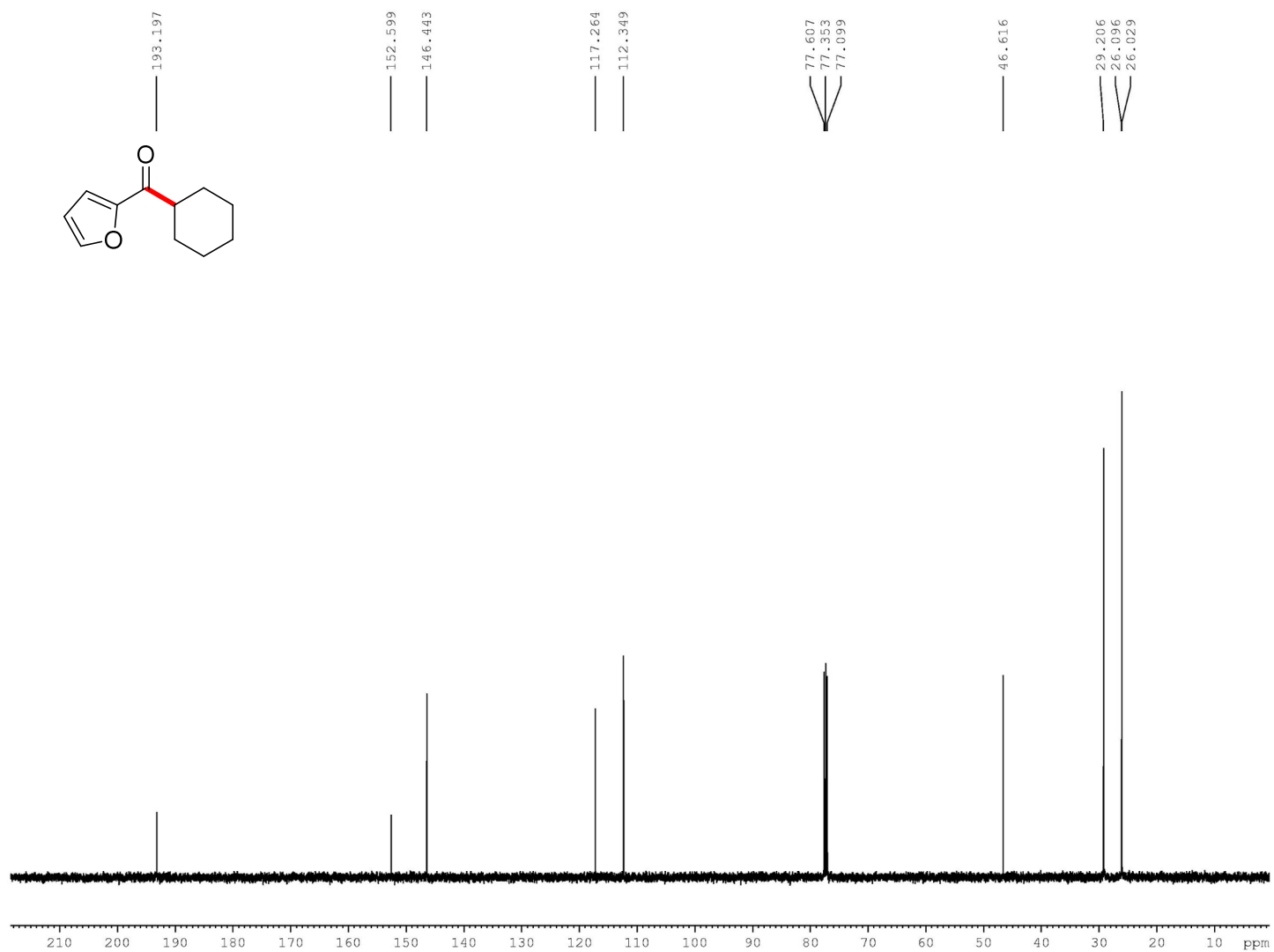
¹H NMR (500 MHz, CDCl₃) Spectrum of Benzo[d][1,3]dioxol-5-yl(cyclohexyl)methanone (2k)



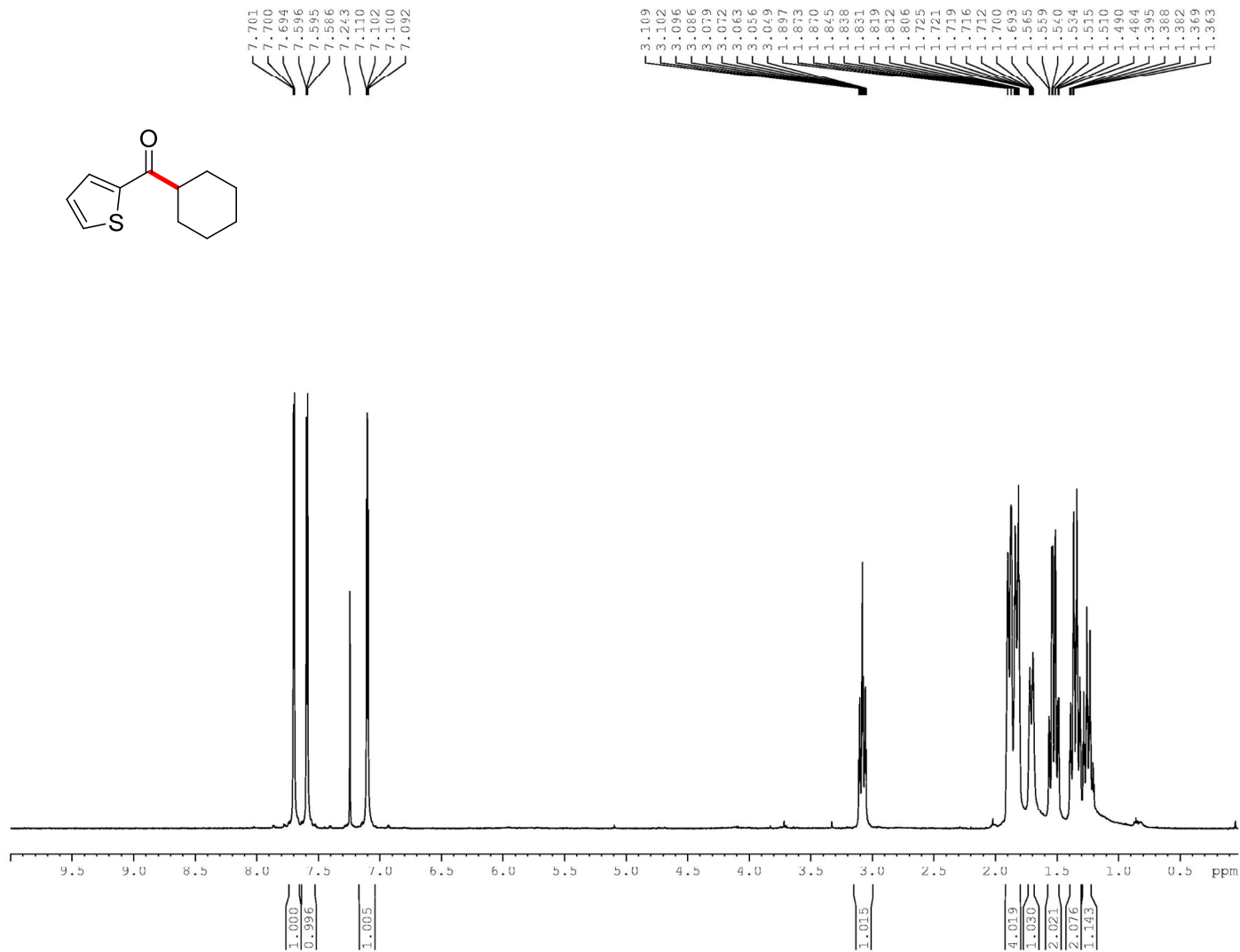
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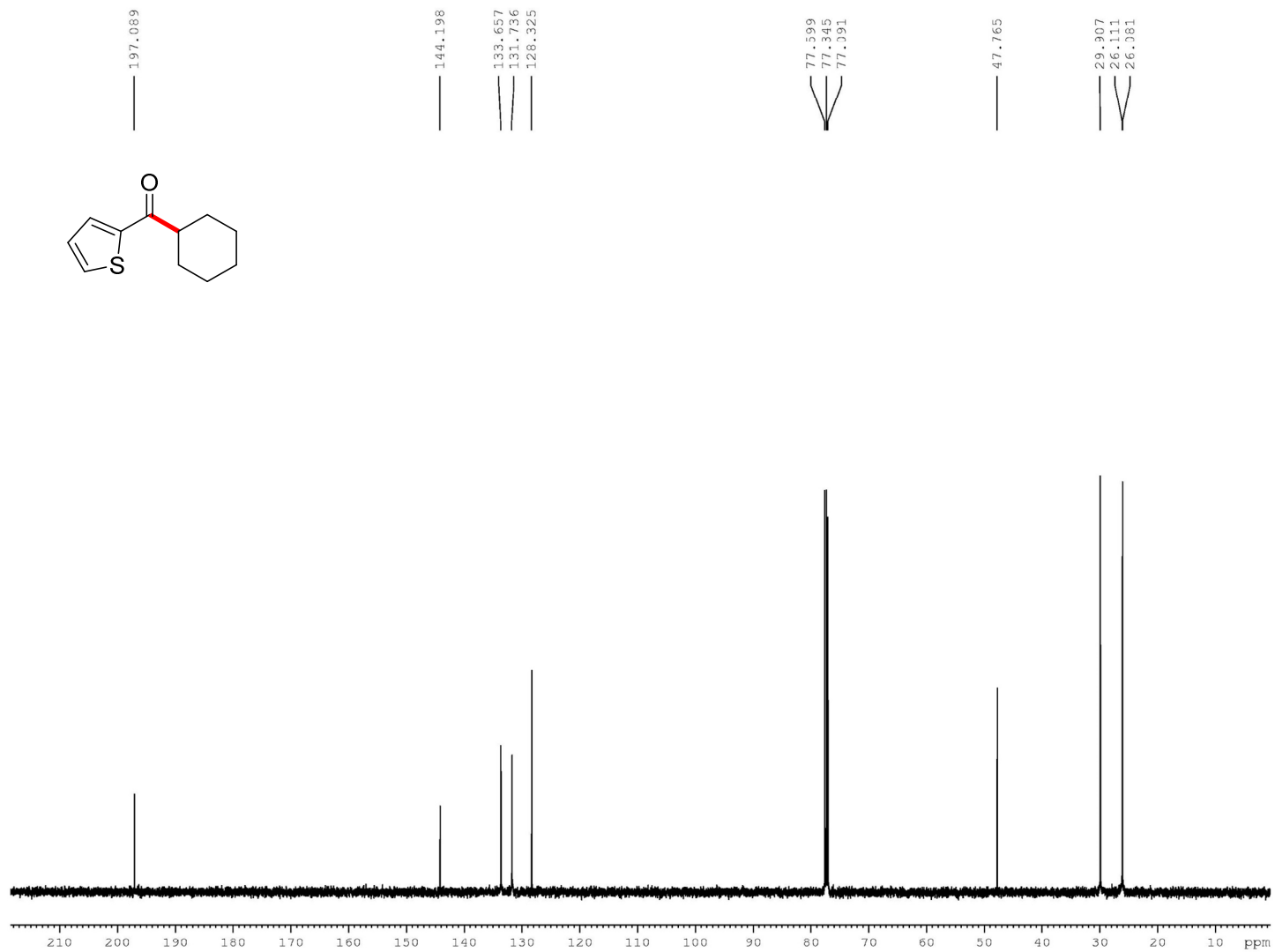
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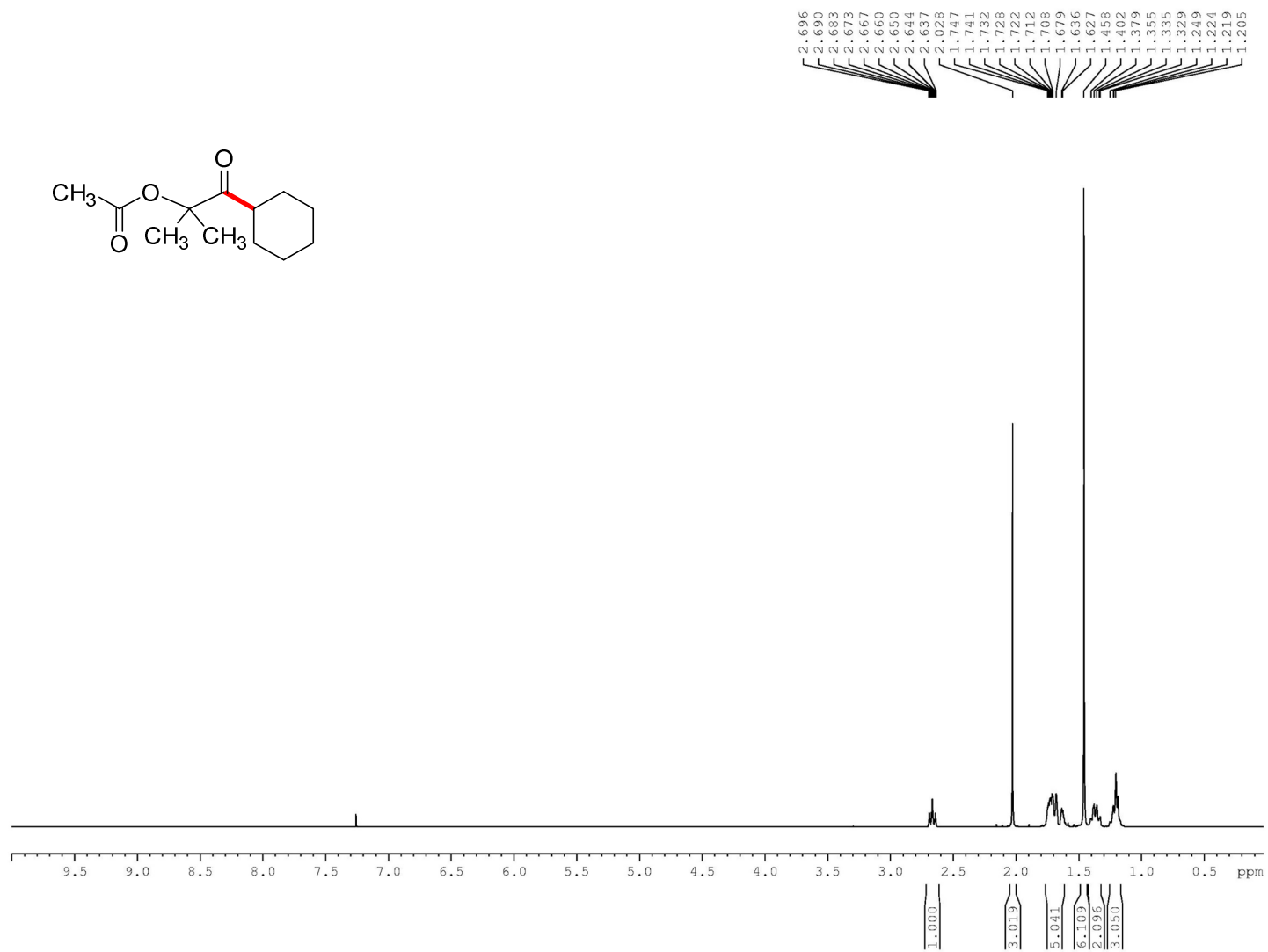
¹³C NMR (125.8 MHz, CDCl₃) Spectrum of Cyclohexyl(furan-2-yl)methanone (2l)



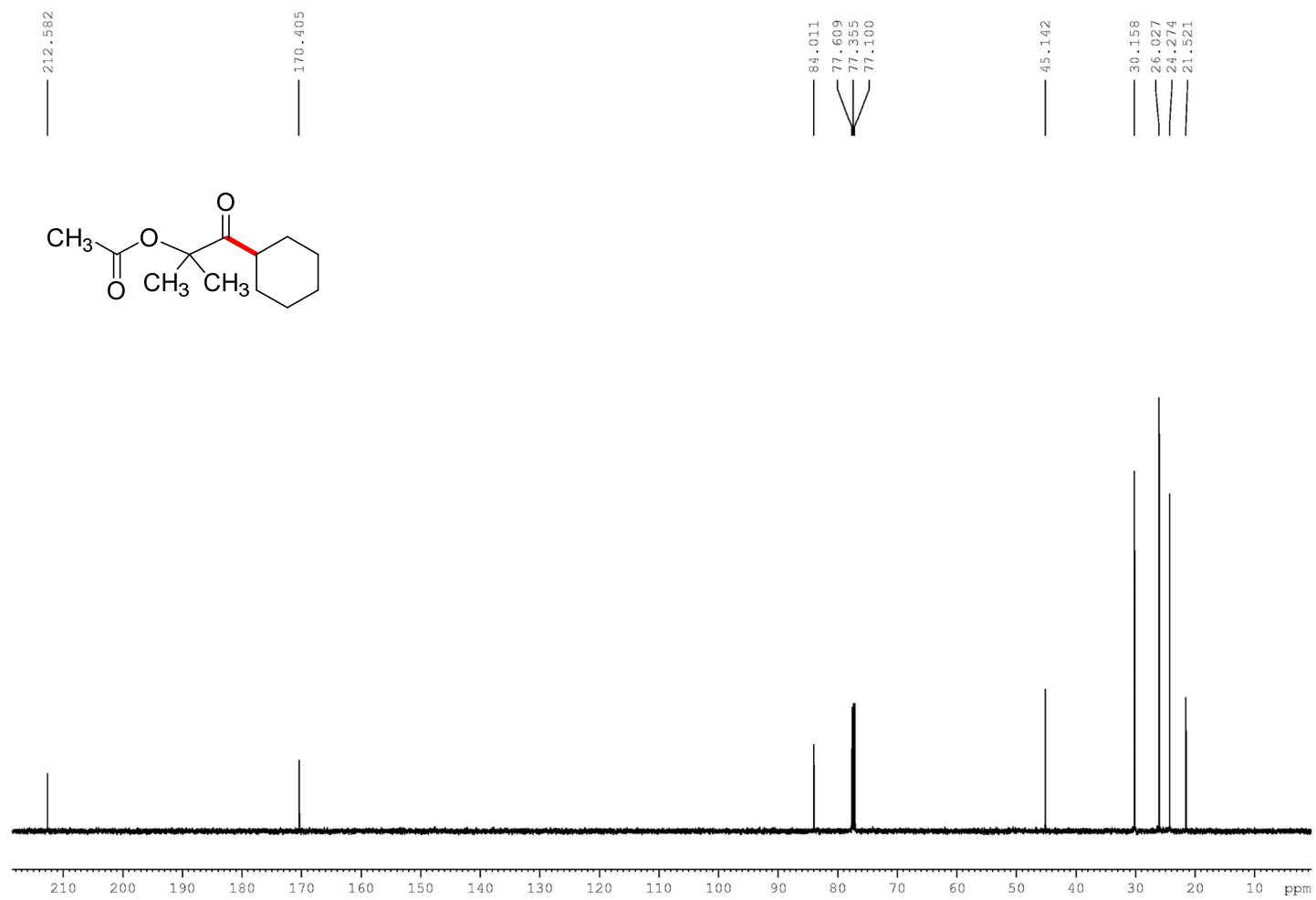
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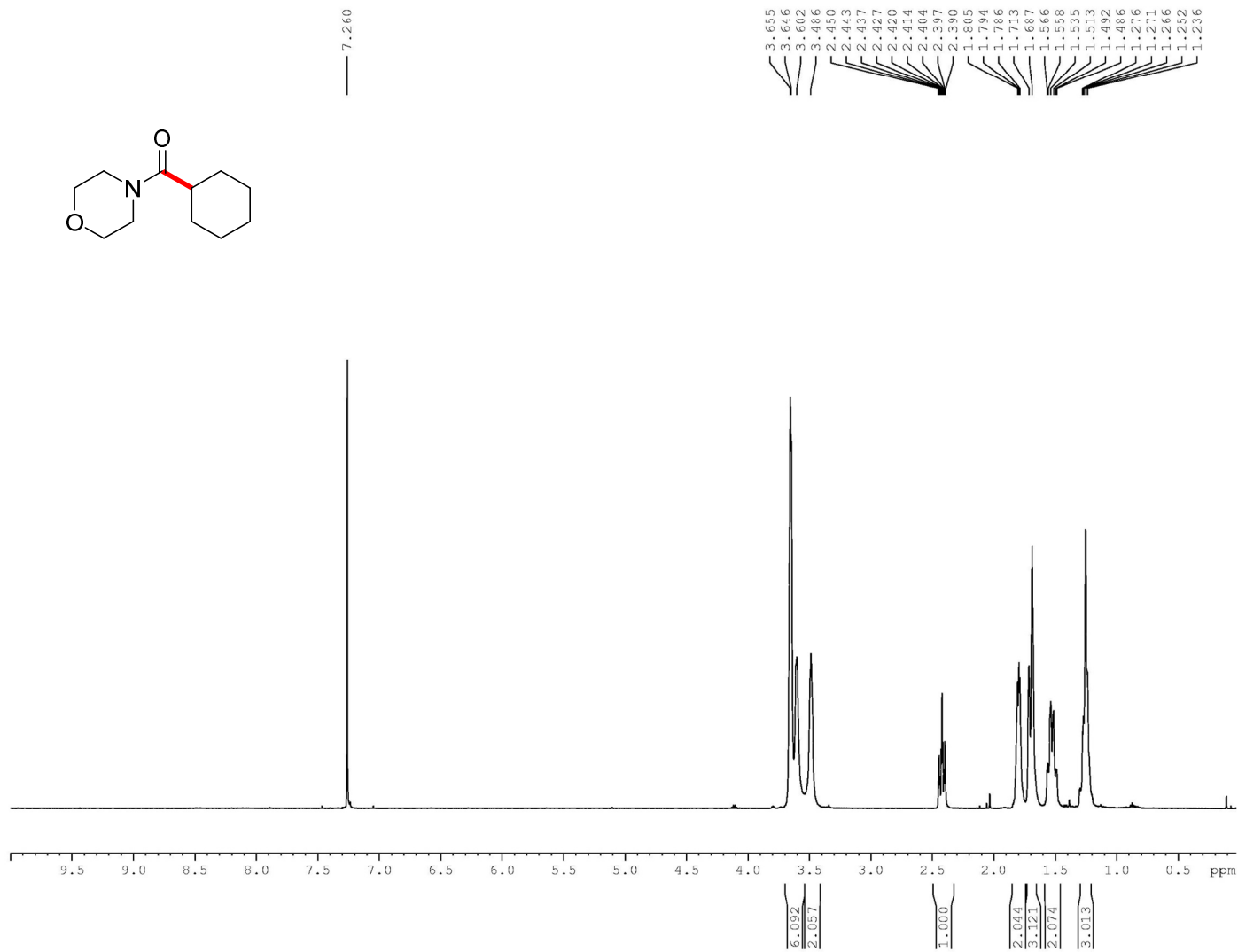
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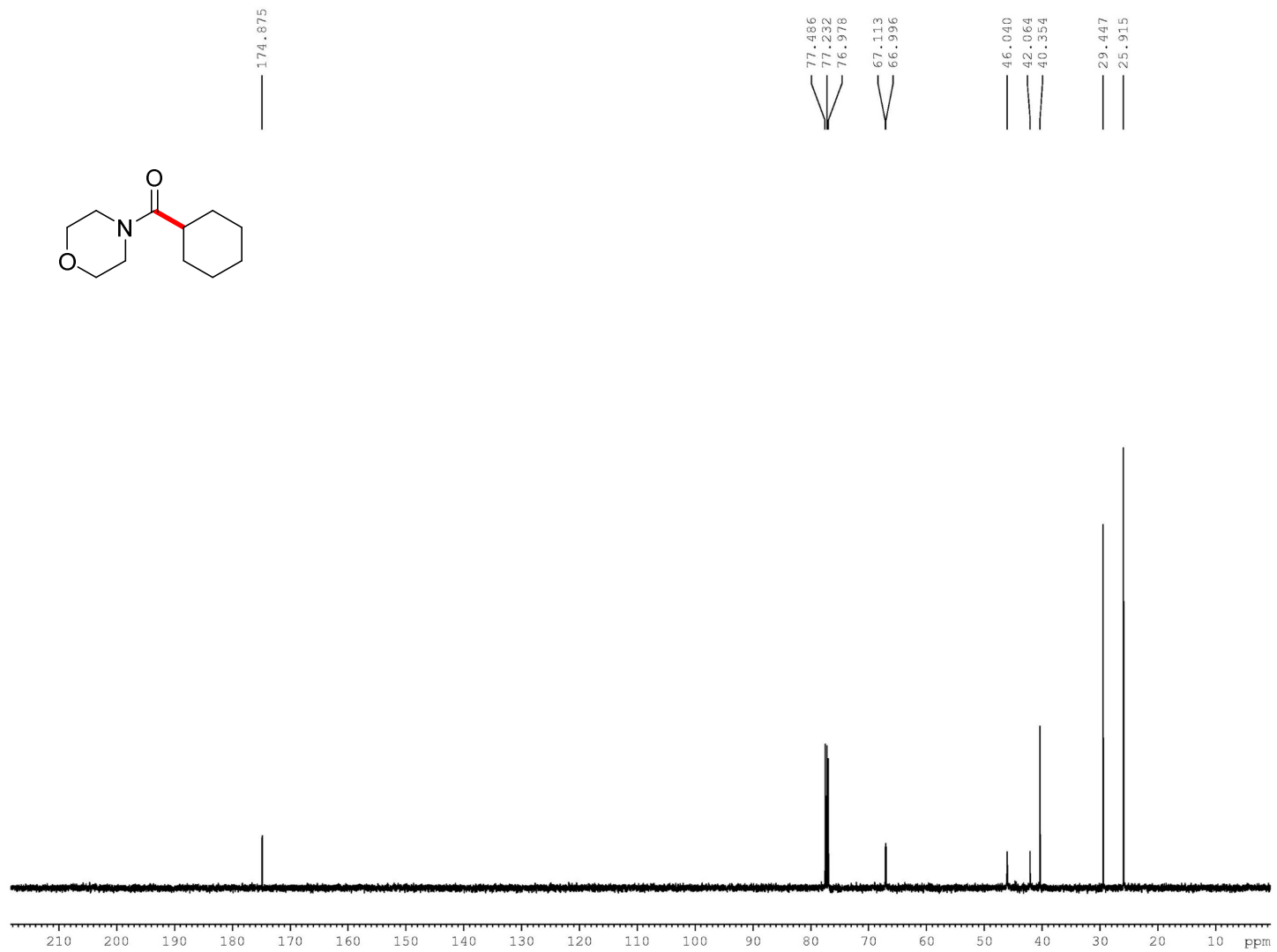
¹H NMR (500 MHz, CDCl₃) Spectrum of 1-Cyclohexyl-2-methyl-1-oxopropan-2-yl acetate (2n)



¹³C NMR (125.8 MHz, CDCl₃) Spectrum of 1-Cyclohexyl-2-methyl-1-oxopropan-2-yl acetate (2n)



¹H NMR (500 MHz, CDCl₃) Spectrum of Cyclohexyl(morpholino)methanone (20)



¹³C NMR (125.8 MHz, CDCl₃) Spectrum of Cyclohexyl(morpholino)methanone (2o)