

Supporting Information

Palladium- and Nickel-Catalyzed Kumada Cross-Coupling Reaction of *gem*-Difluoroalkenes and Monofluoroalkenes with Grignard Reagents

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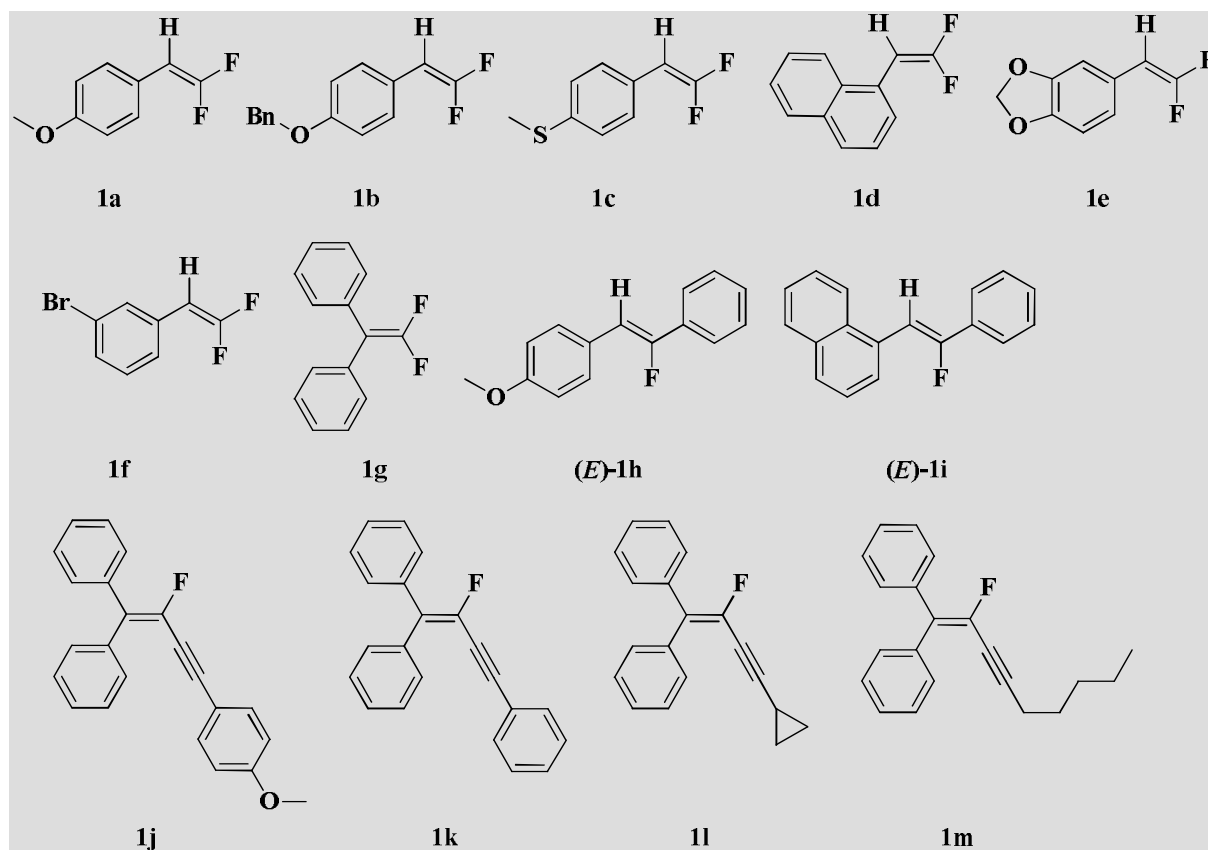
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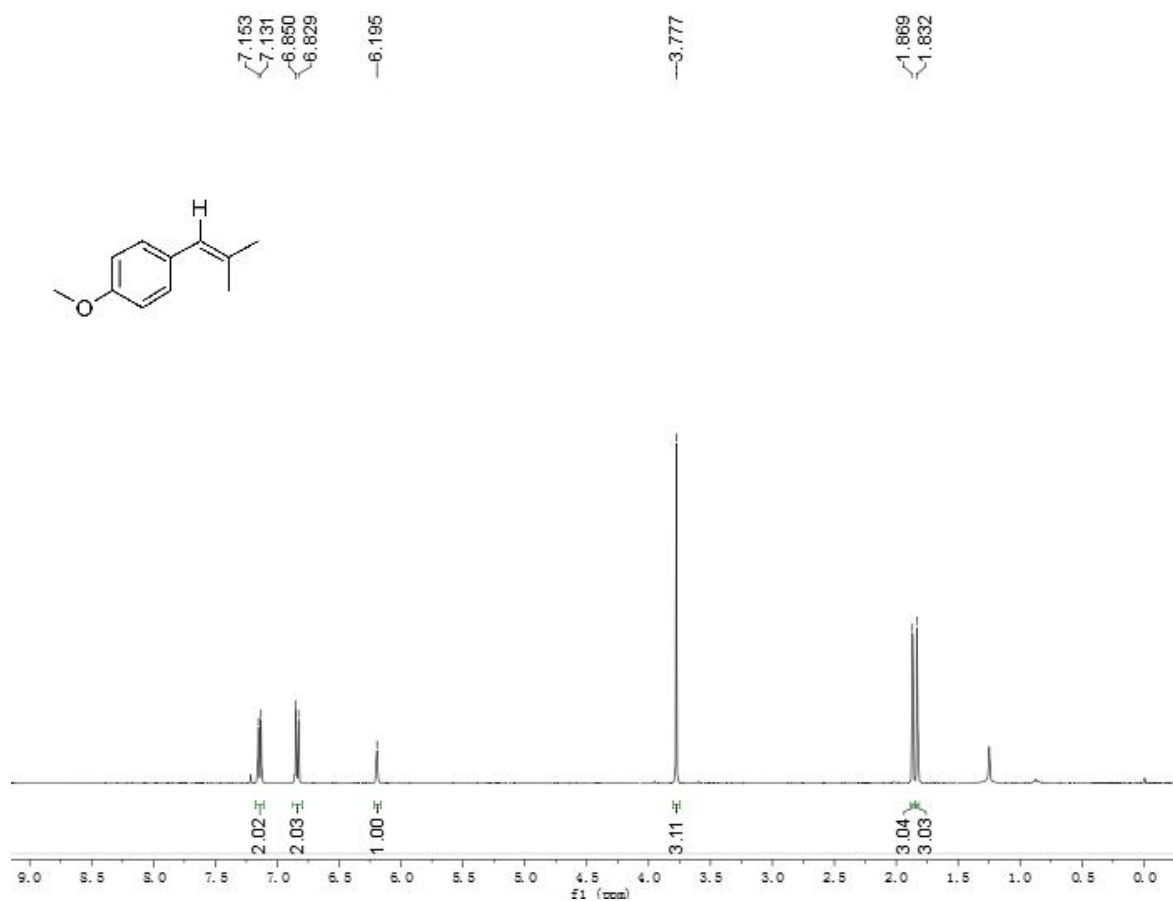
Substrates and Grignard Reagents:



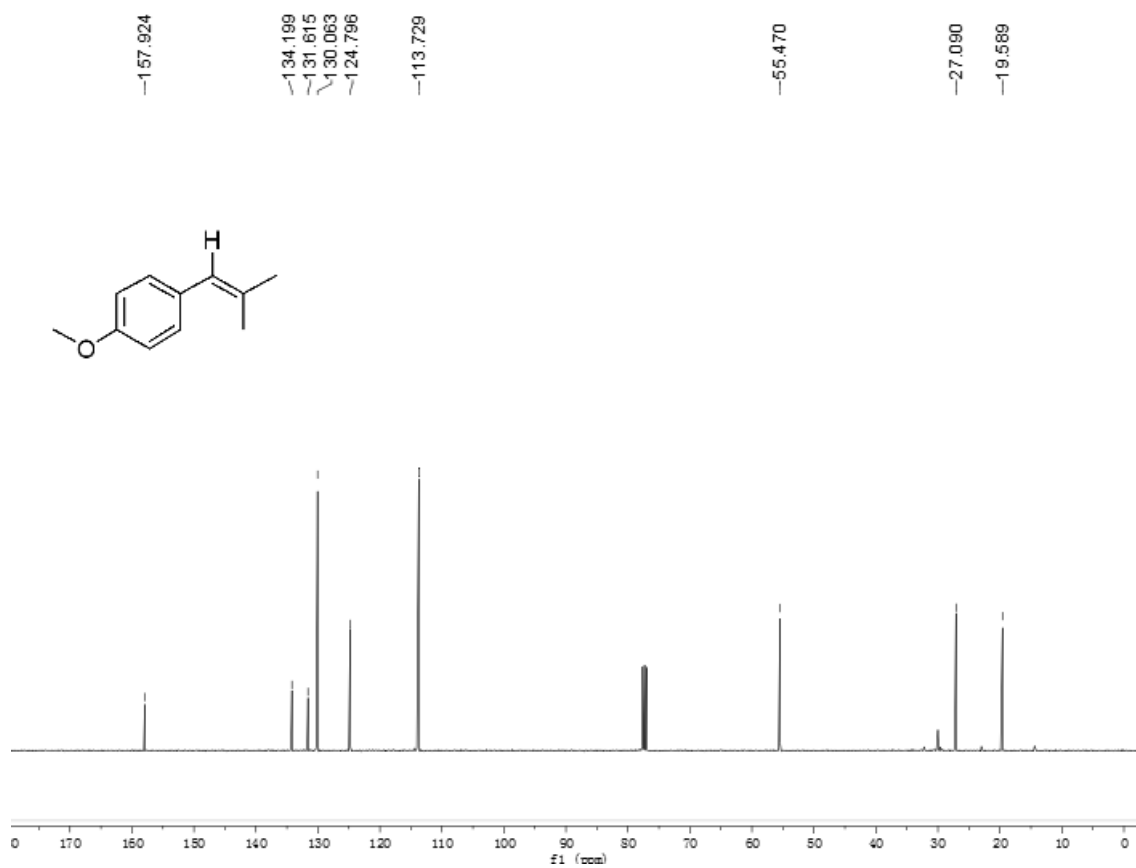
CH_3MgCl (2a); PhMgBr (2b); $\text{C}_6\text{H}_5\text{CH}_2\text{MgCl}$ (2c); *p*-tolylMgBr (2d); 4-FC₆H₄MgBr (2e)

n-BuMgCl (2f); EtMgCl (2g); *n*-PrMgBr (2h); *n*-C₅H₁₁MgBr (2i); C₆H₅CH₂CH₂MgCl (2j)

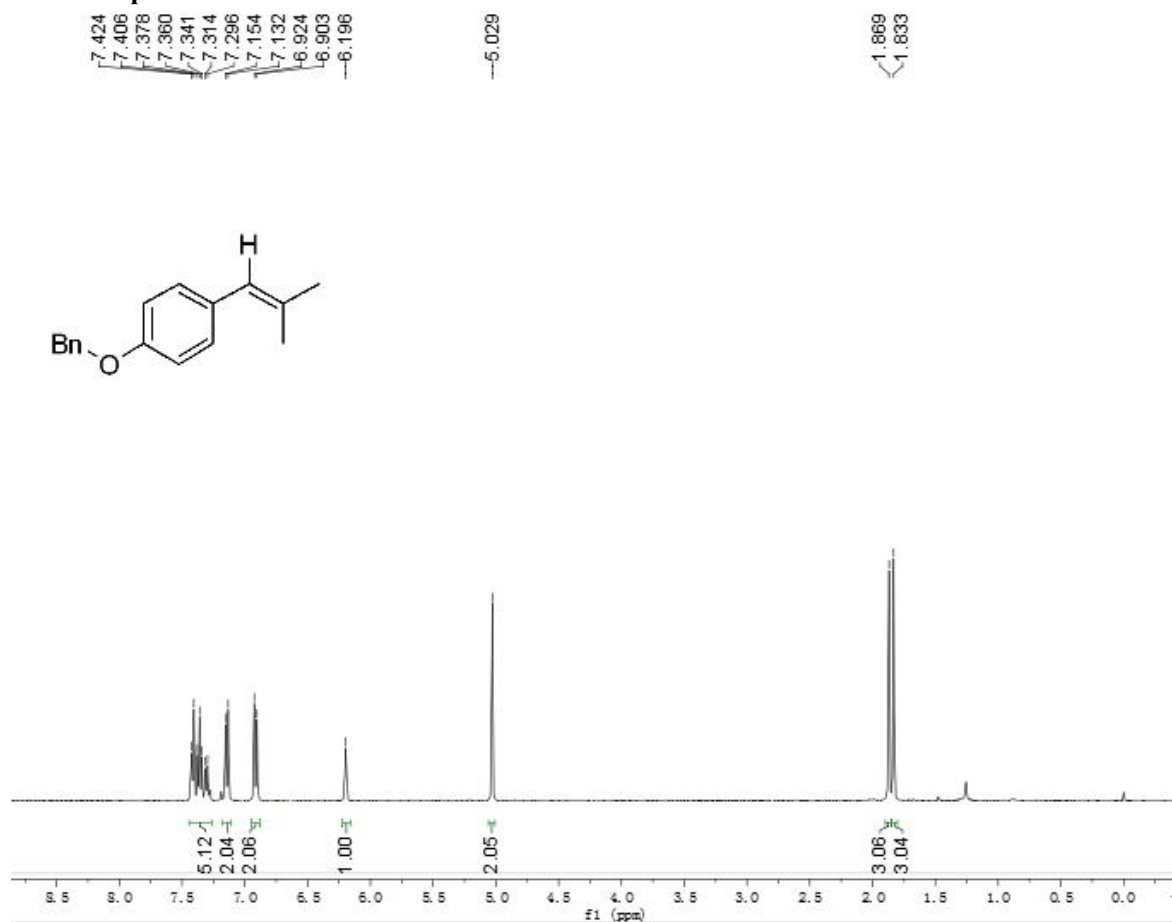
¹H NMR spectra of 3aa



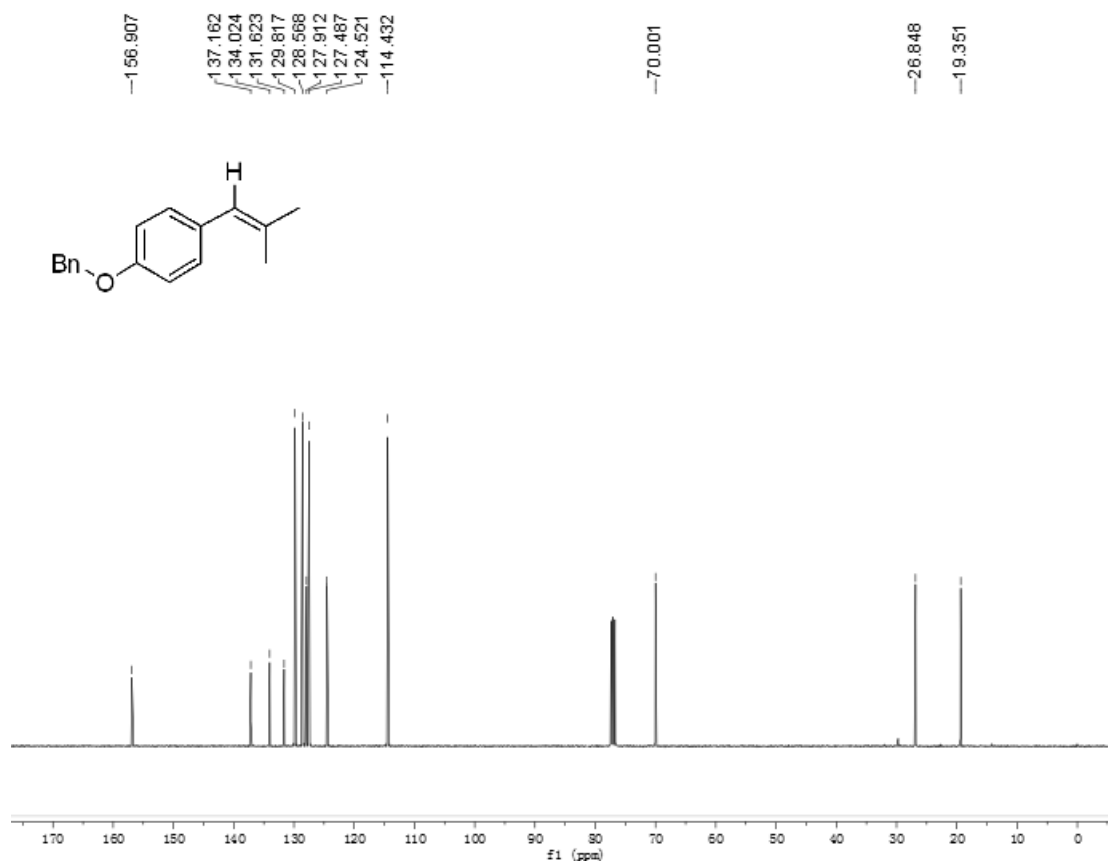
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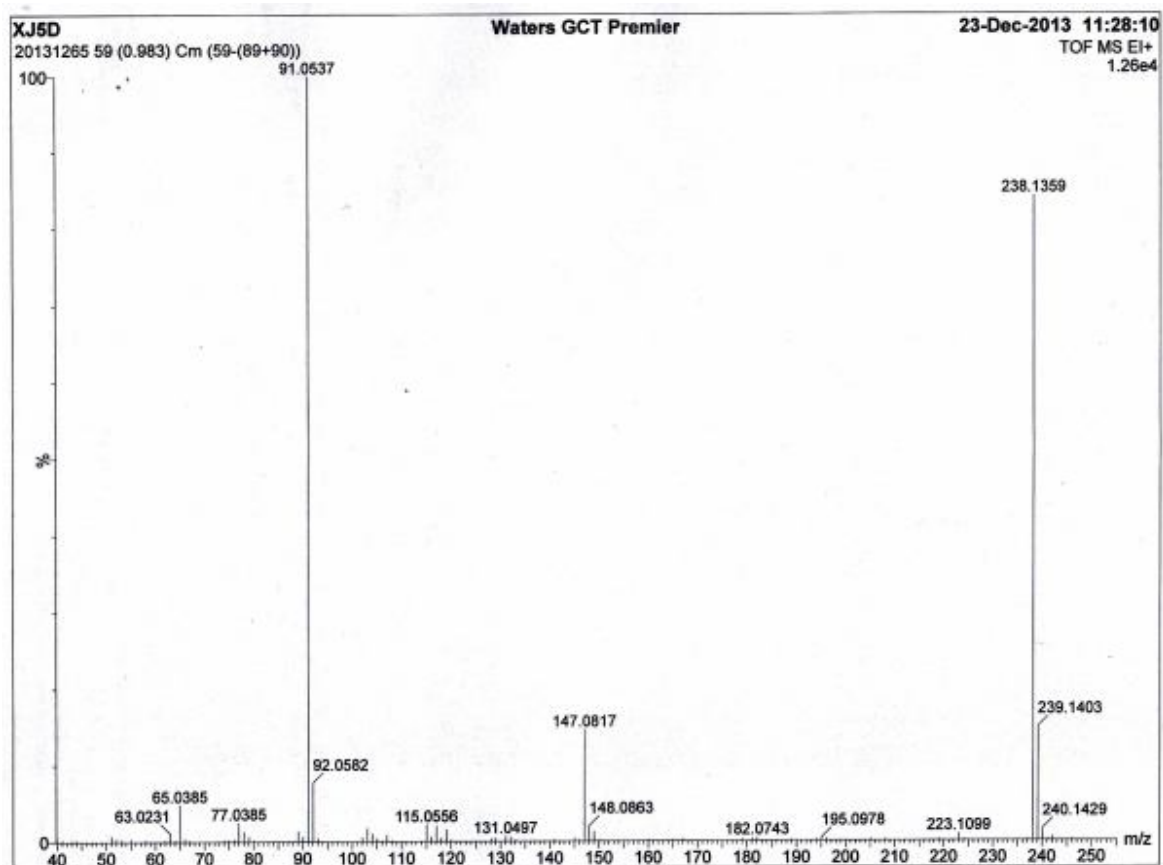
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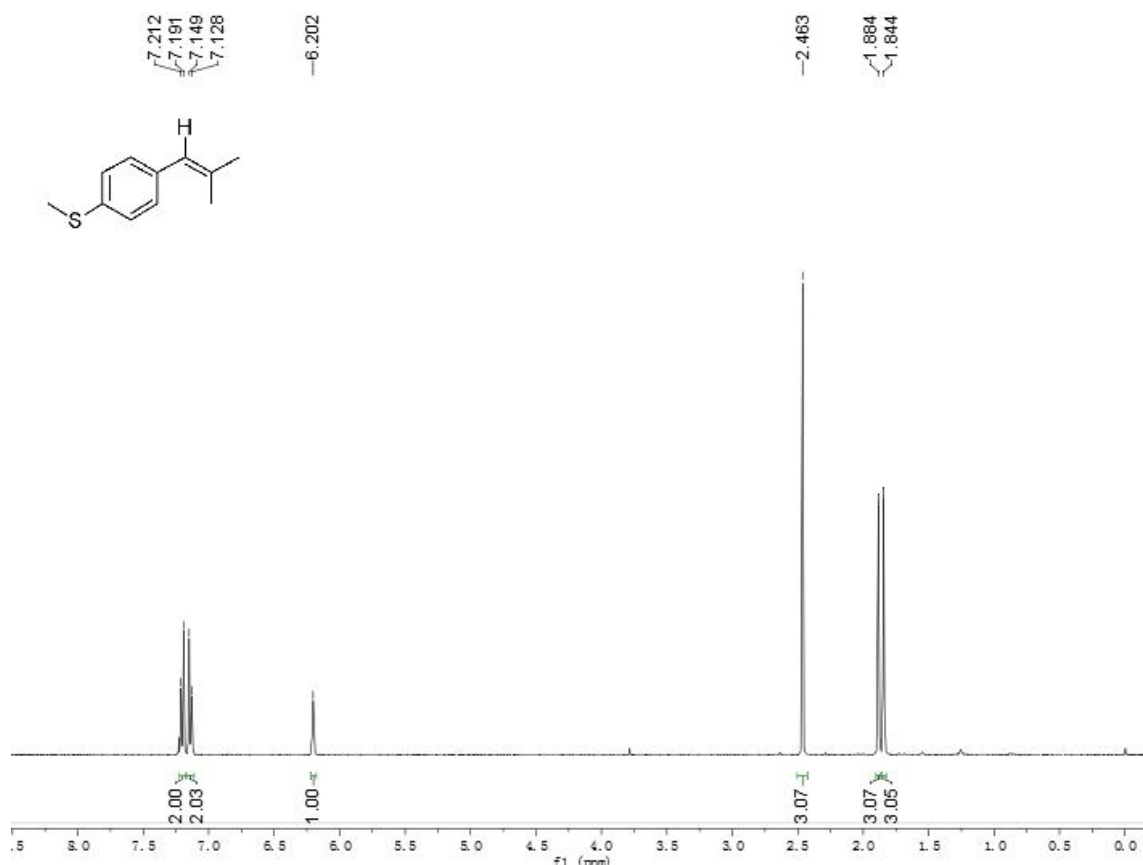
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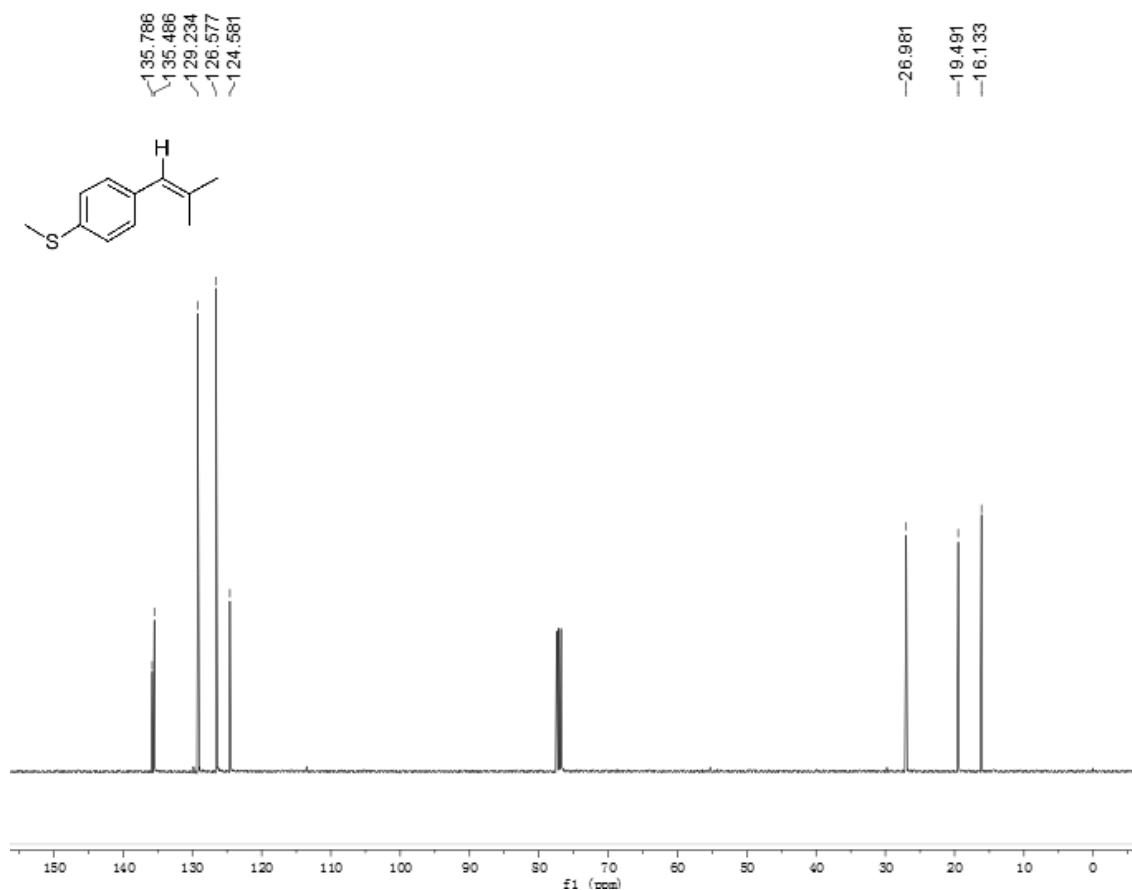
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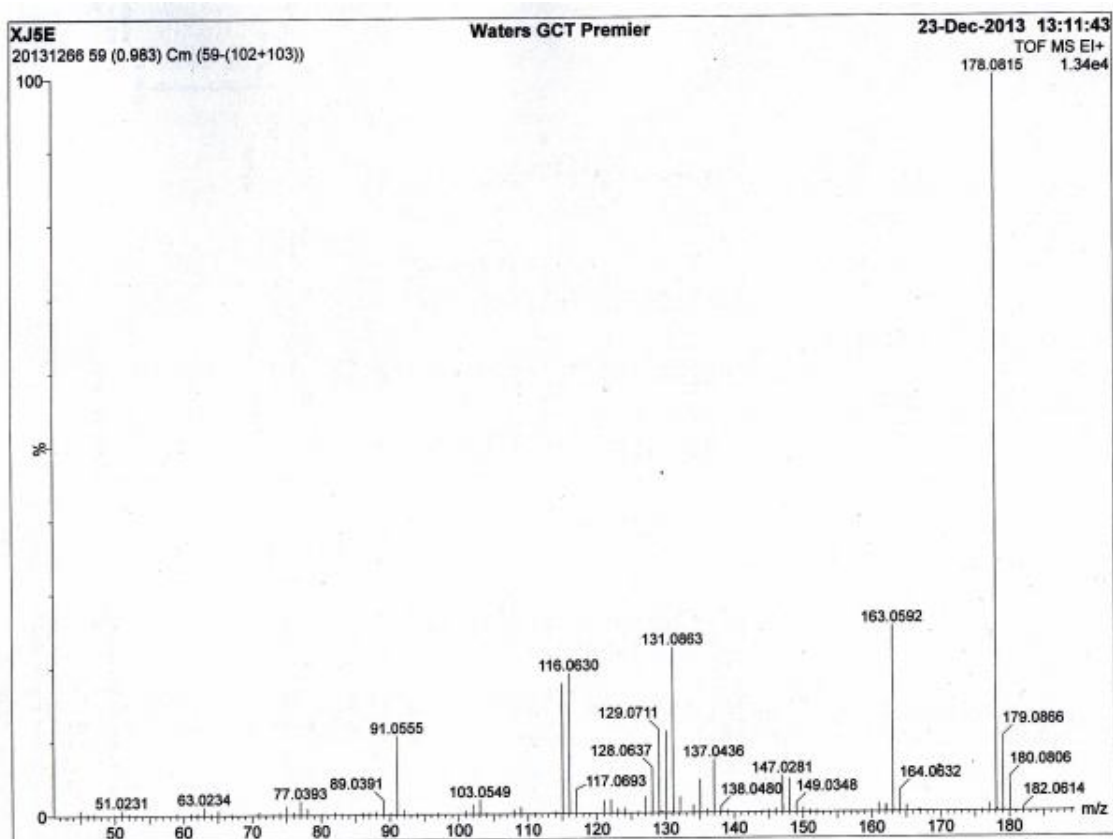
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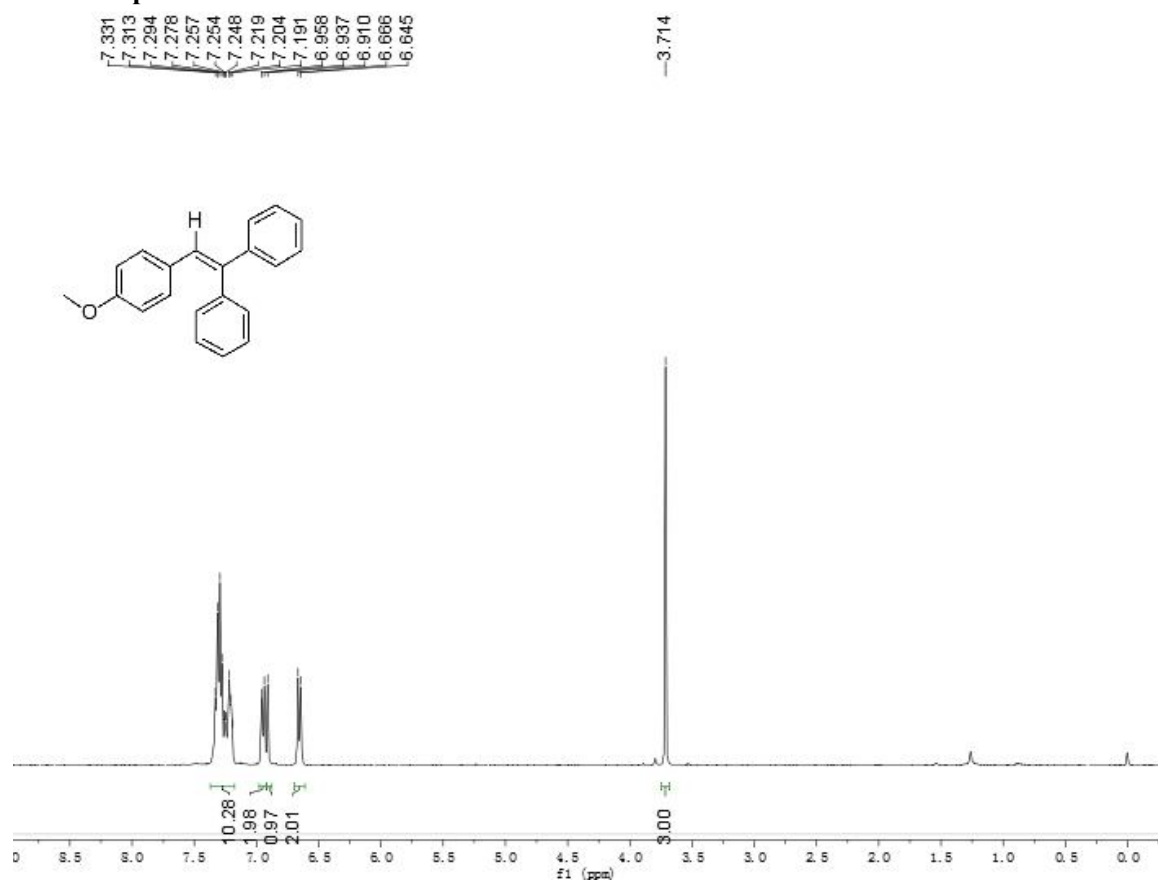
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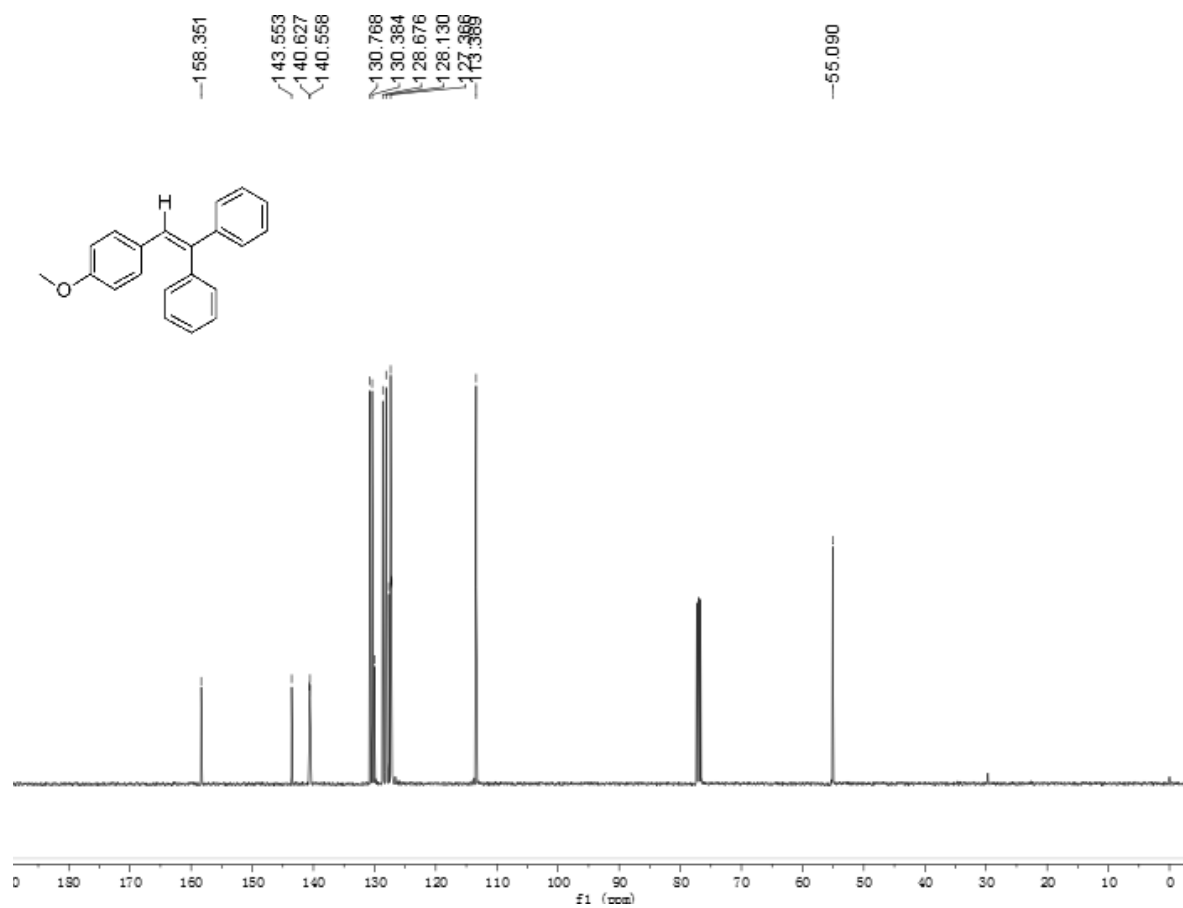
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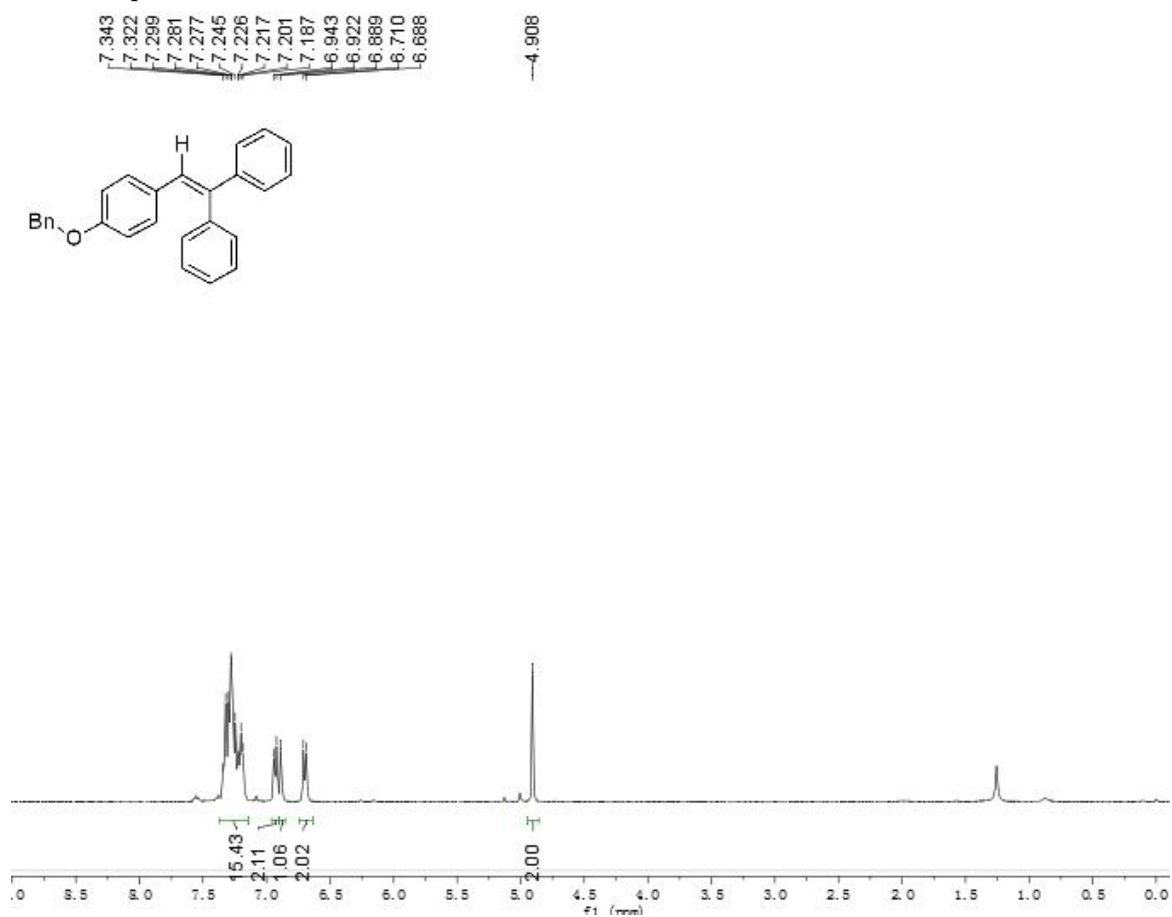
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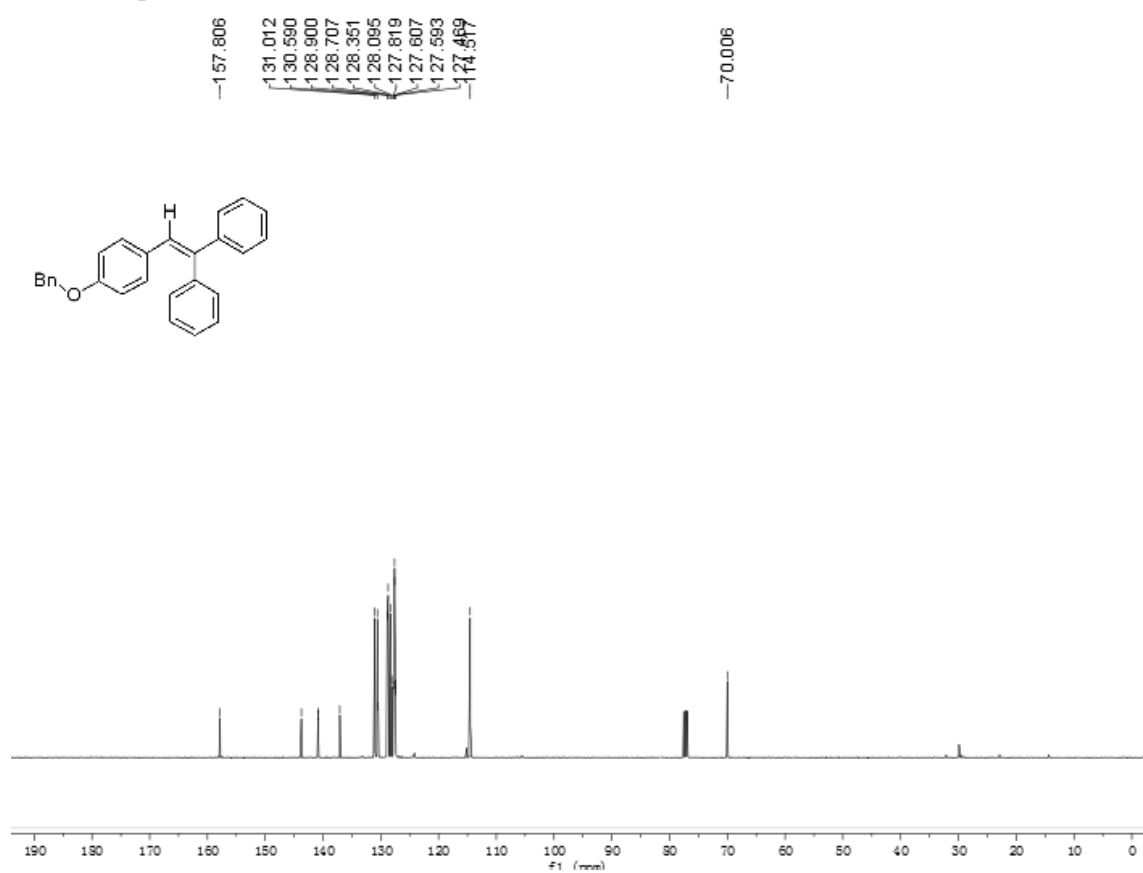
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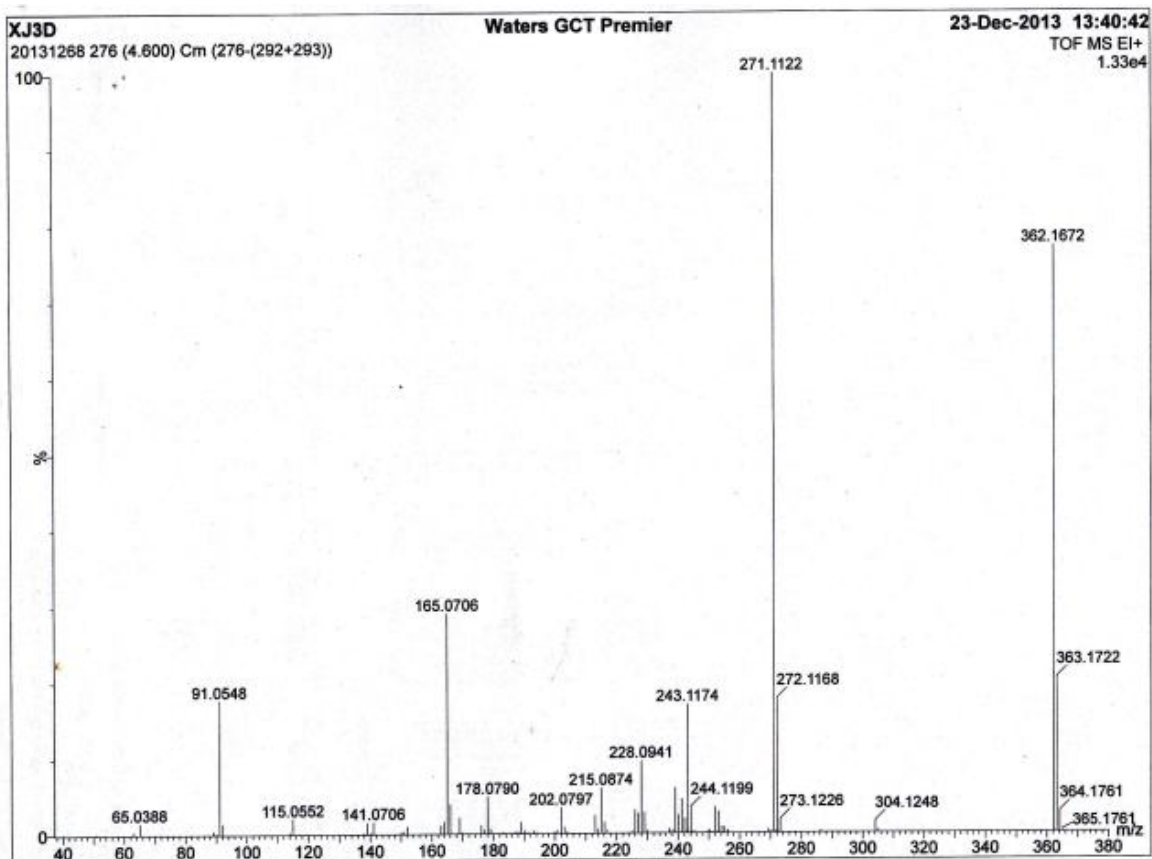
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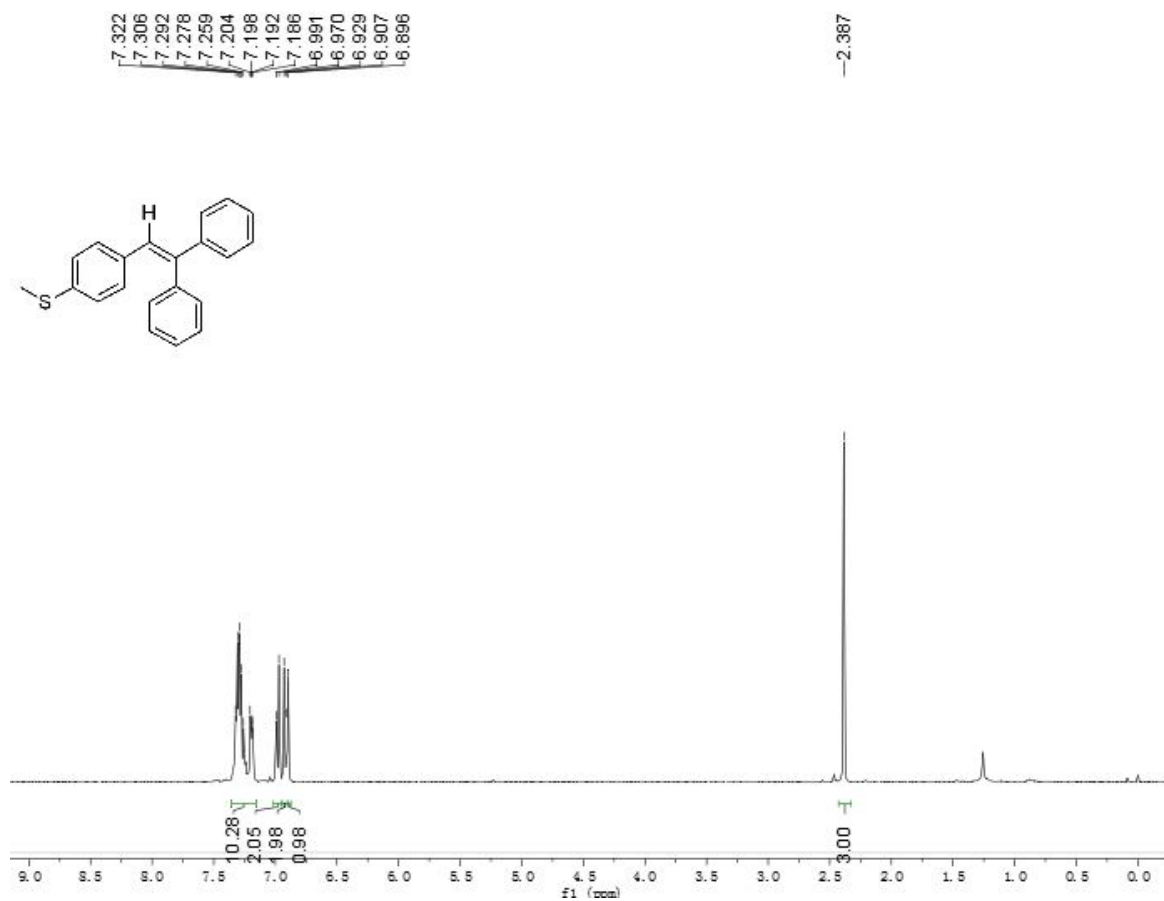
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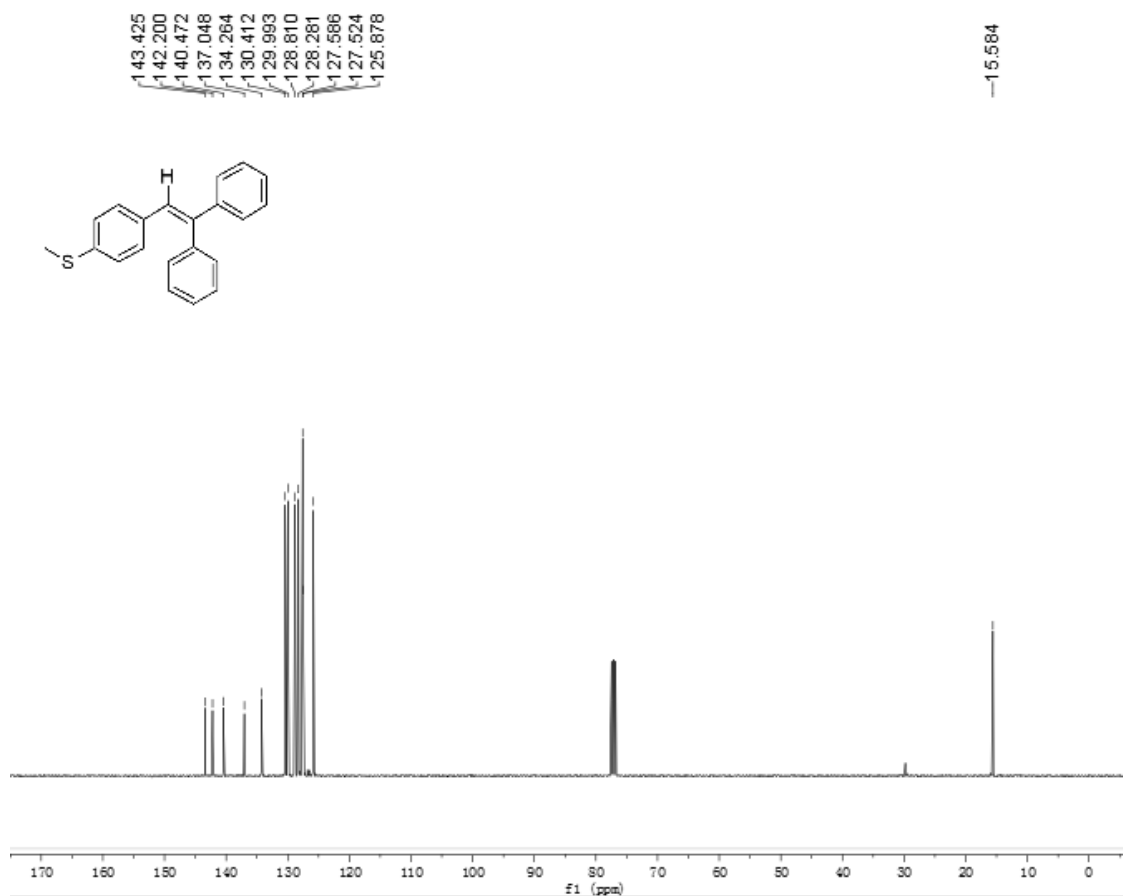
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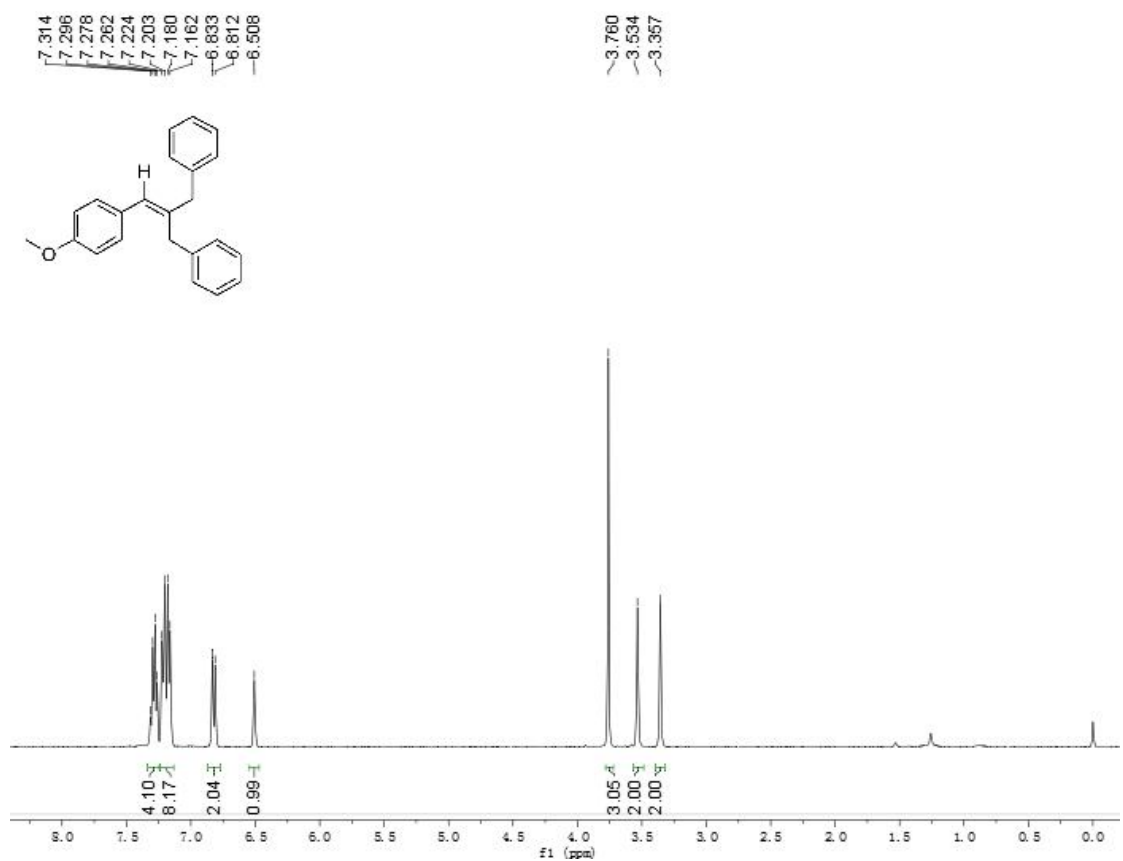
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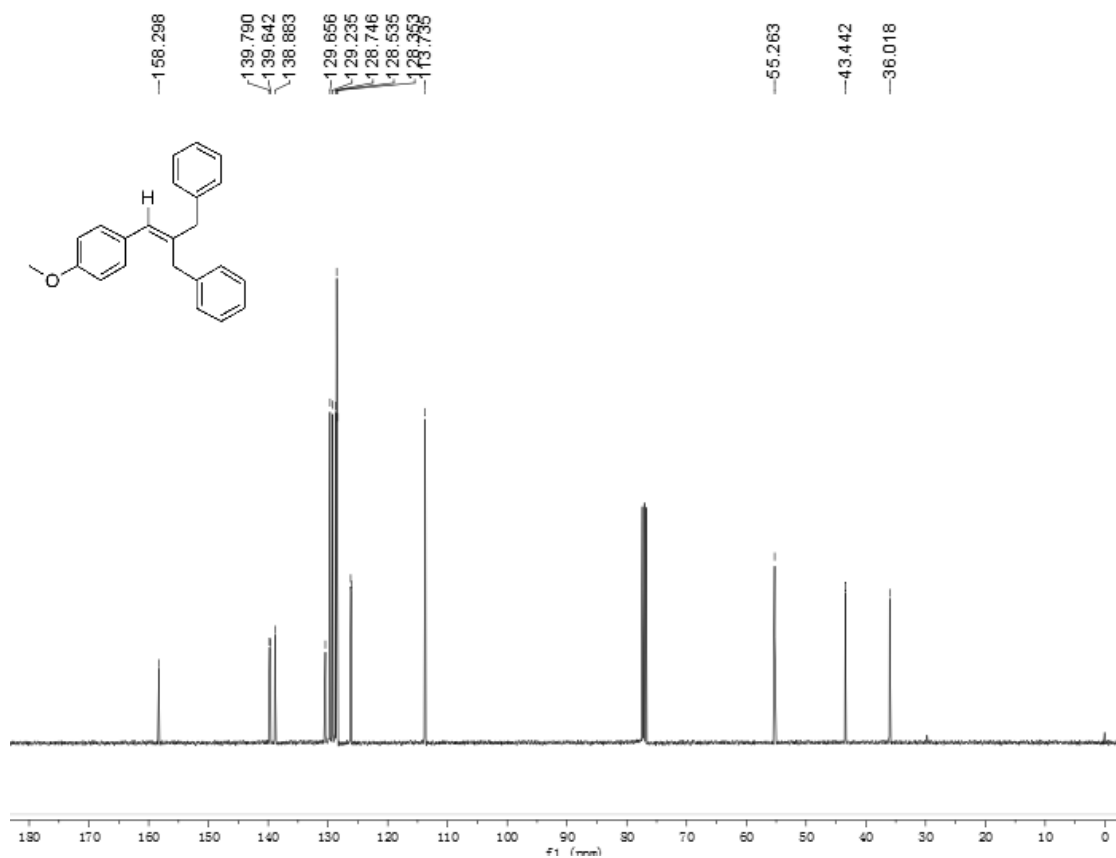
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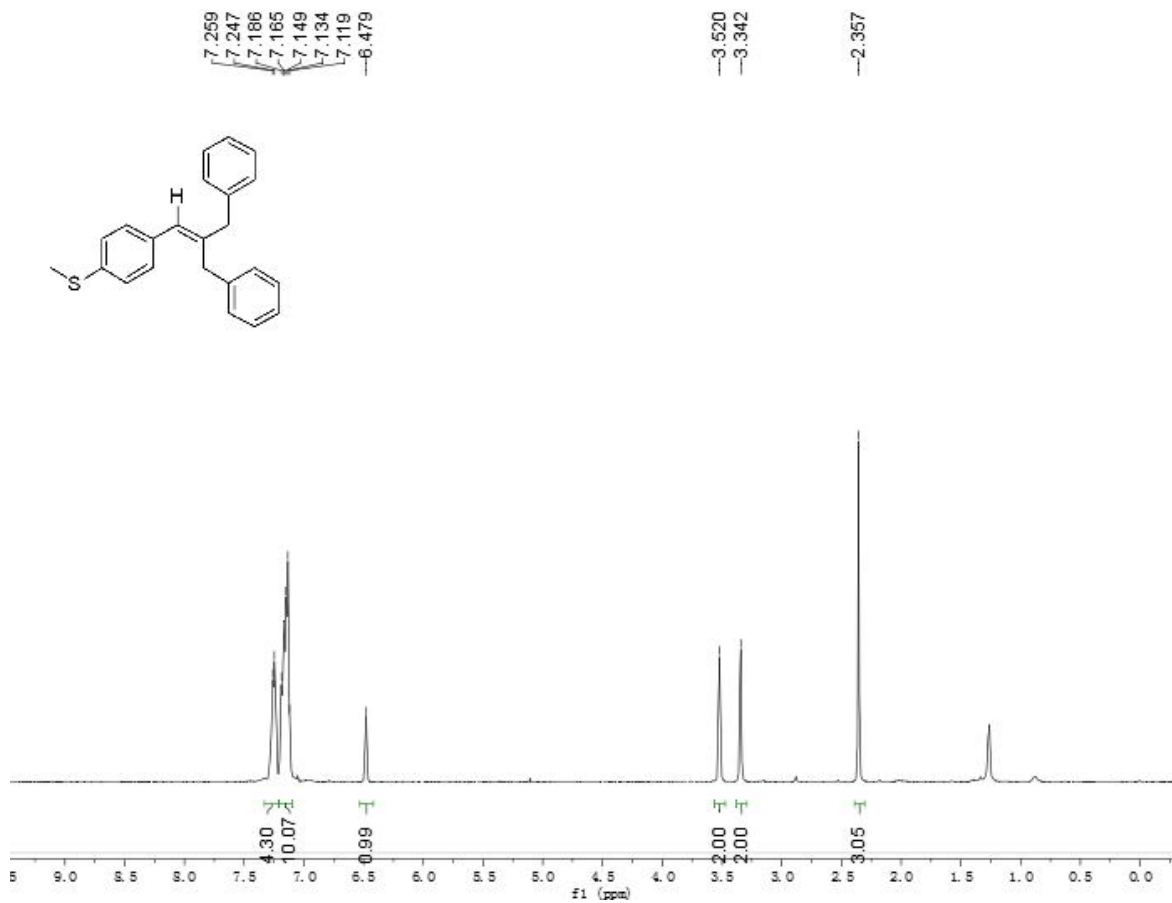
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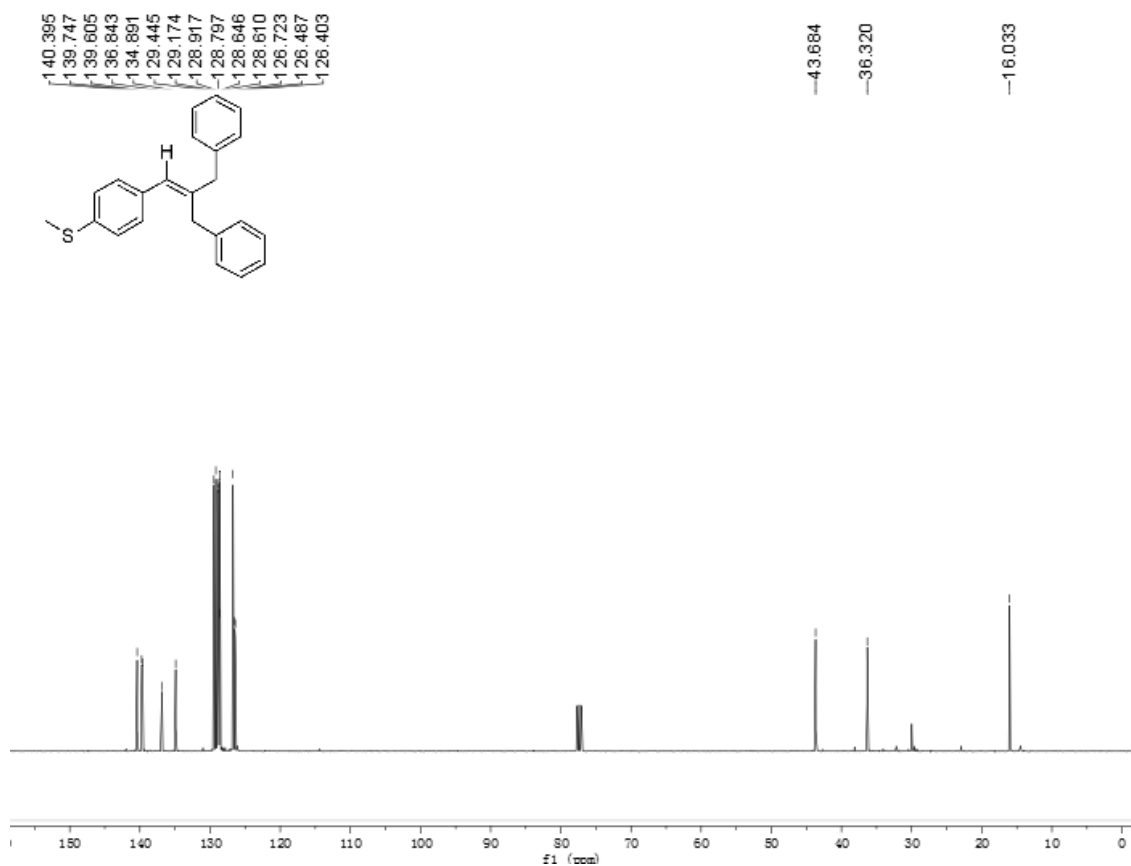
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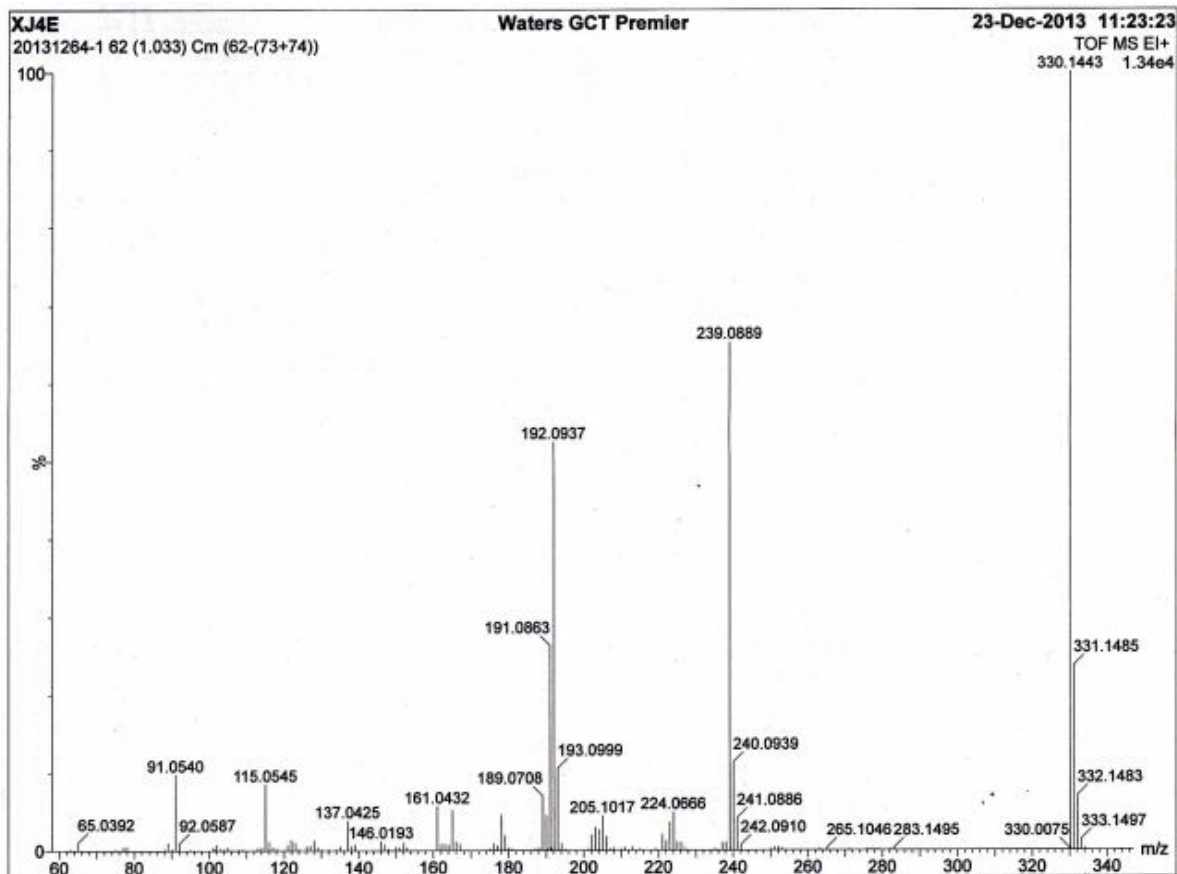
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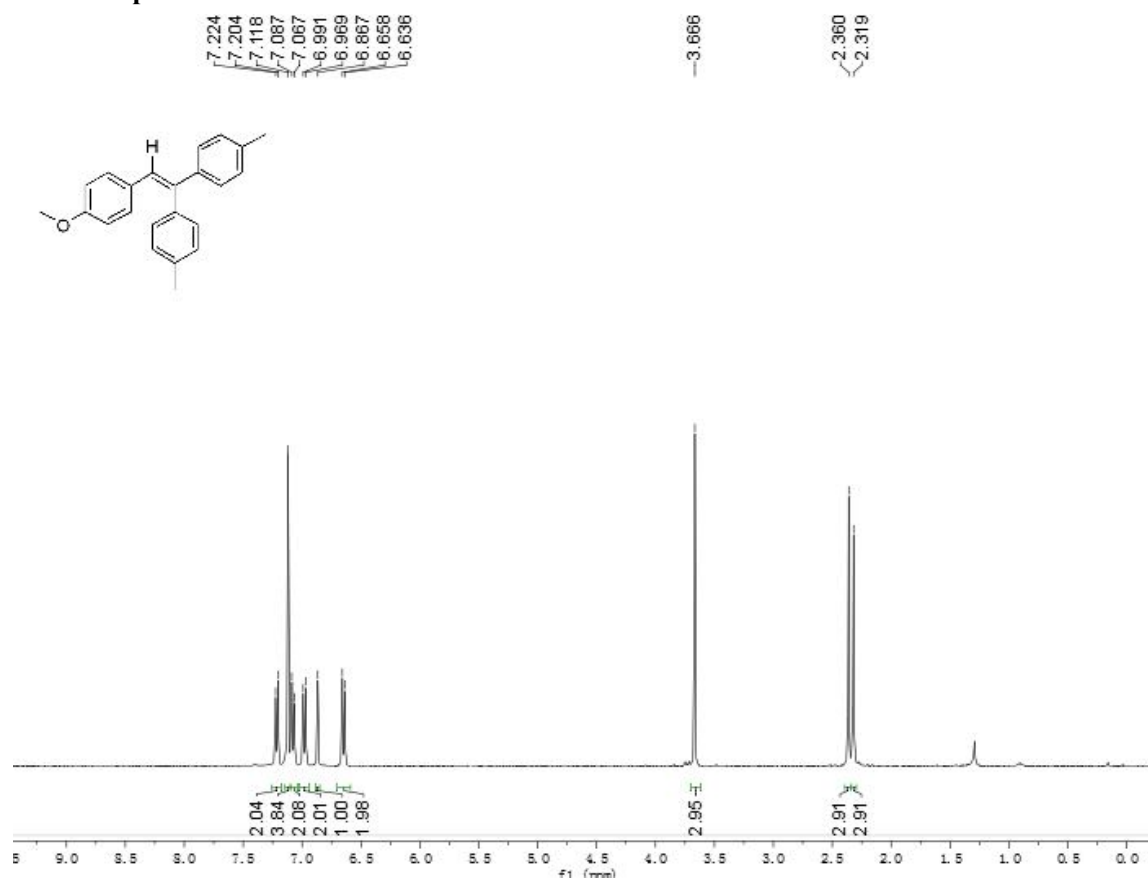
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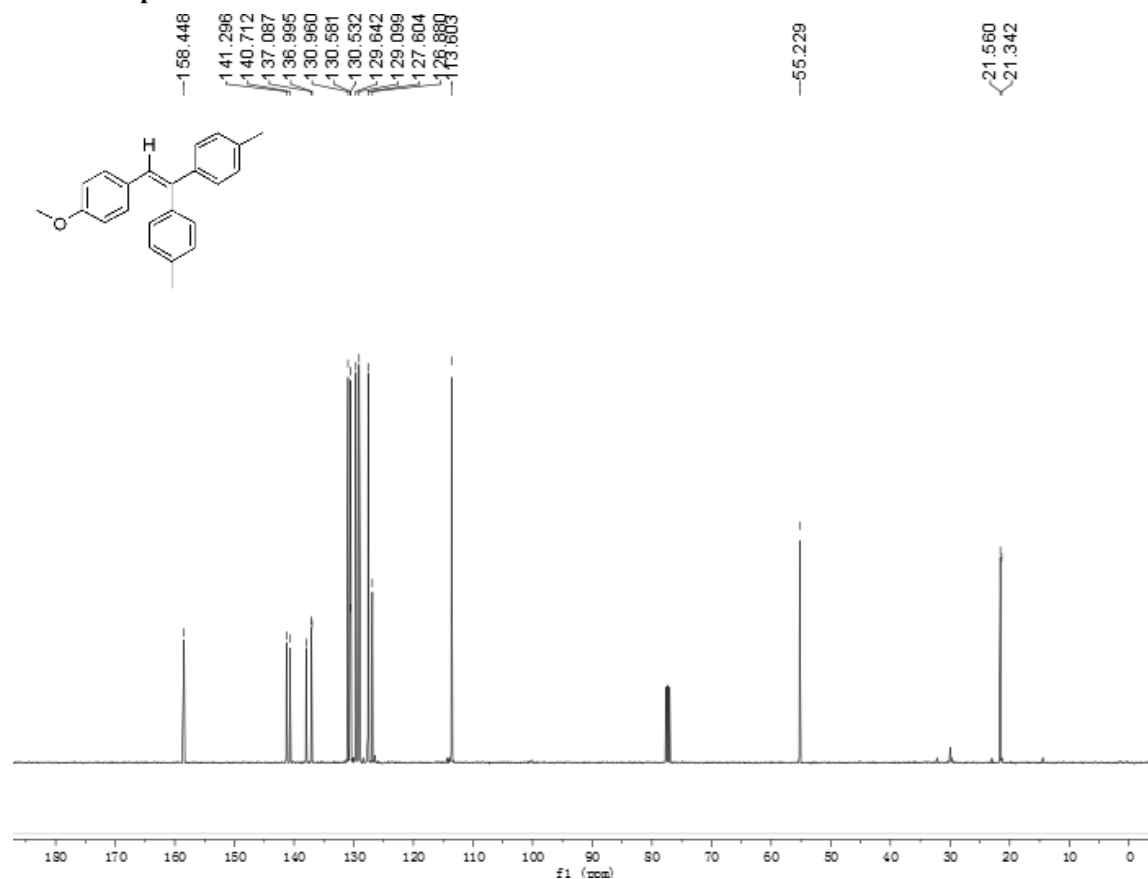
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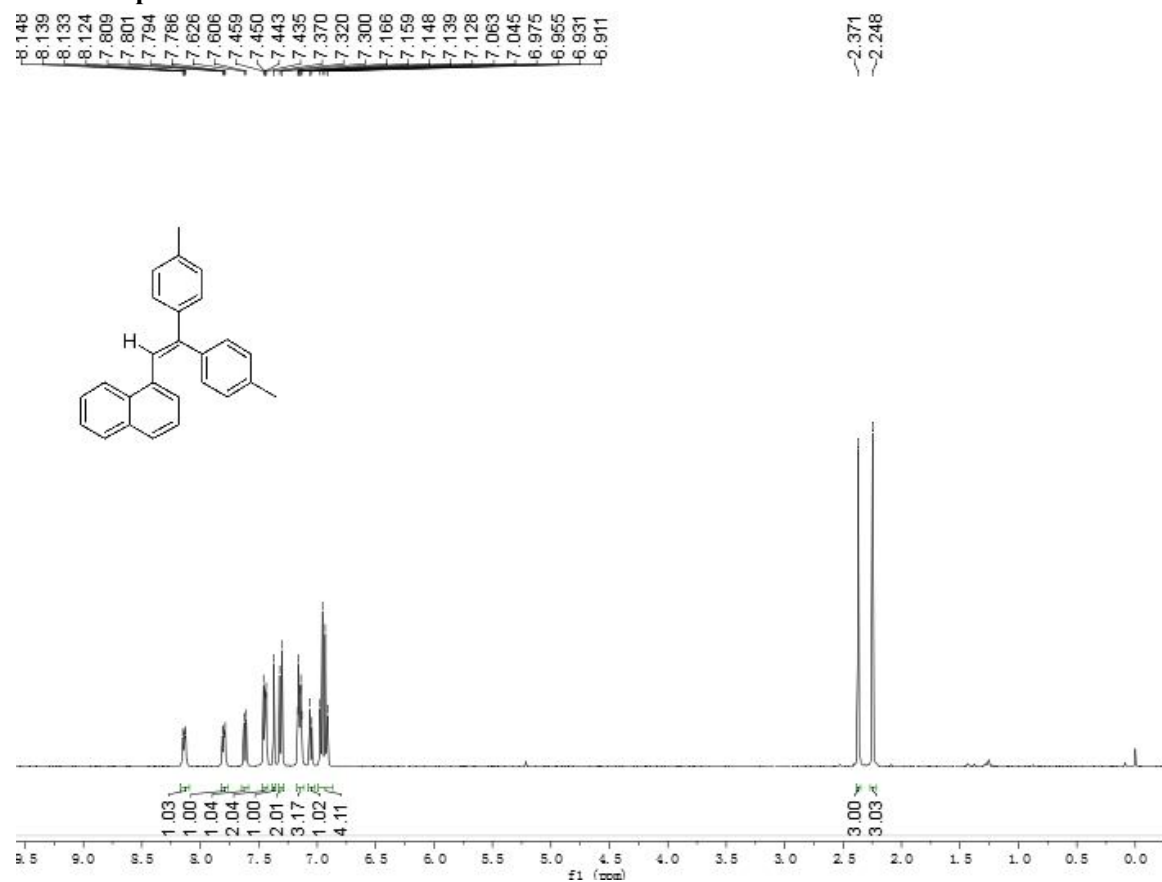
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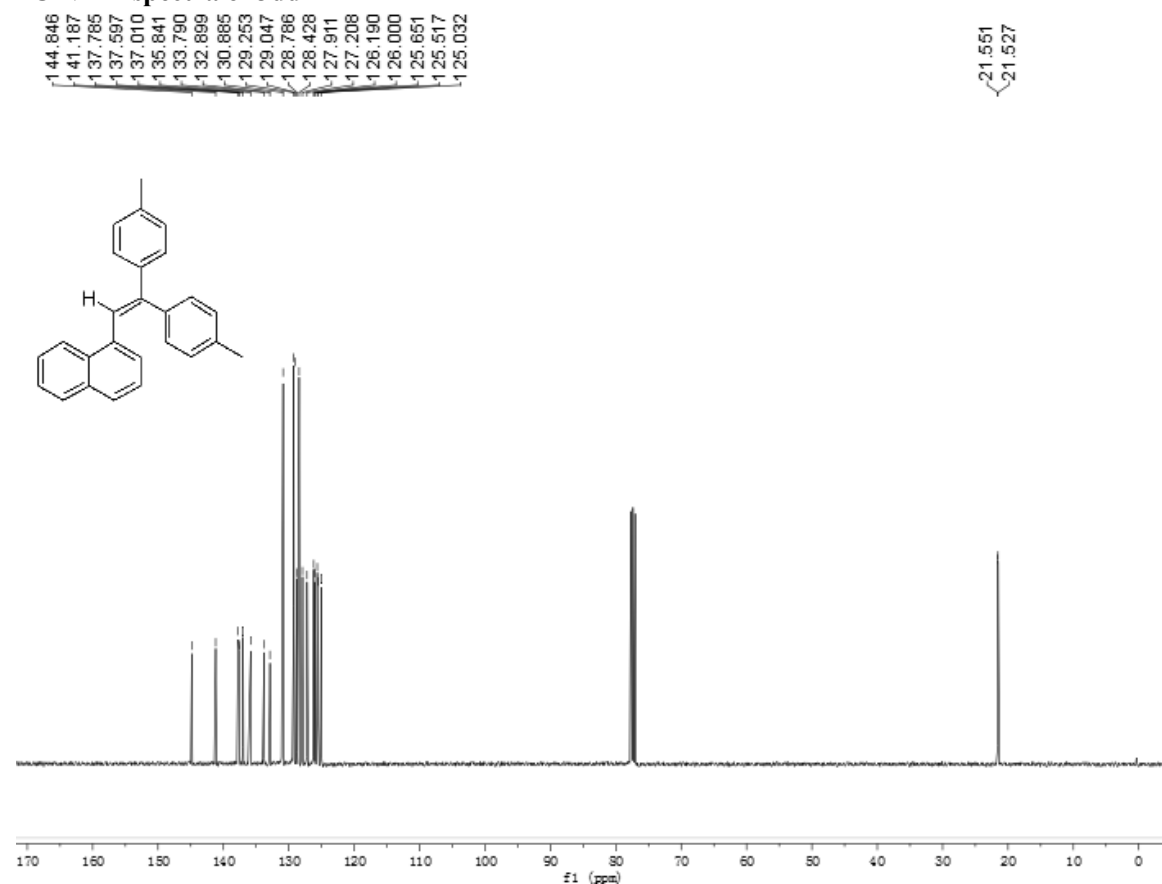
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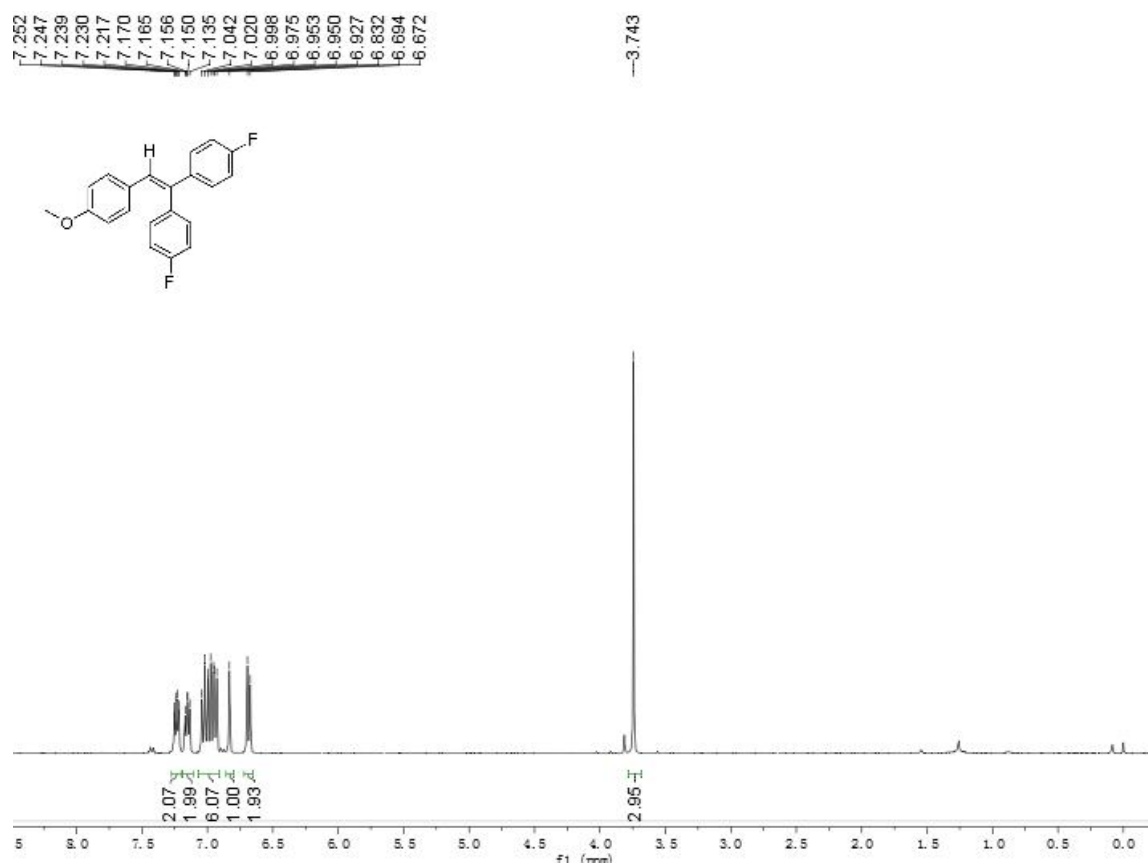
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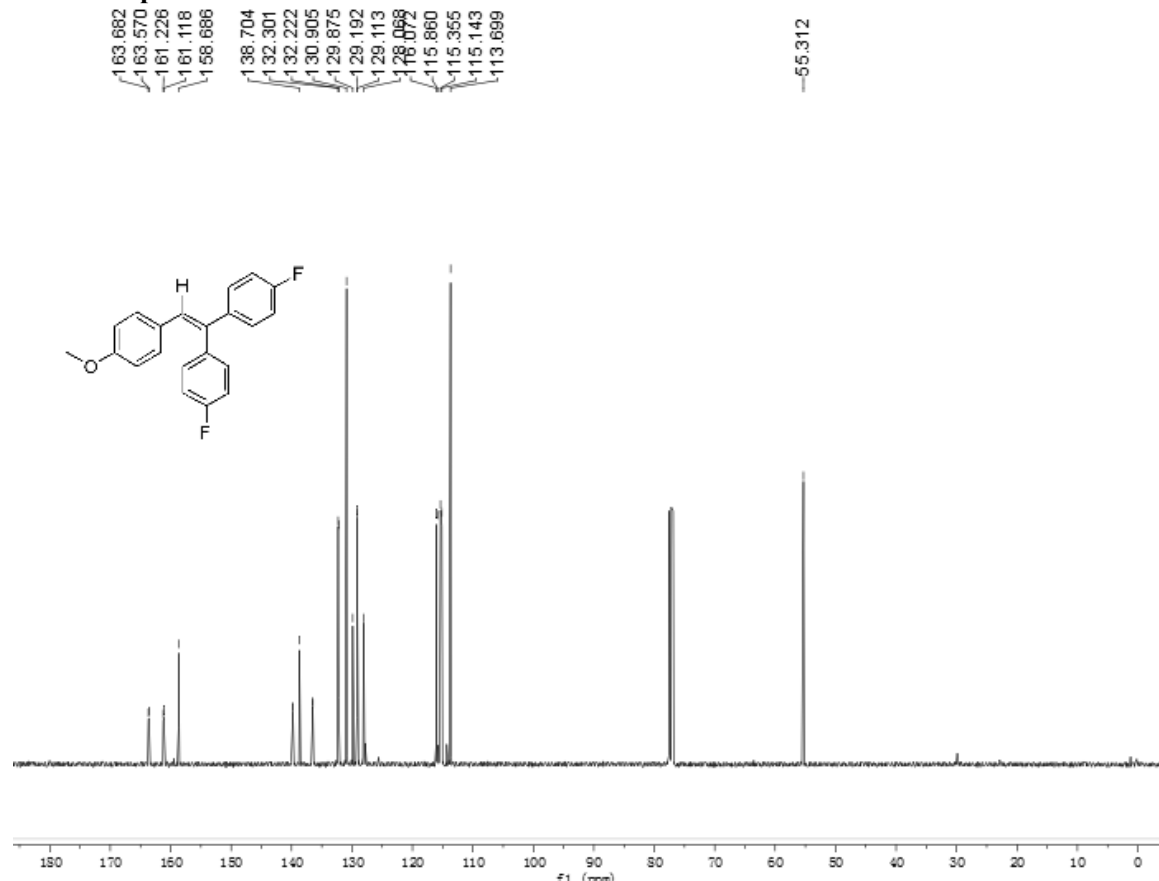
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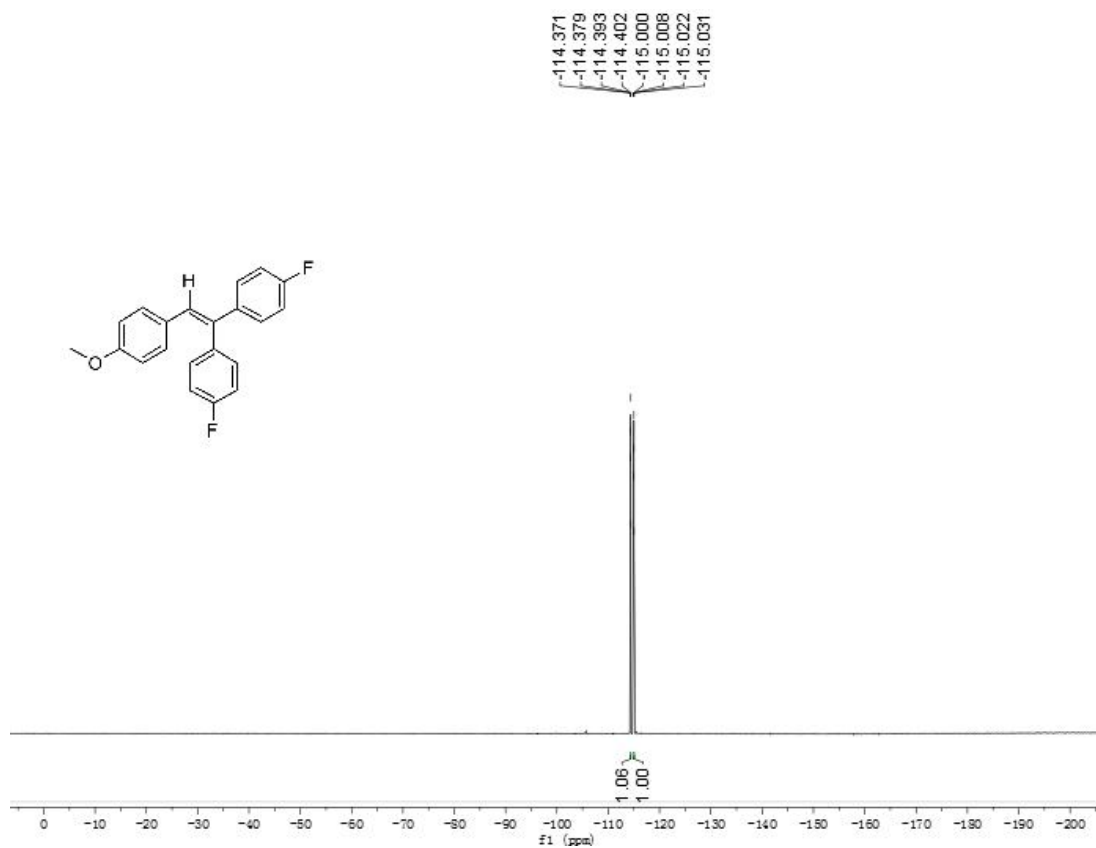
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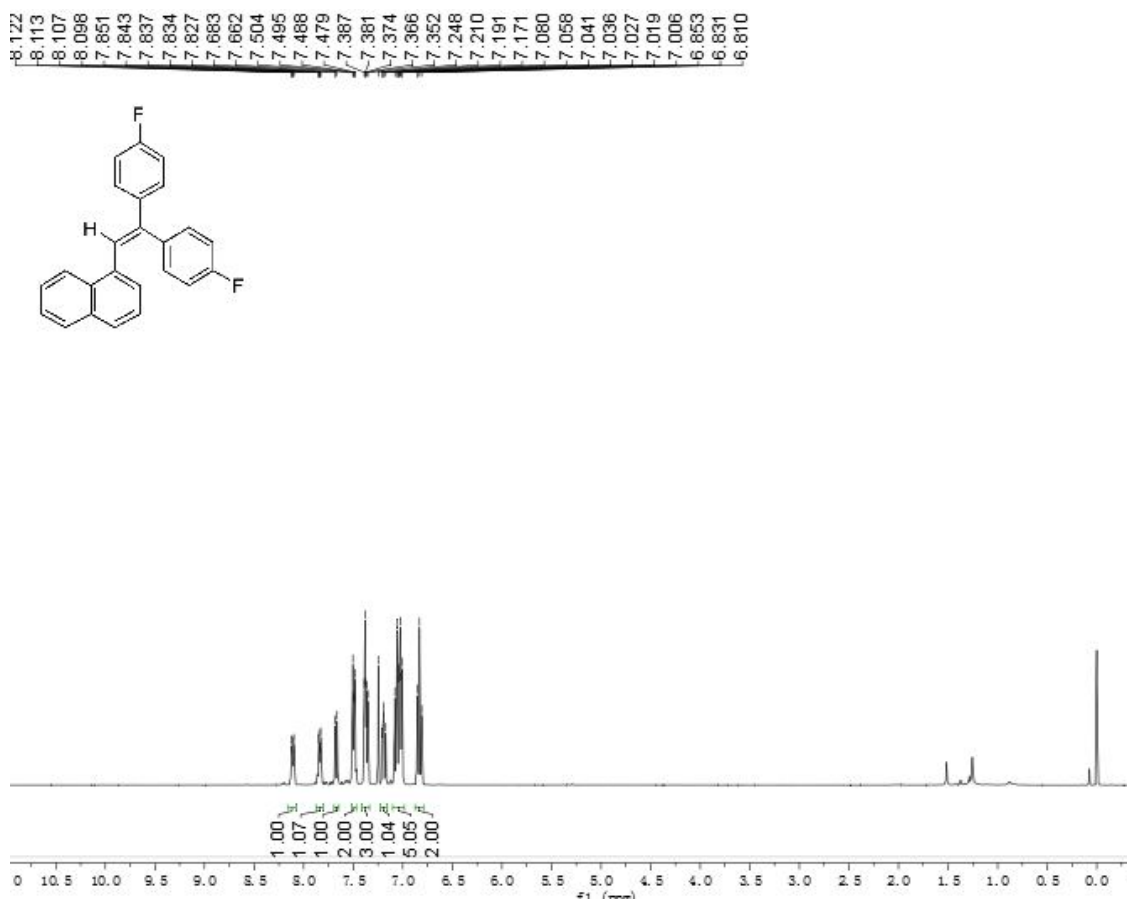
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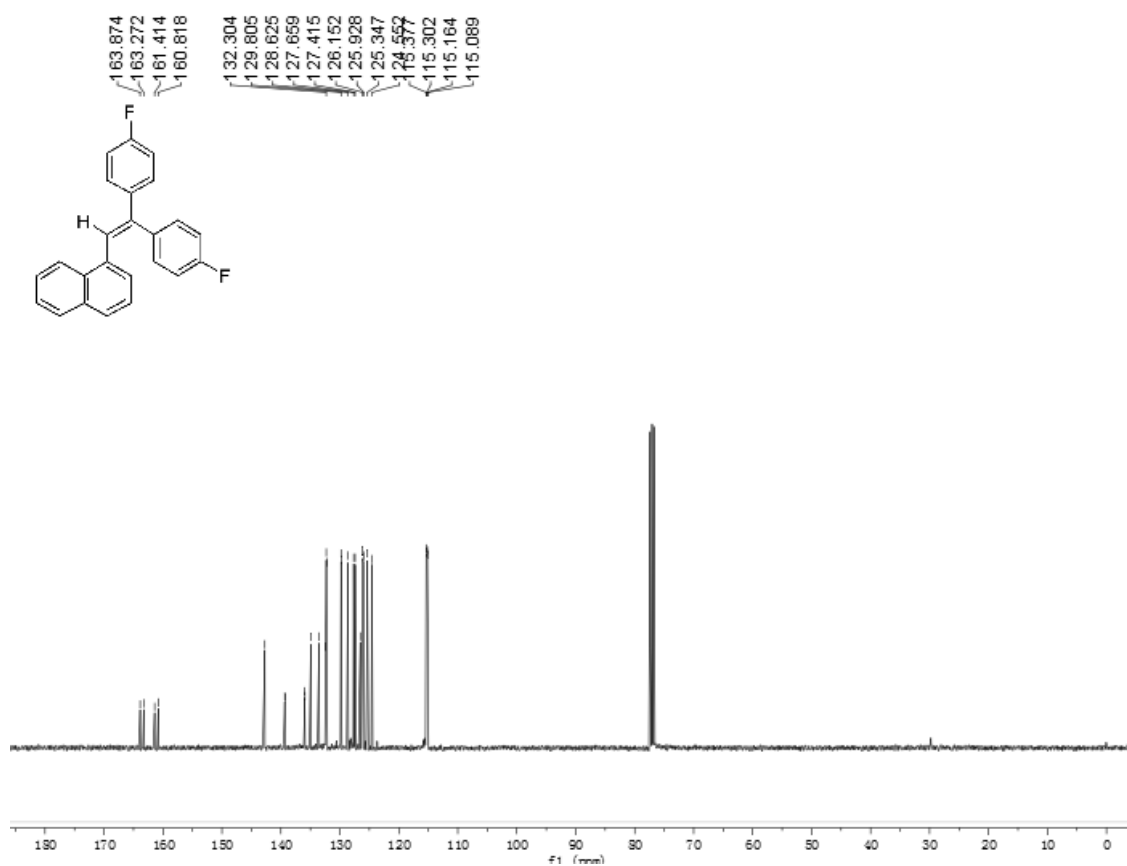
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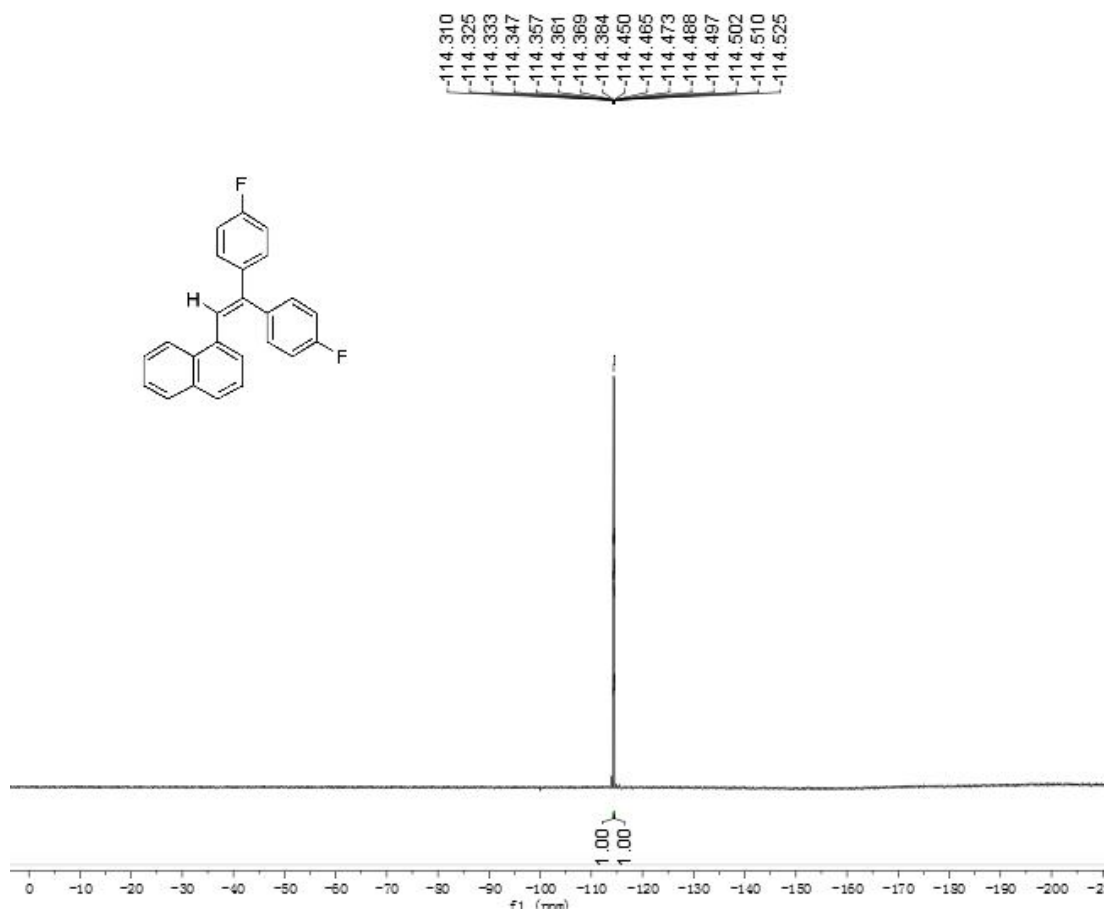
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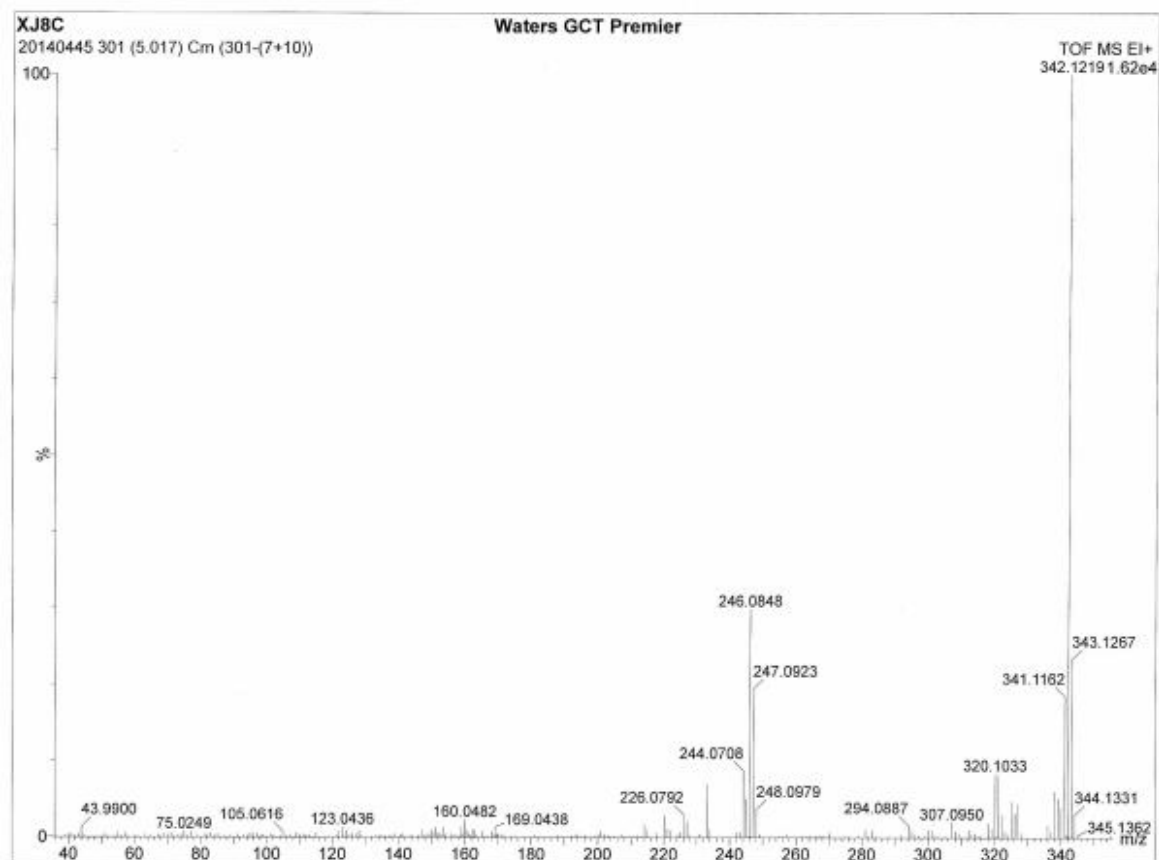
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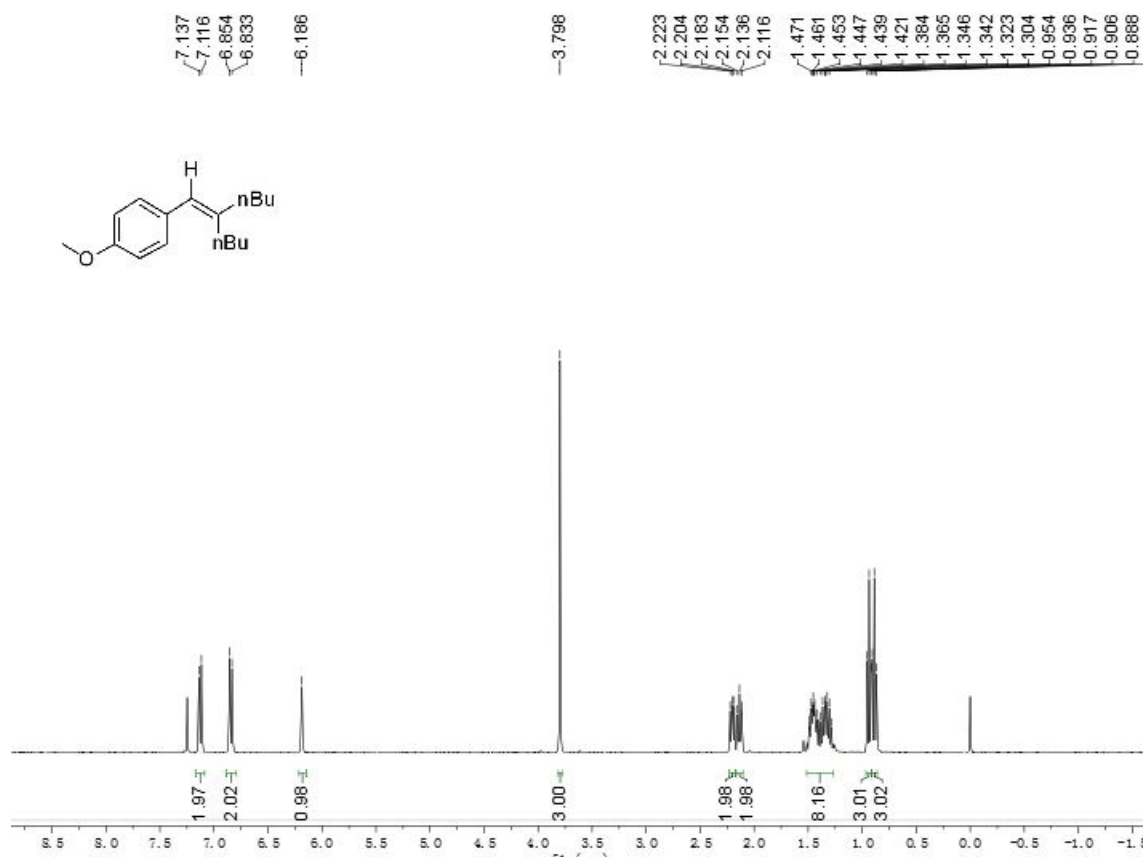
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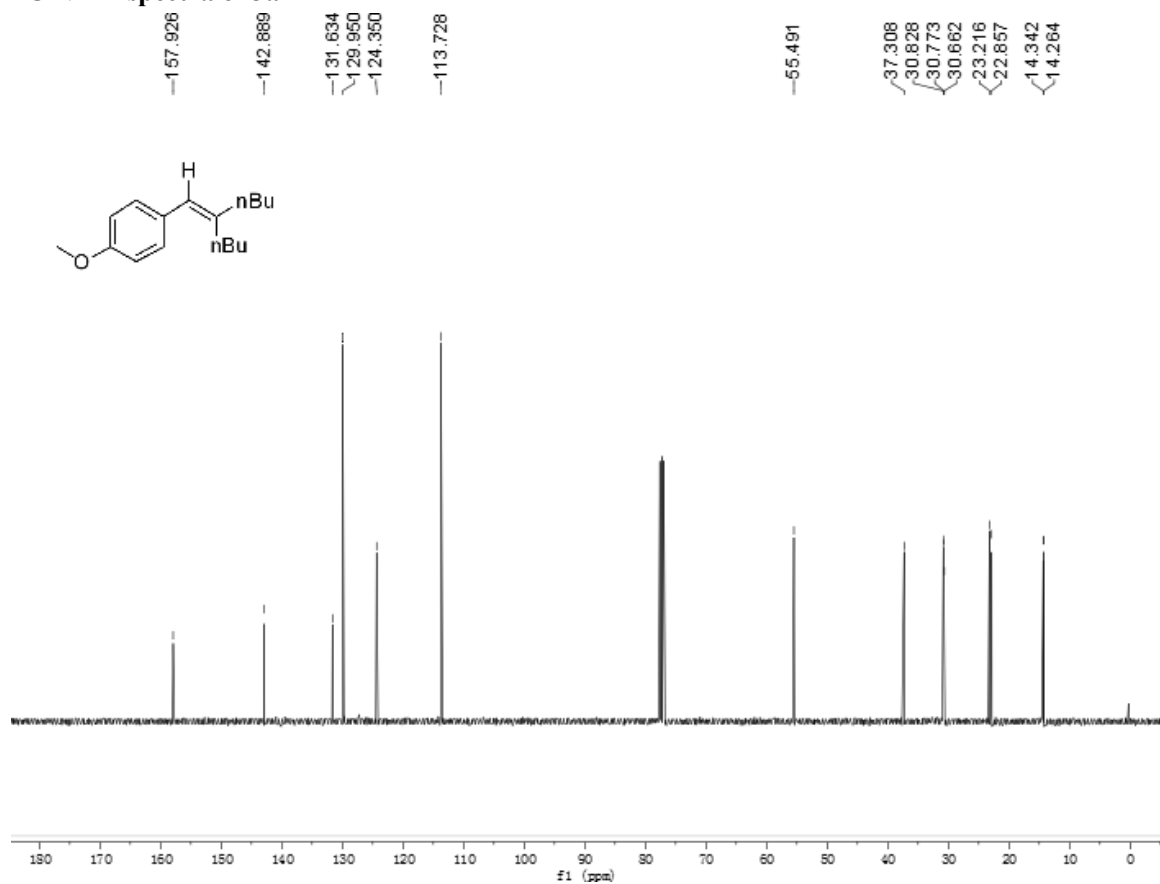
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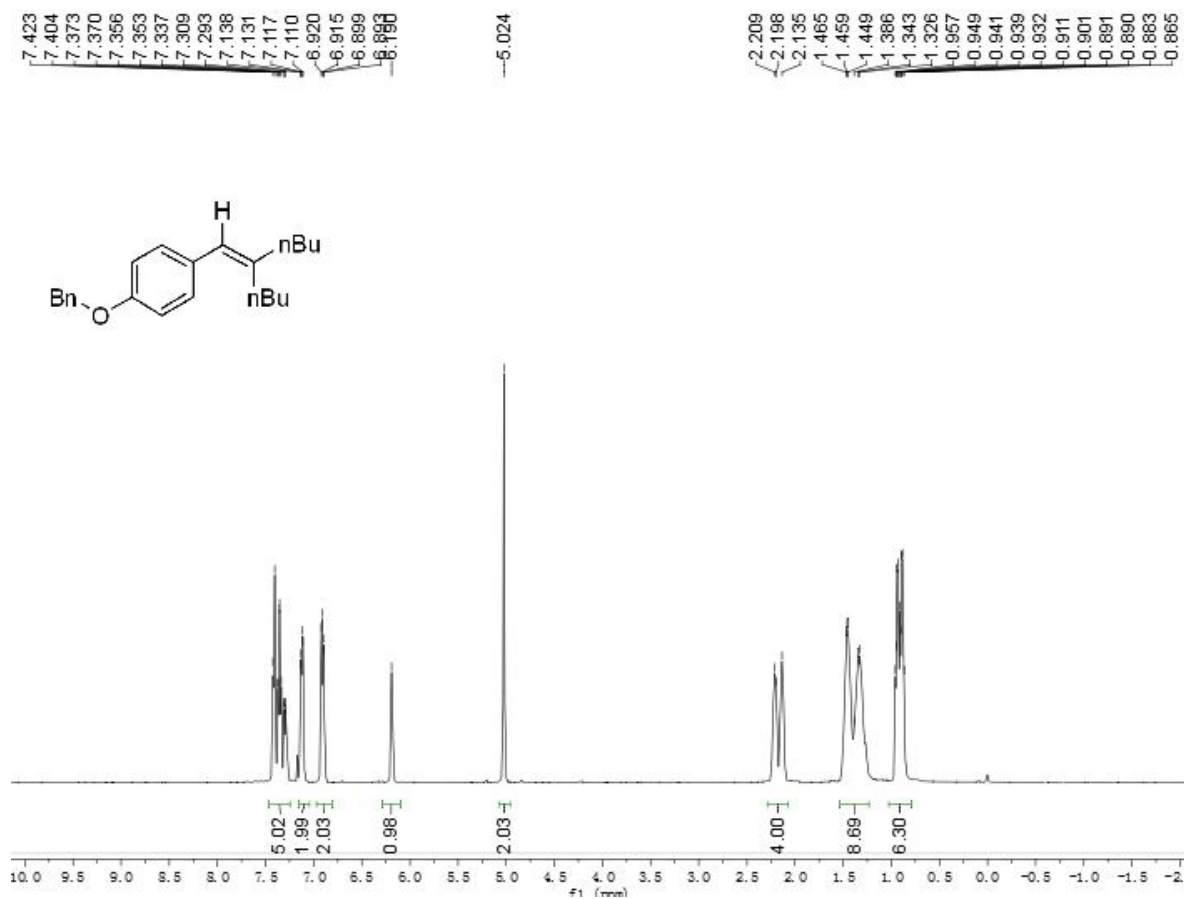
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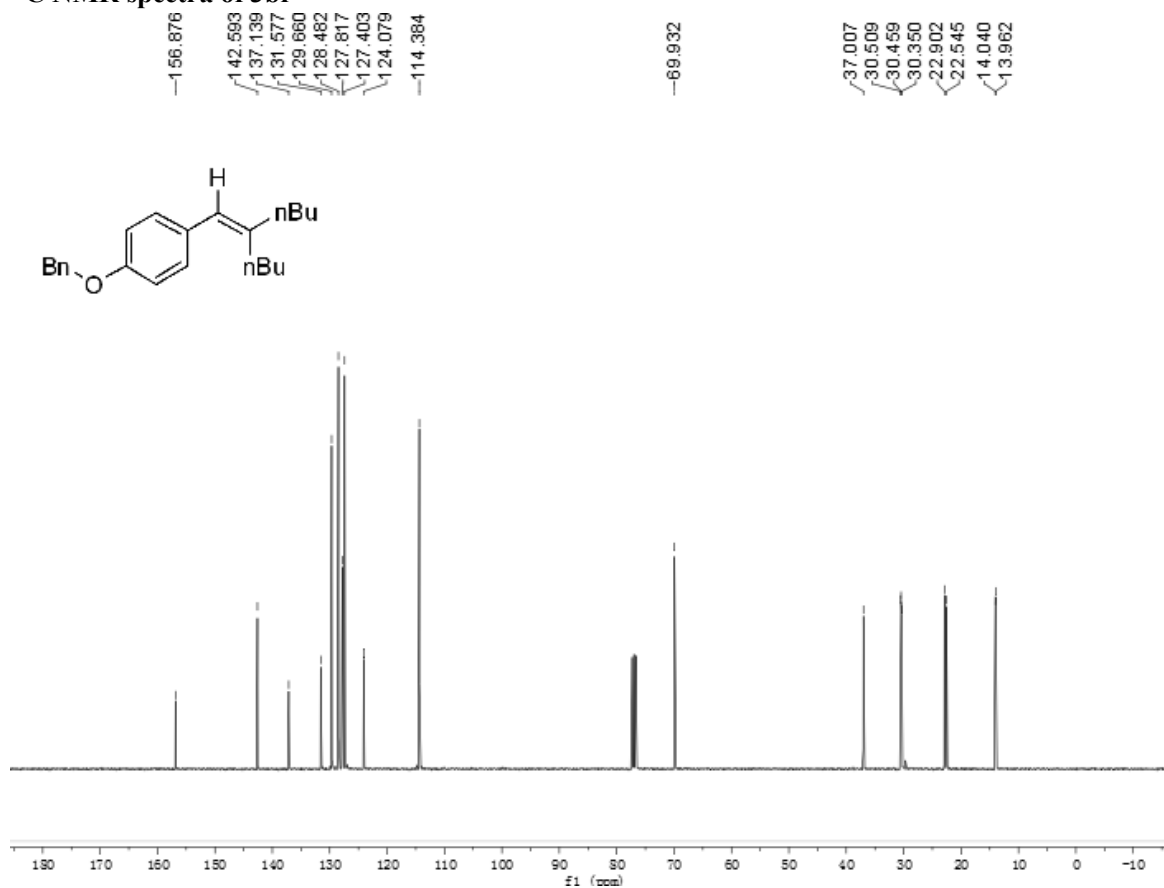
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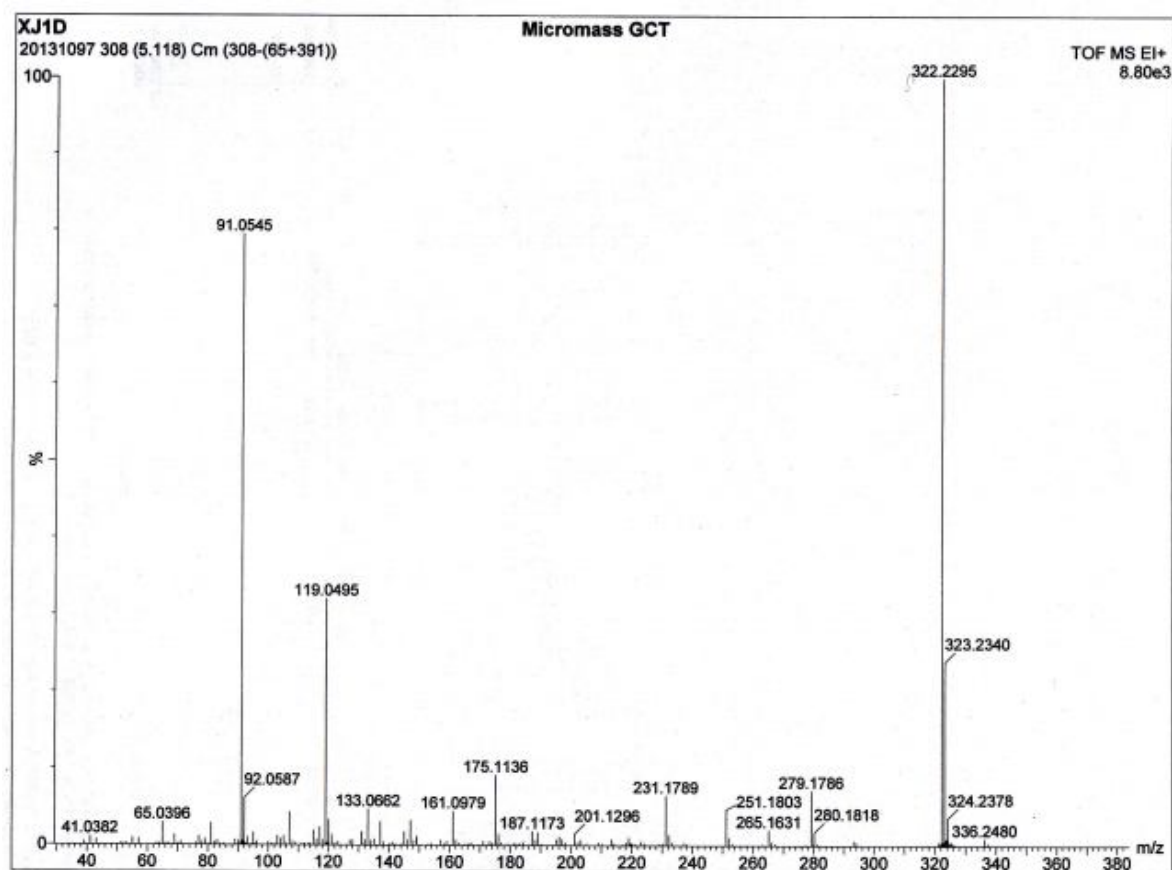
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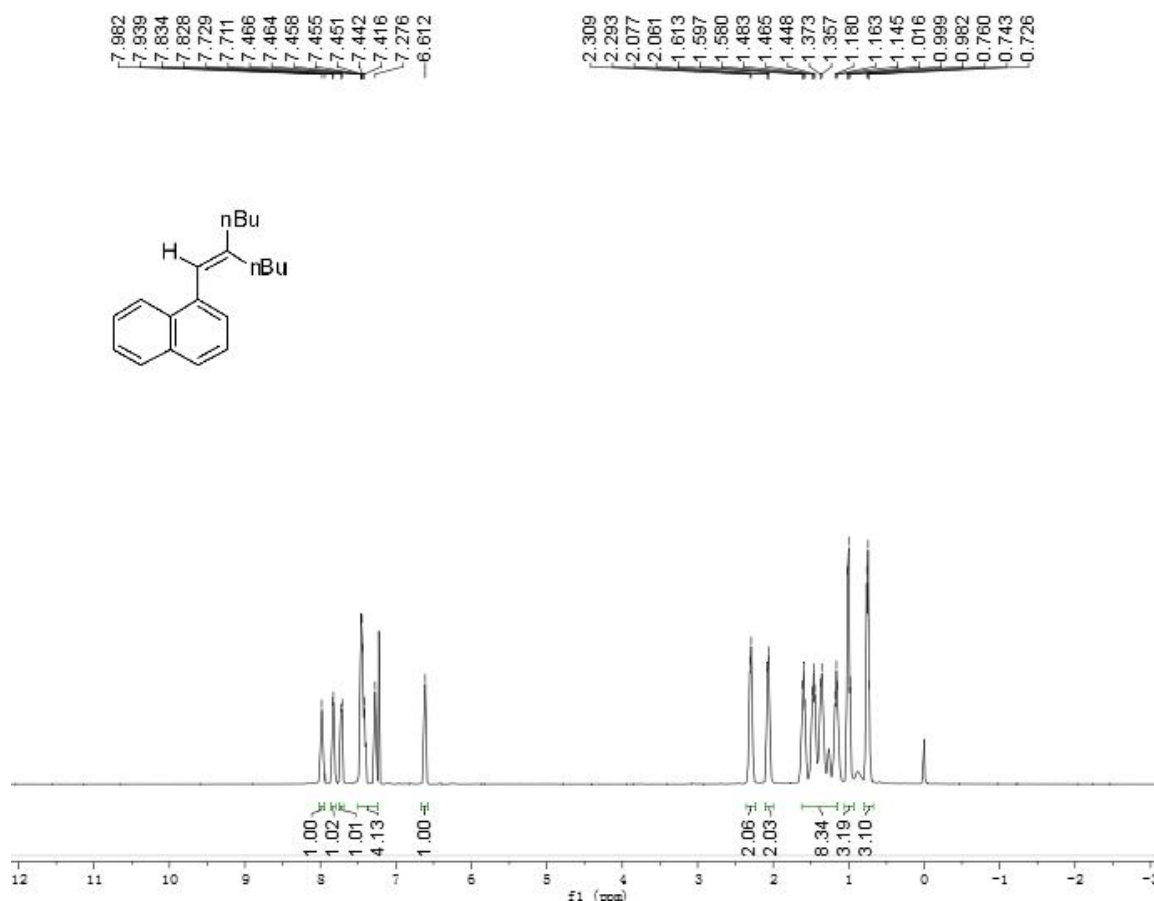
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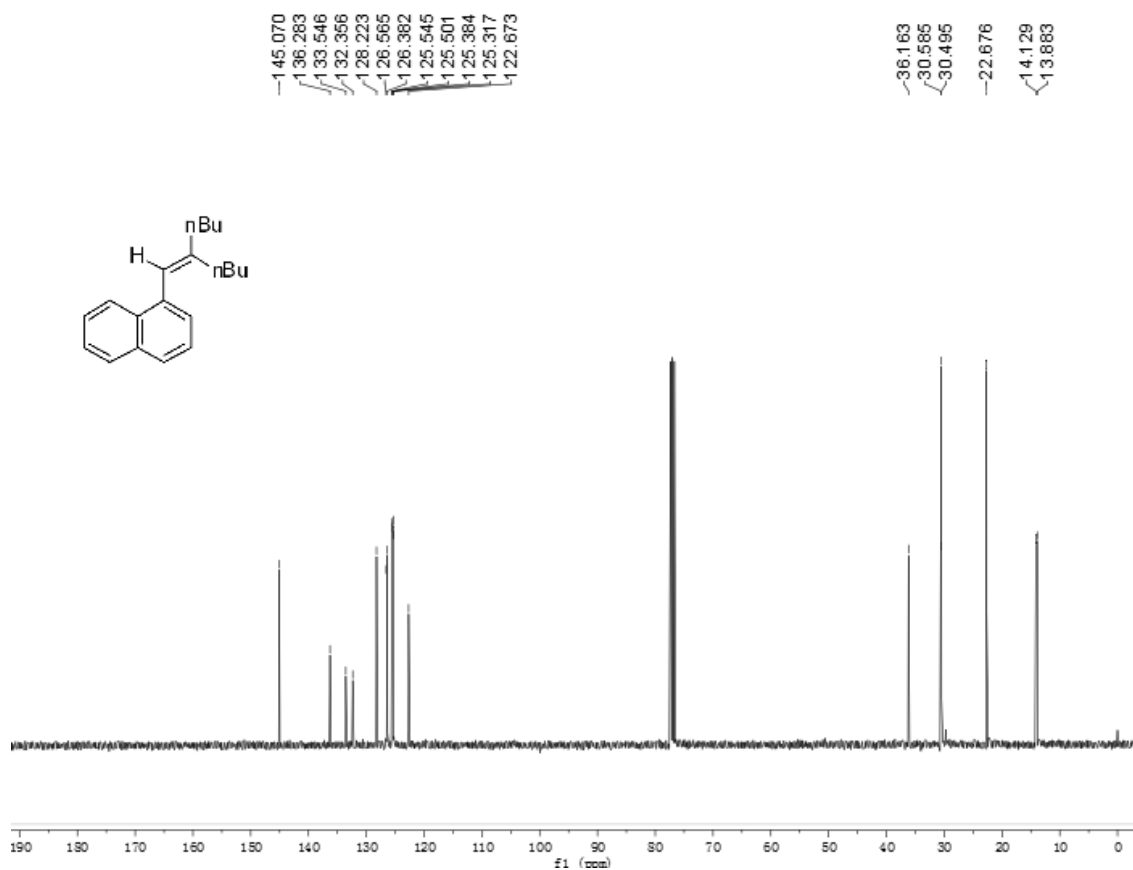
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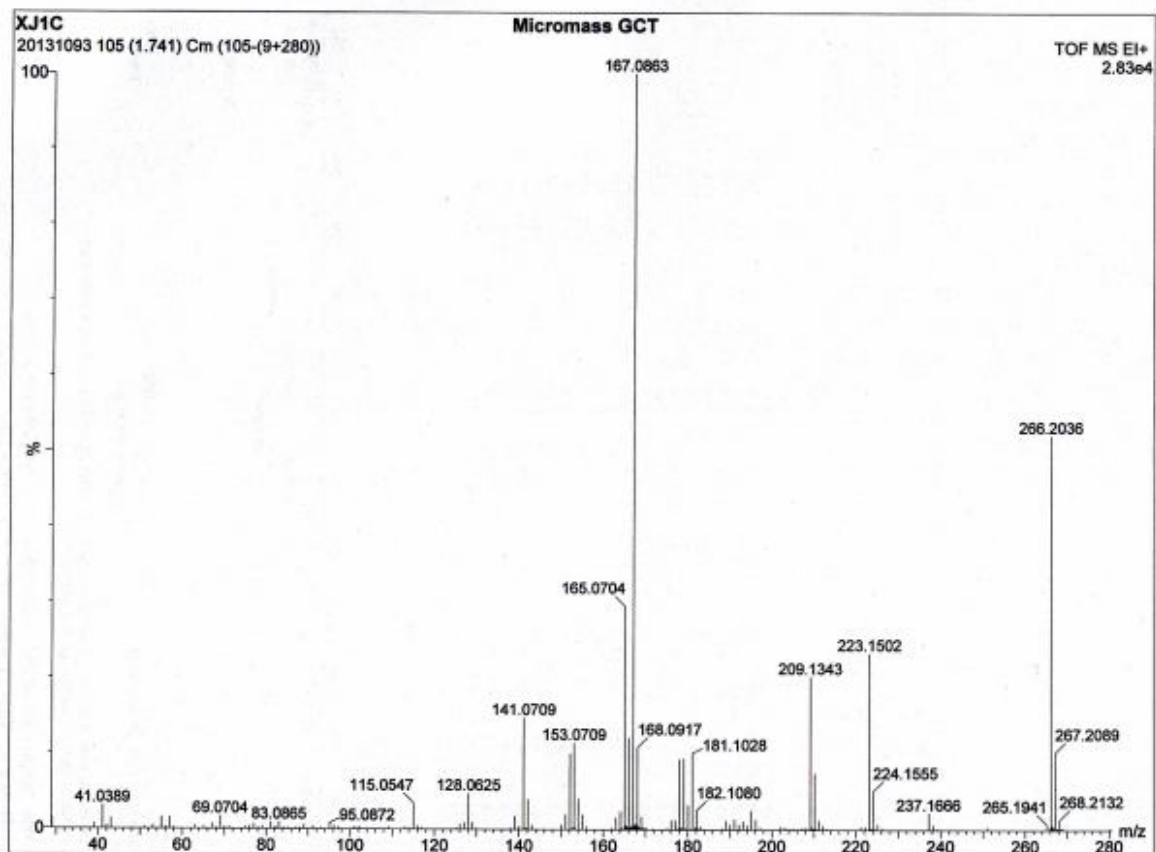
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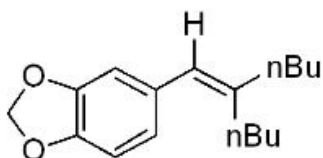
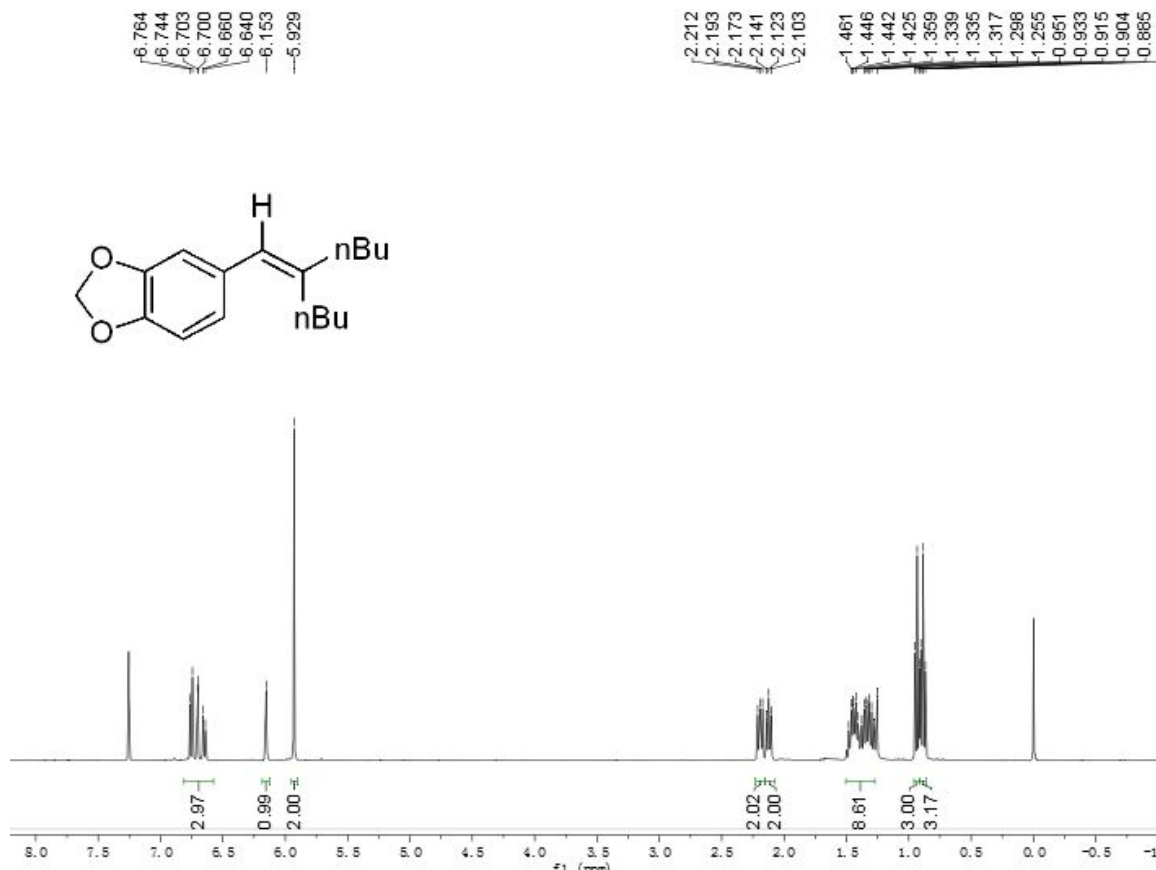
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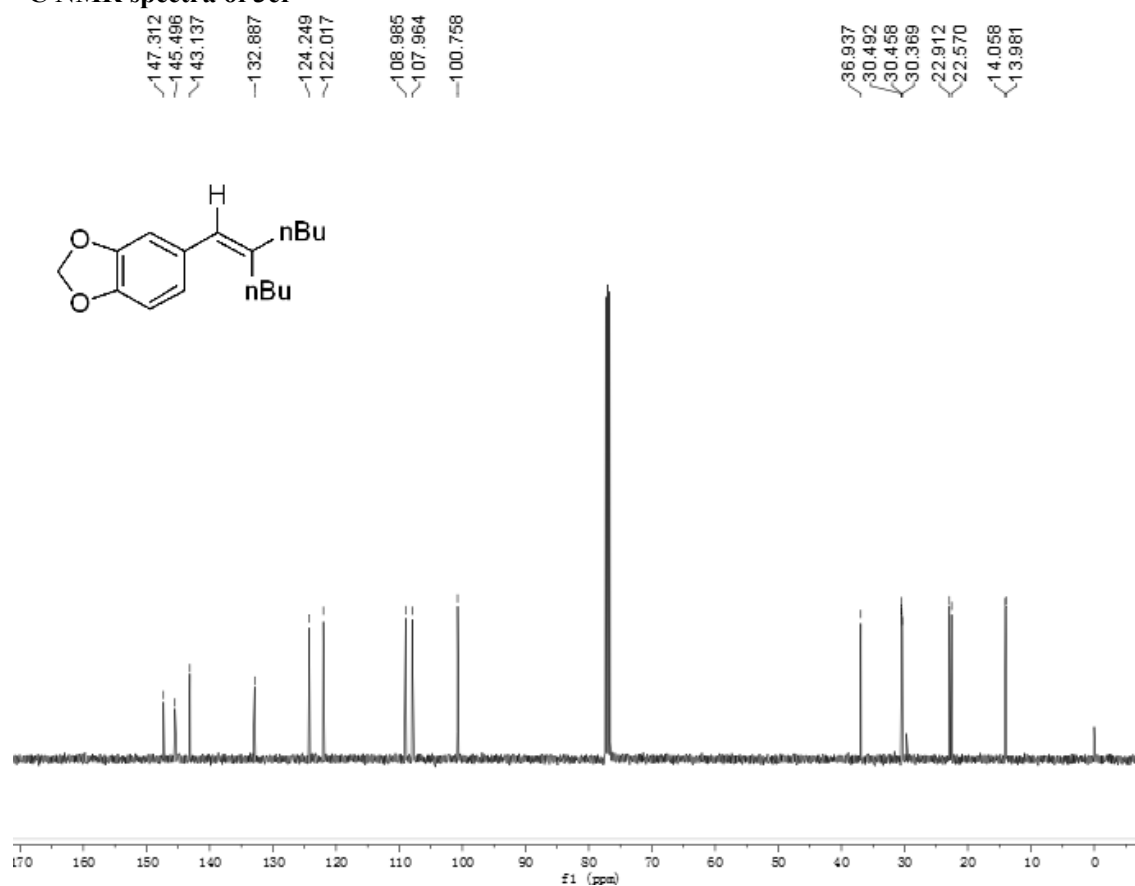
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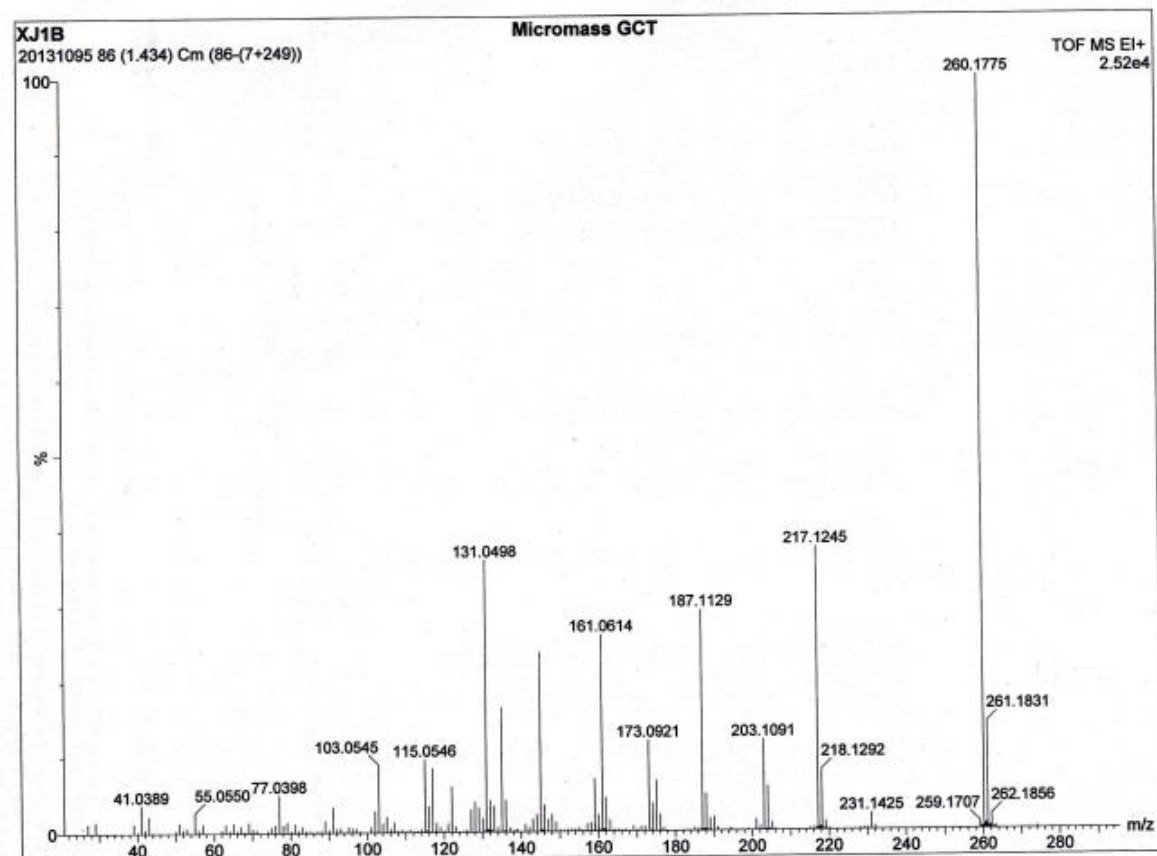
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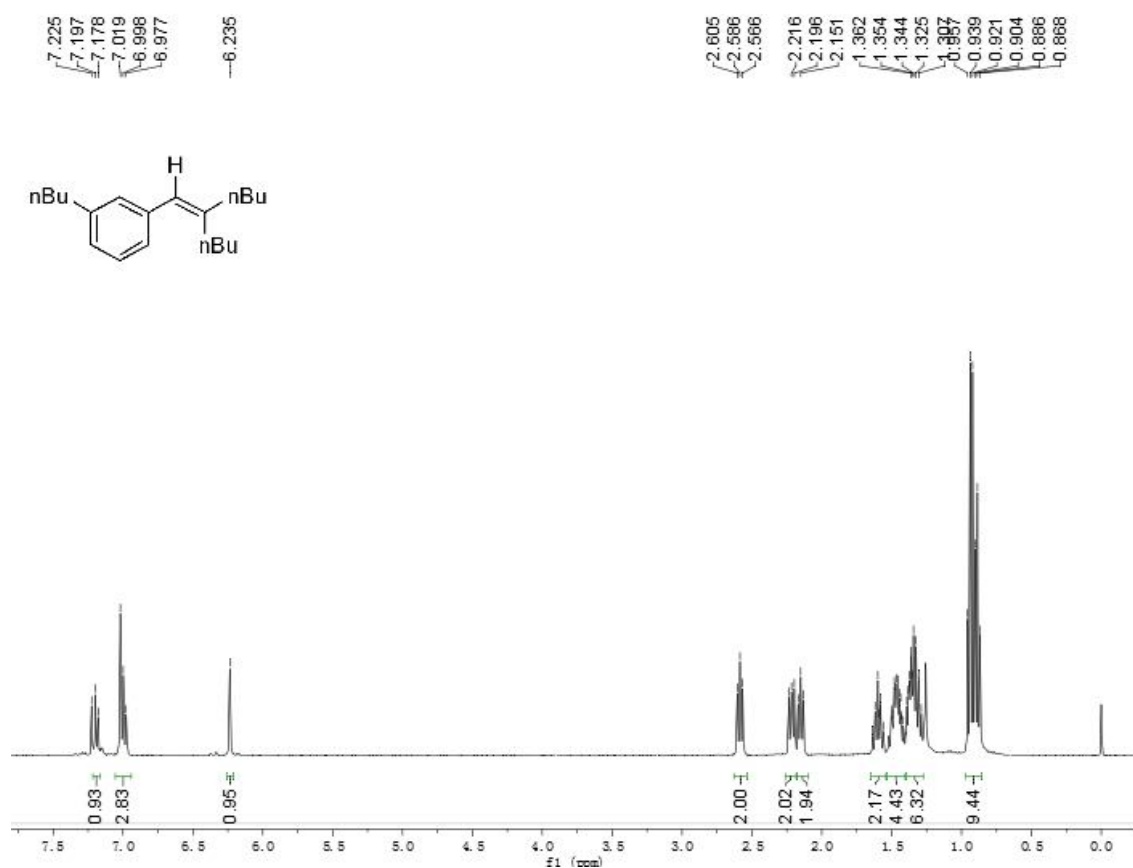
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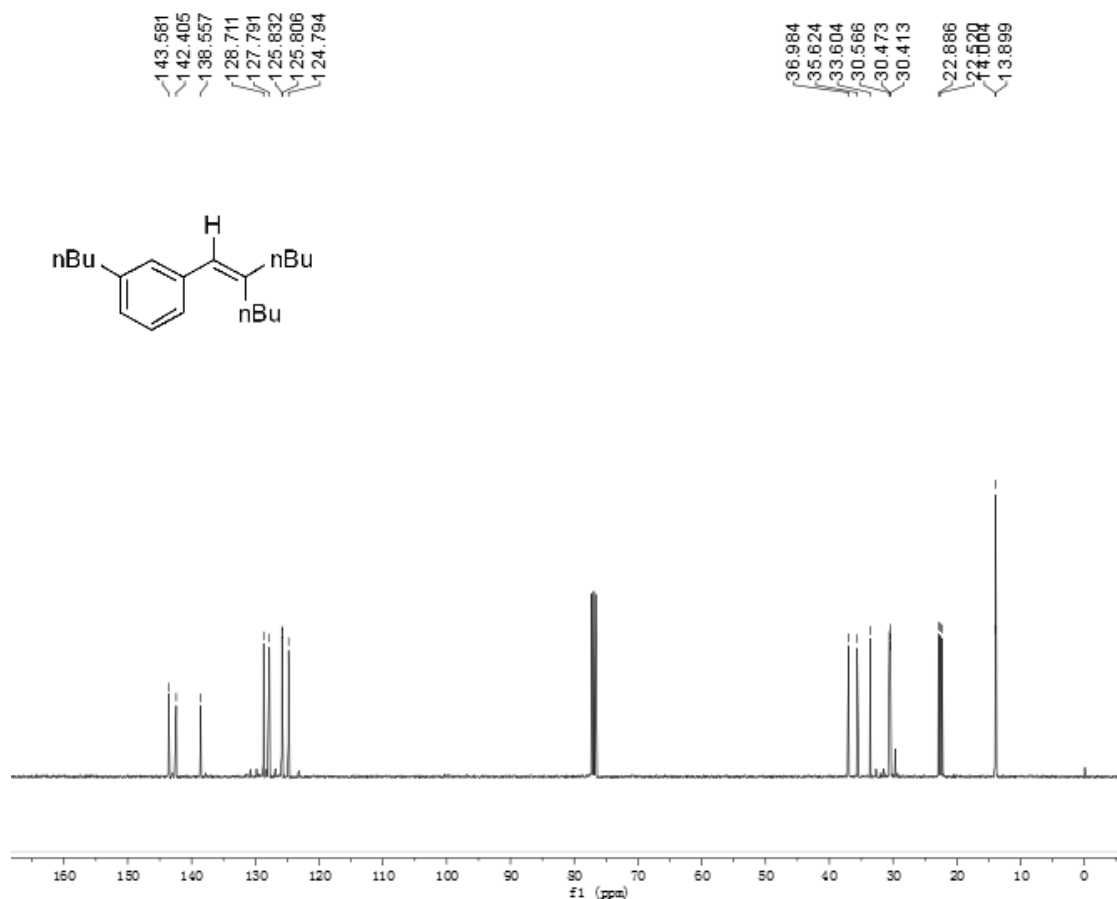
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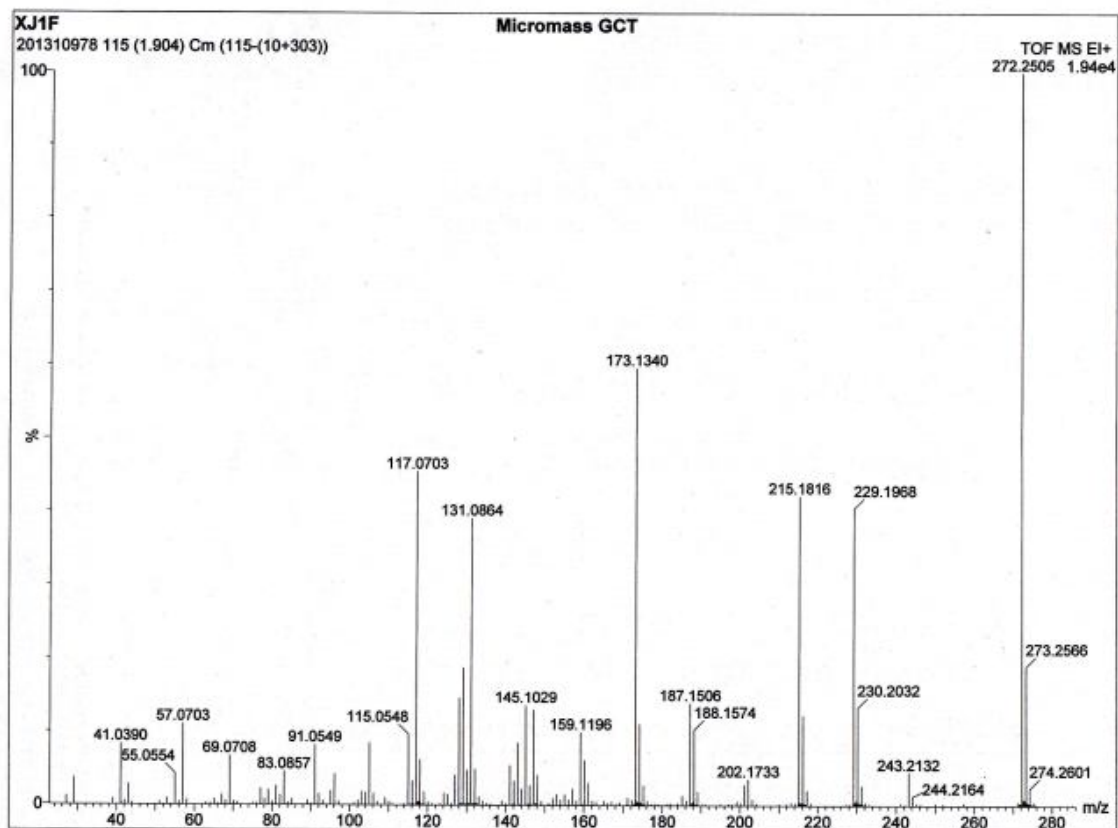
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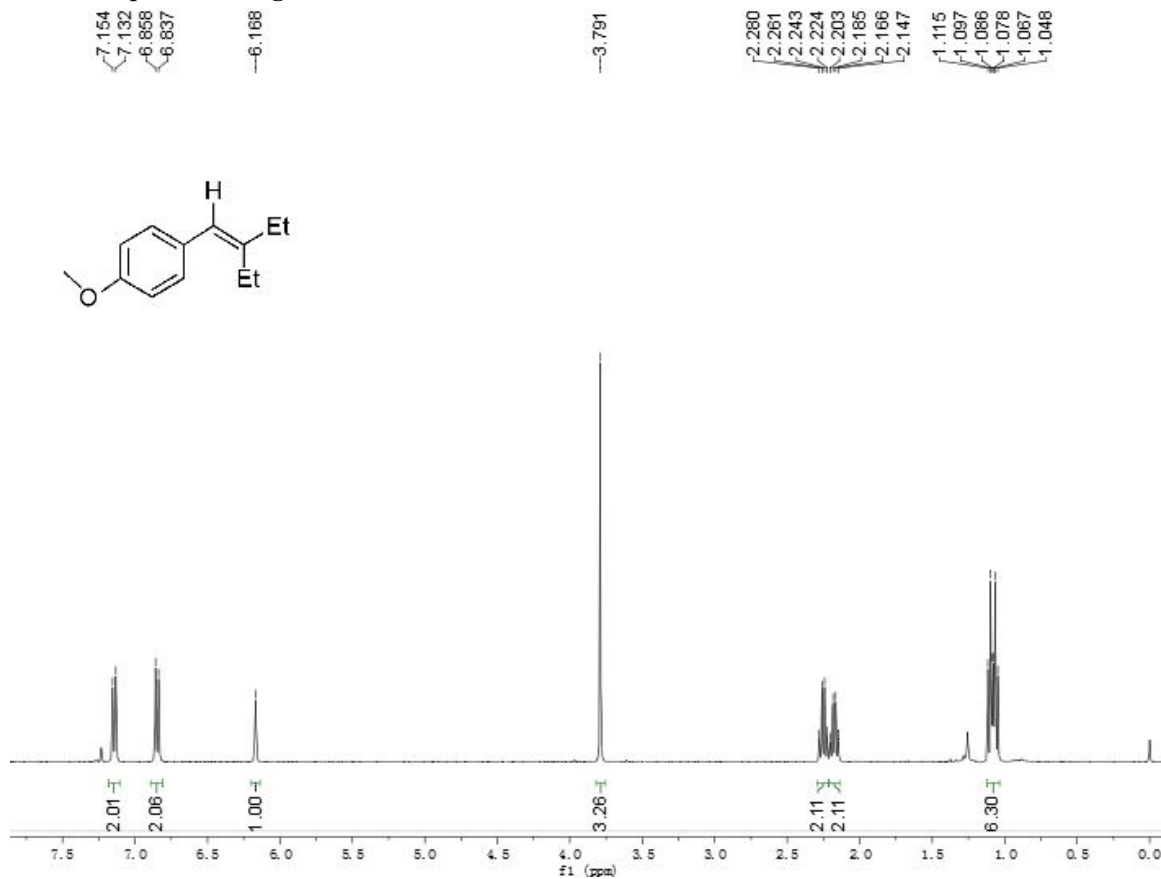
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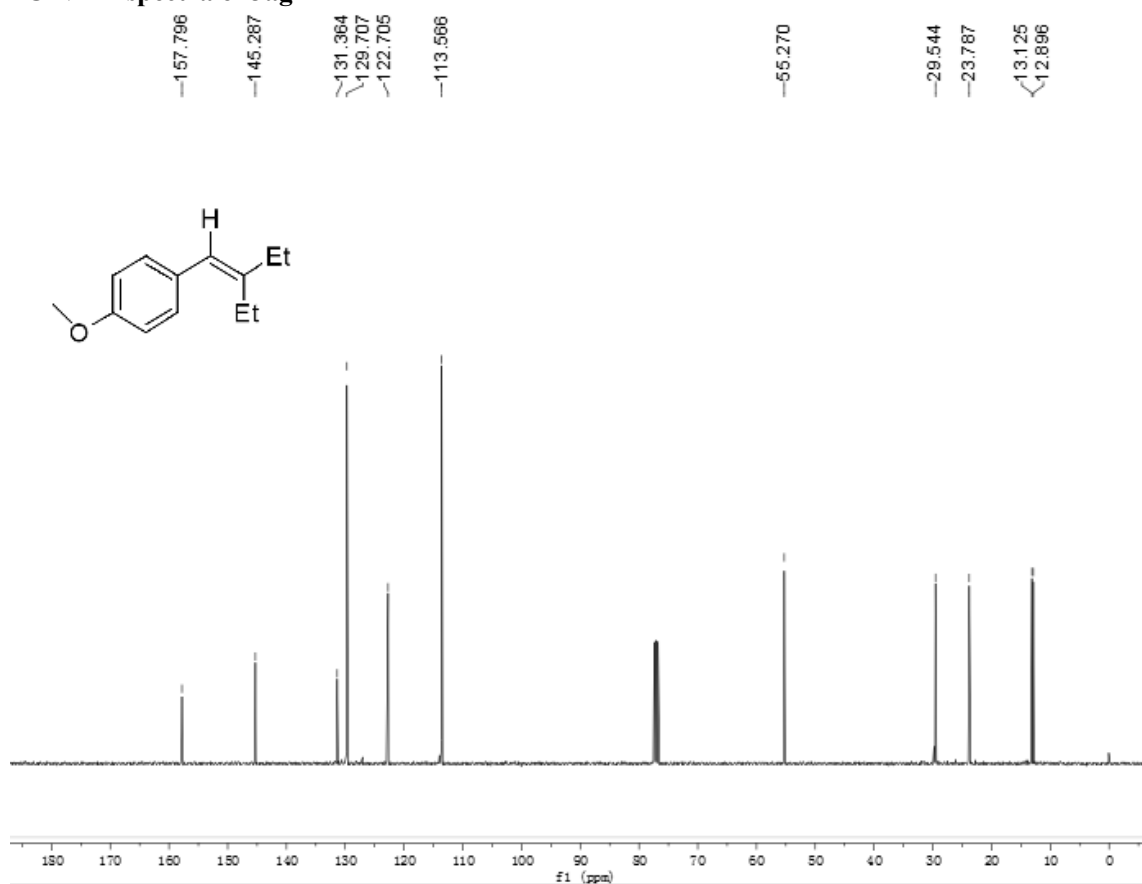
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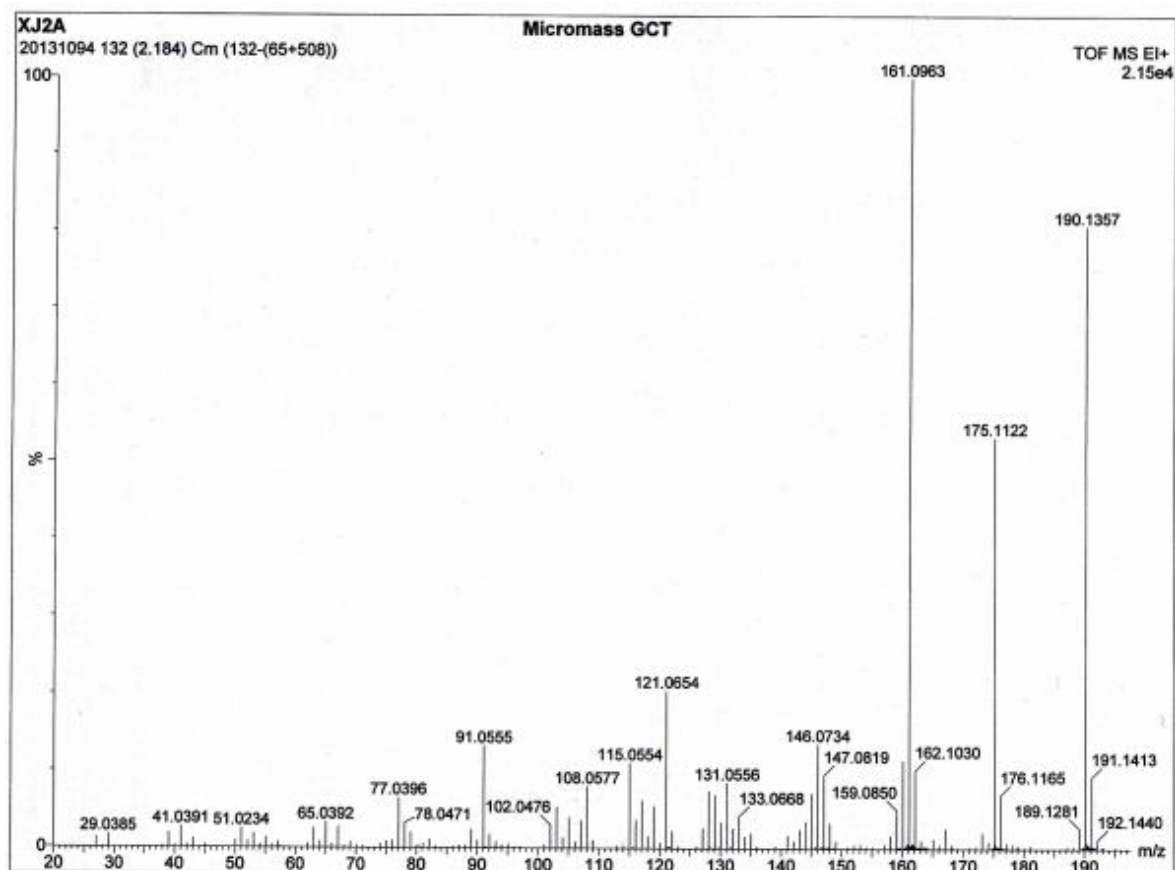
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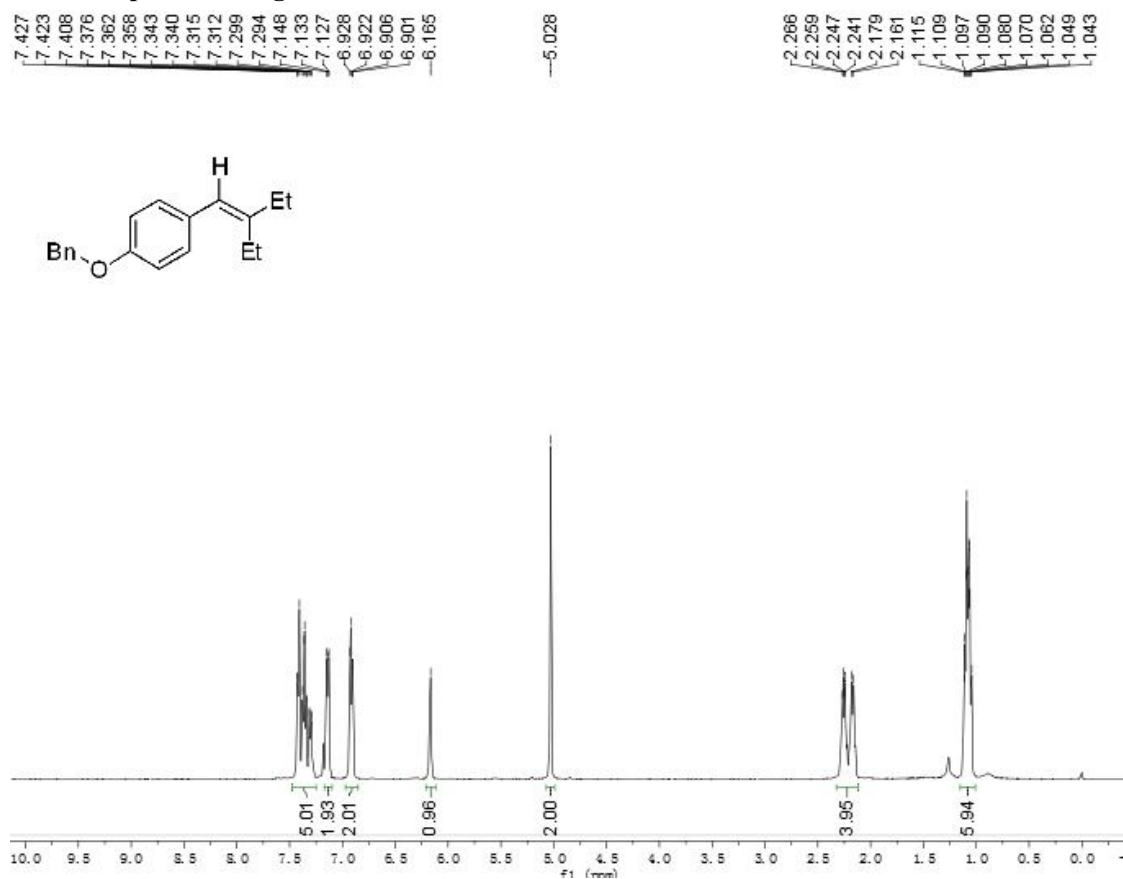
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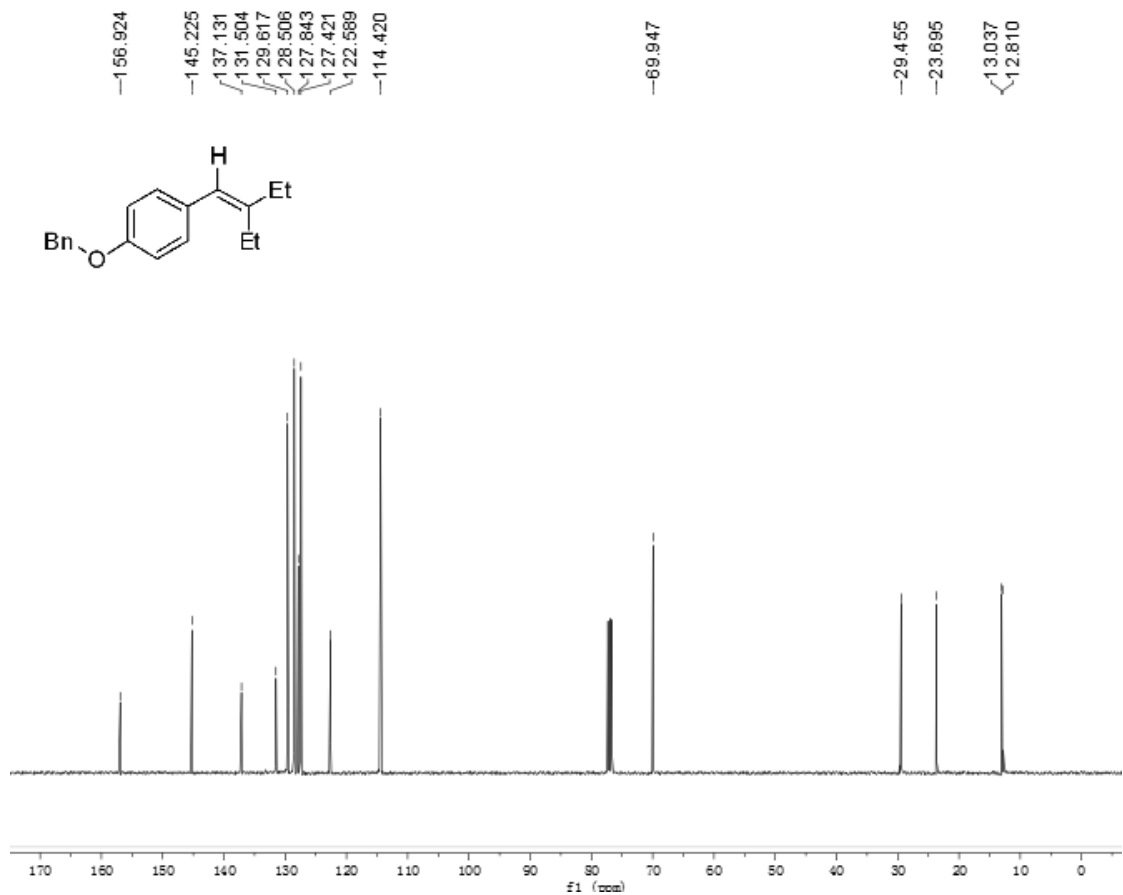
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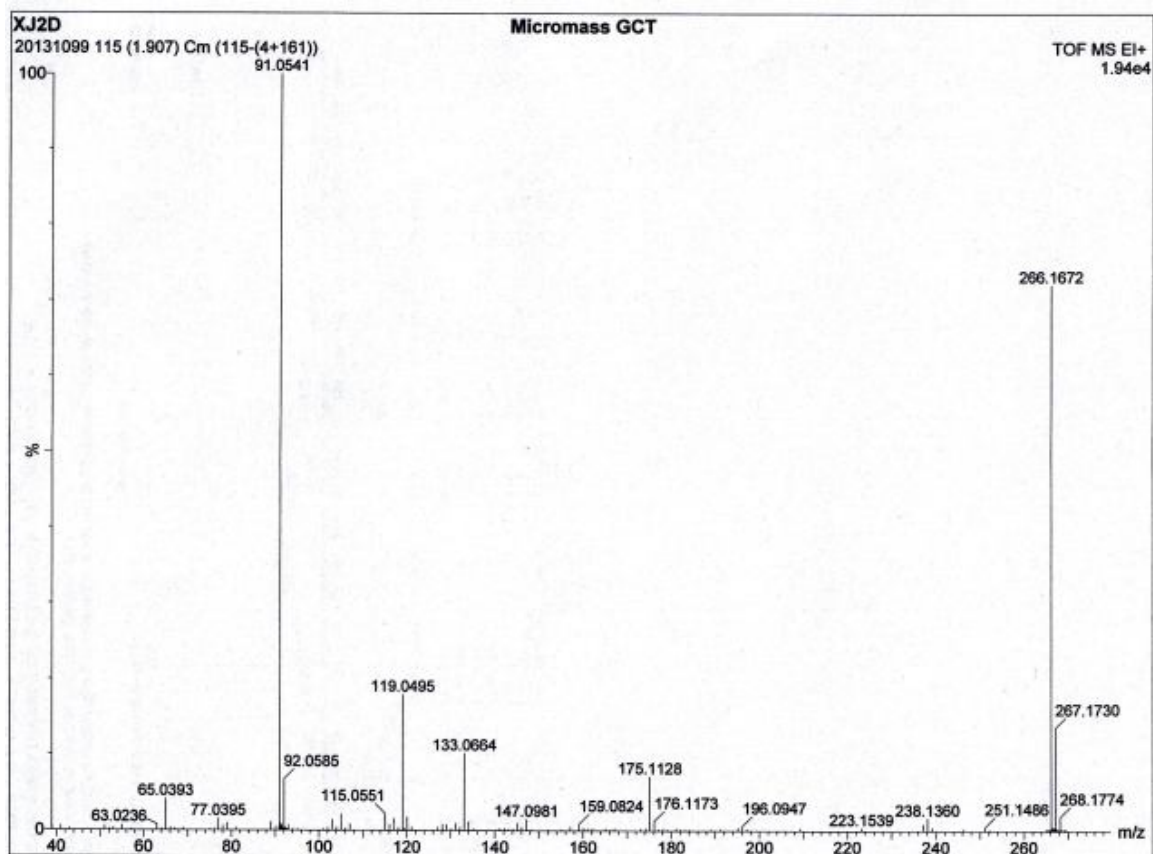
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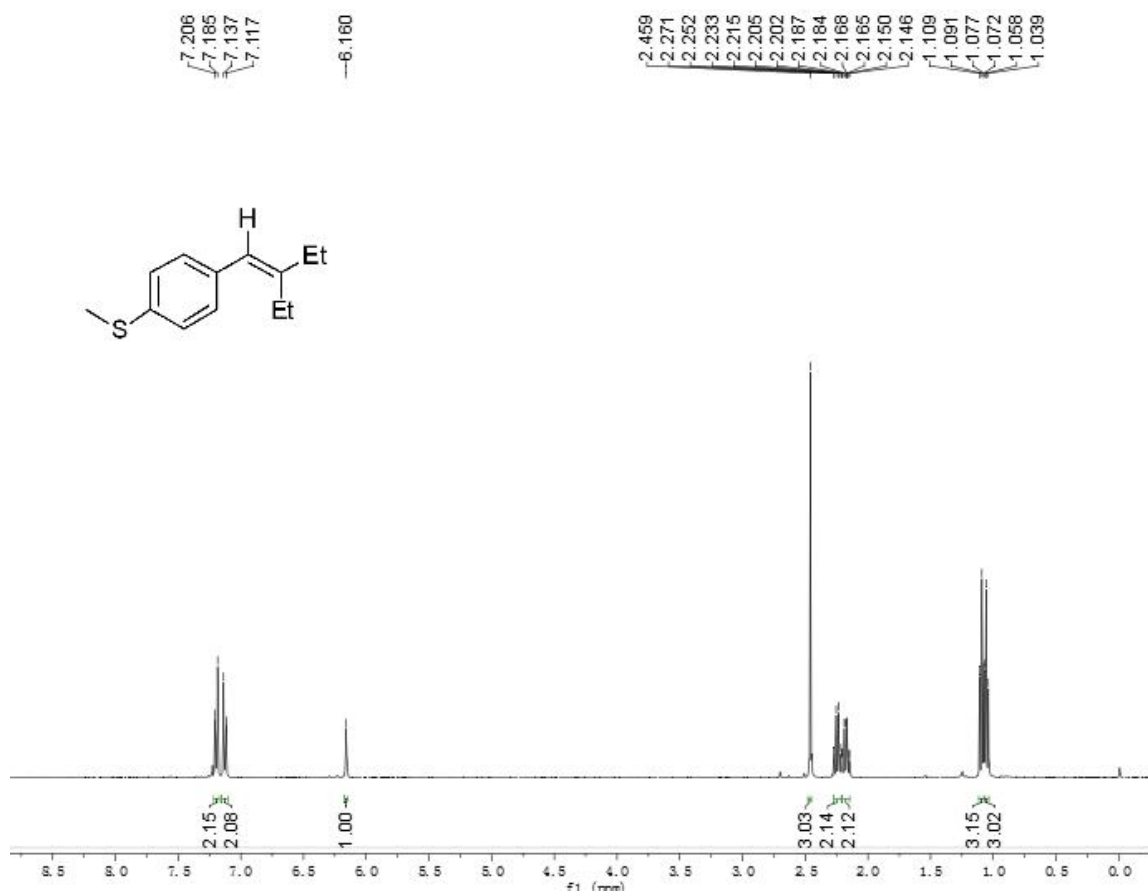
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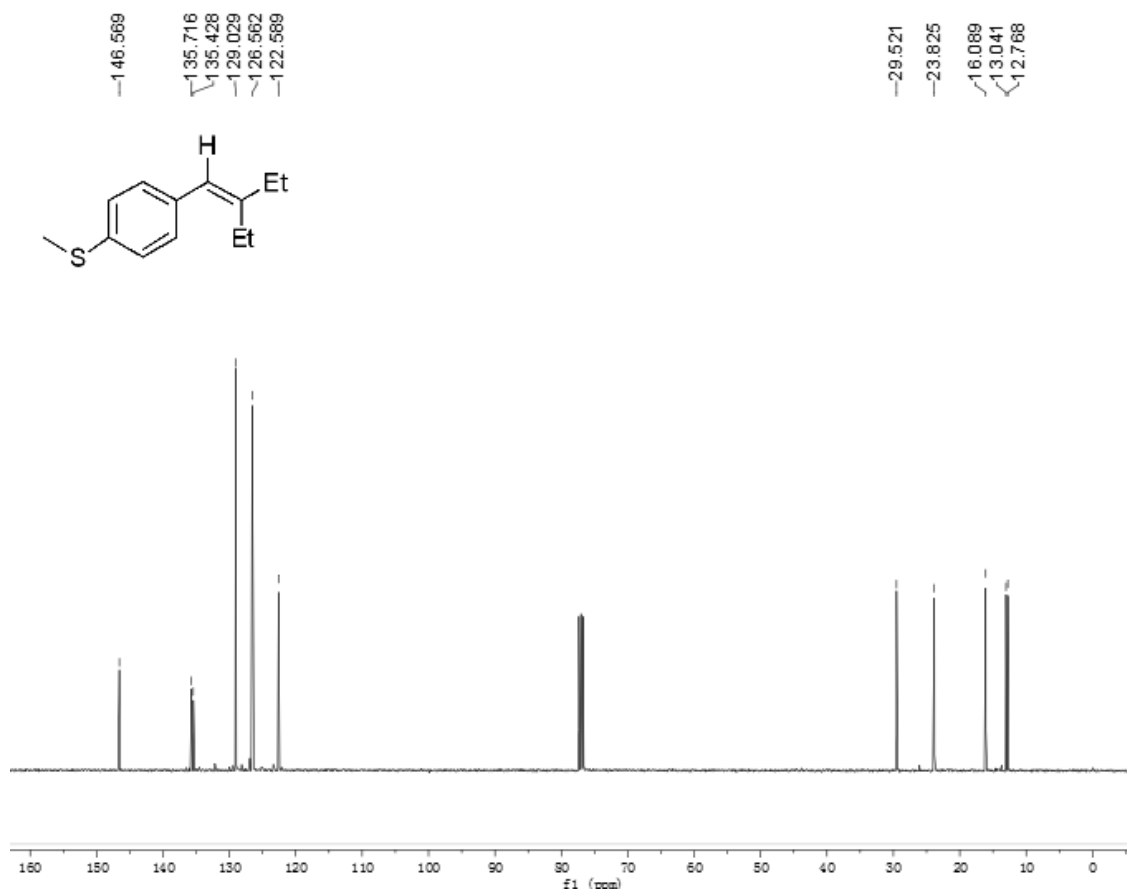
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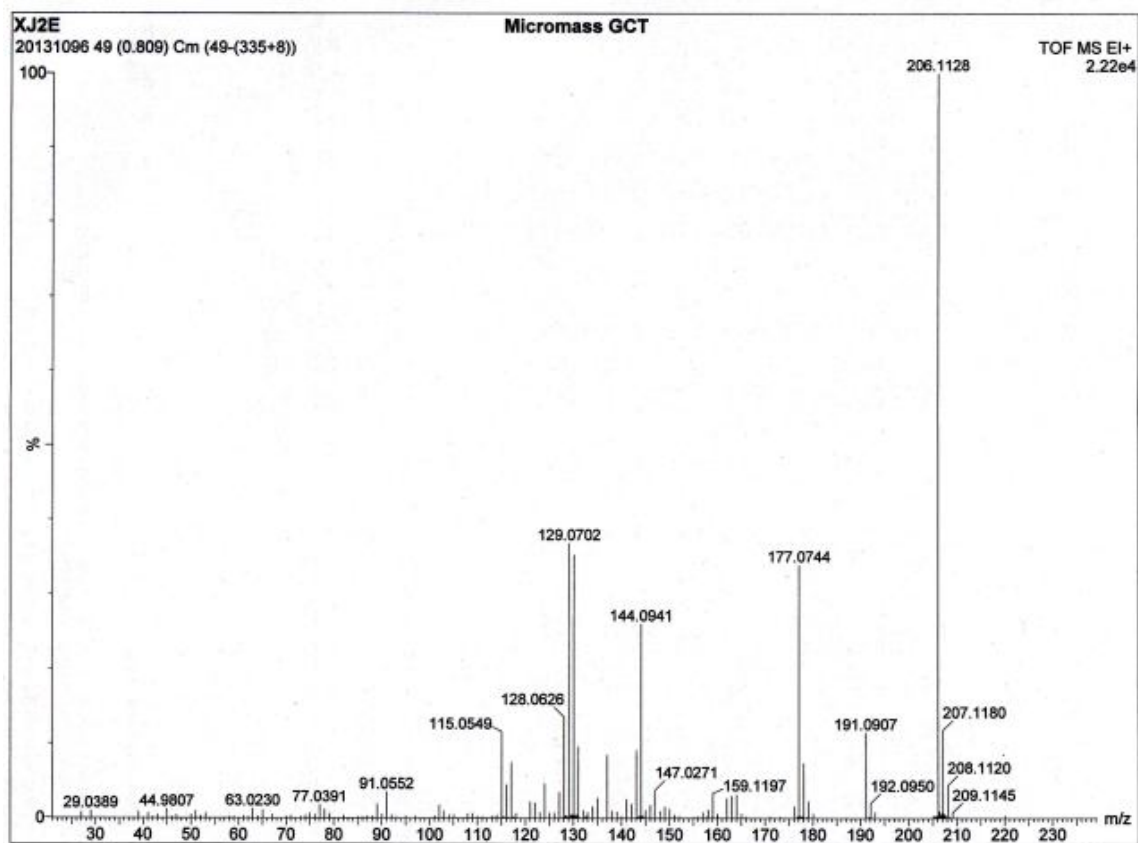
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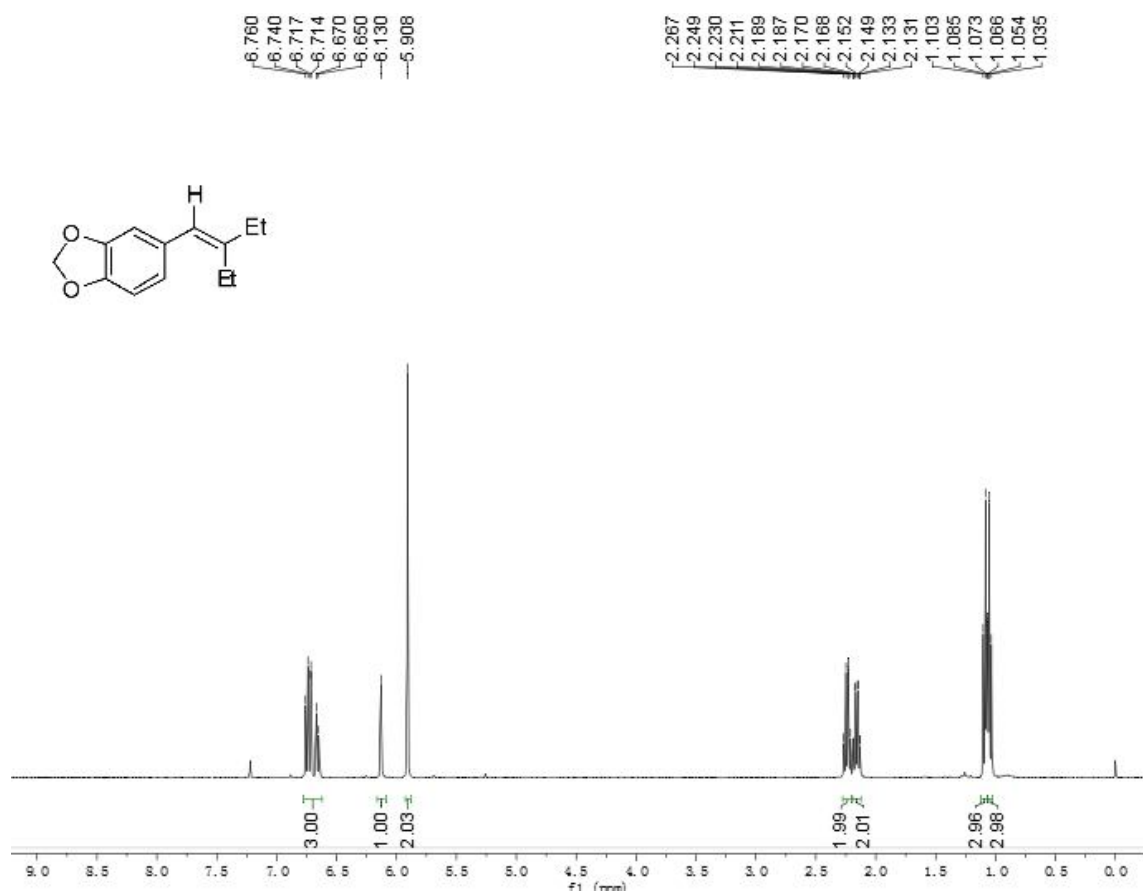
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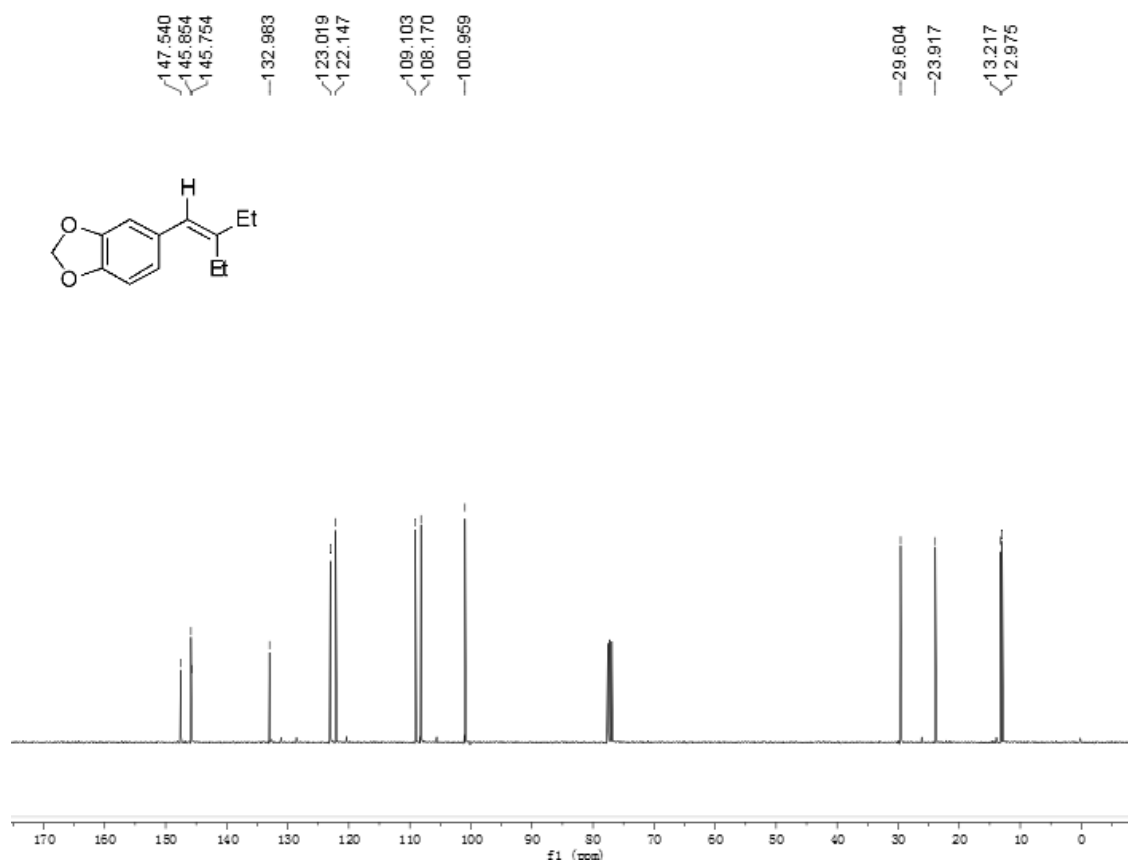
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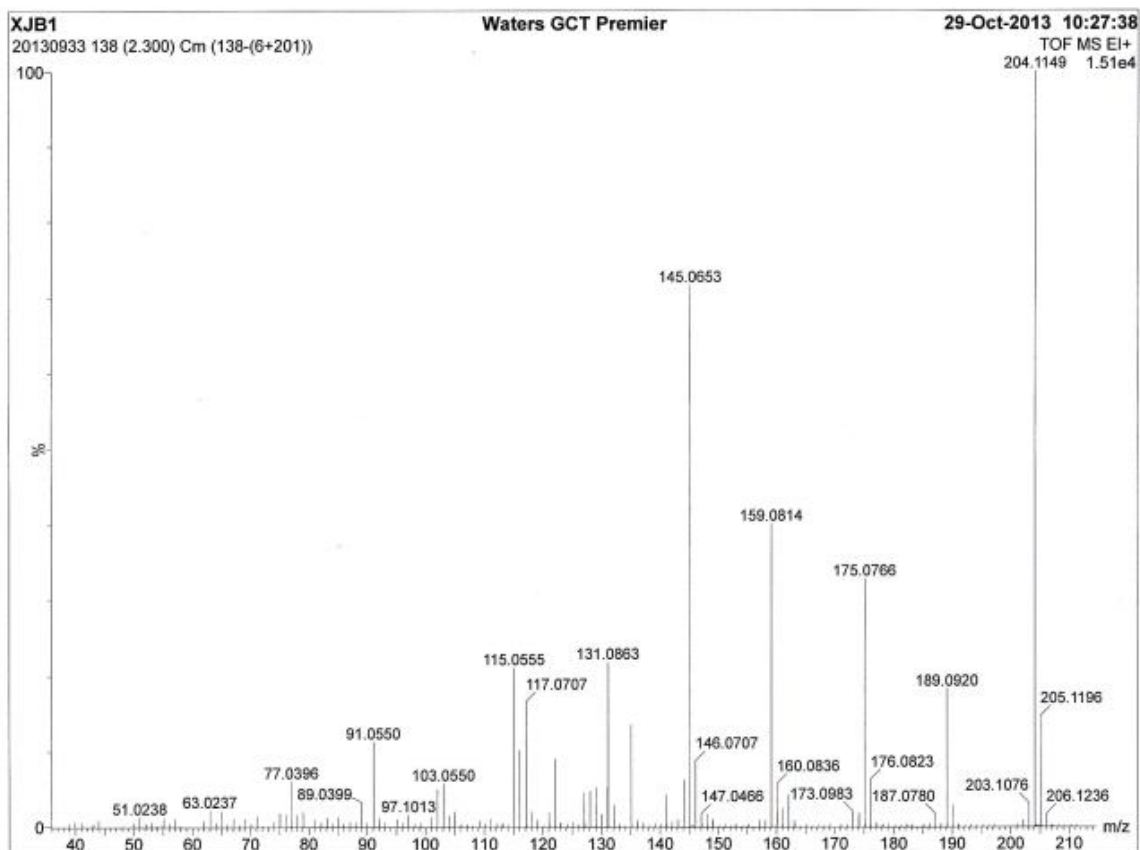
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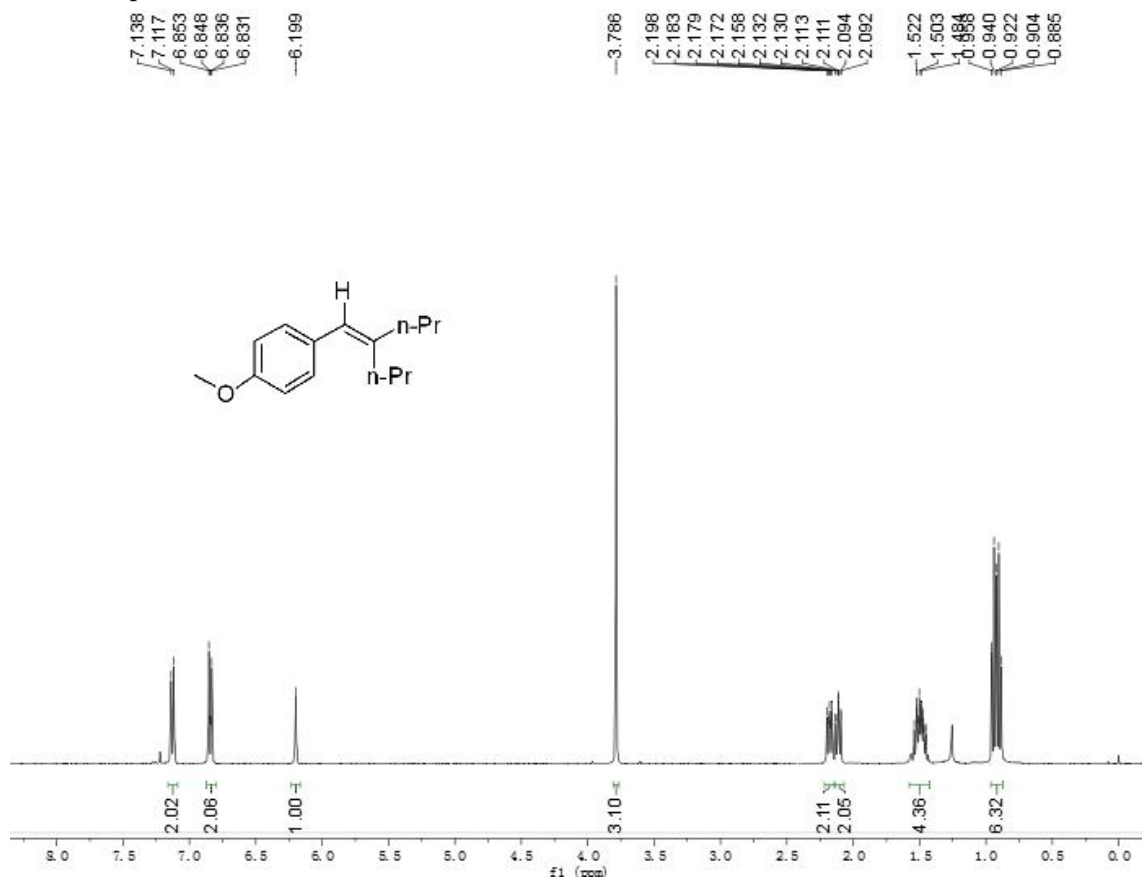
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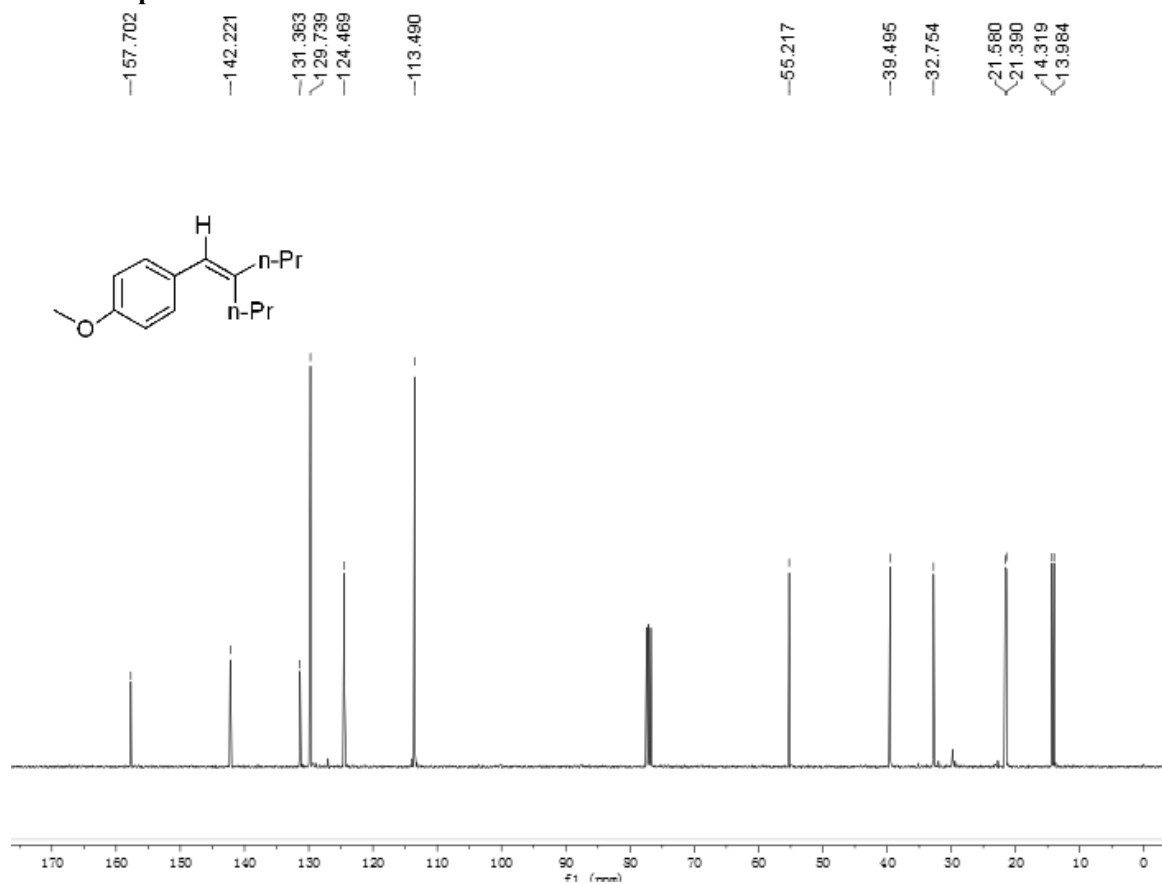
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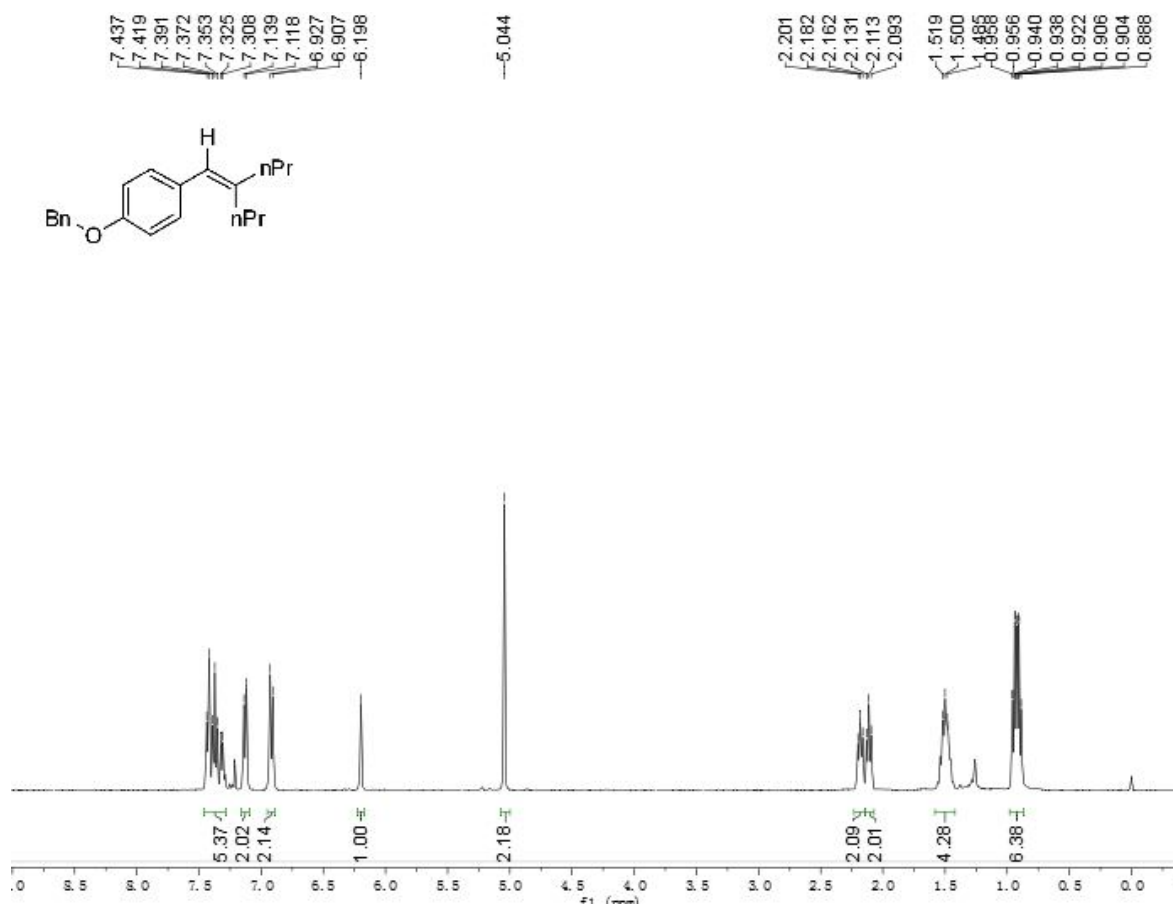
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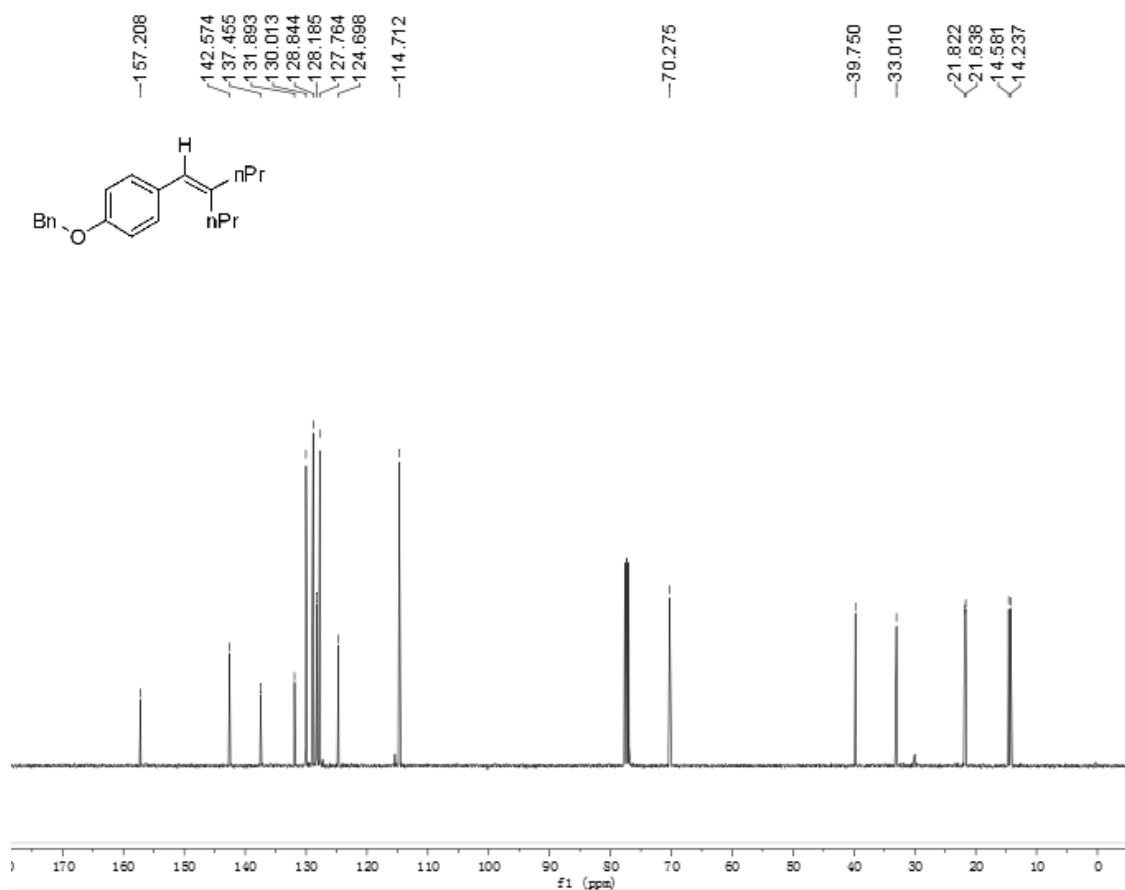
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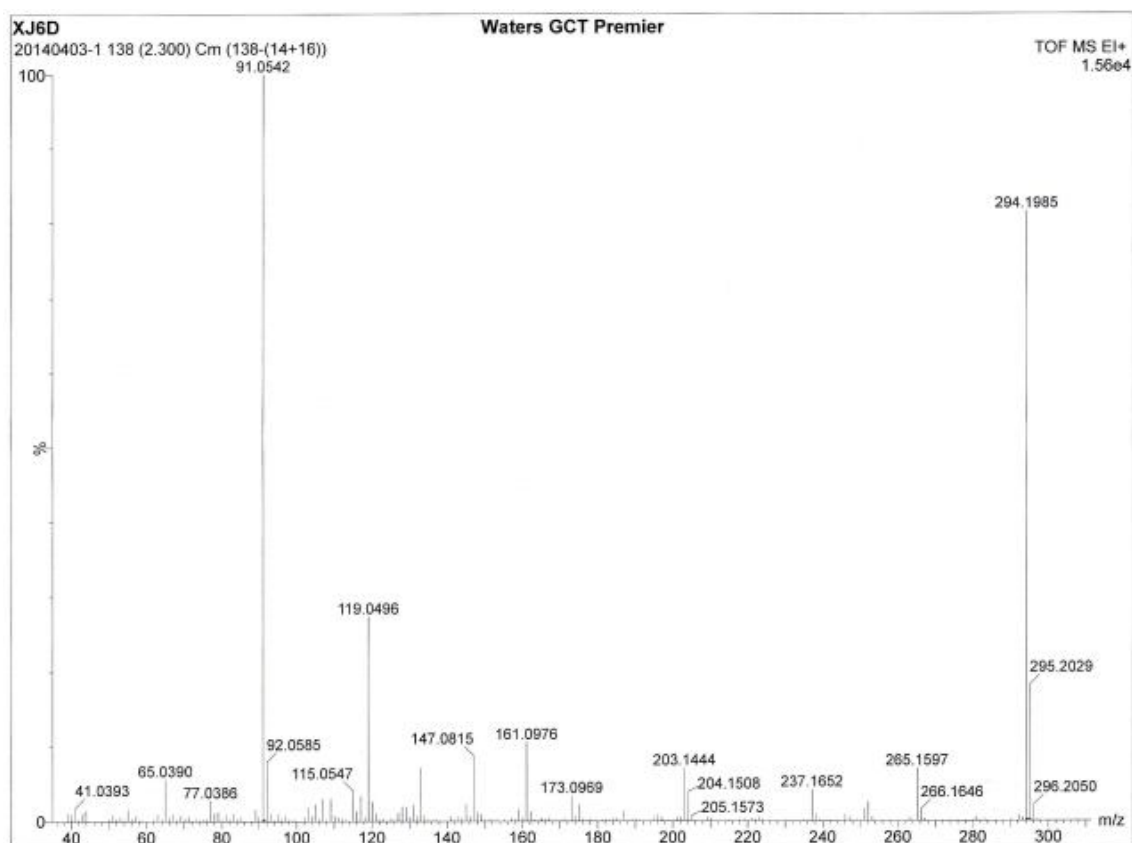
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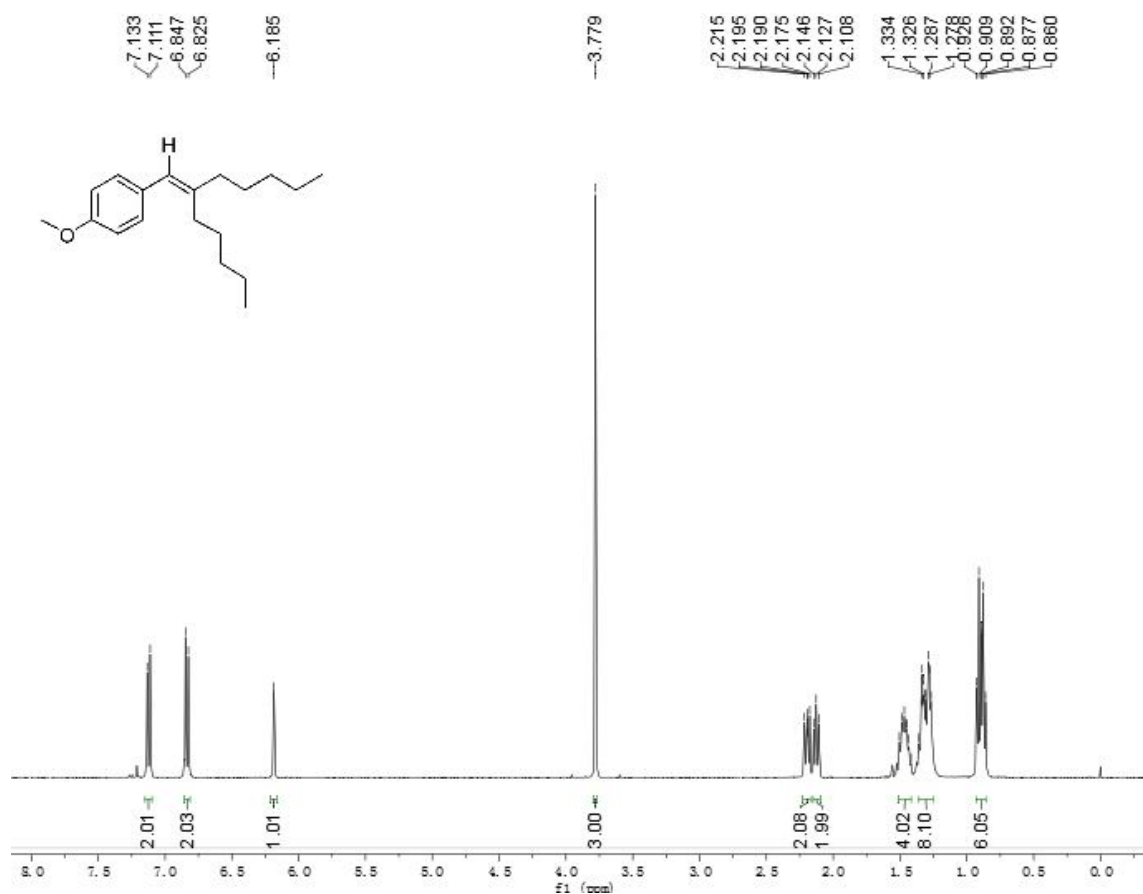
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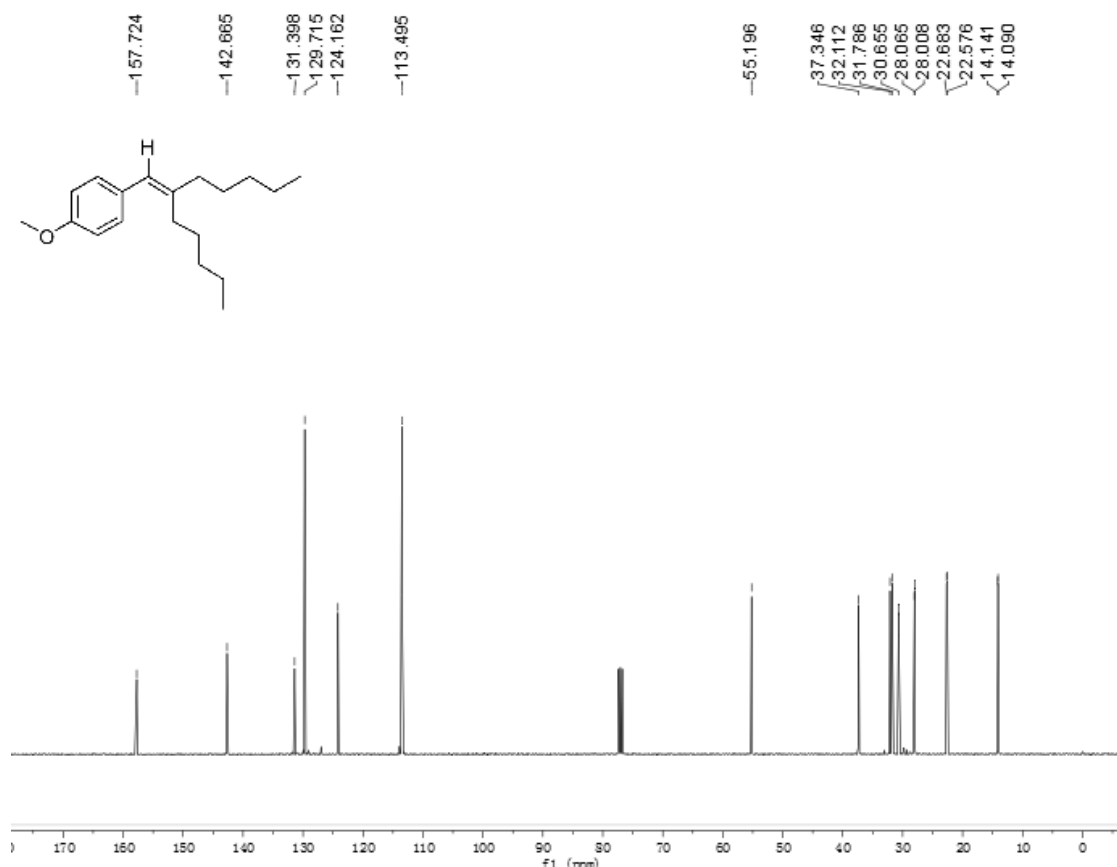
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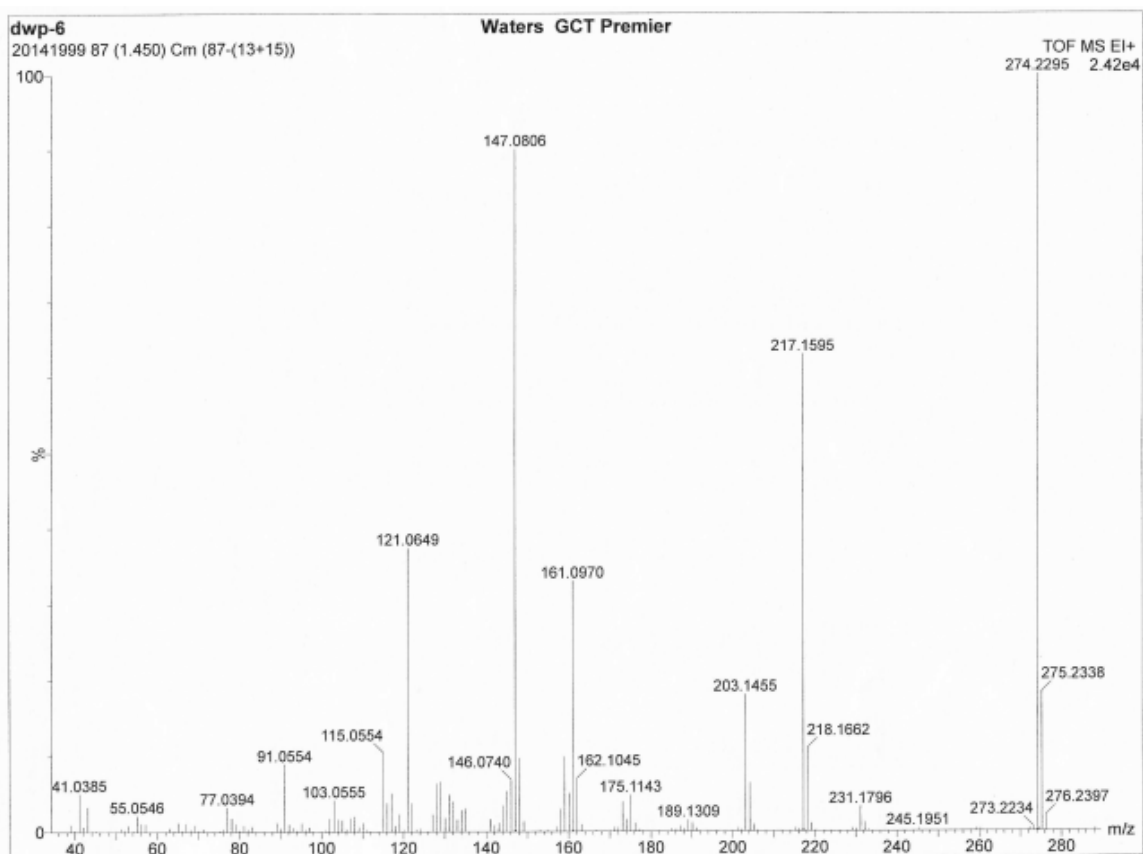
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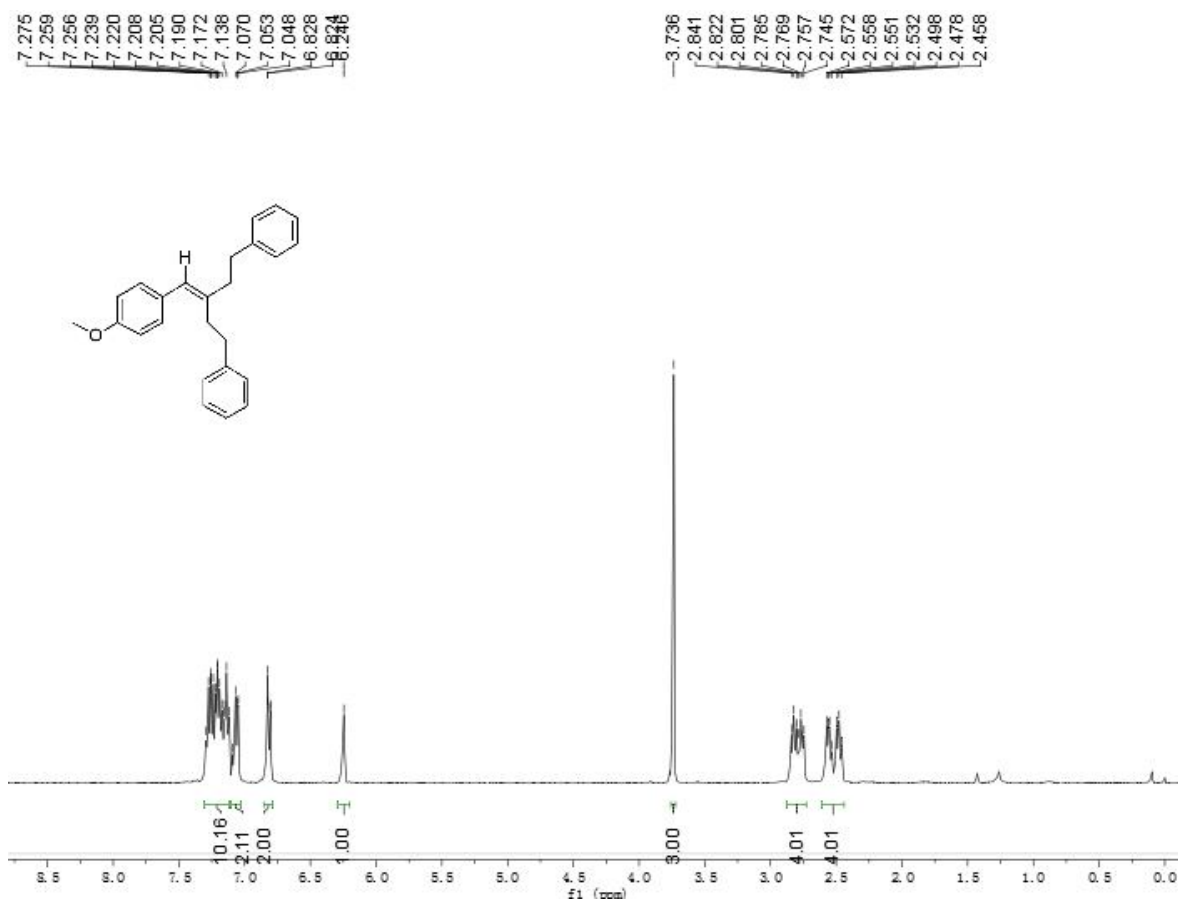
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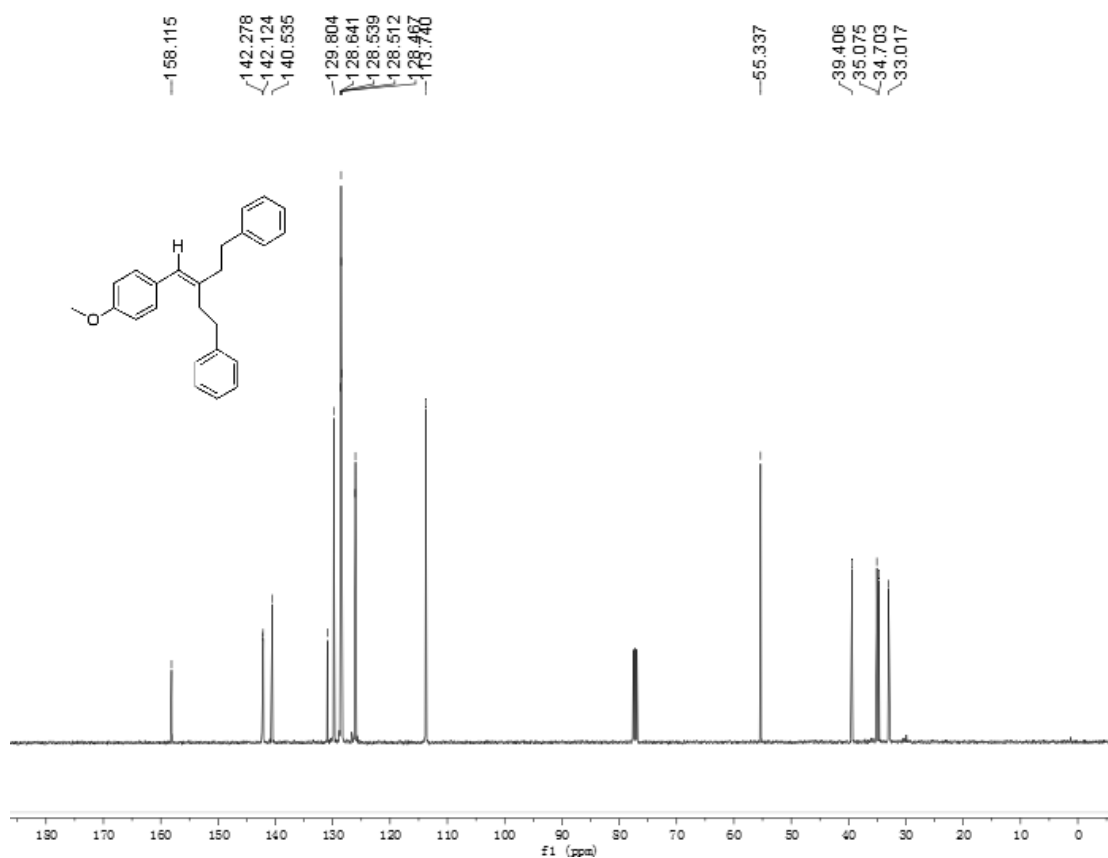
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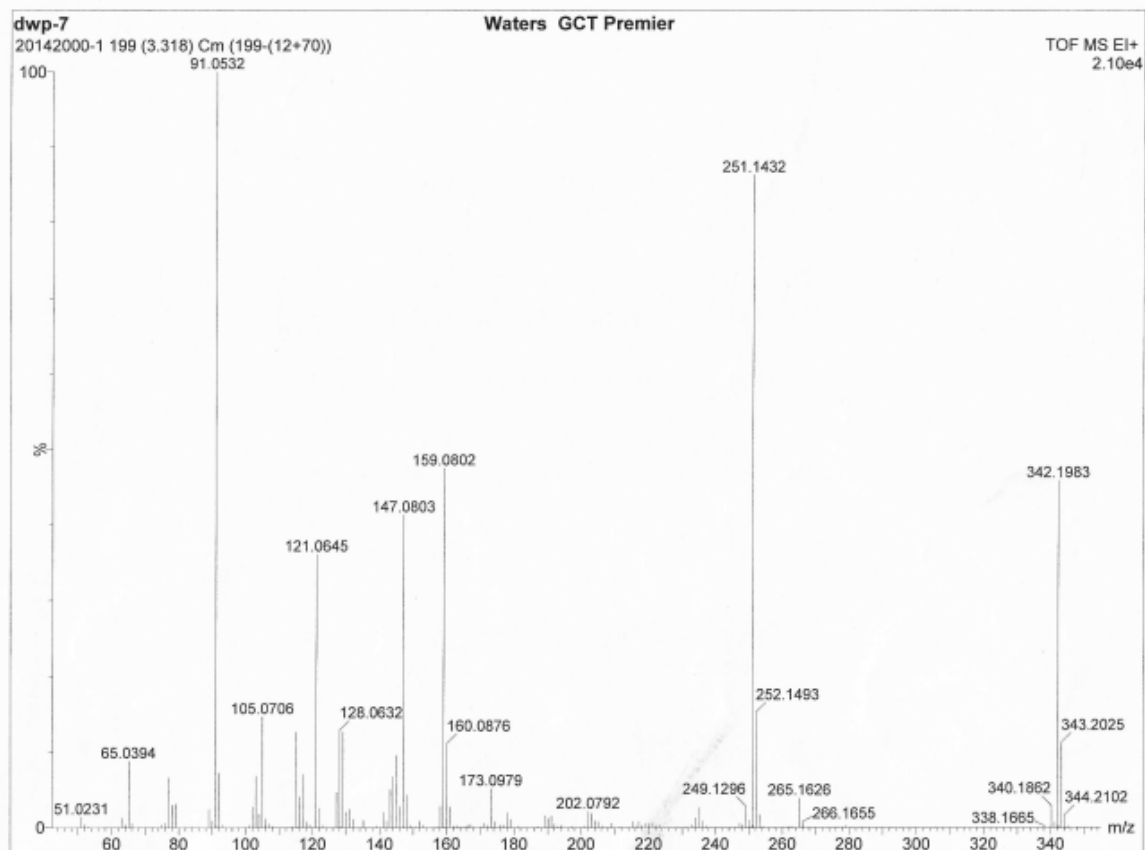
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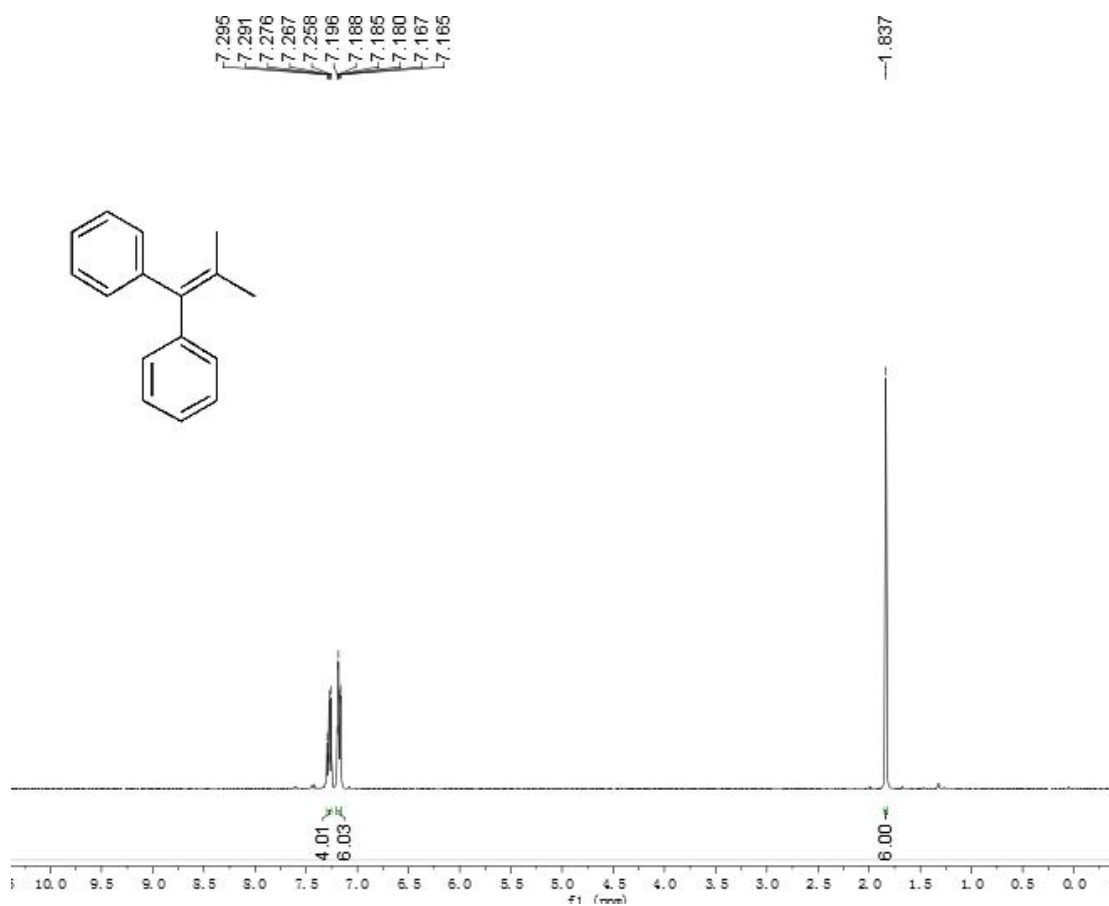
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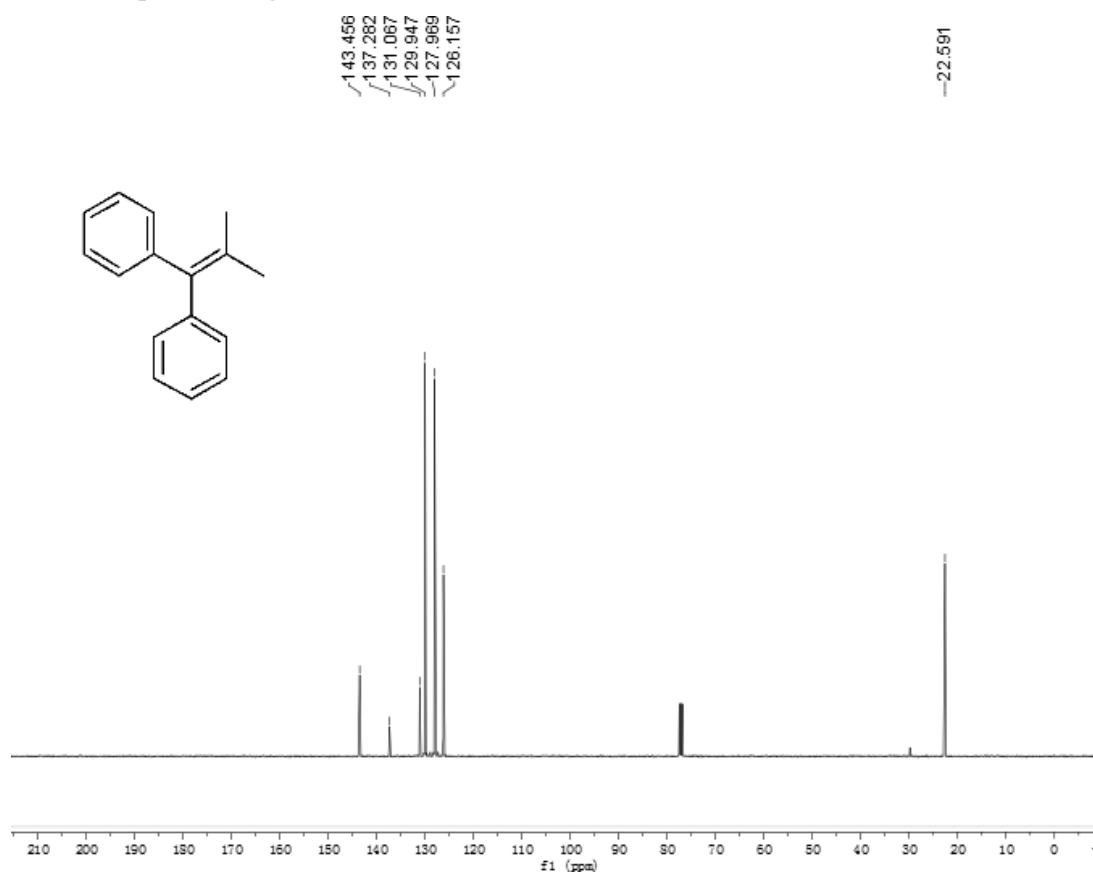
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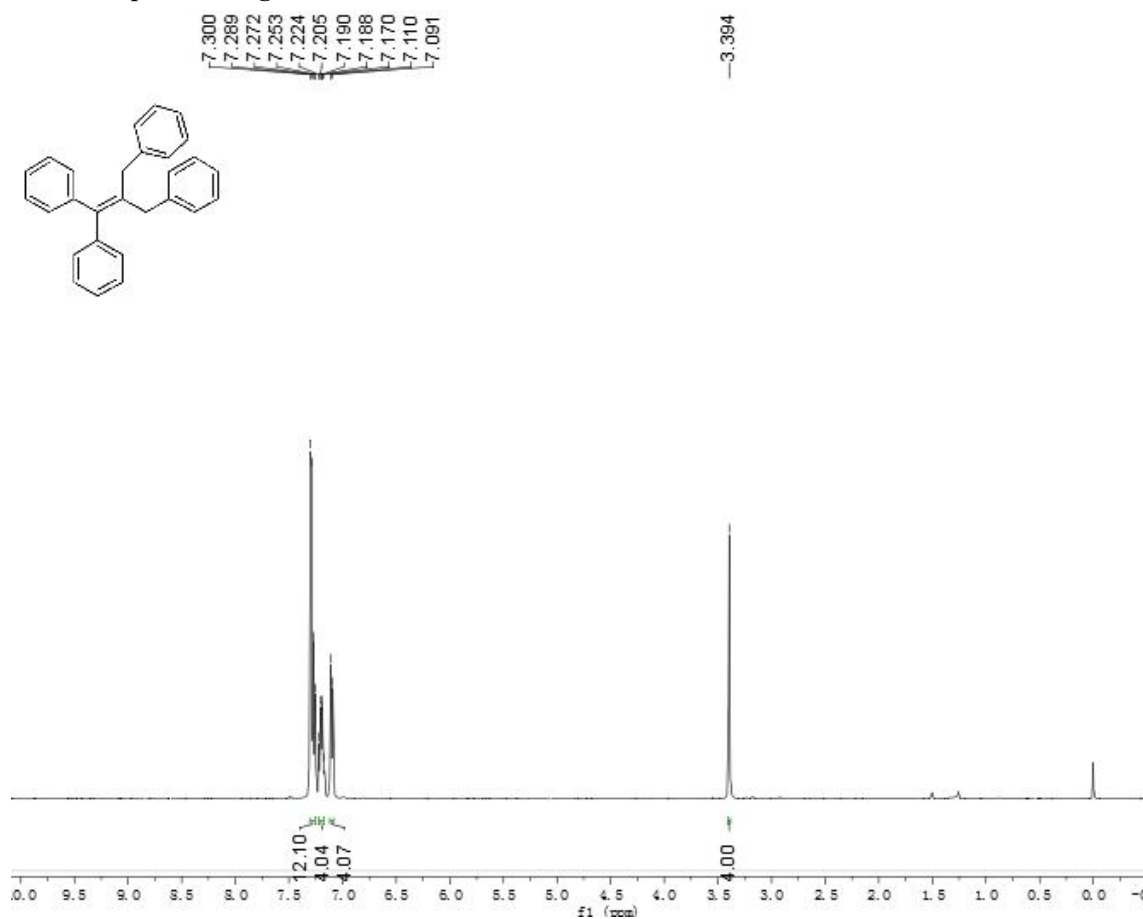
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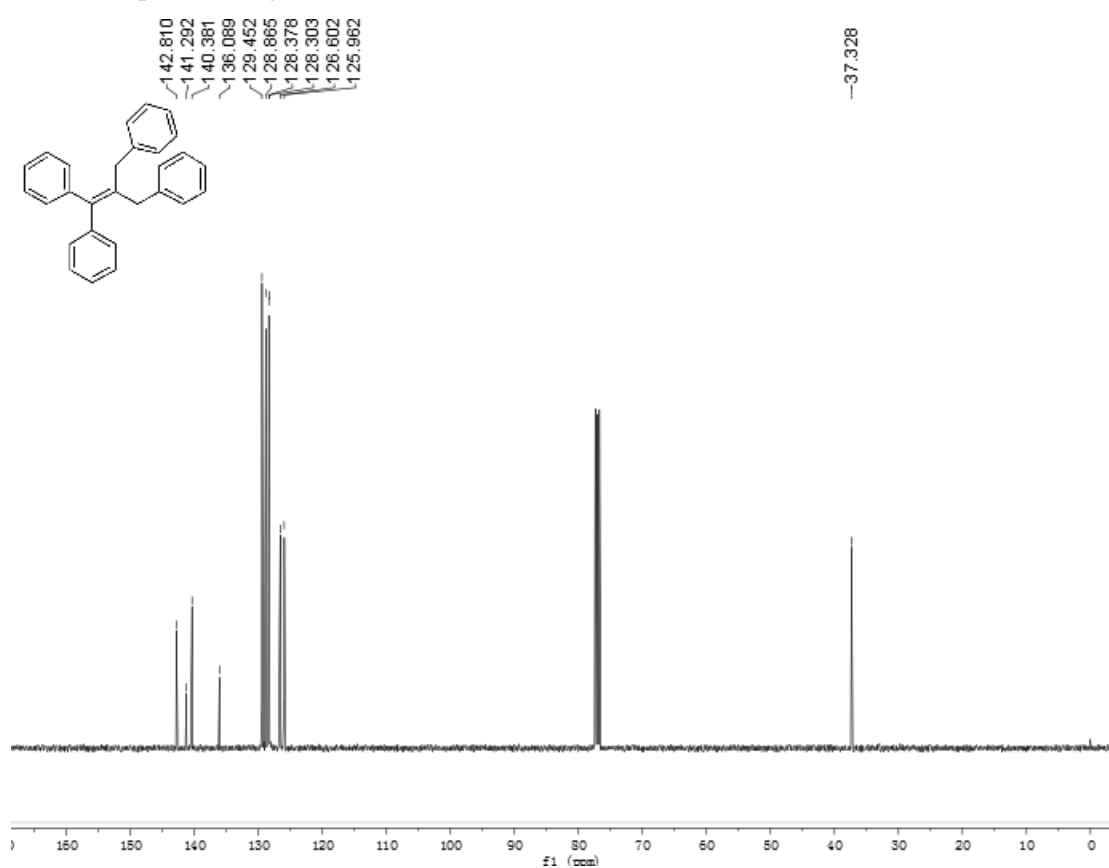
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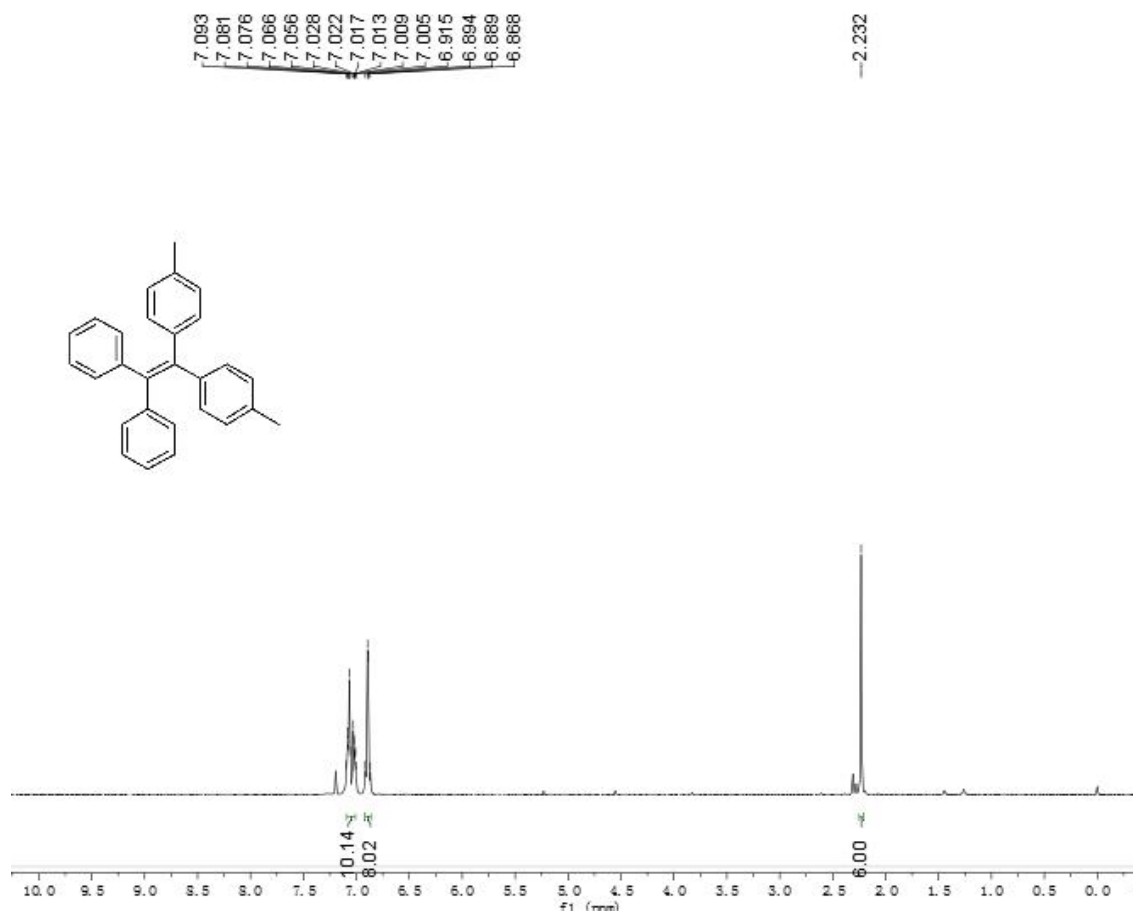
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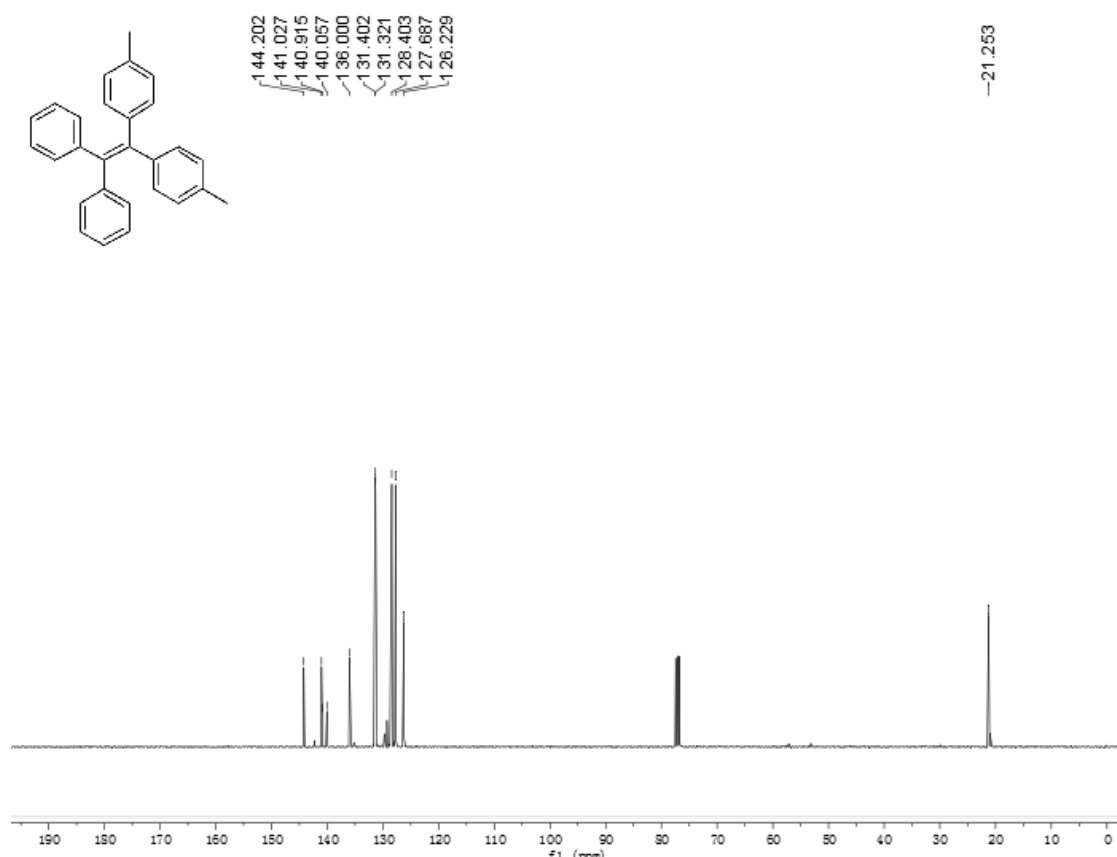
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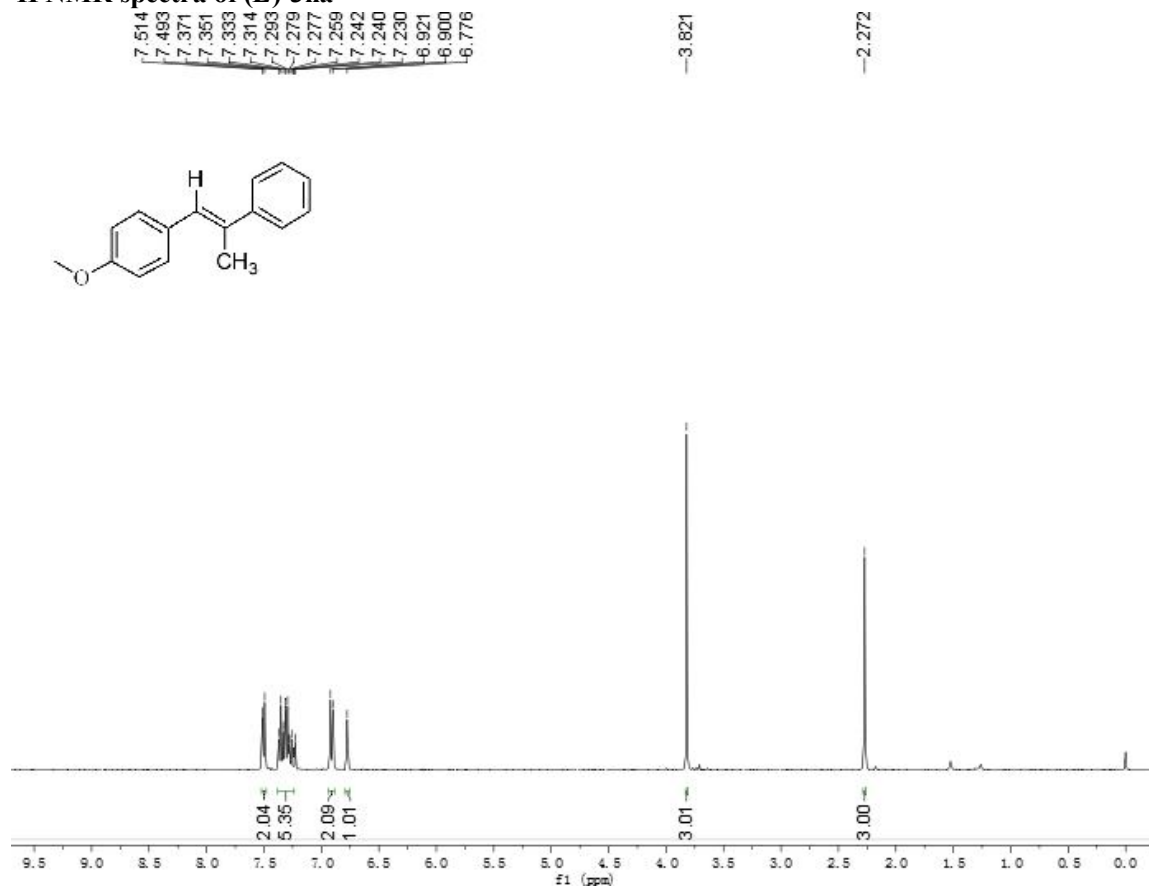
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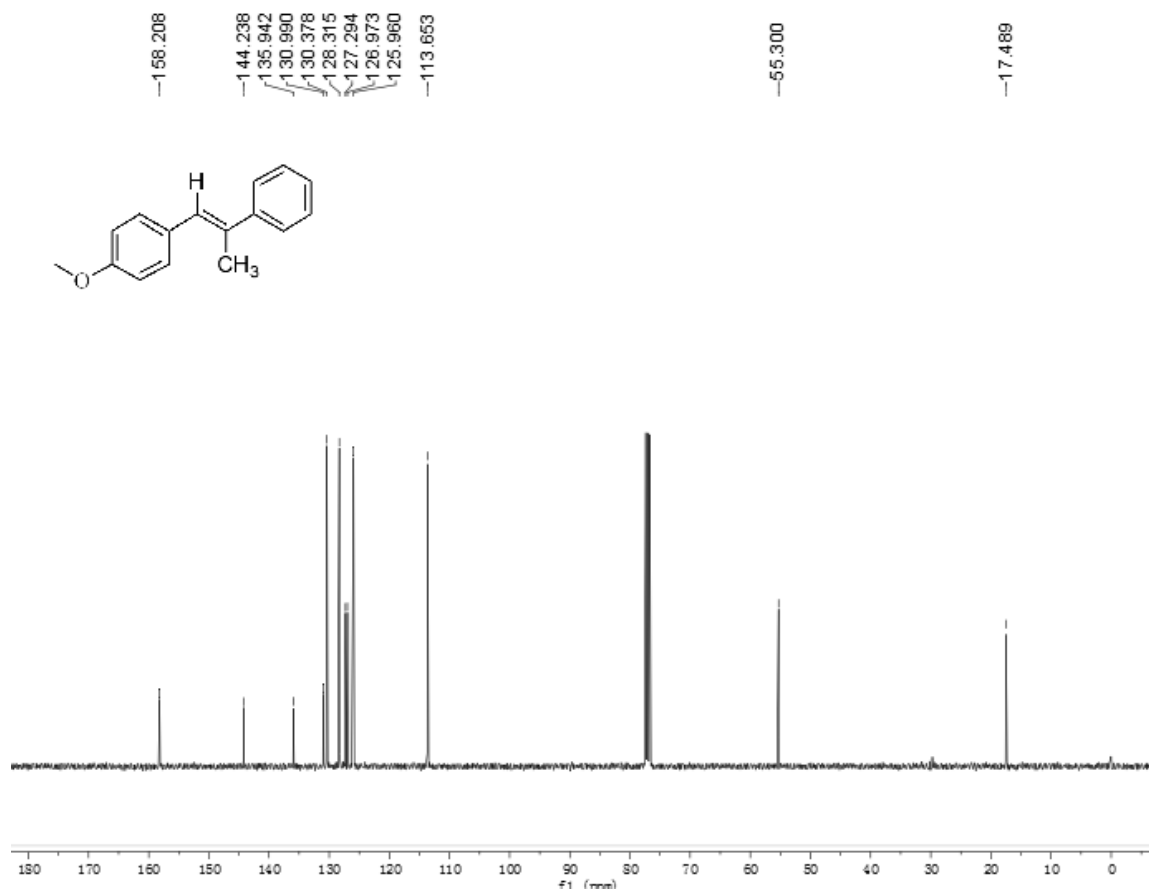
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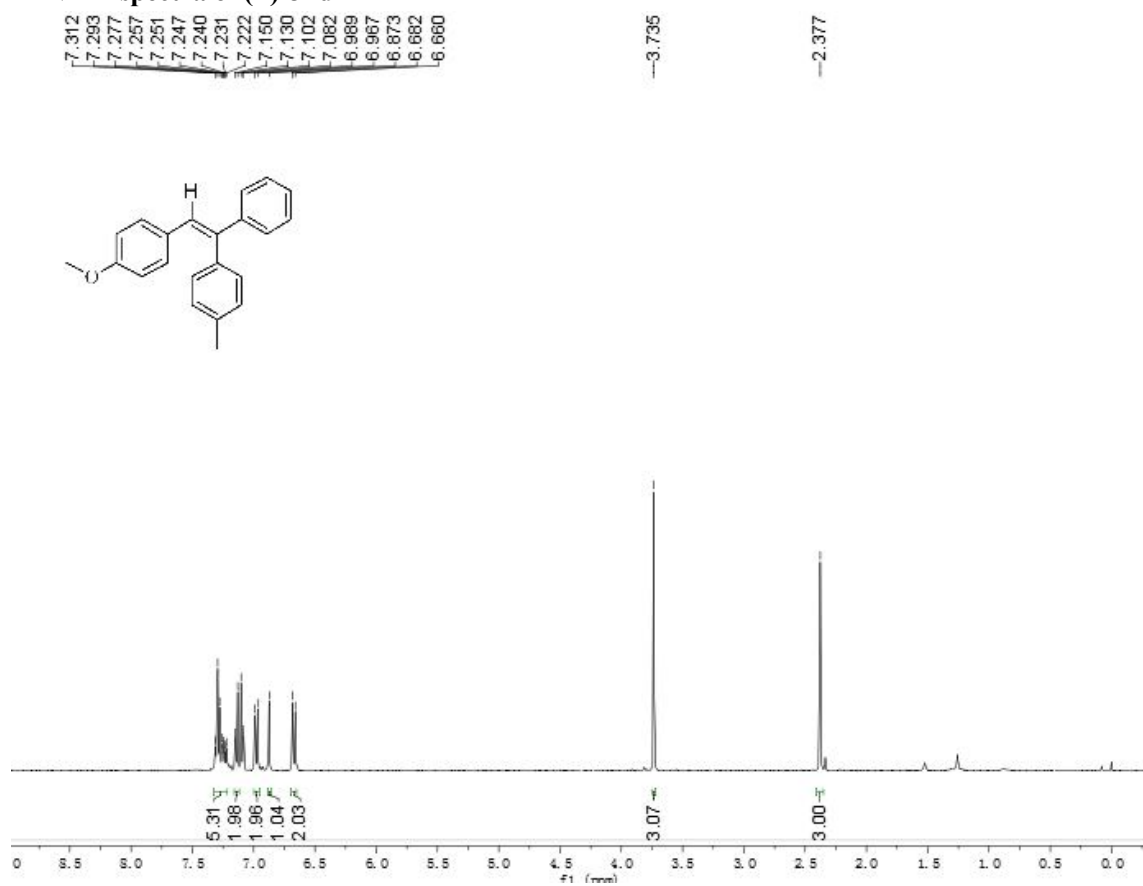
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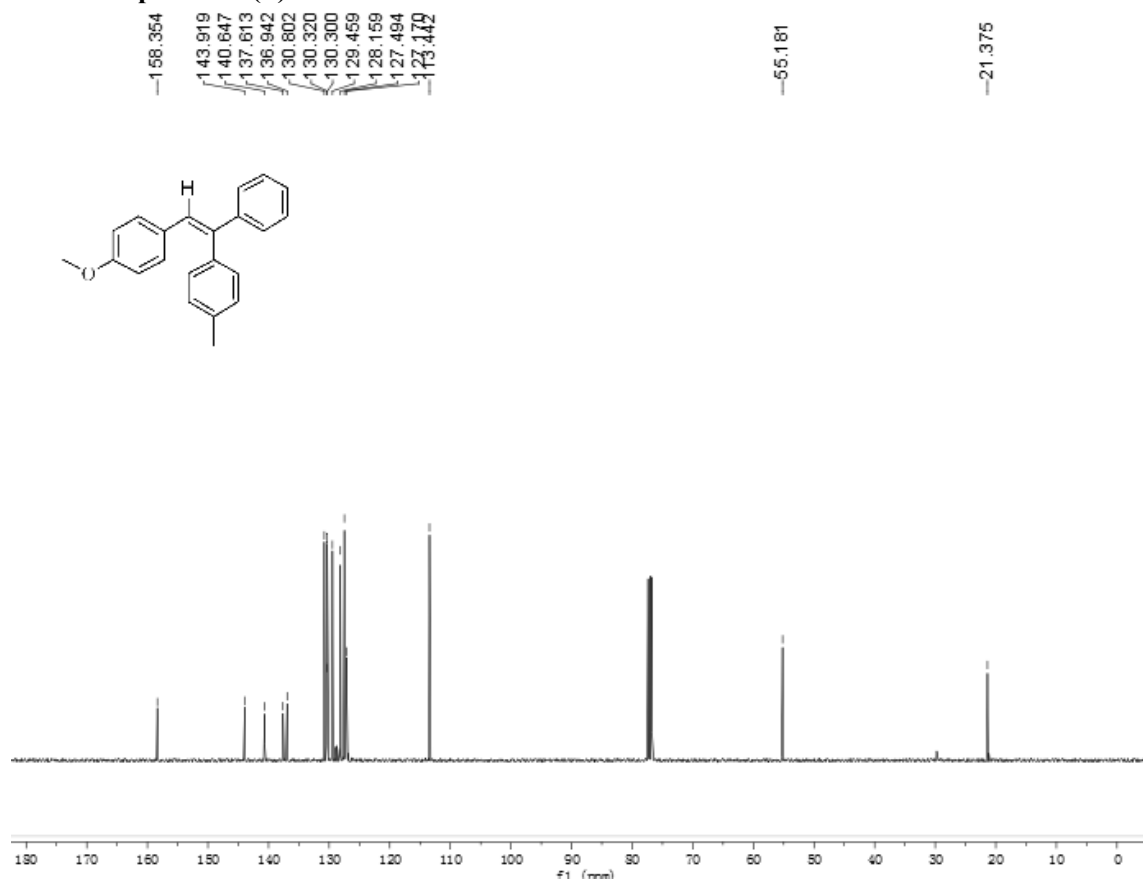
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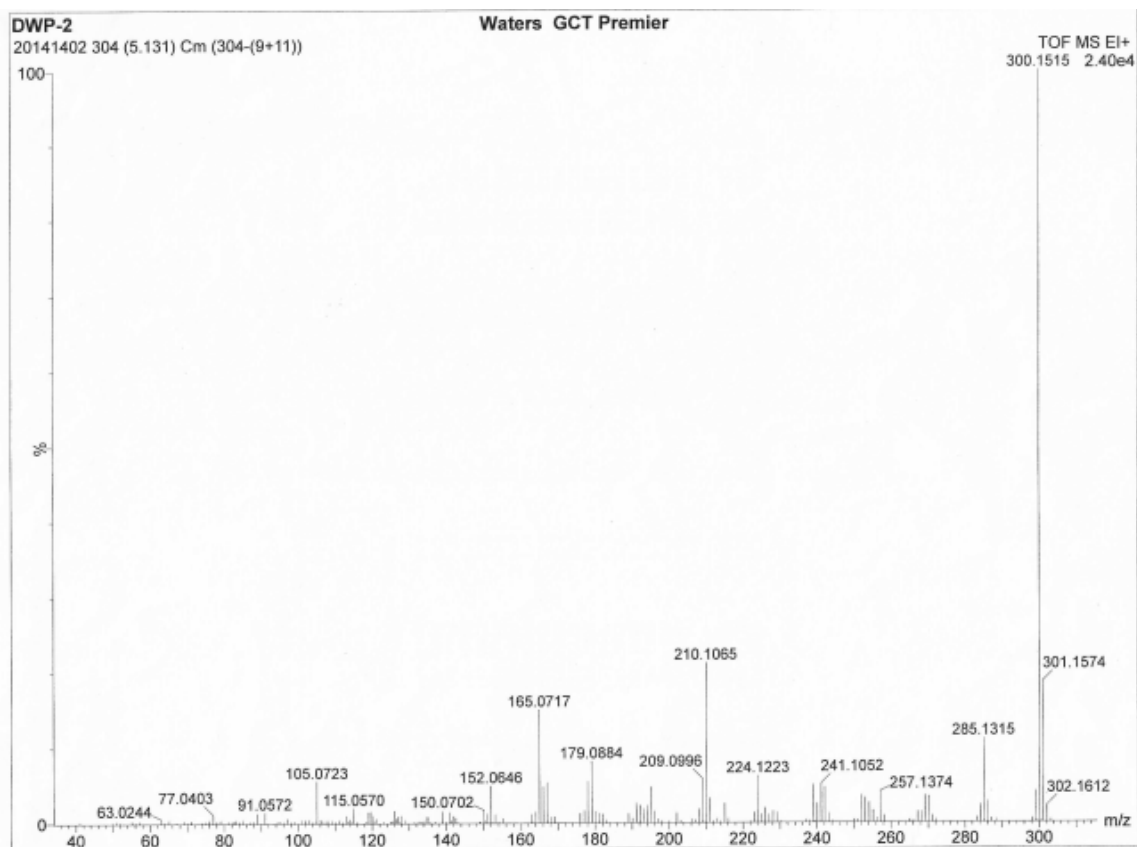
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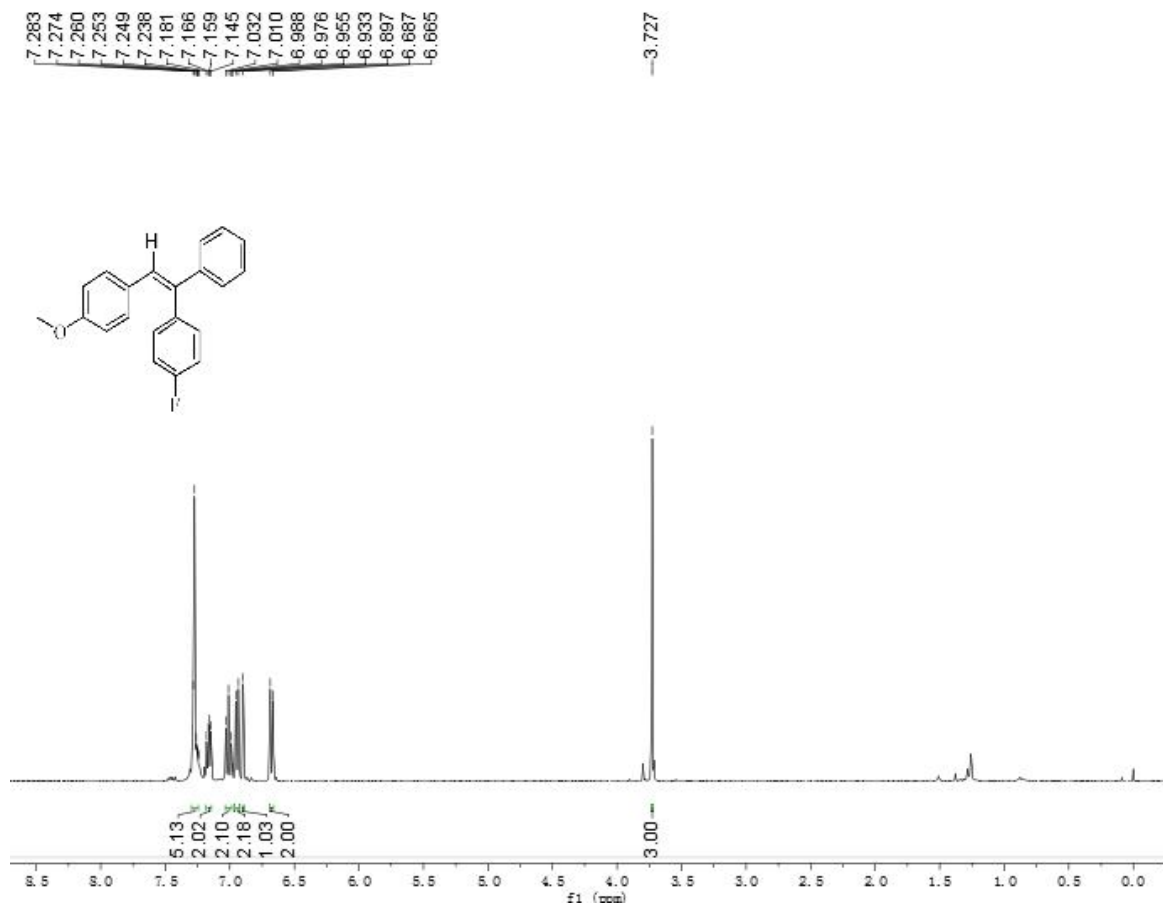
¹³C NMR spectra of (Z)-3hd



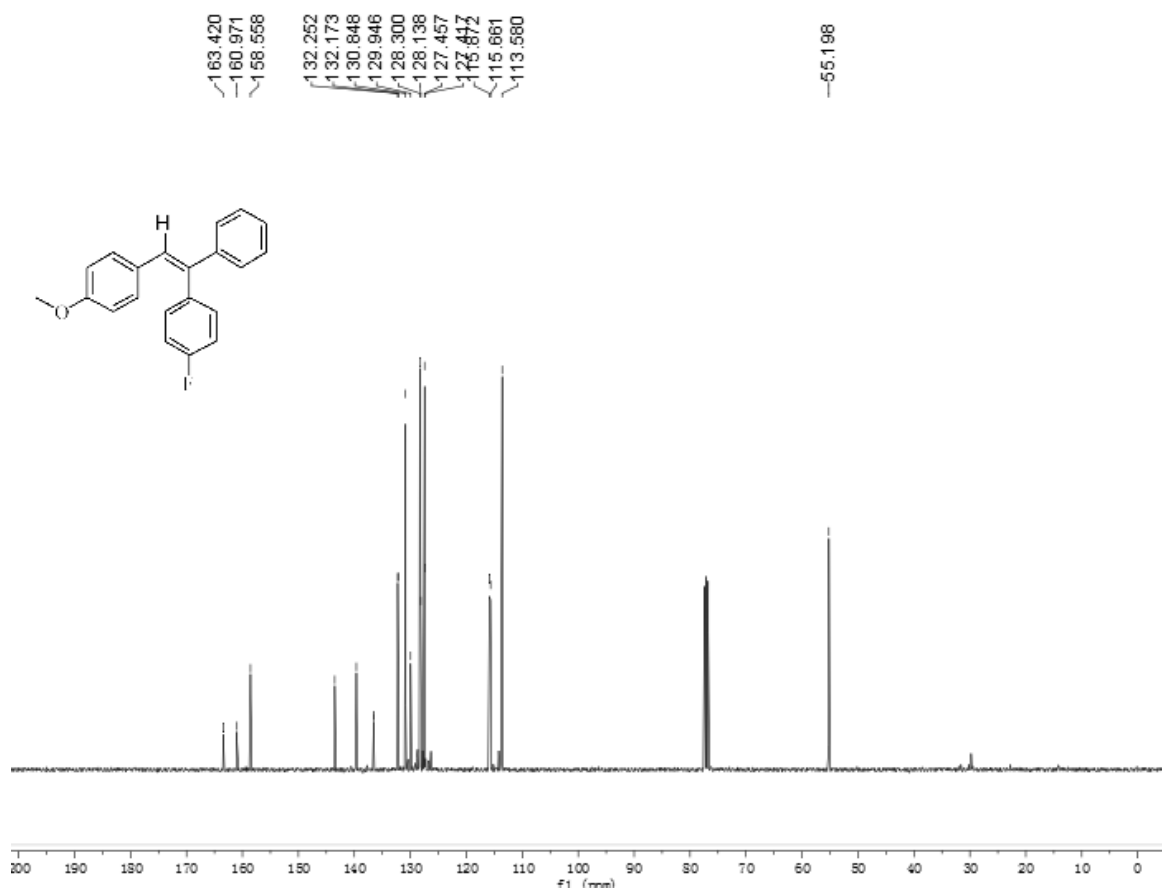
HRMS (EI) spectra of (Z)-3hd



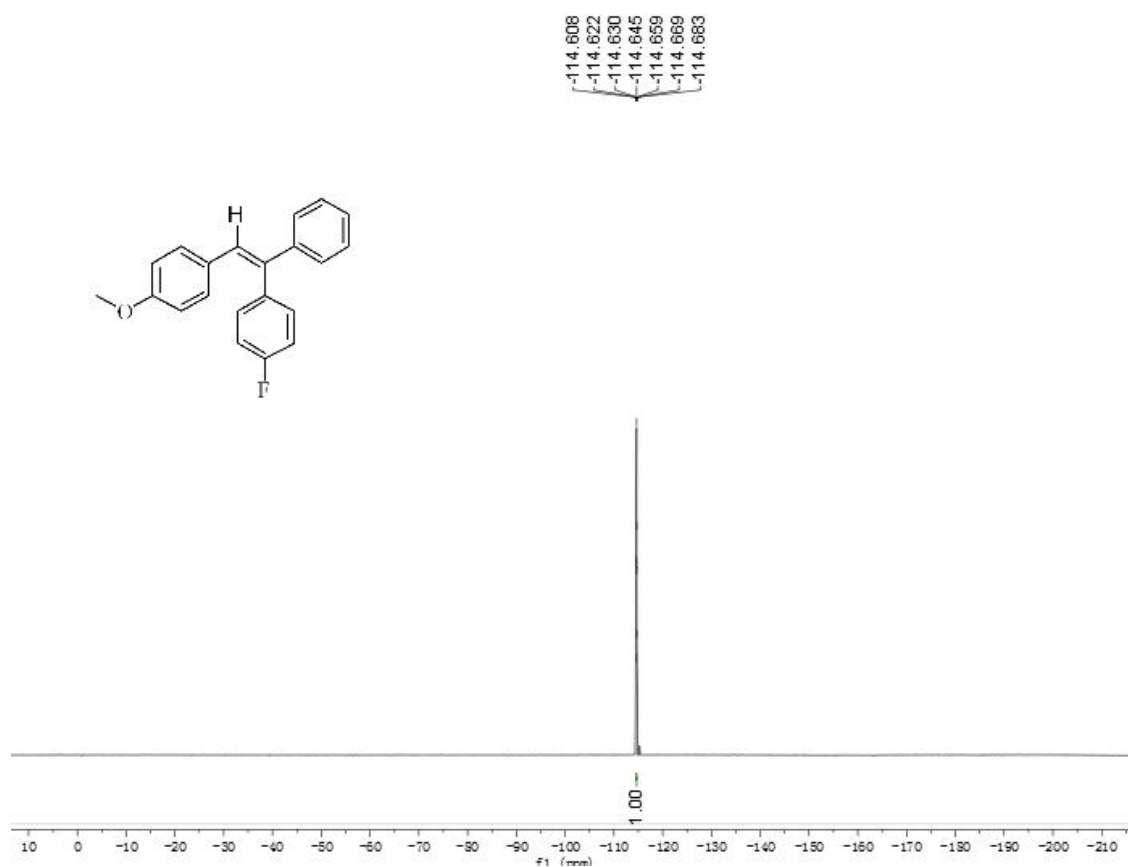
¹H NMR spectra of (Z)-3he



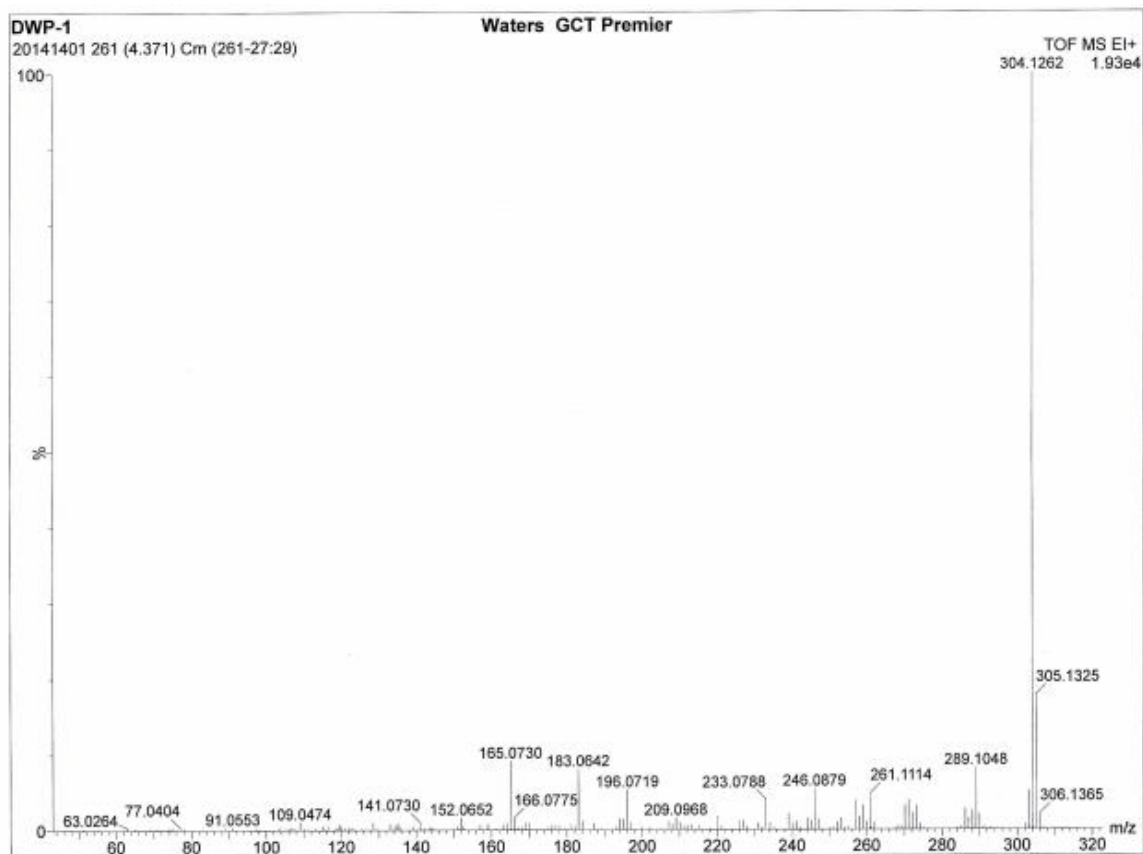
¹³C NMR spectra of (Z)-3he



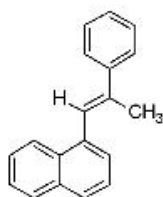
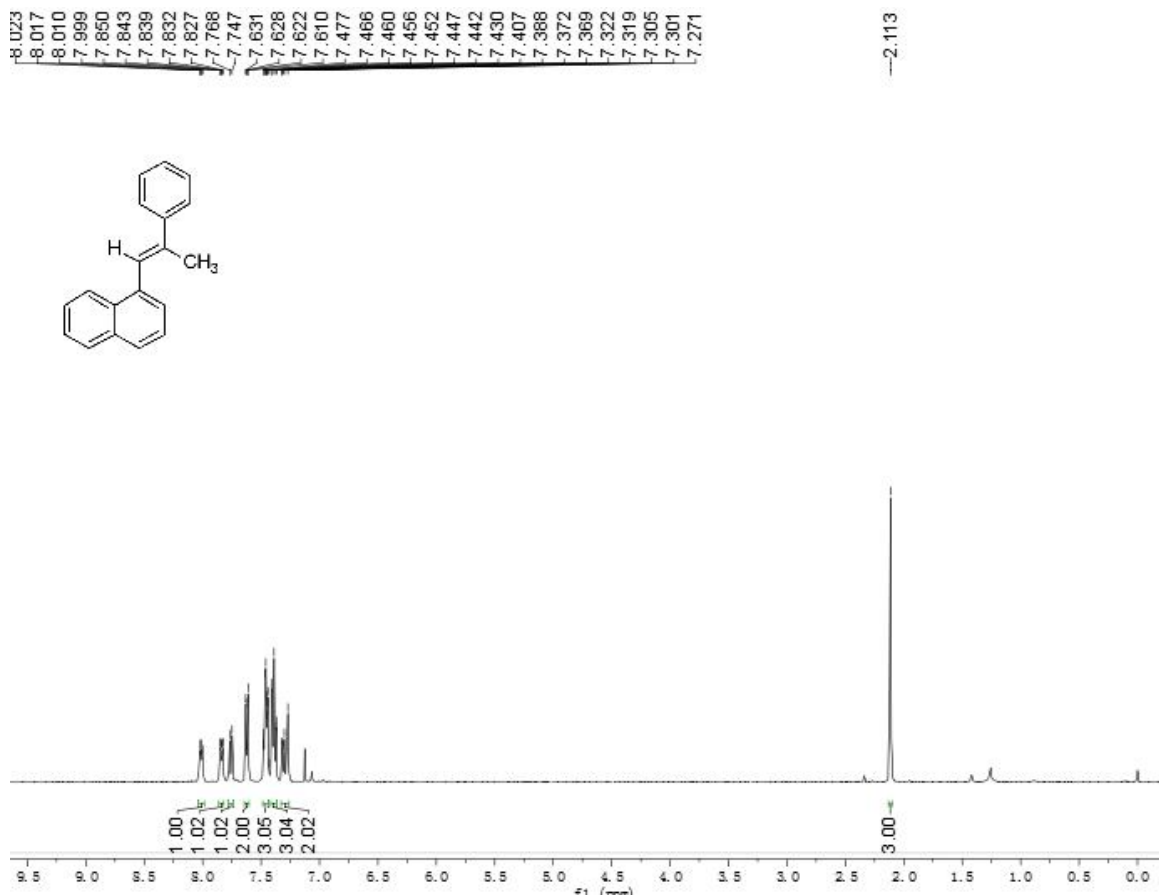
¹⁹F NMR spectra of (Z)-3he



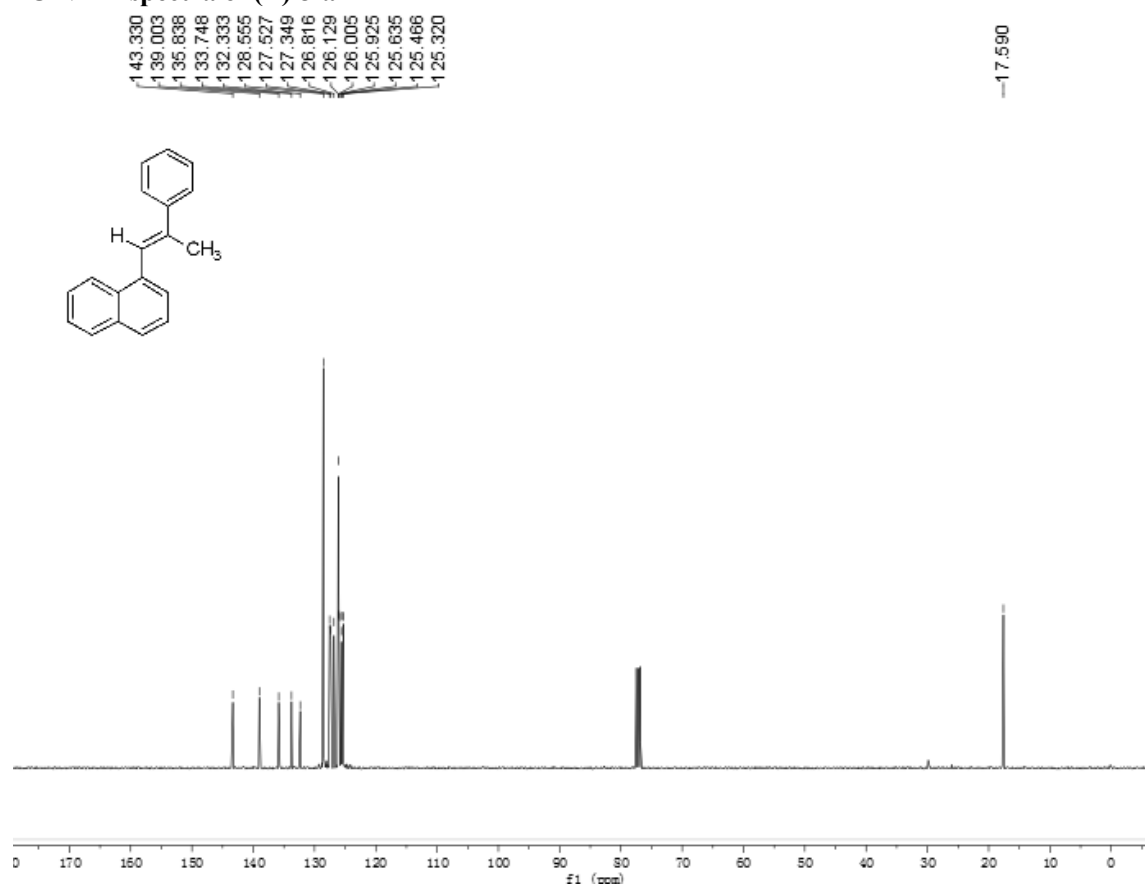
HRMS (EI) spectra of (Z)-3he



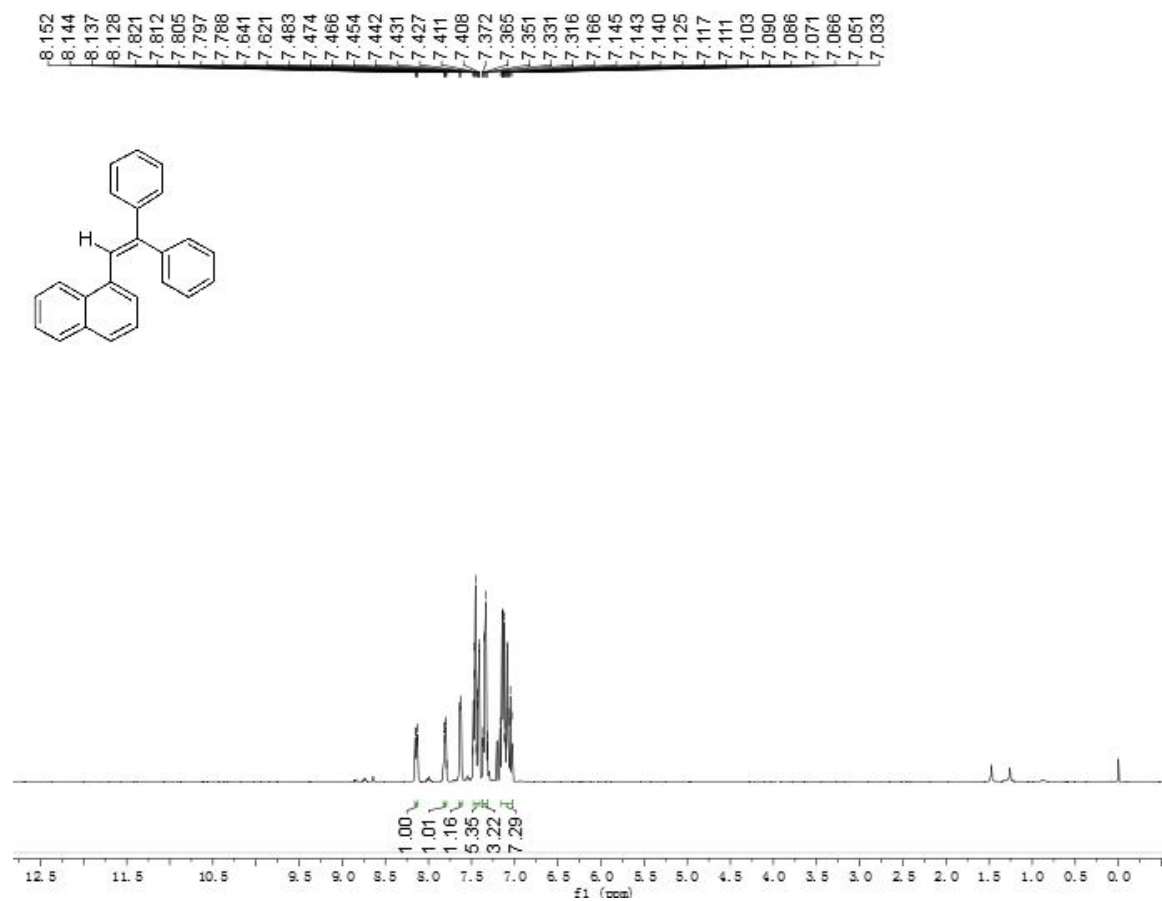
¹H NMR spectra of (E)-3ia



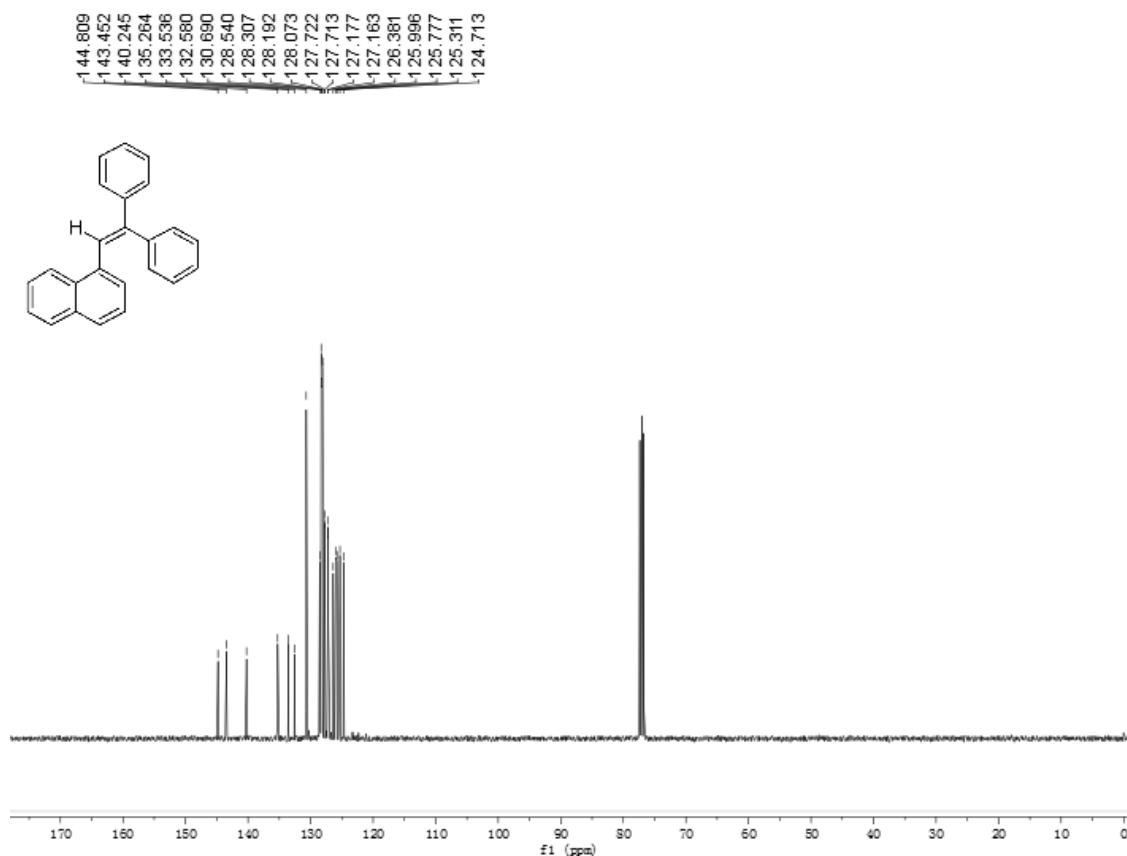
¹³C NMR spectra of (*E*)-3ia



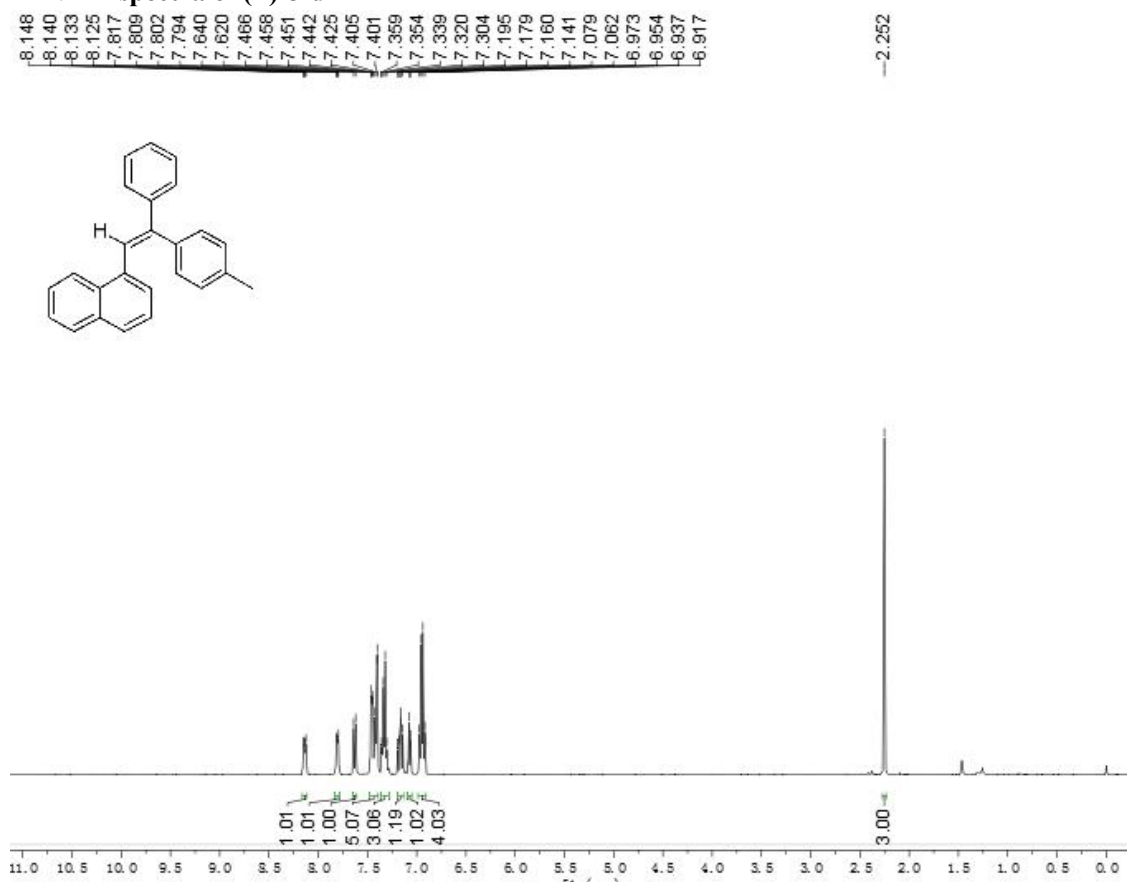
¹H NMR spectra of 3ib



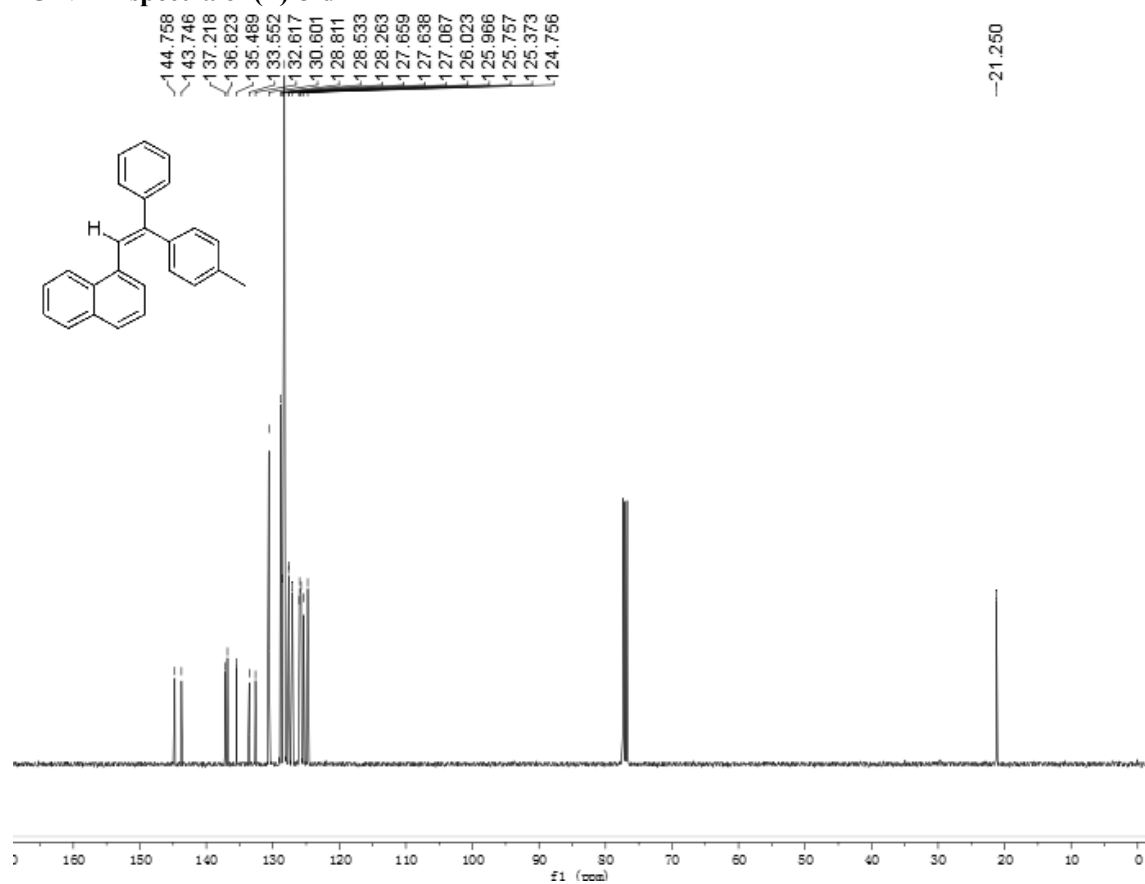
^{13}C NMR spectra of 3ib



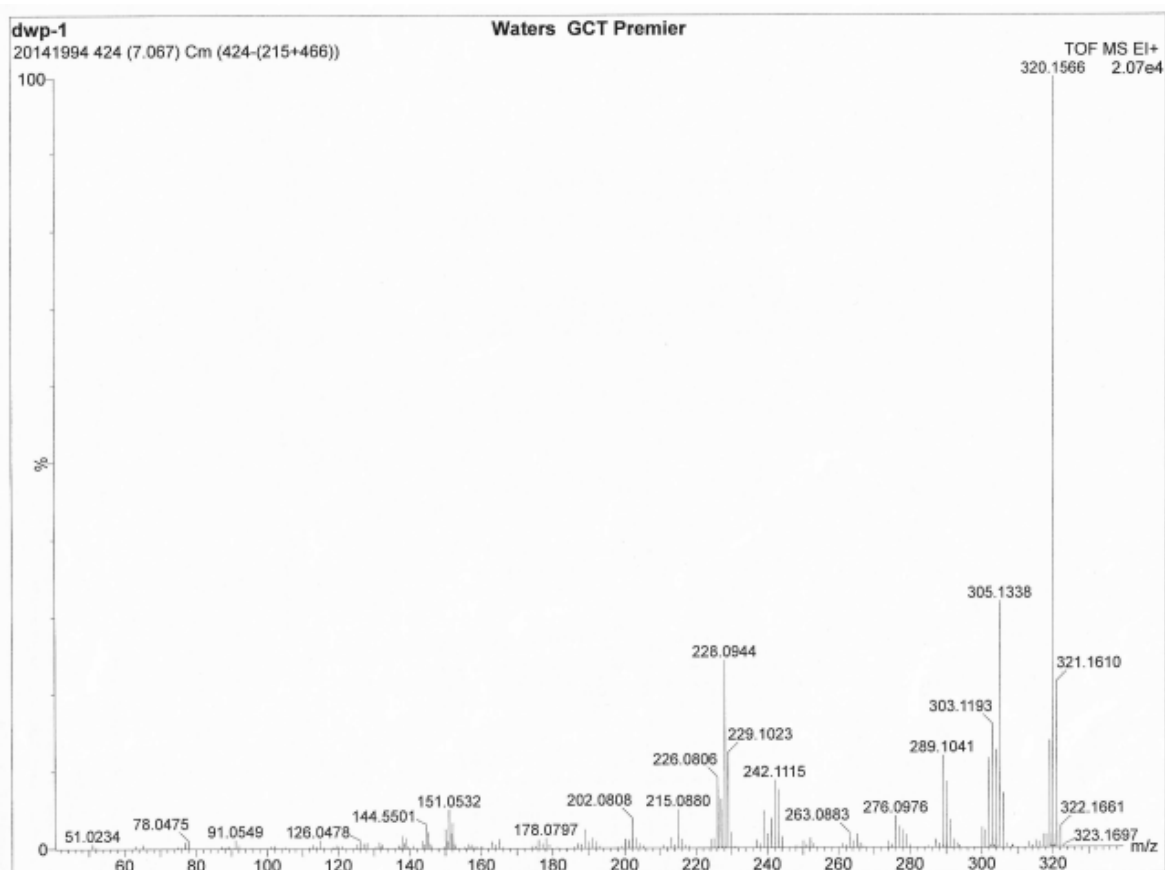
^1H NMR spectra of (Z)-3id



¹³C NMR spectra of (Z)-3id

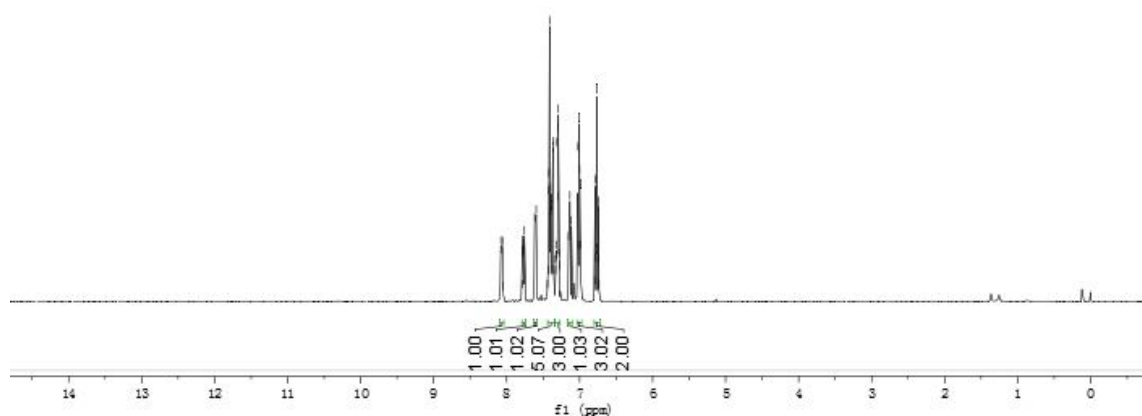
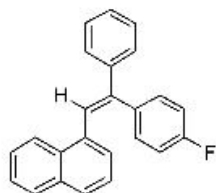


HRMS (EI) spectra of (Z)-3id



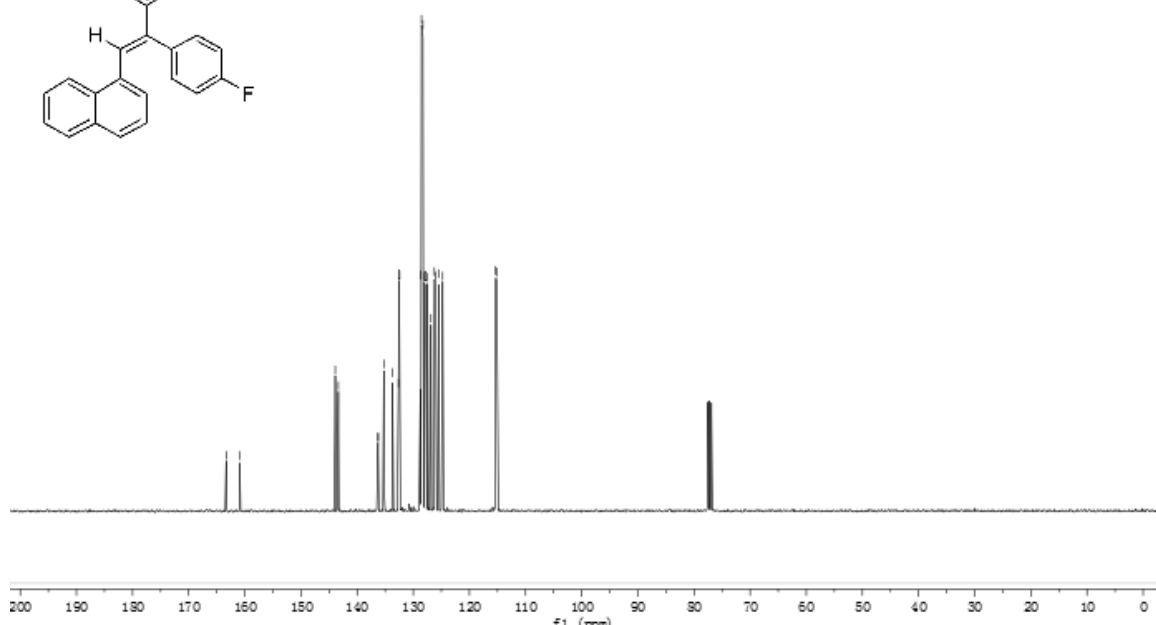
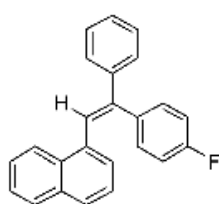
¹H NMR spectra of (Z)-3ie

8.080
8.066
8.056
8.048
7.788
7.780
7.774
7.770
7.760
7.757
7.616
7.595
7.440
7.435
7.423
7.420
7.410
7.400
7.396
7.385
7.381
7.366
7.362
7.355
7.333
7.329
7.324
7.319
7.311
7.300
7.295
7.293
7.282
7.278
7.152
7.134
7.114
7.023
7.017
7.008
7.001
6.992
6.987
6.793
6.786
6.781
6.764
6.759
6.747
6.742
6.735

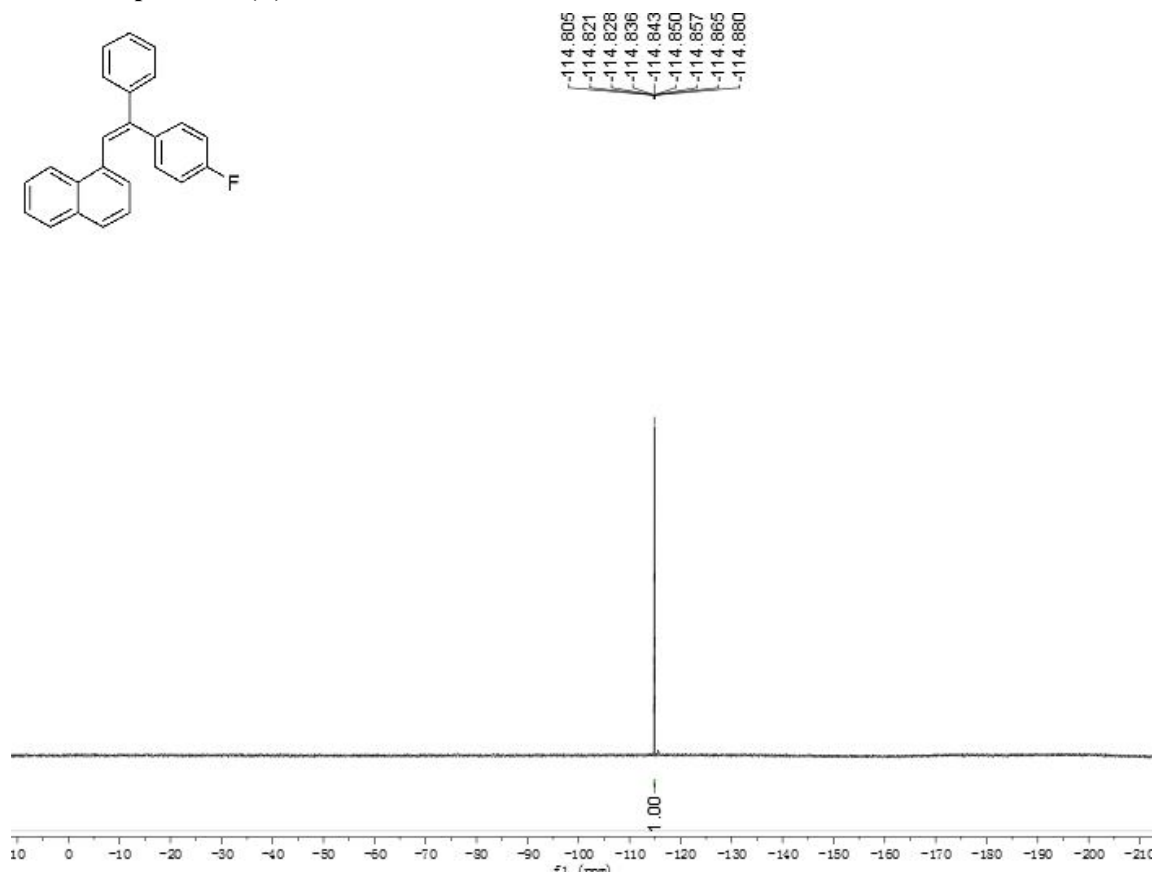


¹³C NMR spectra of (Z)-3ie

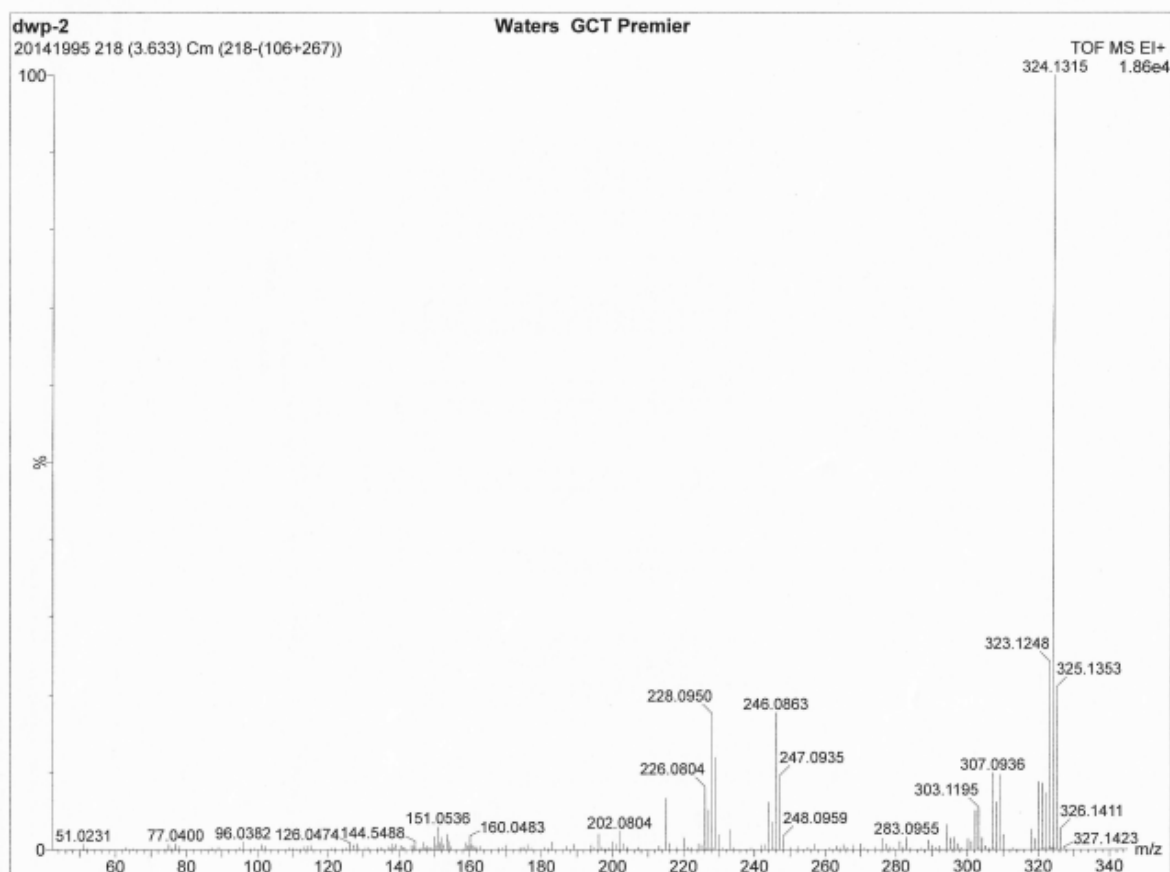
163.342
160.891
132.510
132.432
128.729
128.530
128.290
128.035
127.802
126.241
125.484
124.771
115.125



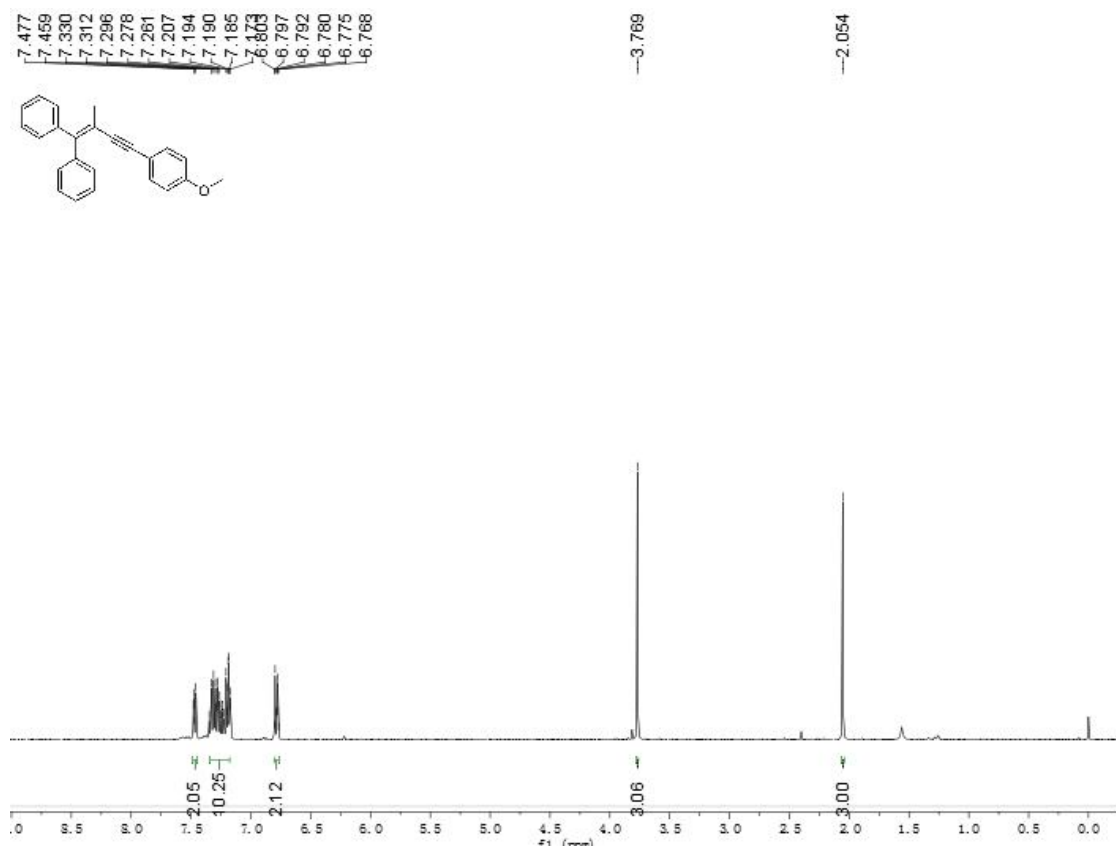
¹⁹F NMR spectra of (*E*)-3ie



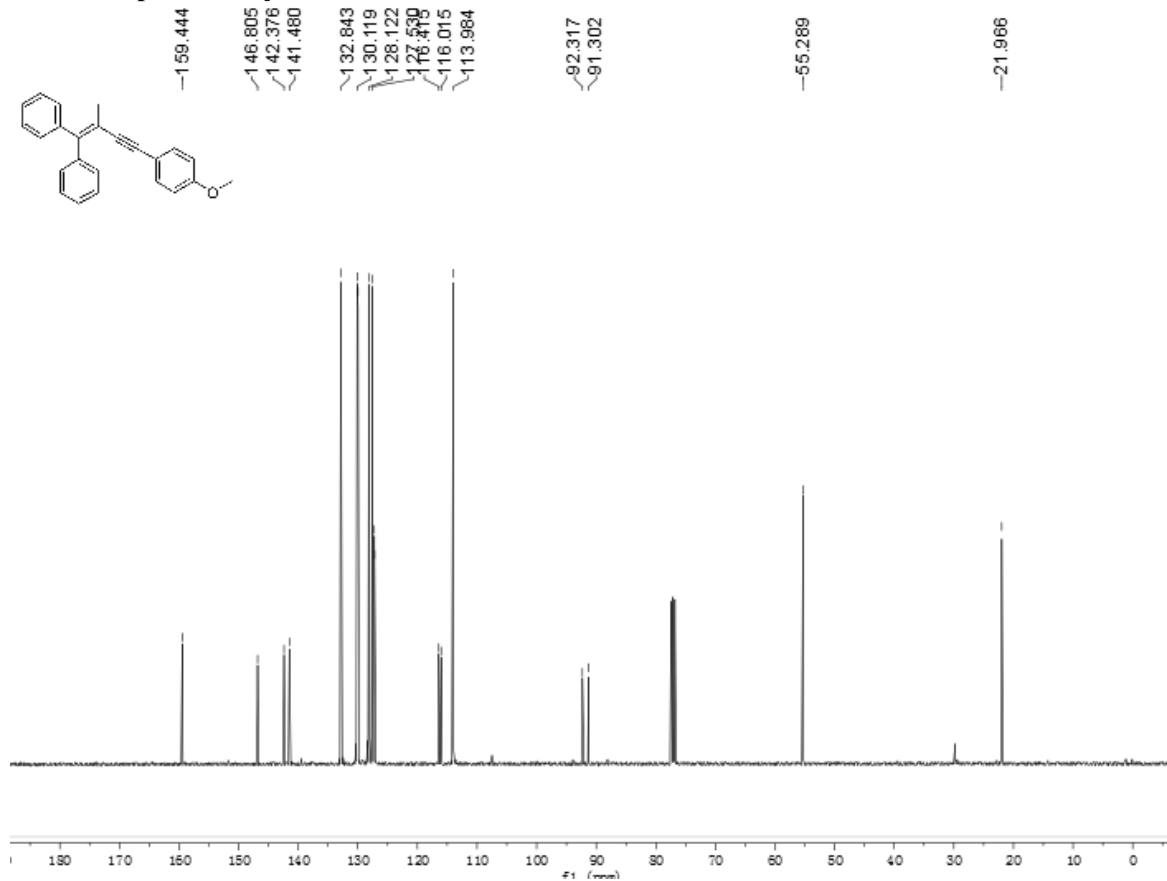
HRMS (EI) spectra of (*Z*)-3ie



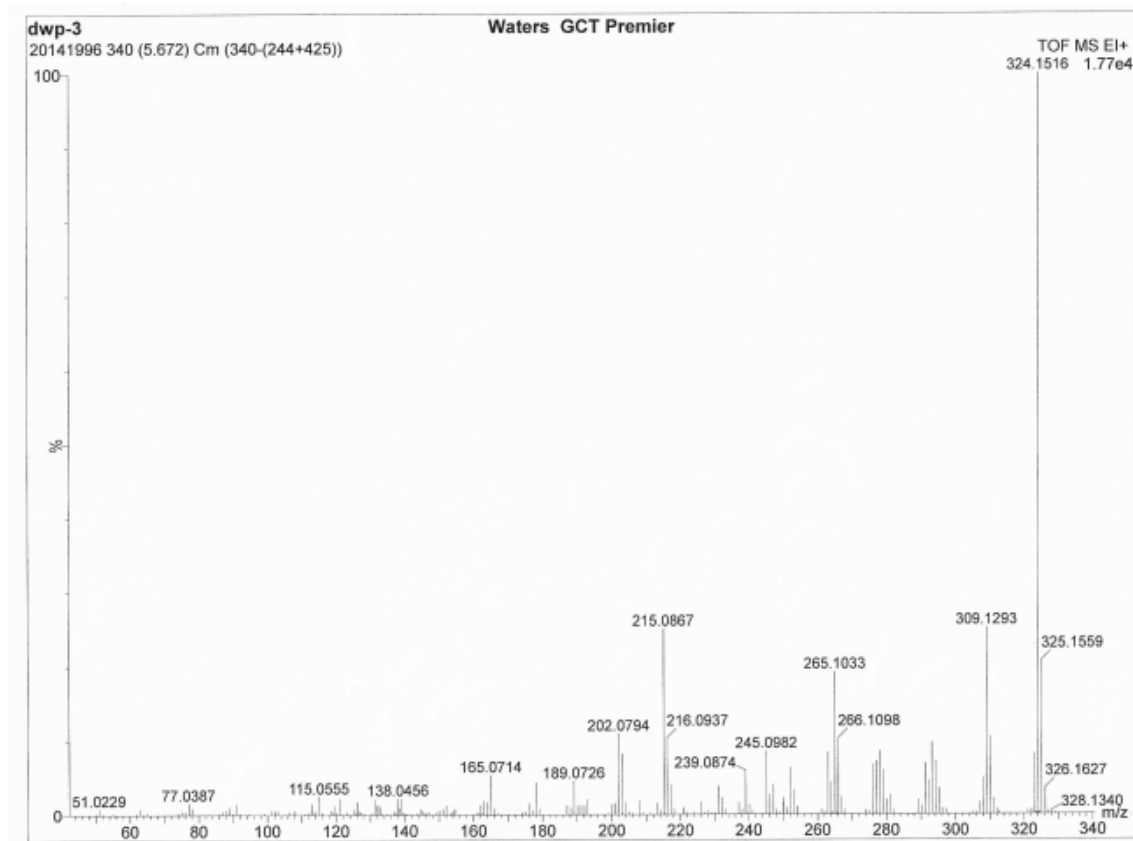
¹H NMR spectra of 3ja



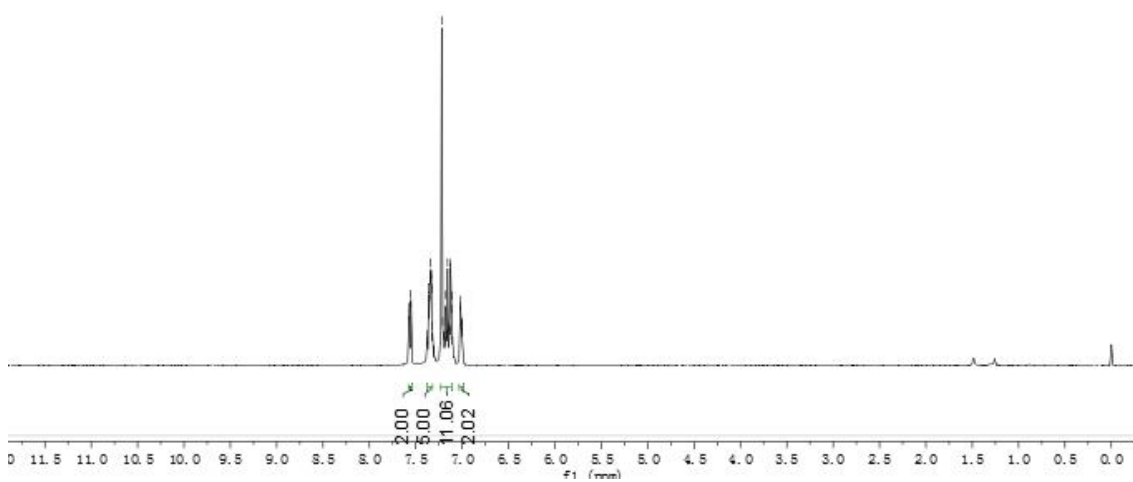
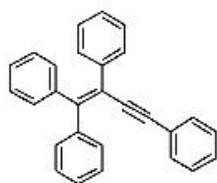
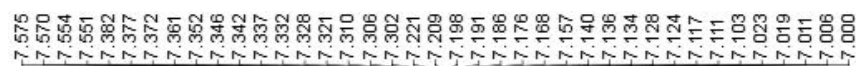
¹³C NMR spectra of 3ja



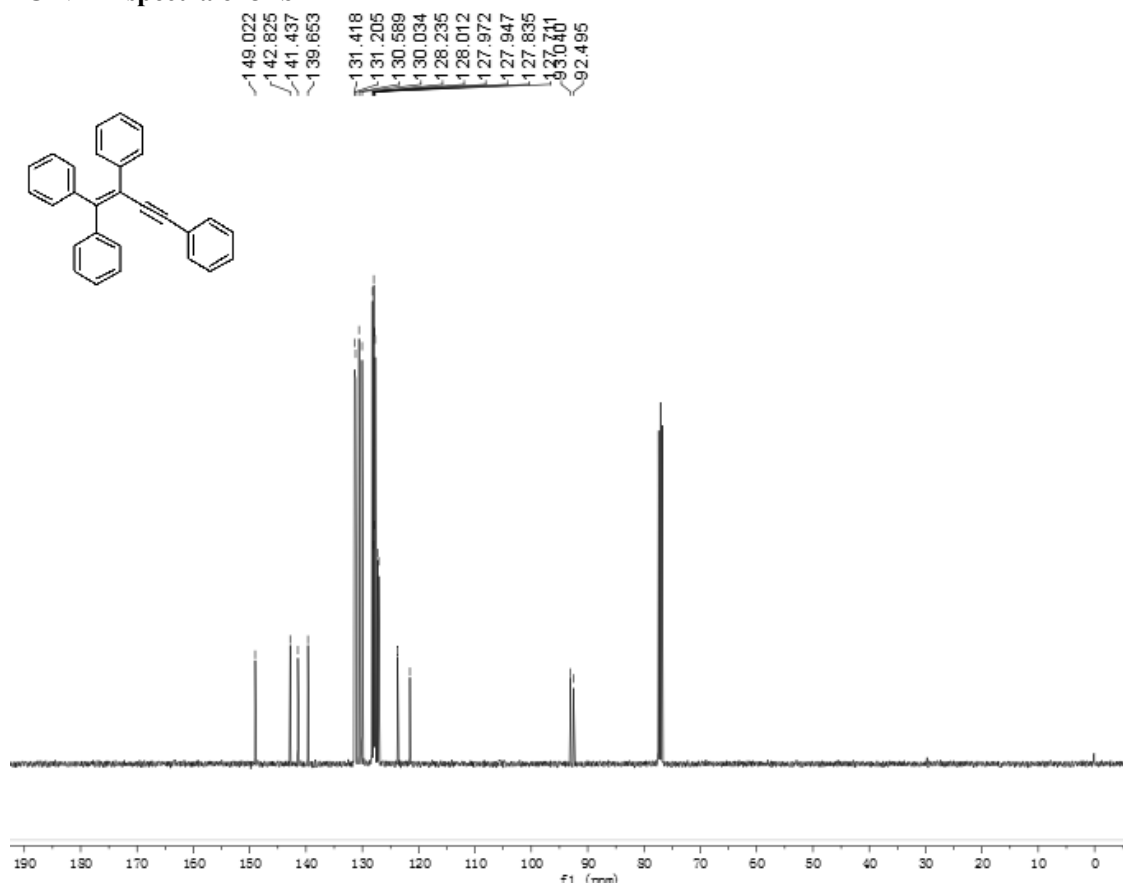
HRMS (EI) spectra of 3ja



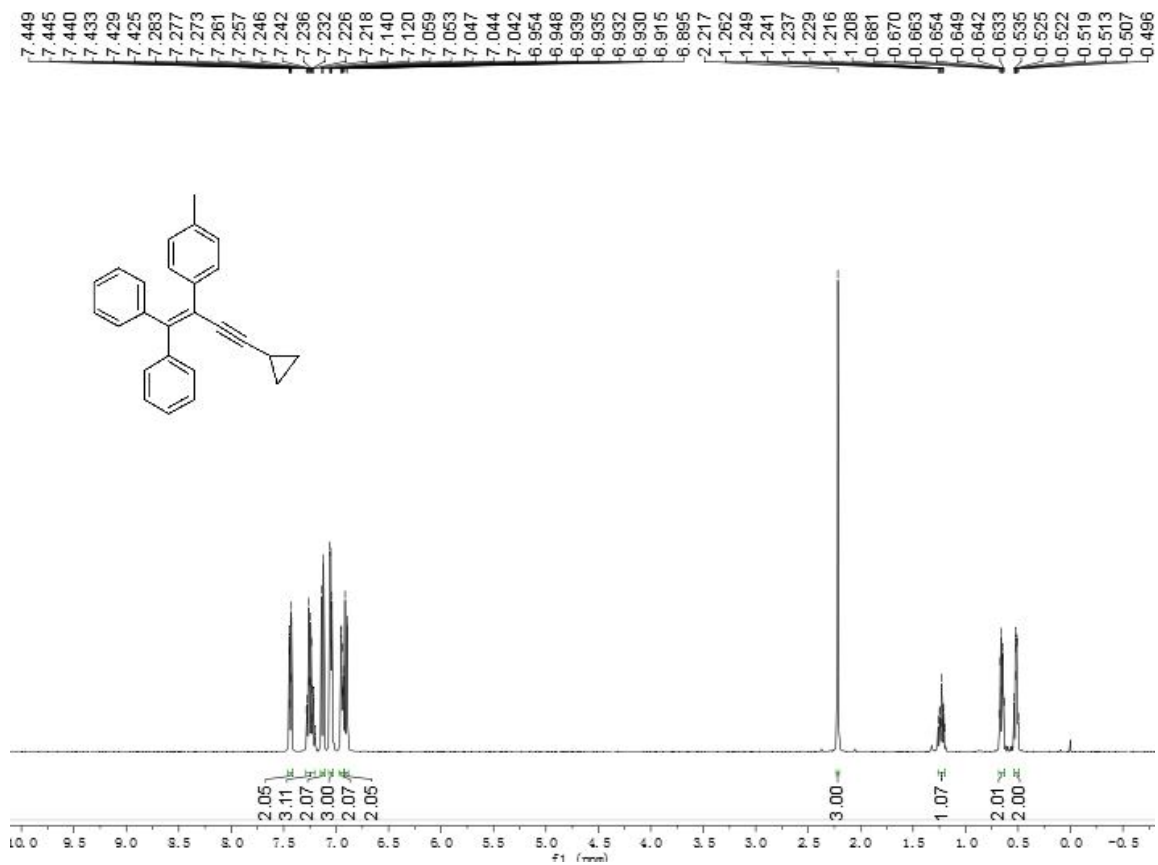
¹H NMR spectra of 3kb



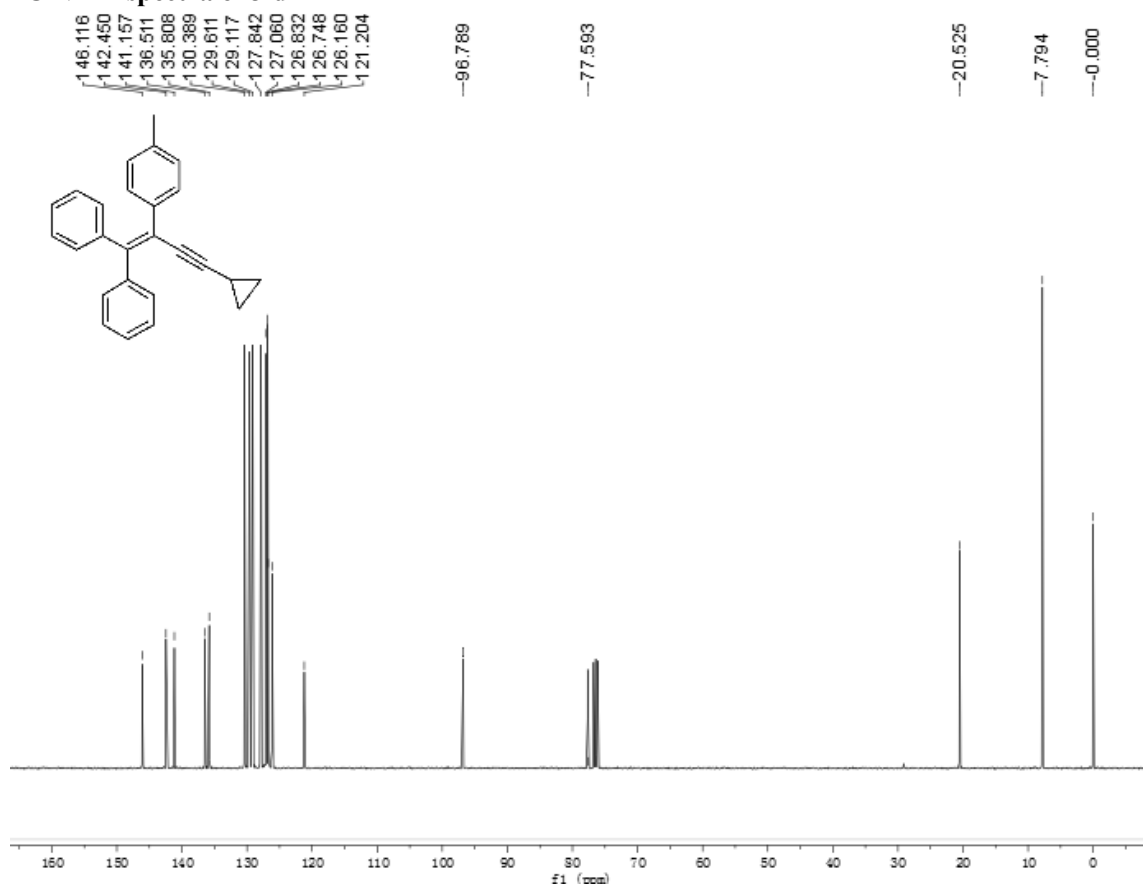
¹³C NMR spectra of 3kb



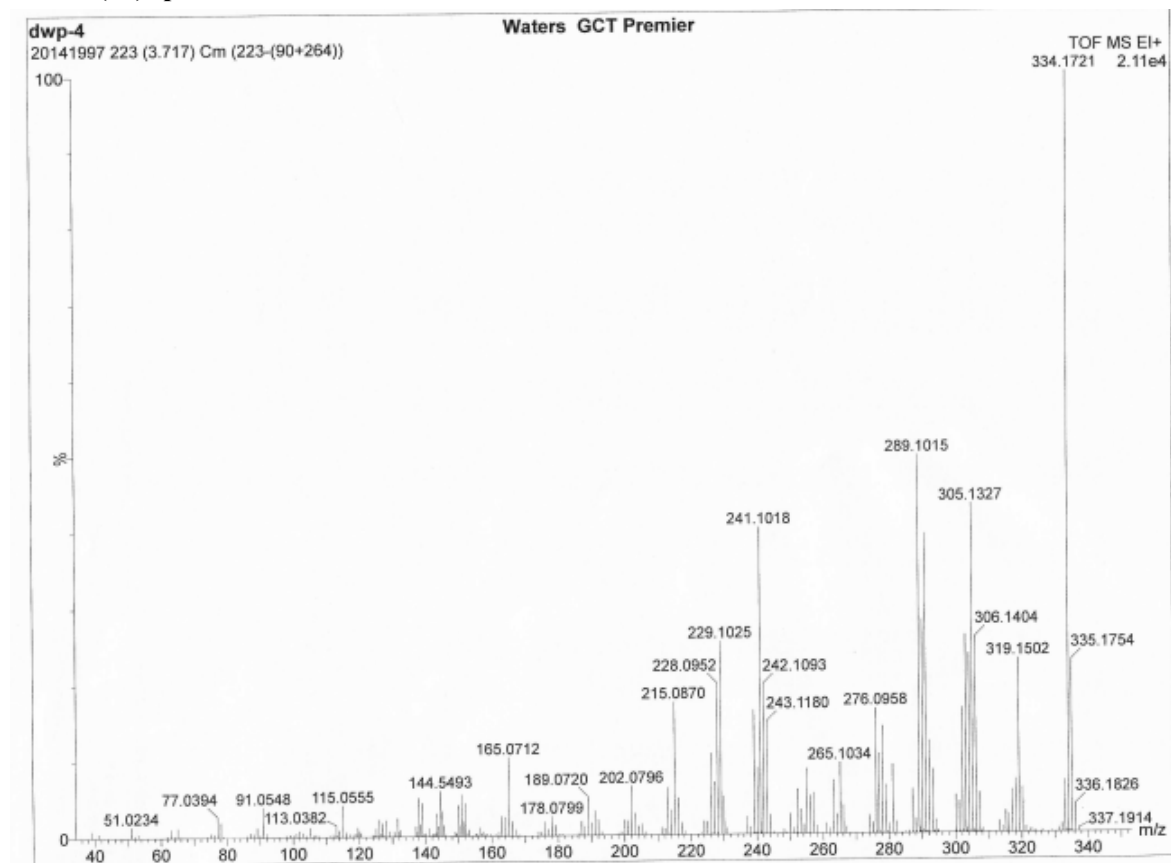
¹H NMR spectra of 3ld



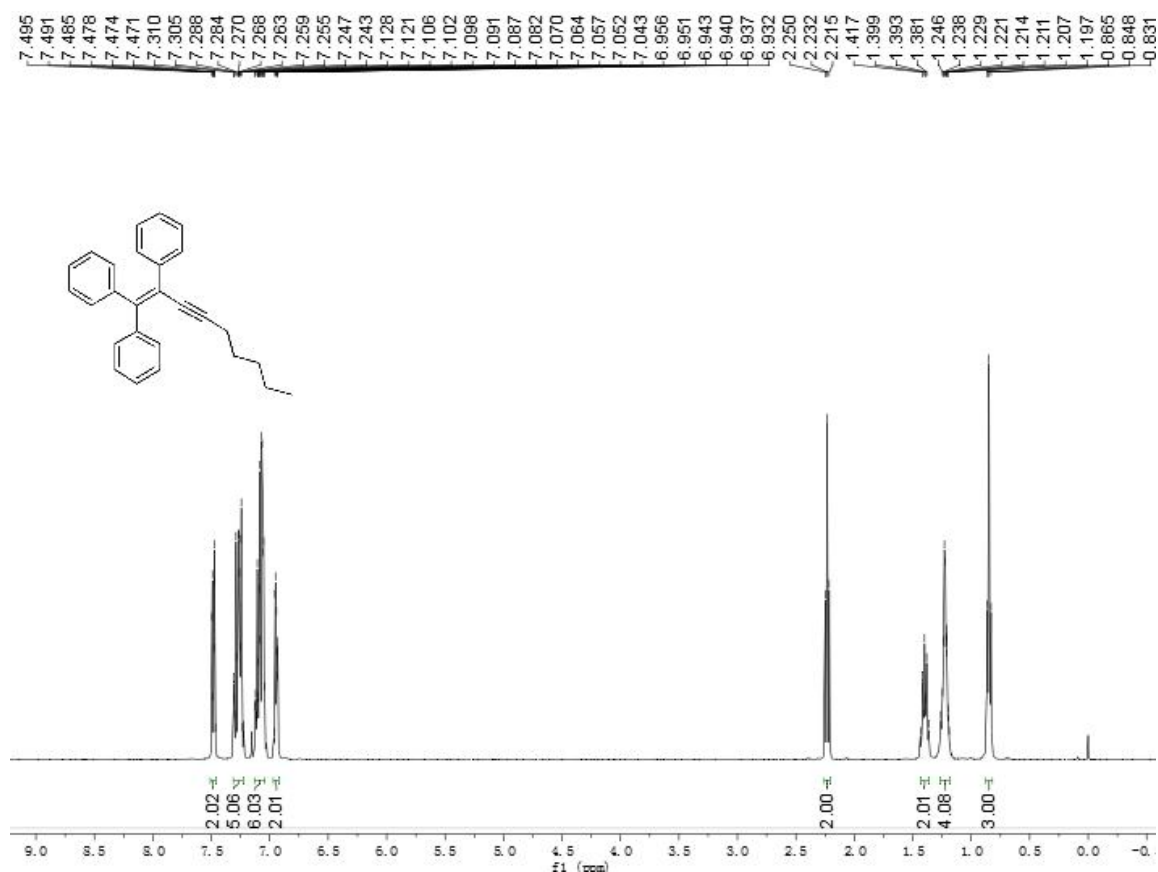
^{13}C NMR spectra of 3ld



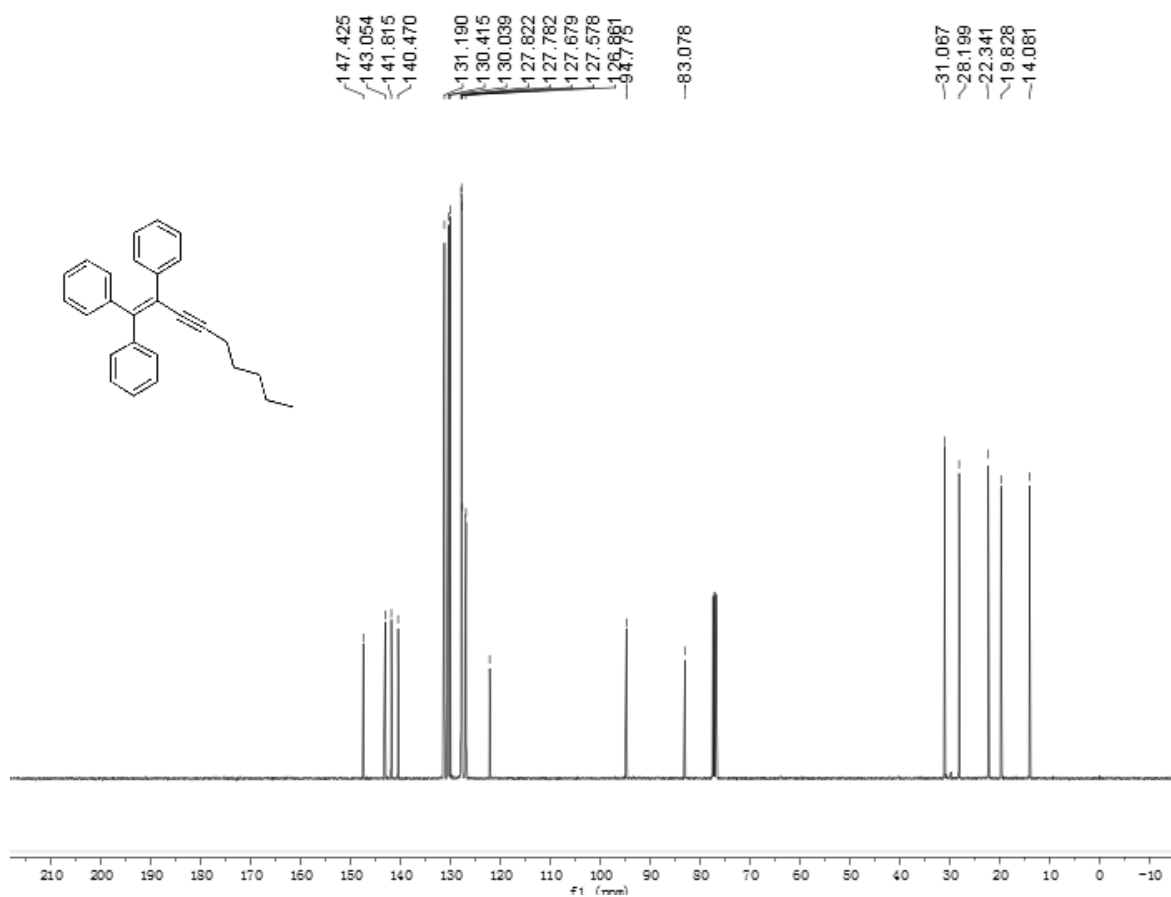
HRMS (EI) spectra of 3ld



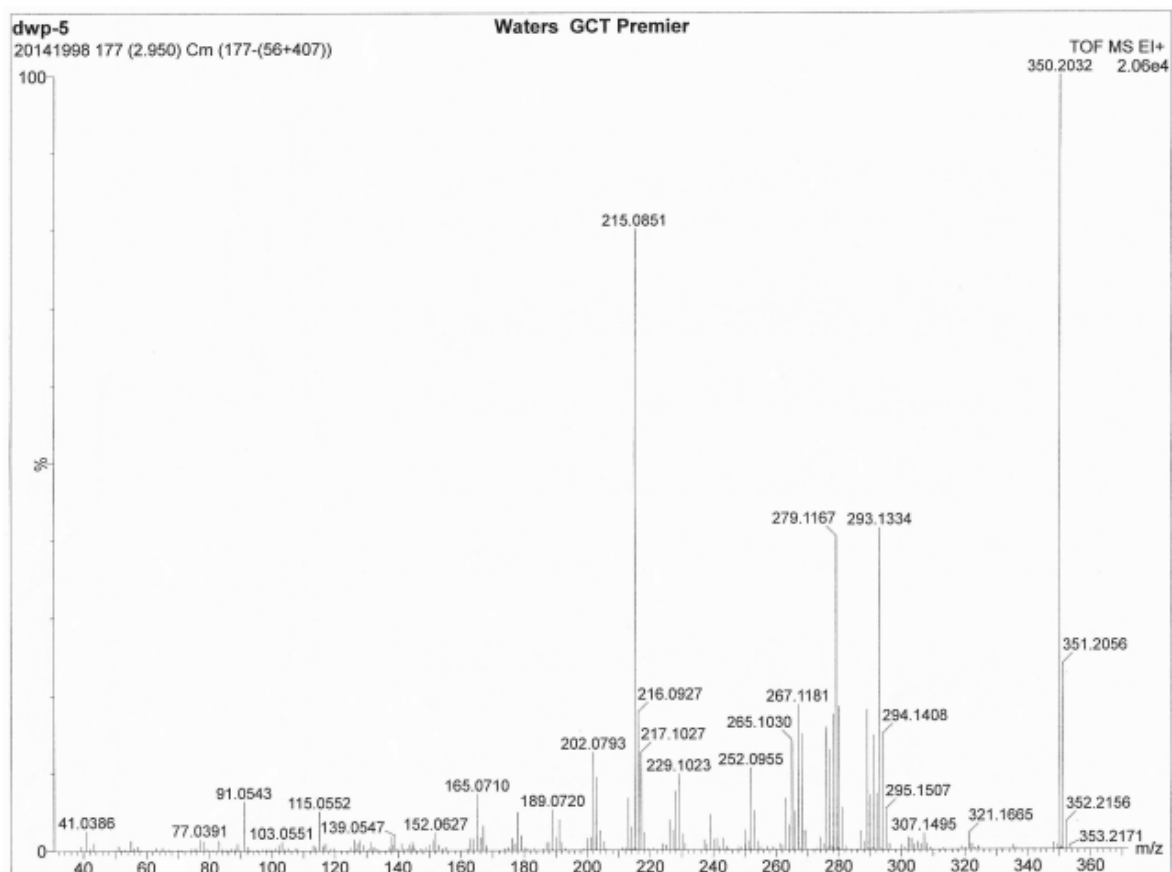
¹H NMR spectra of 3mb



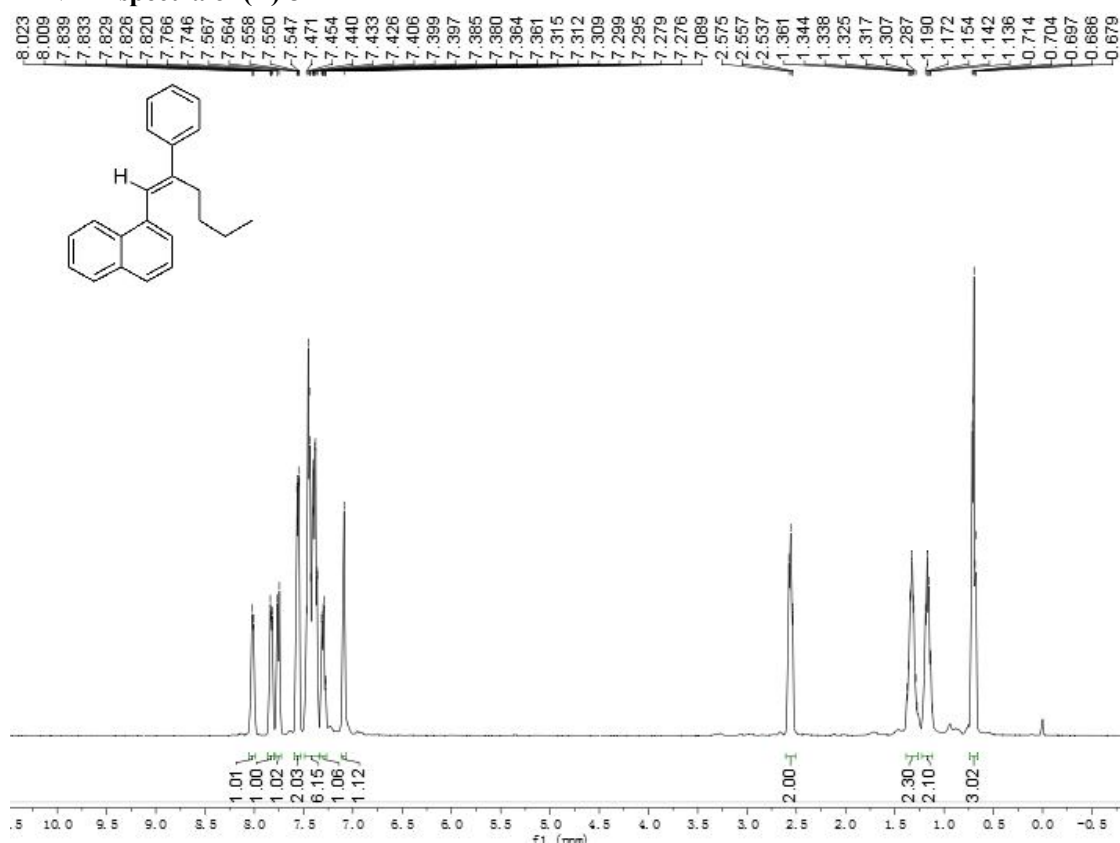
¹³C NMR spectra of 3mb



HRMS (EI) spectra of 3mb



¹H NMR spectra of (*E*)-3if



¹³C NMR spectra of (*E*)-3if

