Electronic Supplementary Information for

Regioselective Aerobic Oxidative Heck Reactions with Electronically Unbiased Alkenes: Efficient Access to α-Alkyl Vinylarenes

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Table of Contents

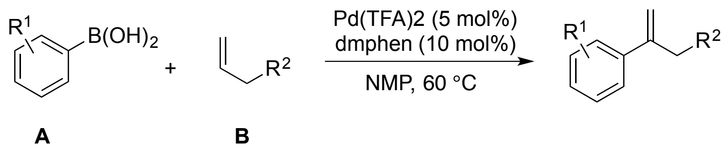
General Information. All commercially available compounds were purchased and used as received. Solvents were dried over activated-alumina columns prior to use; however, purification and drying of commercial solvents is not required for the catalytic reactions described here. ^{1}H and ^{13}C spectra were recorded on Bruker AC-300 or Varian MercuryPlus 300 instruments, and $CDCl_3$, $Pd(TFA)_2$, dmphen, 1-octene, and *N*-methylpyrrolidone were purchased from Sigma-Aldrich and used as received. Arylboronic acids were purchased from Sigma-Aldrich, Combi-Blocks or Frontier Scientific and used as received. The chemical shift values are given in parts per million relative to $CDCl_3$ (7.26 ppm for ^{1}H, and 77.23 ppm for ^{13}C). Gas chromatographic analysis of reactions was conducted with a Shimadzu GC-17A or GC-2010Plus gas chromatograph with either a DB-Wax or a RTX-5 column. Flash chromatography was performed using SiliaFlash® P60 (Silicycle, particle size 40-63 μm, 230-400 mesh).

Typical Procedure for Palladium-Catalyzed Oxidative Heck Reactions. In a disposable culture tube, $Pd(TFA)_2$ (3.3 mg, 0.01 mmol) and dmphen (4.2 mg, 0.02 mmol) were dissolved in NMP (0.2 mL). The reaction tube was placed into an aluminum block mounted on a Large Capacity Mixer (Glas-Col) that enabled several reactions to be performed simultaneously under a constant pressure of (approx.) 1 atm with controlled temperature and orbital agitation. The headspace above the tubes was purged with oxygen gas for ca. 5 min. Then a solution of terminal alkene (0.2 mmol) and arylboronic acid (0.3 mmol) in NMP (0.3 mL) was added. The temperature was slowly raised to 60 °C and continued for 6 hours. After completion, EtOAc (5 mL) was added to the reaction mixture, followed by aq. NH_4Cl (5 mL). The solution was extracted 3 times with EtOAc (5 mL×3), dried over Na_2SO_4 and filtered. The solvent was removed at reduced pressure. The residue was loaded onto a silica gel column and purified by flash chromatography (hexanes/ether mixture).

Procedure for 1 mmol-Scale Reactions.

To a 25 mL three-neck round bottom flask with a stir bar was added $Pd(TFA)_2$ (16 mg, 0.05 mmol), dmphen (21 mg, 0.1 mmol) and NMP (1.5 mL). The flask was evacuated briefly under vacuum, filled with oxygen gas and sealed with a septum. A balloon was filled with O_2 and connected to a 6-inch needle. The needle attached to the O_2 balloon was inserted through the septum, and the solution was sparged with O_2 gas for ca. 10 min. A solution of arylboronic acid (1.5 mmol) and alkene (1 mmol) in NMP (1 mL) was added. The reaction was heated for 6 h at 60 °C using an oil bath with vigorous stirring under an O_2 atmosphere supplied by the balloon. Pure product was isolated by using the same procedure described above.

Table S1. Comparison of Different Arylboronic Acid to Alkene Ratios.



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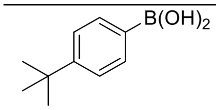
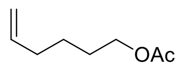
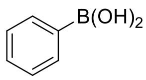
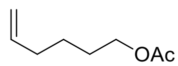
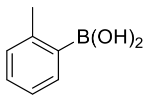
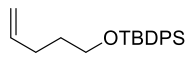
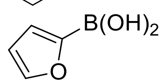
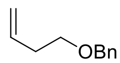
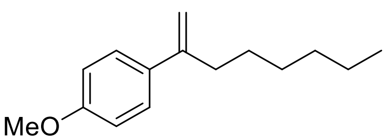
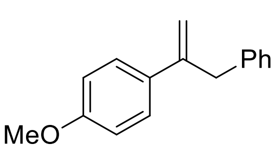
		83	57	72
		79	43	63
		85	51	68
		66	38	60

Spectral data for products



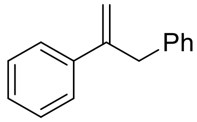
1-Methoxy-4-(oct-1-en-2-yl)benzene[1] 3a

Yield: 70%, >20:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.34 (d, *J* = 8.4 Hz, 2H), 6.85 (d, *J* = 8.7 Hz, 2H), 5.18 (d, *J* = 1.2 Hz, 1H), 4.96 (d, *J* = 1.2 Hz, 1H), 3.80 (s, 3H), 2.46 (t, *J* = 7.2 Hz, 2H), 1.27-1.49 (m, 8H), 0.87 (t, *J* = 6.9 Hz, 3H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 159.2, 148.3, 134.1, 127.4, 113.8, 110.7, 55.5, 35.7, 31.9, 29.3, 28.5, 22.9, 14.3.



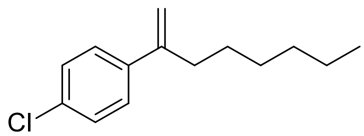
1-Methoxy-4-(3-phenylprop-1-en-2-yl)benzene[2] 3b

Yield: 81%, 10:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.37 (d, *J* = 9.0 Hz, 2H), 7.23-7.26 (m, 5H), 6.81 (d, *J* = 9.0 Hz, 2H), 5.43 (d, *J* = 1.2 Hz, 1H), 4.94 (d, *J* = 1.2 Hz, 1H), 3.81 (s, 2H), 3.77 (s, 3H).



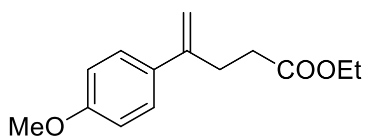
Prop-2-ene-1,2-diyldibenzene[3] 3c

Yield: 76%, 10:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.22-7.47 (m, 10H), 5.52 (s, 1H), 5.04 (s, 1H), 3.86 (s, 2H).



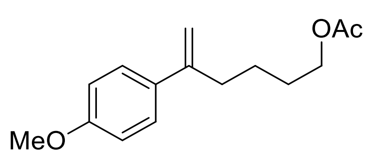
1-Chloro-4-(oct-1-en-2-yl)benzene[4] 3d

Yield: 71%, 10:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.25-7.34 (m, 4H), 5.23 (d, J = 1.2 Hz, 1H), 5.06 (d, J = 1.2 Hz, 1H), 2.46 (t, J = 7.5 Hz, 2H), 1.27-1.44 (m, 8H), 0.87 (t, J = 6.9 Hz, 3H).



Ethyl 4-(4-methoxyphenyl)pent-4-enoate 3e

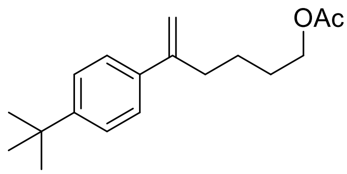
Yield: 84%, 8:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.34 (d, J = 8.8 Hz, 2H), 6.86 (d, J = 9.0 Hz, 2H), 5.23 (d, J = 1.5 Hz, 1H), 5.00 (d, J = 1.2 Hz, 1H), 4.12 (q, J = 6.9 Hz, 2H), 3.81 (s, 3H), 2.81 (t, J = 7.2 Hz, 2H), 2.46 (t, J = 7.2 Hz, 2H), 1.24 (t, J = 7.2 Hz, 3H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 173.4, 159.4, 146.4, 133.2, 127.4, 113.9, 111.5, 60.6, 55.5, 33.6, 30.7, 14.4; **HRMS (EI)** Calcd. for $C_{14}H_{19}O_3$ ($[M+H]^+$): 235.1329, found: 235.1332.



5-(4-Methoxyphenyl)hex-5-en-1-yl acetate 3f

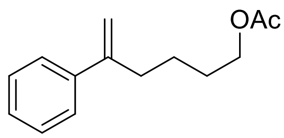
Yield: 80%, 8:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.33 (d, J = 8.8 Hz, 2H), 6.86 (d, J = 9.0 Hz, 2H), 5.21 (d, J = 1.5 Hz, 1H), 4.98 (d, J = 1.2 Hz, 1H), 4.05 (t, J = 6.3 Hz, 2H), 3.81 (s, 3H), 2.51 (t, J = 6.3 Hz, 2H), 2.02 (s, 3H), 1.63-1.68 (m, 2H), 1.48-1.56 (m, 2H); **^{13}C NMR** (75 MHz,

$CDCl_3$) δ 171.4, 159.3, 147.5, 133.7, 127.4, 113.9, 111.3, 64.5, 55.5, 35.1, 28.4, 24.7, 21.2; **HRMS (EI)** Calcd. for $C_{15}H_{21}O_3$ ($[M+H]^+$): 249.1486, found:249.1485.



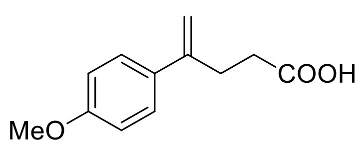
5-(4-(*tert*-Butyl)phenyl)hex-5-en-1-yl acetate 3g

Yield: 83%, 10:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.34 (s, 4H), 5.28 (s, 1H), 5.02 (s, 1H), 4.06 (t, *J* = 6.6 Hz, 2H), 2.53 (t, *J* = 7.2 Hz, 2H), 2.02 (s, 3H), 1.62-1.71 (m, 2H), 1.48-1.55 (m, 2H), 1.32 (s, 9H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 171.4, 150.6, 147.9, 138.2, 125.9, 124.4, 112.1, 64.6, 35.0, 34.7, 31.5, 28.4, 24.7, 21.2; **HRMS (EI)** Calcd. for $C_{18}H_{27}O_2$ ($[M+H]^+$): 275.2006, found: 275.2008.



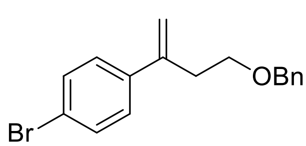
5-Phenylhex-5-en-1-yl acetate 3h

Yield: 79%, 8:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.26-7.40 (m, 5H), 5.28 (s, 1H), 5.07 (s, 1H), 4.05 (t, *J* = 6.6 Hz, 2H), 2.53 (t, *J* = 7.2 Hz, 2H), 2.04 (s, 3H), 1.61-1.71 (m, 2H), 1.46-1.56 (m, 2H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 171.4, 148.3, 141.3, 128.5, 127.6, 126.3, 112.8, 64.5, 35.1, 28.4, 24.7, 21.2; **HRMS (EI)** Calcd. for $C_{14}H_{22}NO_2$ ($[M+NH_4]^+$): 236.1646, found: 236.1640.



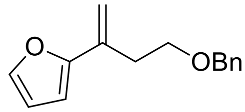
4-(4-Methoxyphenyl)pent-4-enoic acid[5] 3i

Yield: 76%, 12:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3/CD_3OD$ = 3:1) δ 7.35 (d, *J* = 8.7 Hz, 2H), 6.92 (d, *J* = 8.7 Hz, 2H), 5.21 (s, 1H), 4.99 (s, 1H), 3.78 (s, 3H), 2.77 (t, *J* = 7.8 Hz, 2H), 2.41 (t, *J* = 8.1 Hz, 2H).



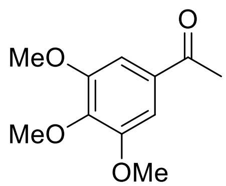
1-(4-(Benzyloxy)but-1-en-2-yl)-4-bromobenzene 3j

Yield: 68%, 4:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.43 (dd, *J* = 6.6, 1.8 Hz, 2H), 7.25-7.32 (m, 7H), 5.34 (s, 1H), 5.15 (s, 1H), 4.48 (s, 2H), 3.57 (t, *J* = 6.9 Hz, 2H), 2.80 (t, *J* = 6.6 Hz, 2H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 144.5, 140.1, 138.5, 131.6, 128.6, 128.0, 127.81, 127.80, 121.6, 114.7, 73.2, 69.1, 35.8; **HRMS (EI)** Calcd. for $C_{17}H_{17}BrO$ ($[M]^+$): 316.0458, found: 316.0446.



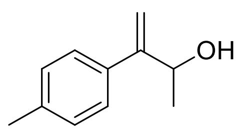
2-(4-(Benzyloxy)but-1-en-2-yl)furan 3k

Yield: 66%, 7:1 regioselectivity. ^{1}**H NMR** (300 MHz, $CDCl_3$) δ 7.25-7.35 (m, 6H), 6.36-6.37 (m, 1H), 6.31 (d, J = 3.3 Hz, 1H), 5.58 (s, 1H), 5.03 (s, 1H), 4.53 (s, 2H), 3.68 (t, J = 6.9 Hz, 2H), 2.70 (t, J = 7.2 Hz, 2H); ^{13}**C NMR** (75 MHz, $CDCl_3$) δ 154.6, 142.1, 138.6, 134.4, 128.6, 127.9, 127.8, 111.3, 110.9, 106.4, 73.2, 69.6, 33.8; **HRMS (EI)** Calcd. for $C_{15}H_{17}O_2$ ($[M+H]^+$): 229.1224, found: 229.1226.



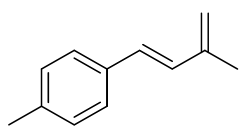
1-(3,4,5-Trimethoxyphenyl)ethanone[6] 3l

Yield: 67%. ^{1}**H NMR** (300 MHz, $CDCl_3$) δ 7.22 (s, 2H), 3.93 (s, 9H), 2.60 (s, 3H).



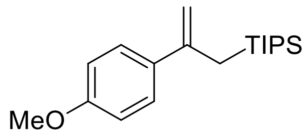
3-(*p*-Tolyl)but-3-en-2-ol[7] 3m

Yield: 41%, 20:1 regioselectivity. ^{1}**H NMR** (300 MHz, $CDCl_3$) δ 7.29 (d, J = 8.1 Hz, 2H), 7.15 (d, J = 8.4 Hz, 2H), 5.32 (s, 1H), 5.26 (s, 1H), 4.78-4.85 (m, 1H), 2.35 (s, 3H), 1.67 (d, J = 4.2 Hz, 1H), 1.33 (d, J = 6.3 Hz, 3H).



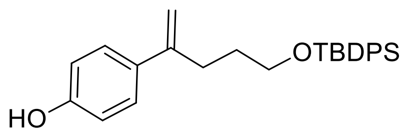
(*E*)-1-Methyl-4-(3-methylbuta-1,3-dien-1-yl)benzene[8] 3n

Yield: 43%, <1:20 regioselectivity. ^{1}**H NMR** (300 MHz, $CDCl_3$) δ 7.33 (d, J = 8.4 Hz, 2H), 7.12 (d, J = 8.1 Hz, 2H), 6.83 (d, J = 16.2 Hz, 1H), 6.50 (d, J = 16.2 Hz, 1H), 5.09 (s, 1H), 5.04 (s, 1H), 2.33 (s, 3H), 1.97 (s, 3H); ^{13}**C NMR** (75 MHz, $CDCl_3$) δ 142.4, 137.5, 134.8, 131.0, 129.5, 128.8, 126.6, 117.0, 21.4, 18.8; **HRMS (EI)** Calcd. for $C_{12}H_{14}$ ($[M]^+$): 158.1091, found: 158.1087.



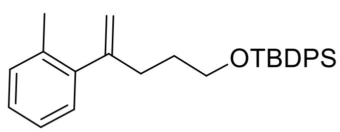
Triisopropyl(2-(4-methoxyphenyl)allyl)silane 3o

Yield: 72%, 20:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.35 (d, *J* = 8.4 Hz, 2H), 6.84 (d, *J* = 9.0 Hz, 2H), 5.01 (S, 1H), 4.92 (S, 1H), 3.81 (s, 3H), 2.07 (s, 2H), 1.05-1.08 (m, 3H), 0.97 (s, 18H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ External: 159.1, 147.0, 136.3, 127.8, 113.6, 110.5, 55.46, 18.9, 18.5, 11.5; Internal: 159.2, 152.3, 137.7, 126.9, 120.9, 113.5, 55.55, 22.6, 19.3, 12.6; **HRMS (EI)** Calcd. for $C_{19}H_{33}OSi$ ($[M+H]^+$): 305.2296, found: 305.2298.



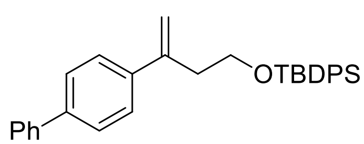
4-(5-((*tert*-Butyldiphenylsilyl)oxy)pent-1-en-2-yl)phenol 3p

Yield: 49%, 10:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.64-7.67 (m, 4H), 7.26-7.42 (m, 8H), 6.77 (d, *J* = 9.0 Hz, 2H), 5.19 (s, 1H), 4.96 (s,1H), 4.73 (s, 1H), 3.68 (t, *J* = 6.3 Hz, 2H), 2.57 (t, *J* = 7.2 Hz, 2H), 1.66-1.75 (m, 2H), 1.05 (s, 9H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 155.1, 147.5, 135.8, 134.2, 134.0, 129.7, 127.8, 127.6, 115.3, 111.0, 63.6, 31.8, 31.6, 27.1, 19.5; **HRMS (EI)** Calcd. for $C_{27}H_{31}O_2Si$ ($[M-H]^+$): 415.2098, found: 415.2108.



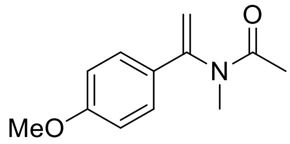
***tert*-Butyldiphenyl((4-(o-tolyl)pent-4-en-1-yl)oxy)silane 3q**

Yield: 85%, 7:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.62-7.65 (m, 4H), 7.36-7.44 (m, 6H), 7.02-7.15 (m, 4H), 5.16 (d, *J* = 1.2 Hz, 1H), 4.85 (d, *J* = 1.5 Hz, 1H), 3.66 (t, *J* = 6.0 Hz, 2H), 2.44 (t, *J* = 7.8 Hz, 2H), 2.27 (s, 3H), 1.60-1.69 (m, 2H), 1.03 (s, 9H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 150.0, 143.3, 135.8, 135.0, 134.3, 130.3, 129.7, 128.6, 127.8, 126.9, 125.6, 114.0, 63.7, 34.2, 31.0, 27.1, 20.1, 19.4; **HRMS (EI)** Calcd. for $C_{28}H_{38}NOSi$ ($[M+NH_4]^+$): 432.2718, found: 432.2710.



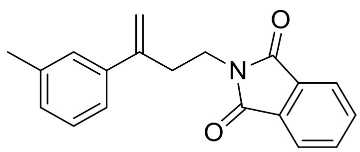
((3-([1,1'-Biphenyl]-4-yl)but-3-en-1-yl)oxy)(*tert*-butyl)diphenylsilane 3r

Yield: 82%, 4:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.24-7.67 (m, 19H), 5.40 (s, 1H), 5.10 (s, 1H), 3.80 (t, *J* = 6.9 Hz, 2H), 2.80 (t, *J* = 6.9 Hz, 2H), 1.03 (s, 9H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 144.8, 141.0, 140.3, 139.9, 135.8, 134.1, 129.8, 129.0, 127.8, 127.5, 127.21, 127.18, 126.6, 114.3, 63.3, 38.7, 27.0, 19.4; **HRMS (EI)** Calcd. for $C_{32}H_{38}NOSi$ ($[M+NH_4]^+$): 480.2718, found: 480.2739.



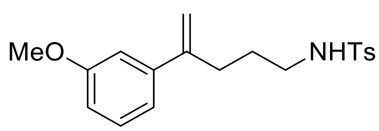
***N*-(1-(4-Methoxyphenyl)vinyl)-*N*-methylacetamide[9] 3s**

Yield: 83%, 20:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.34 (d, *J* = 9.0 Hz, 2H), 6.90 (d, *J* = 9.0 Hz, 2H), 5.57 (s, 1H), 5.11 (s, 1H), 3.83 (s, 3H), 3.09 (s, 3H), 2.03 (s, 3H).



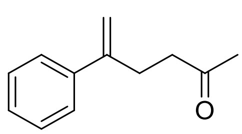
2-(3-(*m*-Tolyl)but-3-en-1-yl)isoindoline-1,3-dione 3t

Yield: 72%, 4:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.78-7.81 (m, 2H), 7.67-7.69 (m, 2H), 7.17-7.26 (m, 3H), 7.00 (d, *J* = 7.5 Hz, 1H), 5.33 (d, *J* = 0.9 Hz, 1H), 5.12 (d, *J* = 0.9 Hz, 1H), 2.83 (t, *J* = 7.5 Hz, 2H), 2.89 (t, *J* = 7.5 Hz, 2H), 2.32 (s, 3H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 168.4, 145.4, 140.4, 138.1, 134.0, 132.3, 128.5, 127.0, 123.5, 123.3, 114.6, 37.7, 34.2, 21.7; **HRMS (EI)** Calcd. for $C_{19}H_{17}NO_2$ ($[M]^+$): 291.1254, found: 291.1249.



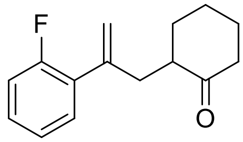
***N*-(4-(3-Methoxyphenyl)pent-4-en-1-yl)-4-methylbenzenesulfonamide 3u**

Yield: 61%, >20:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.70 (d, *J* = 8.4 Hz, 2H), 7.19-7.29 (m, 3H), 6.80-6.91 (m, 3H), 5.24 (d, *J* = 0.6 Hz, 1H), 5.00 (d, *J* = 1.2 Hz, 1H), 4.43 (br, 1H), 3.81 (s, 3H), 2.91-2.98 (m, 2H), 2.48 (t, *J* = 7.2 Hz, 2H), 2.42 (s, 3H), 1.54-1.64 (m, 2H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 159.8, 147.3, 143.6, 142.4, 137.2, 129.9, 129.6, 127.3, 118.8, 113.6, 113.0, 112.3, 55.4, 42.9, 32.6, 28.2, 21.7; **HRMS (EI)** Calcd. for $C_{19}H_{27}N_2O_3S$ ($[M+NH_4]^+$): 363.1737, found: 363.1746.



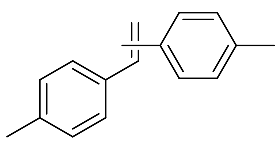
5-Phenylhex-5-en-2-one 3v

Yield: 73%, 10:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.26-7.41 (m, 5H), 5.28 (s, 1H), 5.07 (s, 1H), 2.79 (t, *J* = 7.2 Hz, 2H), 2.58 (t, *J* = 7.2 Hz, 2H), 2.12 (s, 3H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 208.3, 147.4, 140.8, 128.6, 127.8, 126.3, 113.0, 42.6, 30.2, 29.5; **HRMS (EI)** Calcd. for $C_{12}H_{18}NO$ ($[M+NH_4]^+$): 192.1383, found: 192.1379.



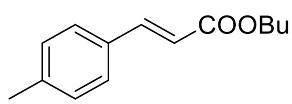
2-(2-(2-Fluorophenyl)allyl)cyclohexanone 3w

Yield: 69%, 4:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.20-7.28 (m, 2H), 7.00-7.12 (m, 2H), 5.22 (d, *J* = 8.7 Hz, 2H), 3.13-3.23 (m, 1H), 1.97-2.42 (m, 6H), 1.78-1.85 (m, 1H), 1.37-1.72 (m, 2H), 1.26-1.36 (m, 1H); **^{13}C NMR** (75 MHz, $CDCl_3$) δ 212.7, 161.7, 158.4, 142.5, 130.2, 130.1, 129.5, 129.3, 129.1, 129.0, 124.3, 124.2, 118.1, 118.0, 116.2, 115.9, 48.8, 42.3, 36.7, 36.6, 33.5, 28.2, 25.1; **HRMS (EI)** Calcd. for $C_{15}H_{17}FO_2$ ($[M]^+$): 232.1258, found: 232.1254.



***di-p*-Tolylethene (α:β = 1:1)[11,10] 3x**

Yield: 93%, 1:1 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ α-product: 7.24 (d, *J* = 8.1 Hz, 4H), 7.14 (d, *J* = 7.5 Hz, 4H), 5.38 (s, 2H), 2.37 (s, 6H); β-product: 7.40 (d, *J* = 8.1 Hz, 4H), 7.16 (d, *J* = 7.8 Hz, 4H), 7.04 (s, 2H), 2.36 (s, 6H).



(*E*)-Butyl 3-(*p*-tolyl)acrylate[11] 3y

Yield: 95%, <1:20 regioselectivity. **^{1}H NMR** (300 MHz, $CDCl_3$) δ 7.66 (d, *J* = 16.2 Hz, 1H), 7.43 (d, *J* = 7.5 Hz, 2H), 7.19 (d, *J* = 7.8 Hz, 2H), 6.40 (d, *J* = 16.2 Hz, 1H), 4.20 (t, *J* = 6.6 Hz, 2H), 2.37 (s, 3H), 1.64-1.71 (m, 2H), 1.40-1.48 (m, 2H), 0.97 (t, *J* = 7.2 Hz, 3H).

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[9] Ruan, J.; Iggo, J. A.; Berry, N. G.; Xiao, J. *J. Am. Chem. Soc.* **2010**, *132*, 16689.
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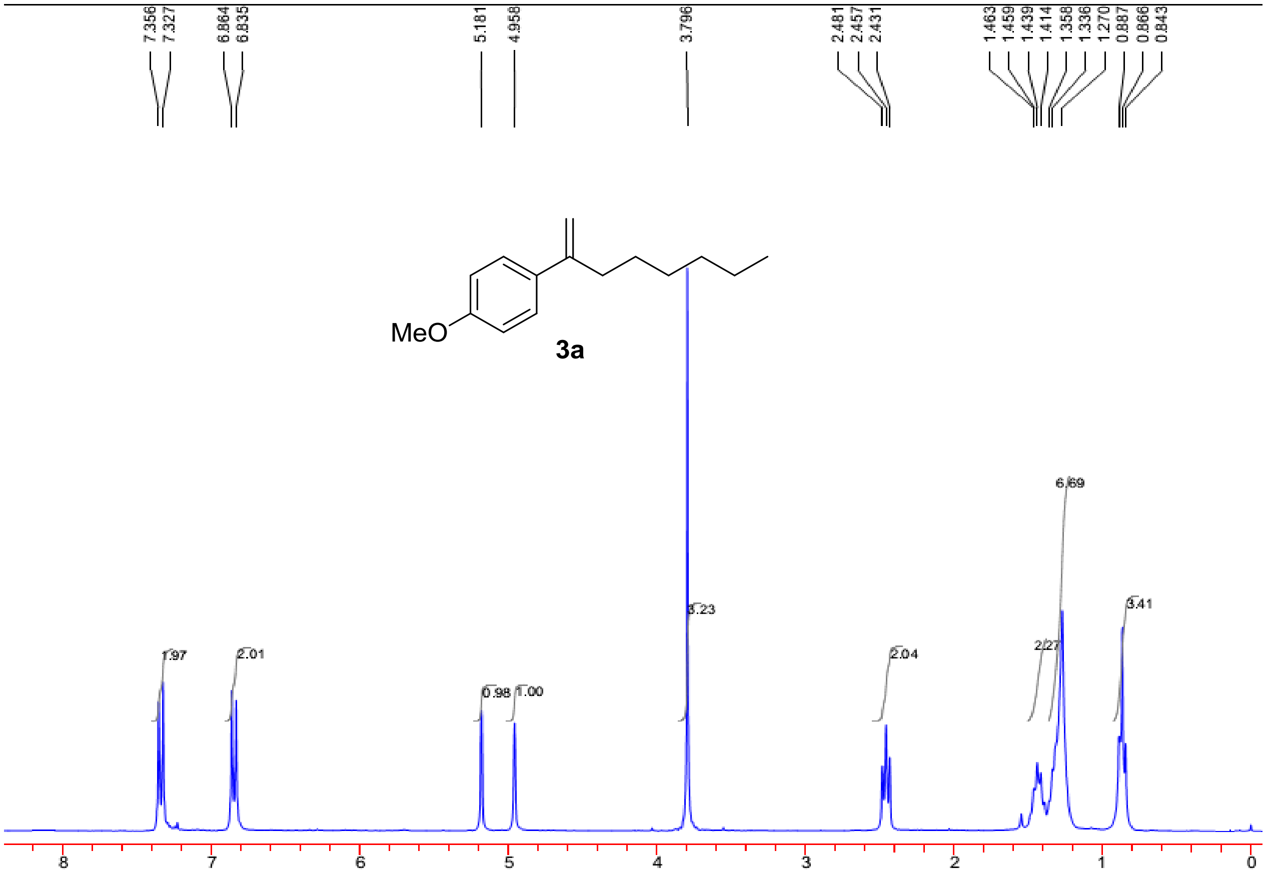
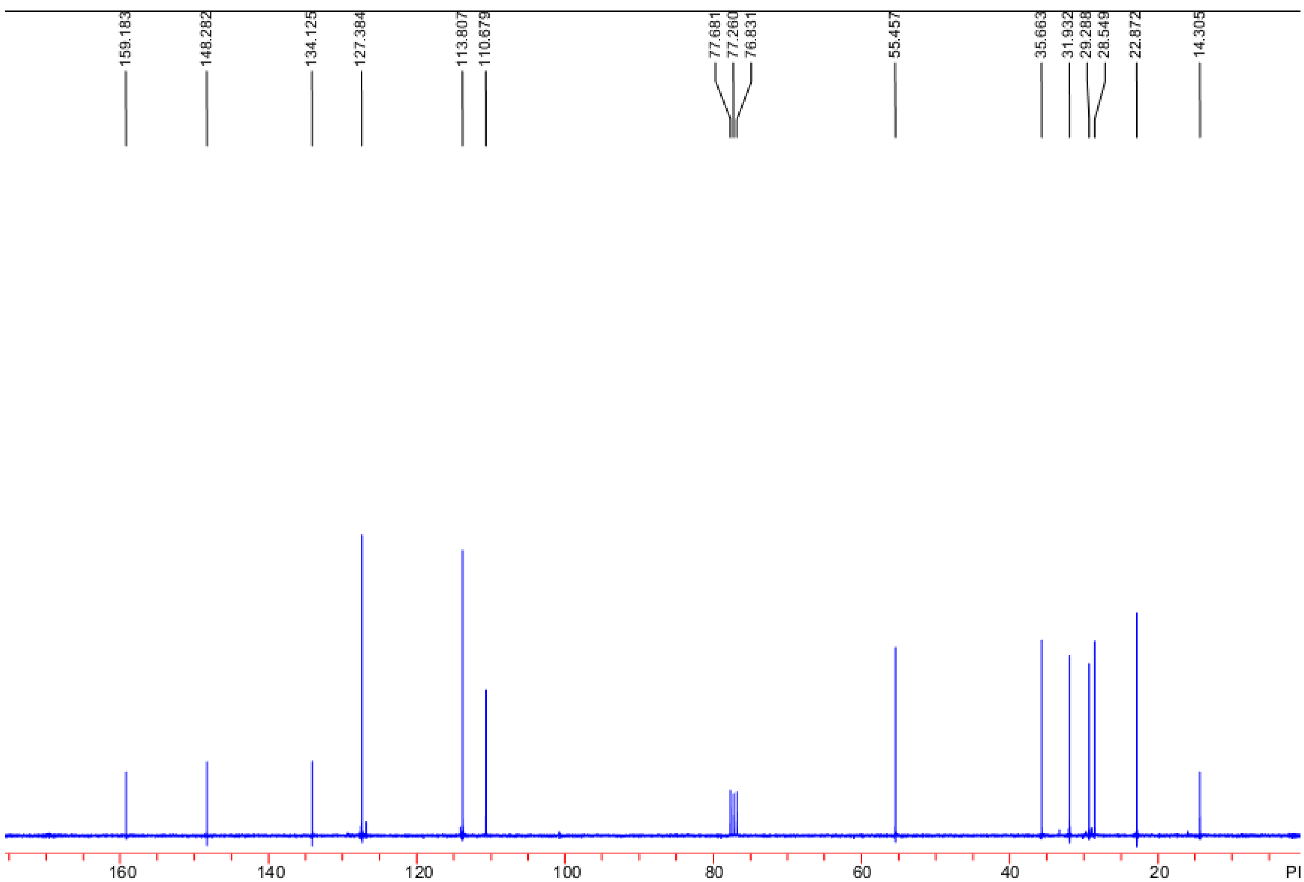
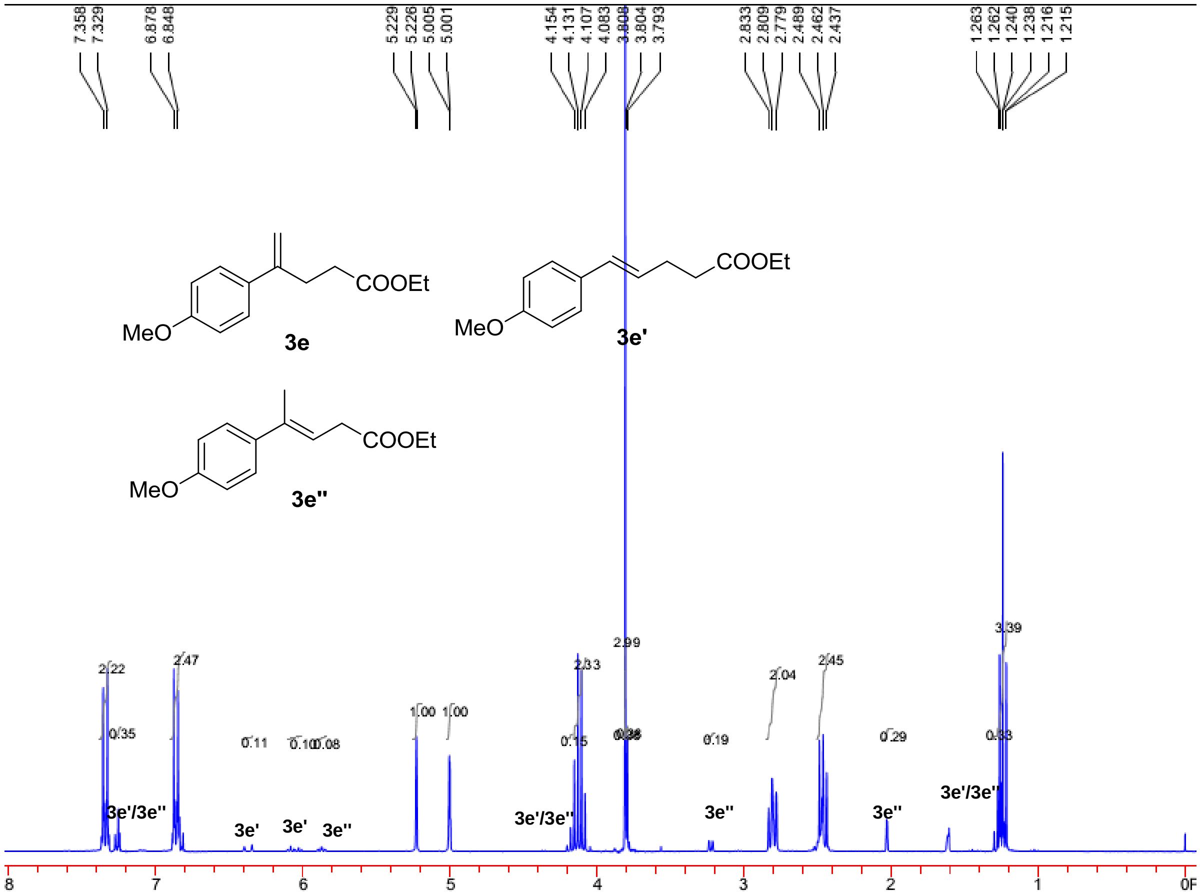
[11] Yang, F.-L.; Ma, X.-T.; Tian, S.-K. *Chem. Eur. J.* **2012**, *18*, 1582.

[1]H NMR and [13]C NMR Spectra



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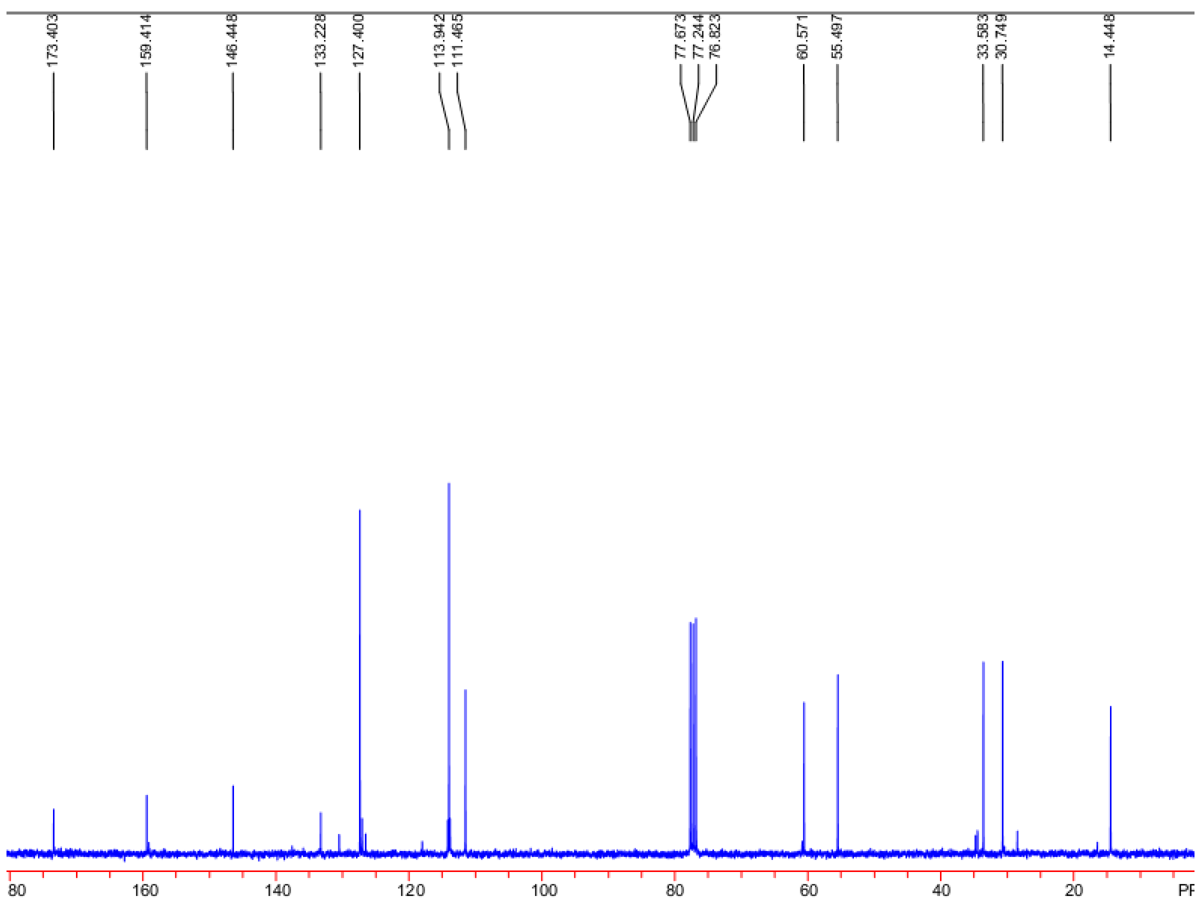
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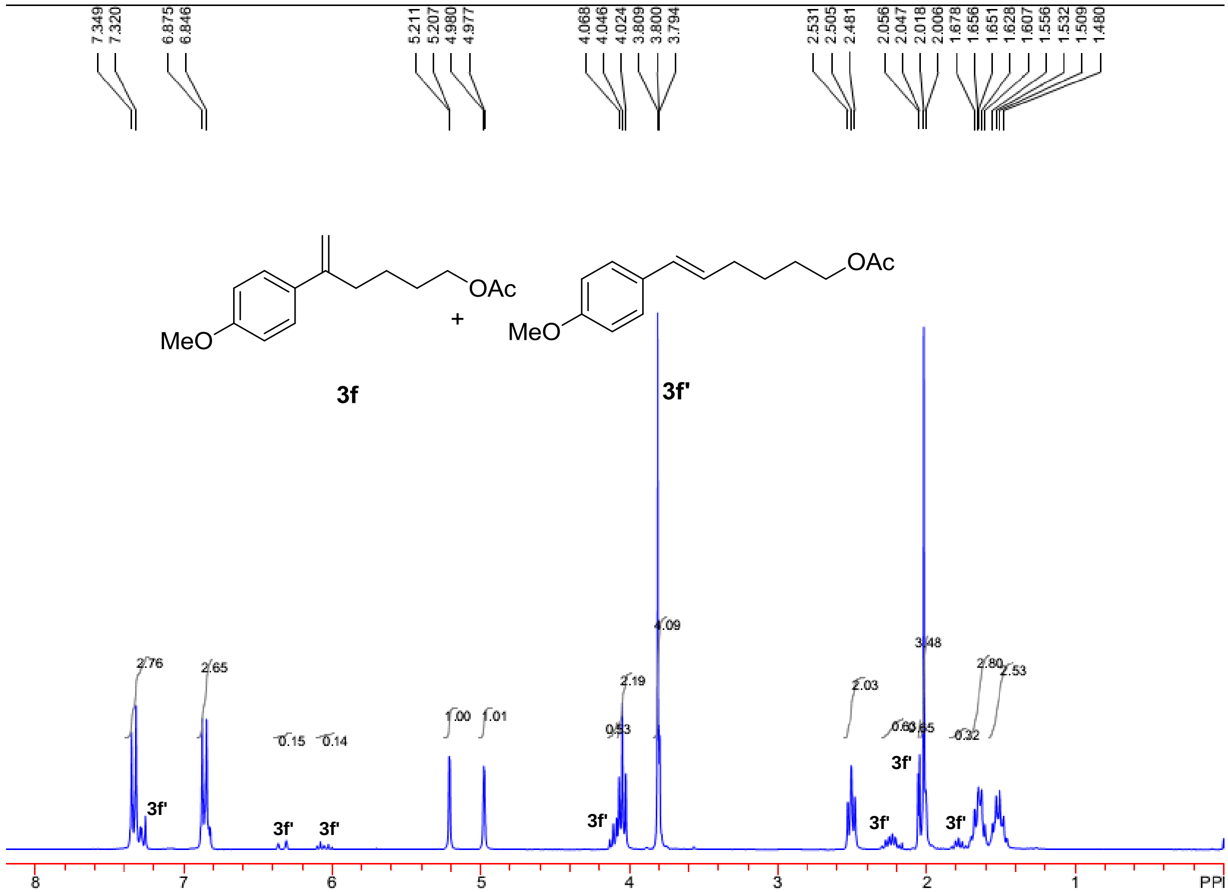
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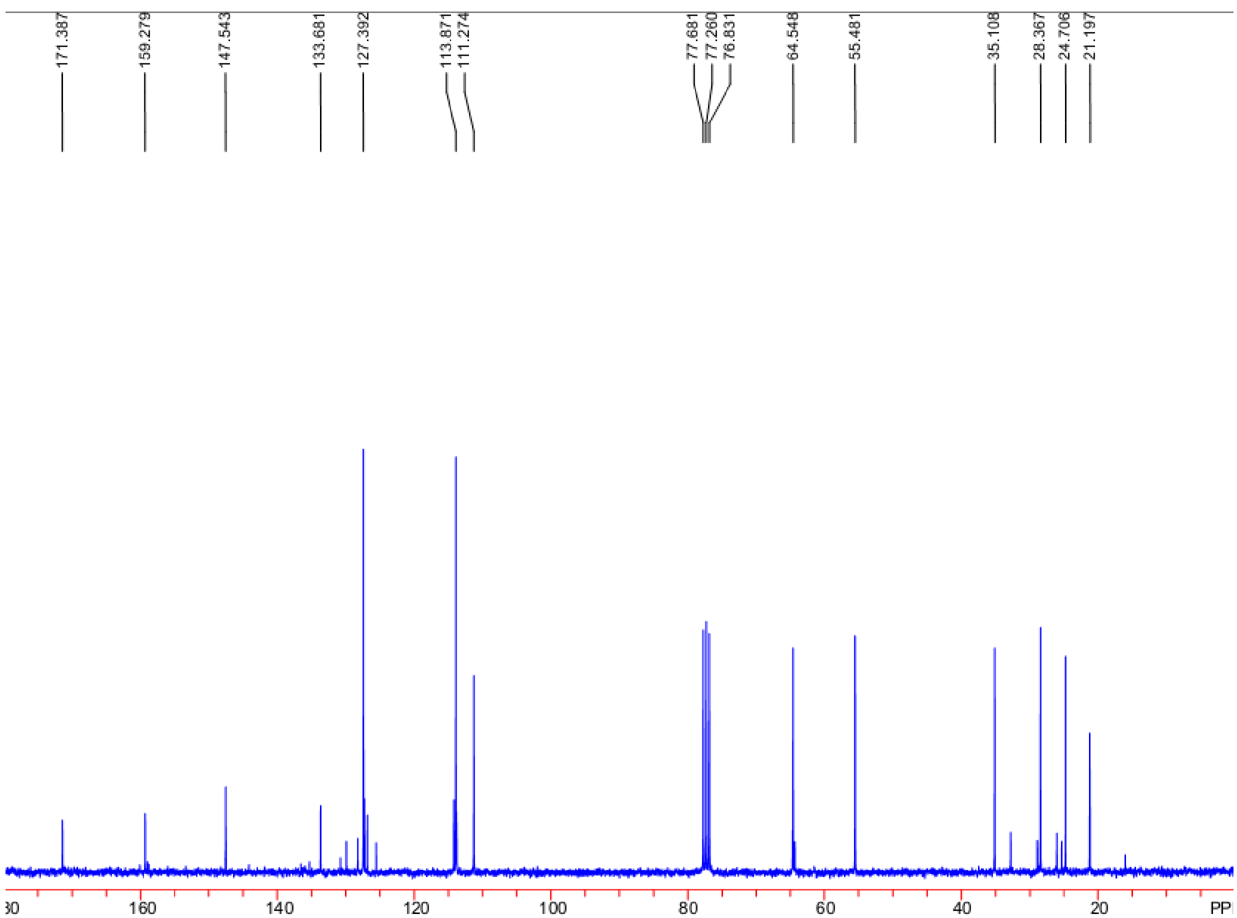
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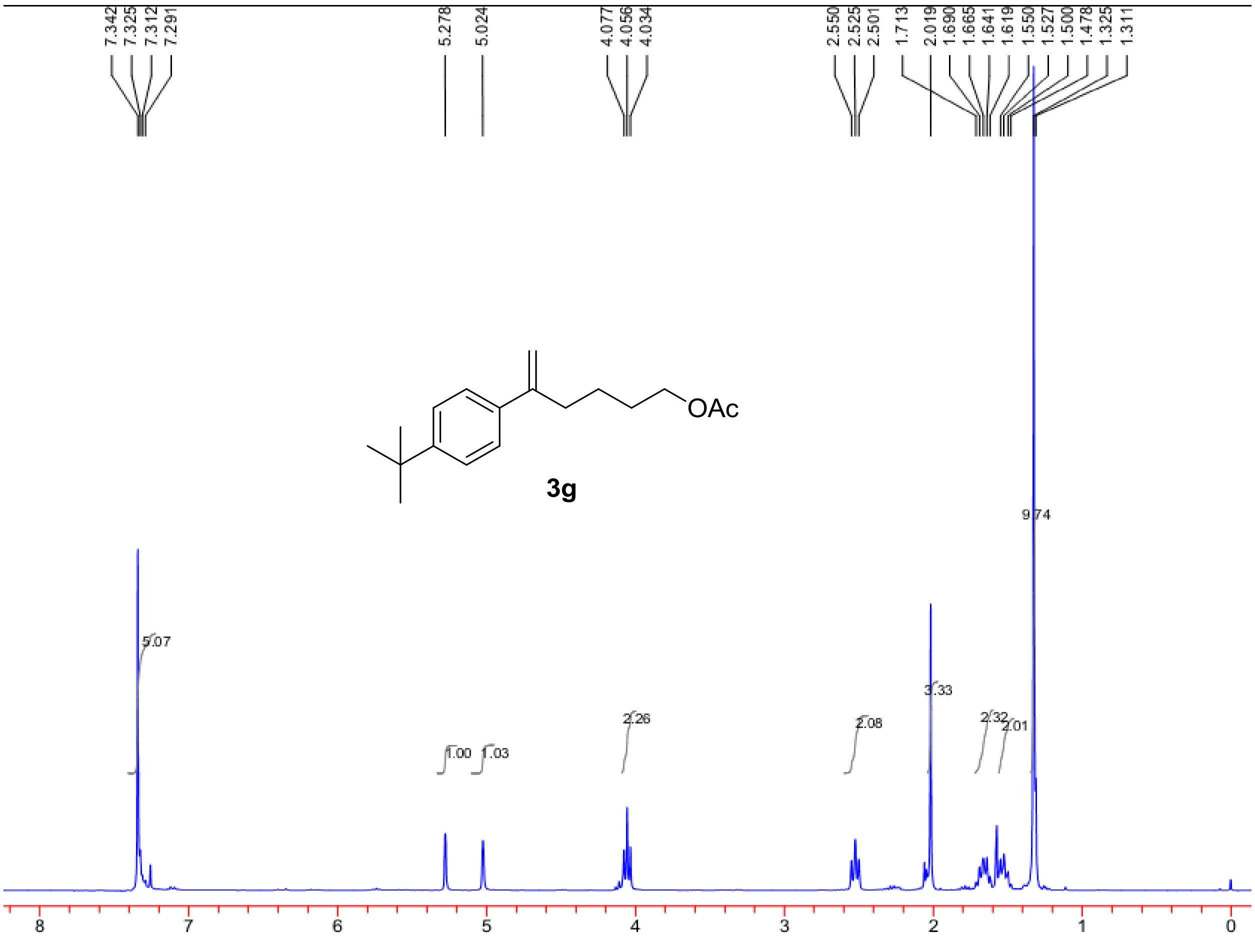
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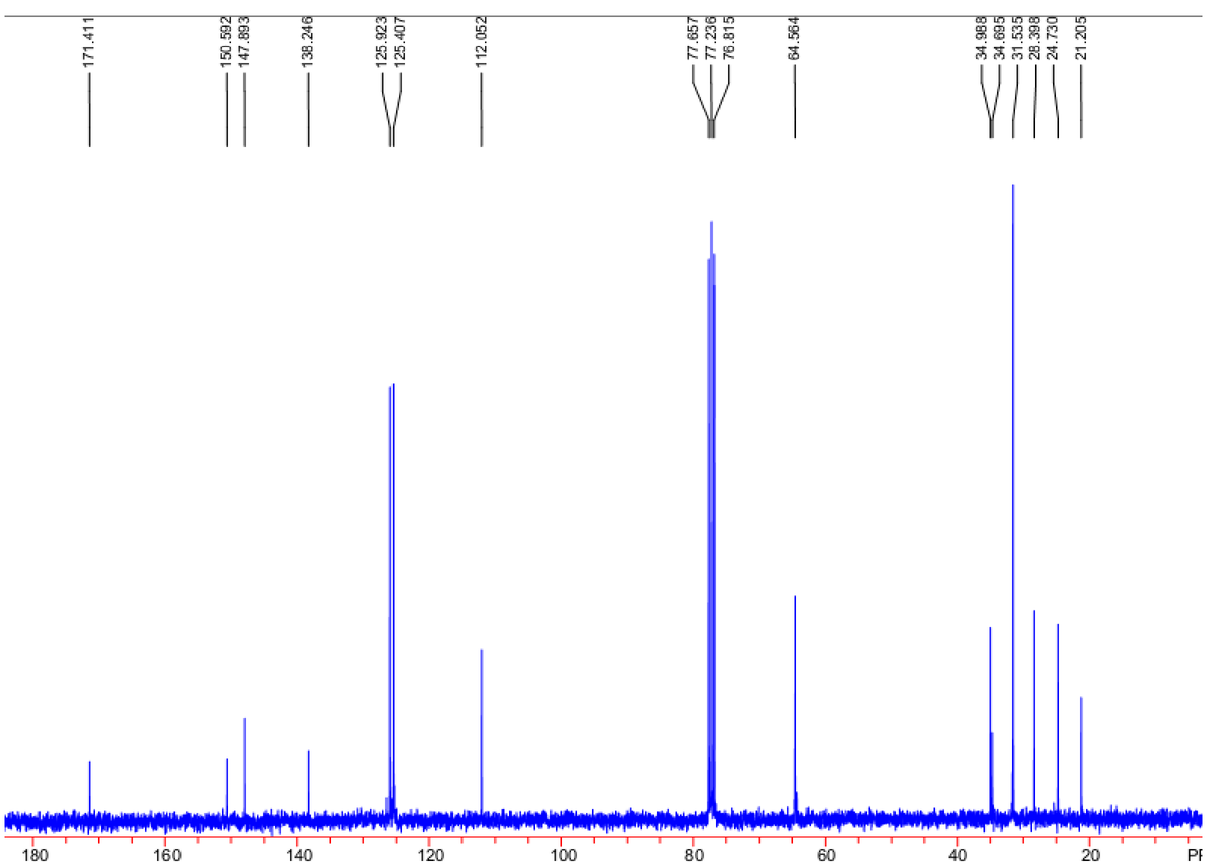
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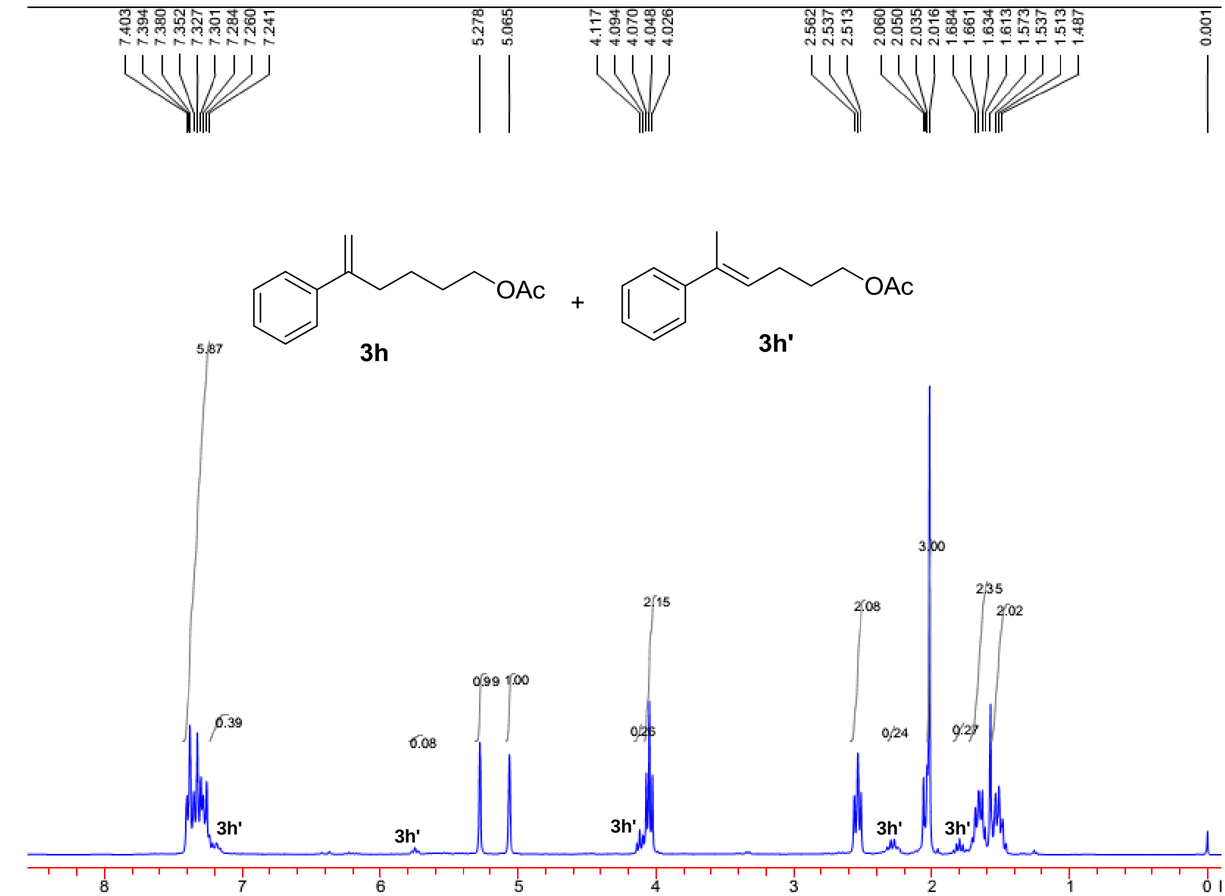
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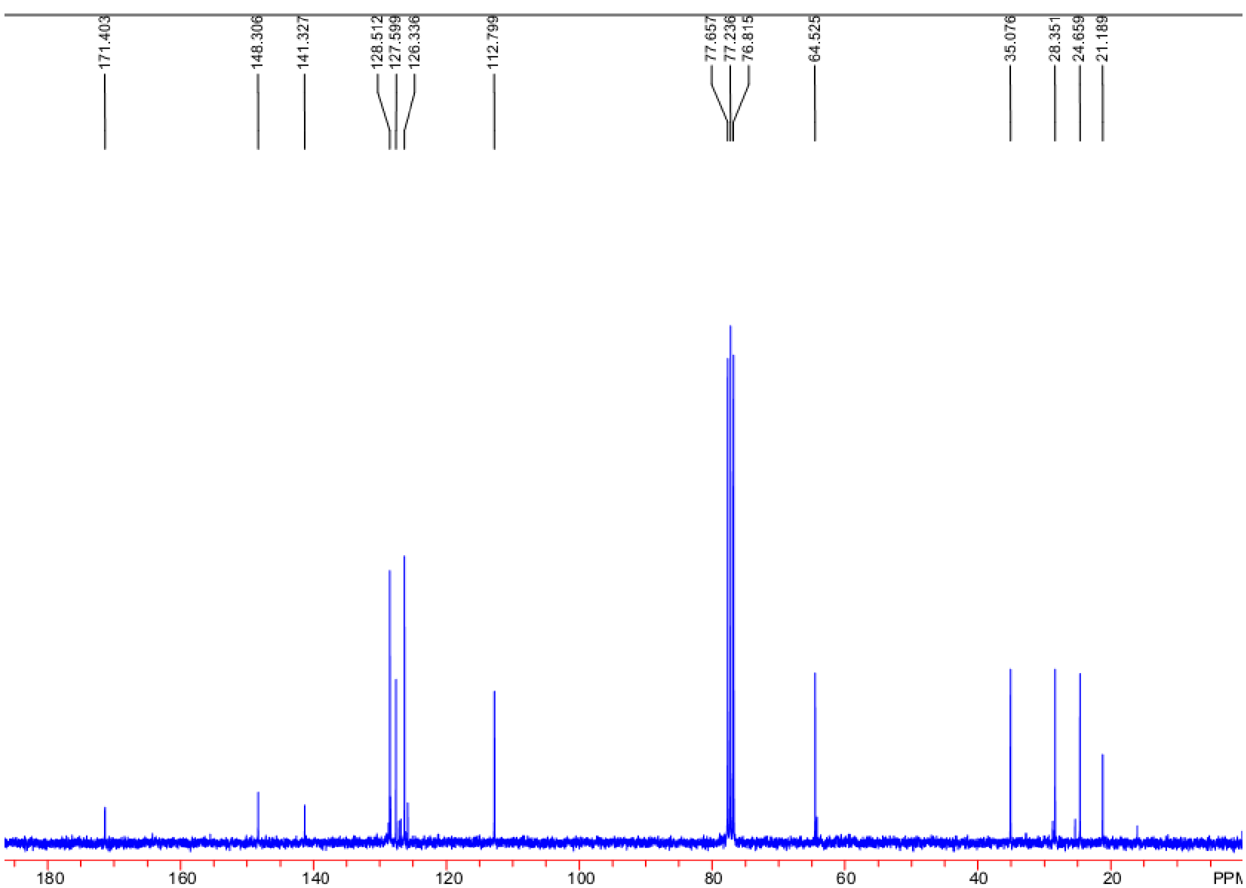
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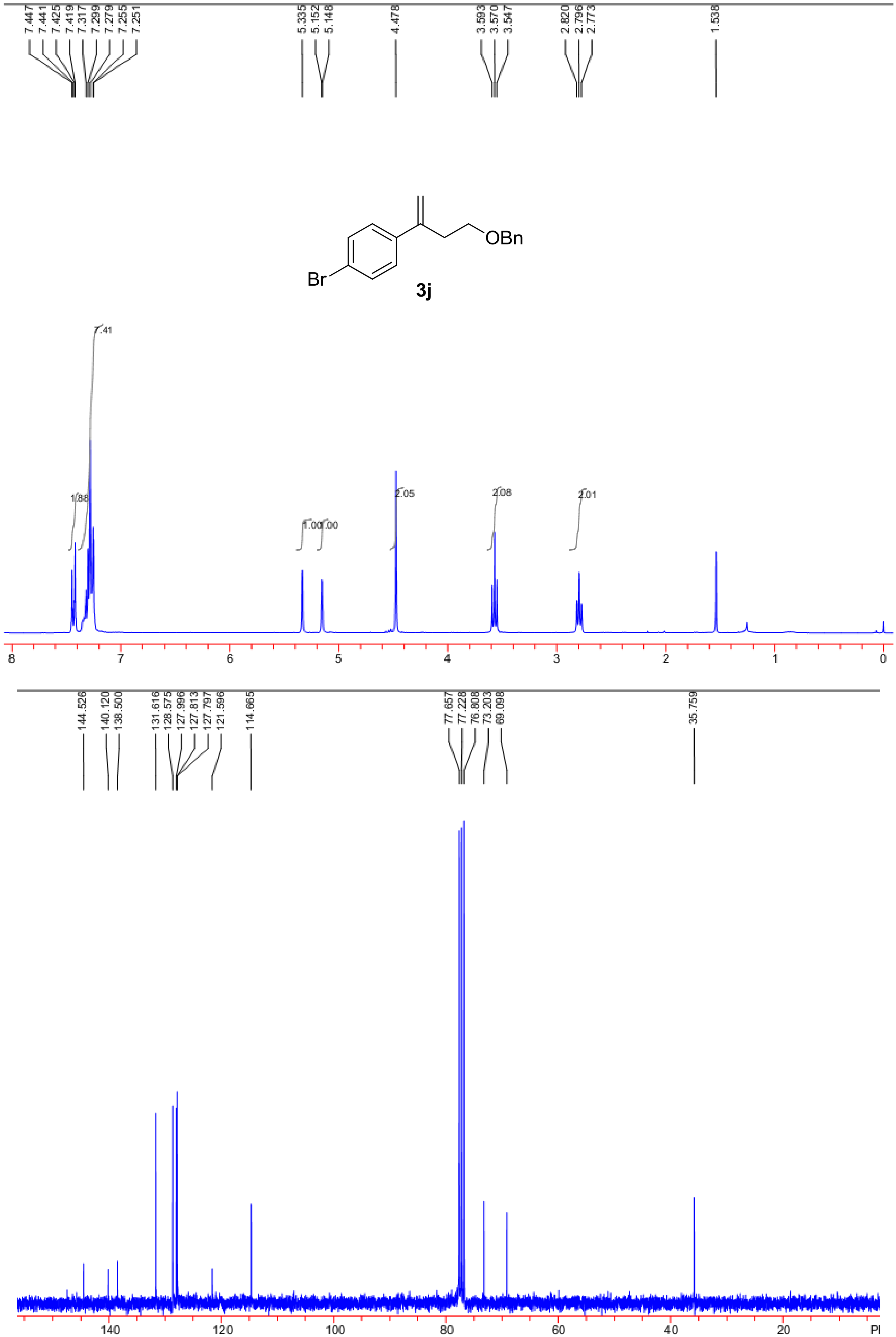

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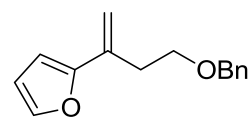

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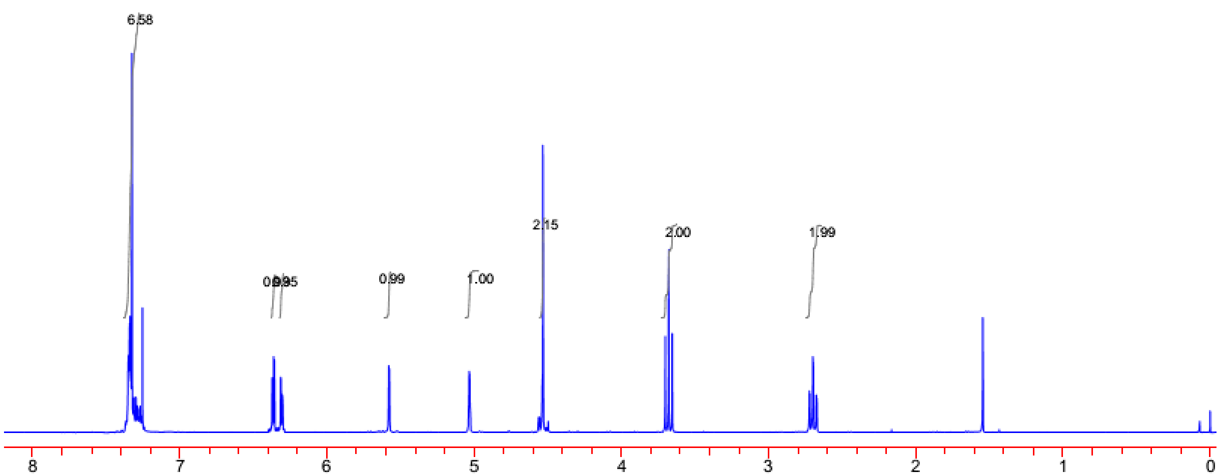
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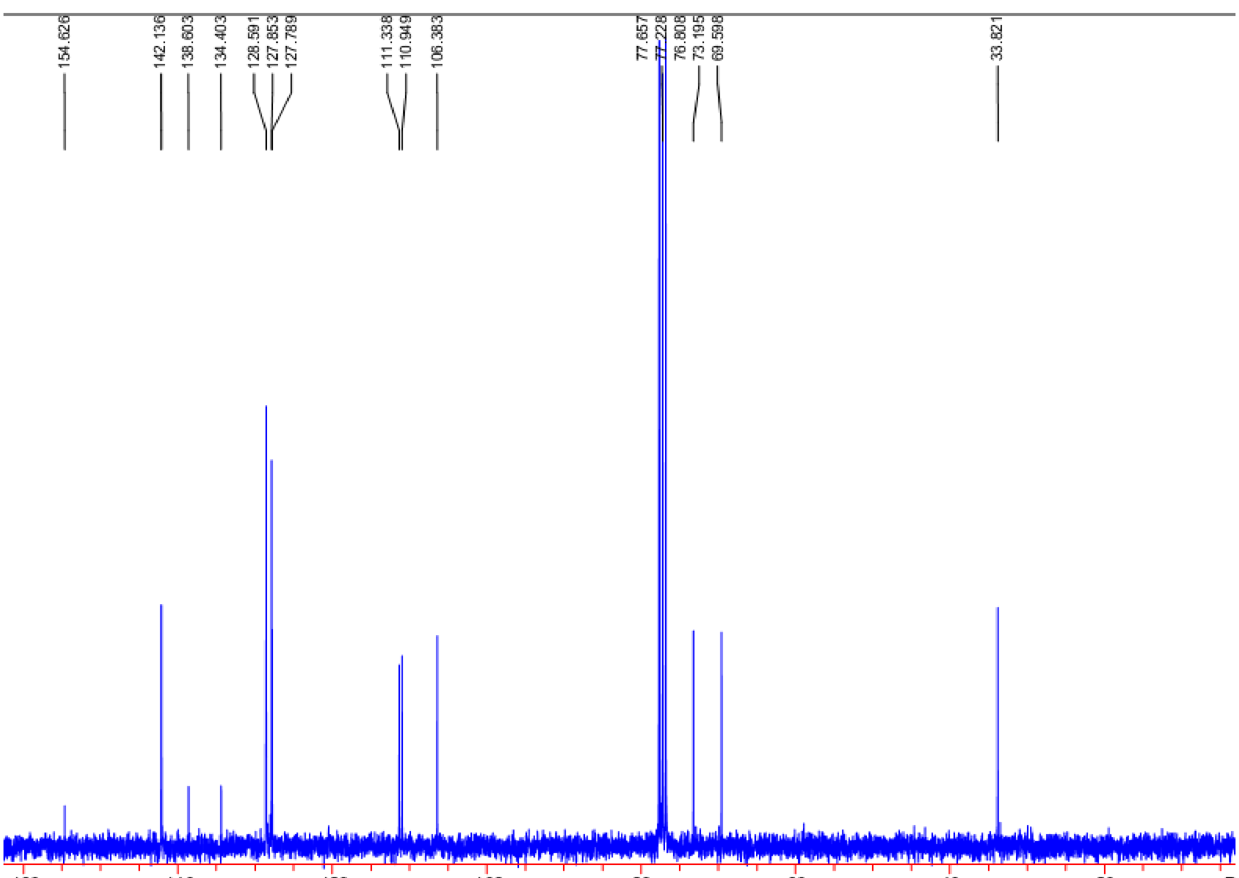
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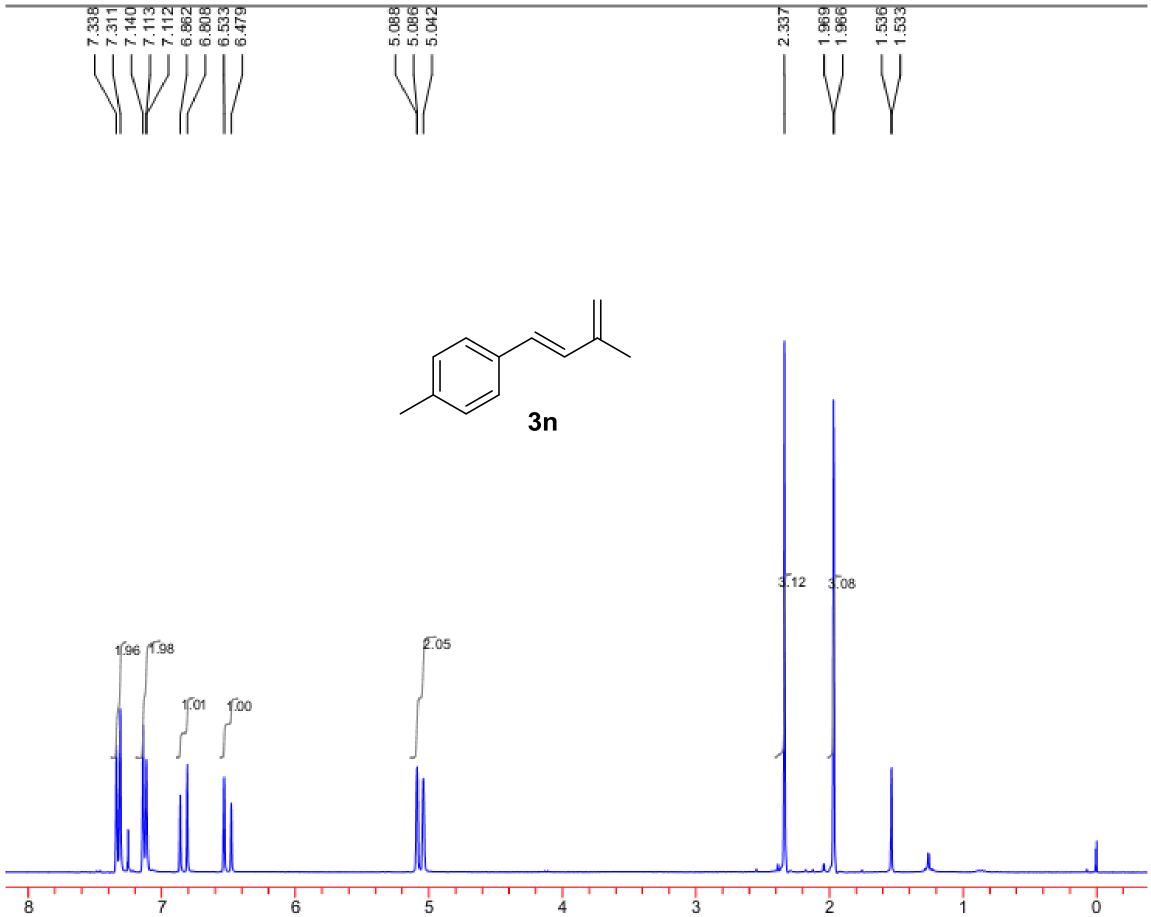
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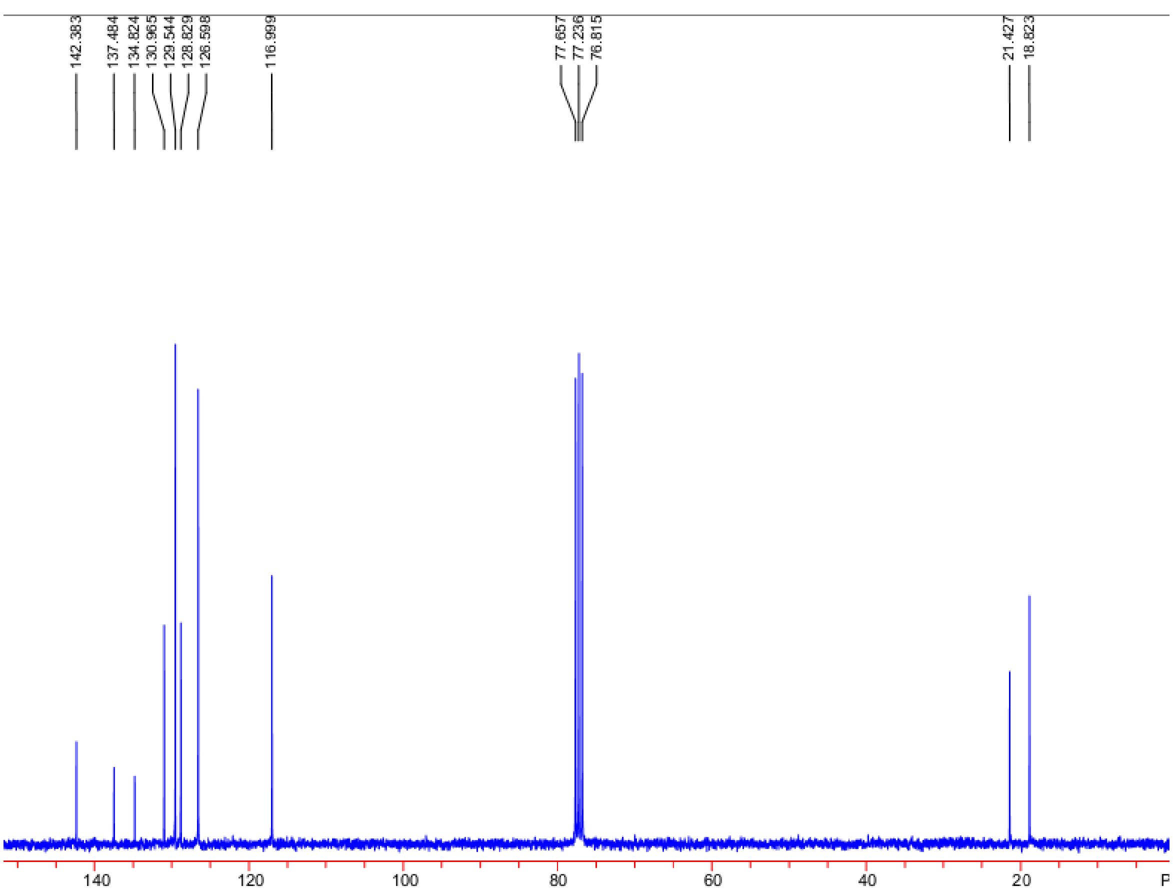
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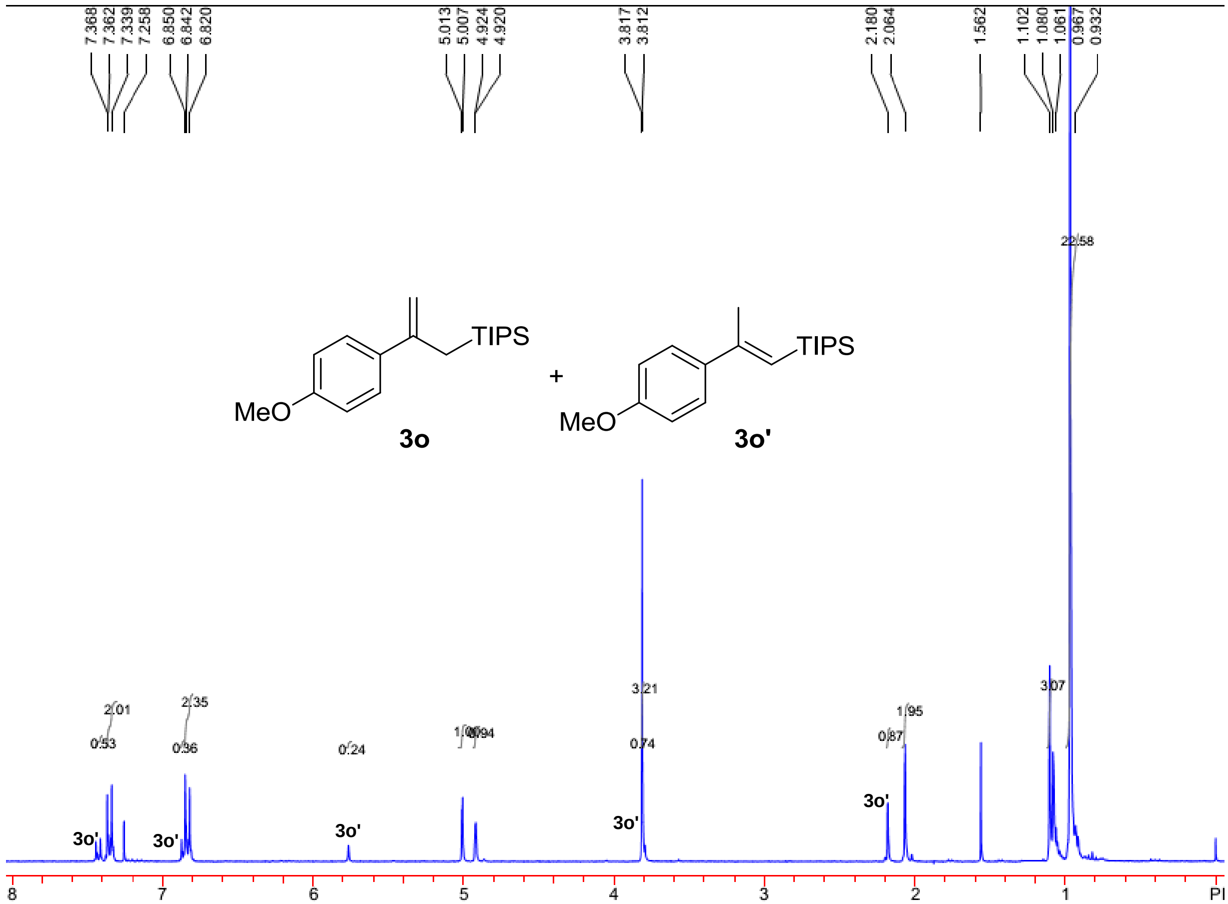

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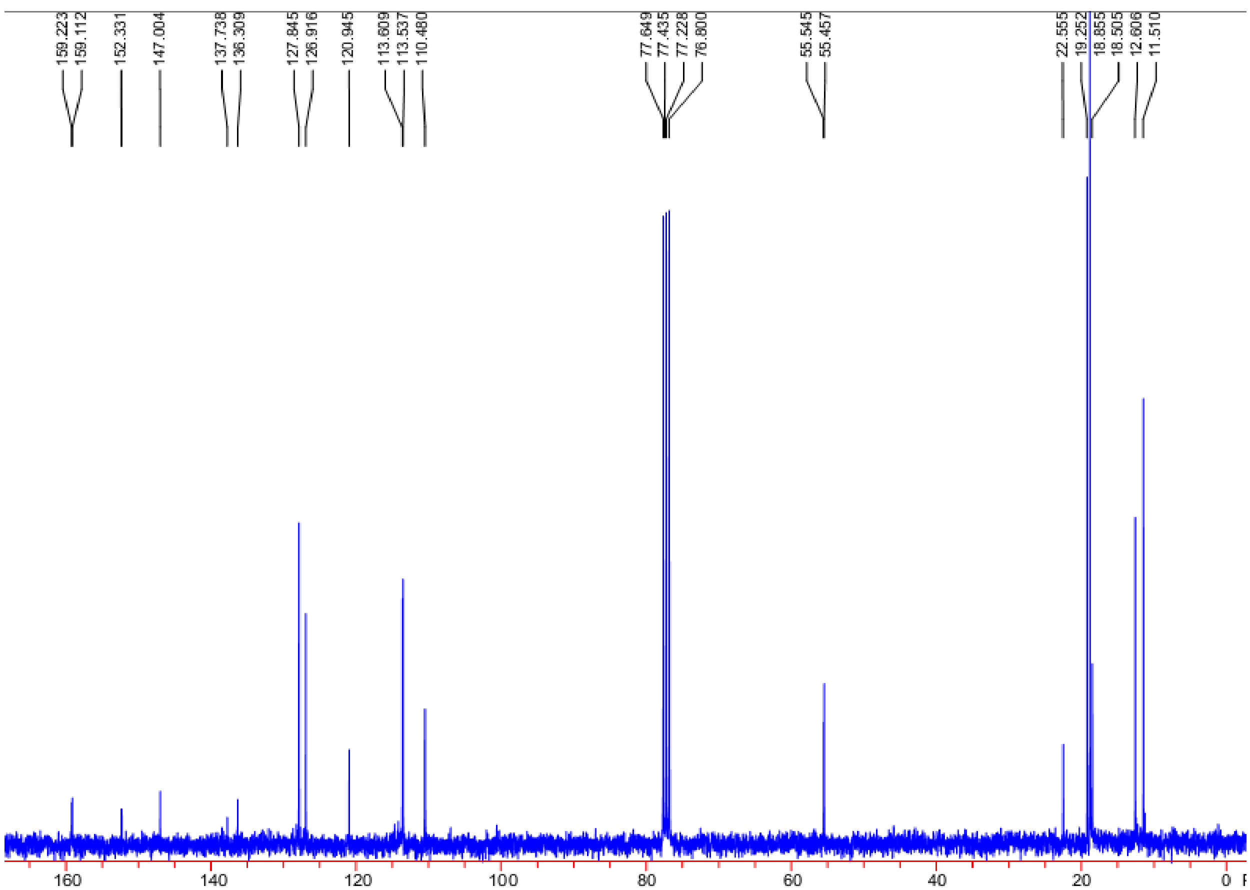

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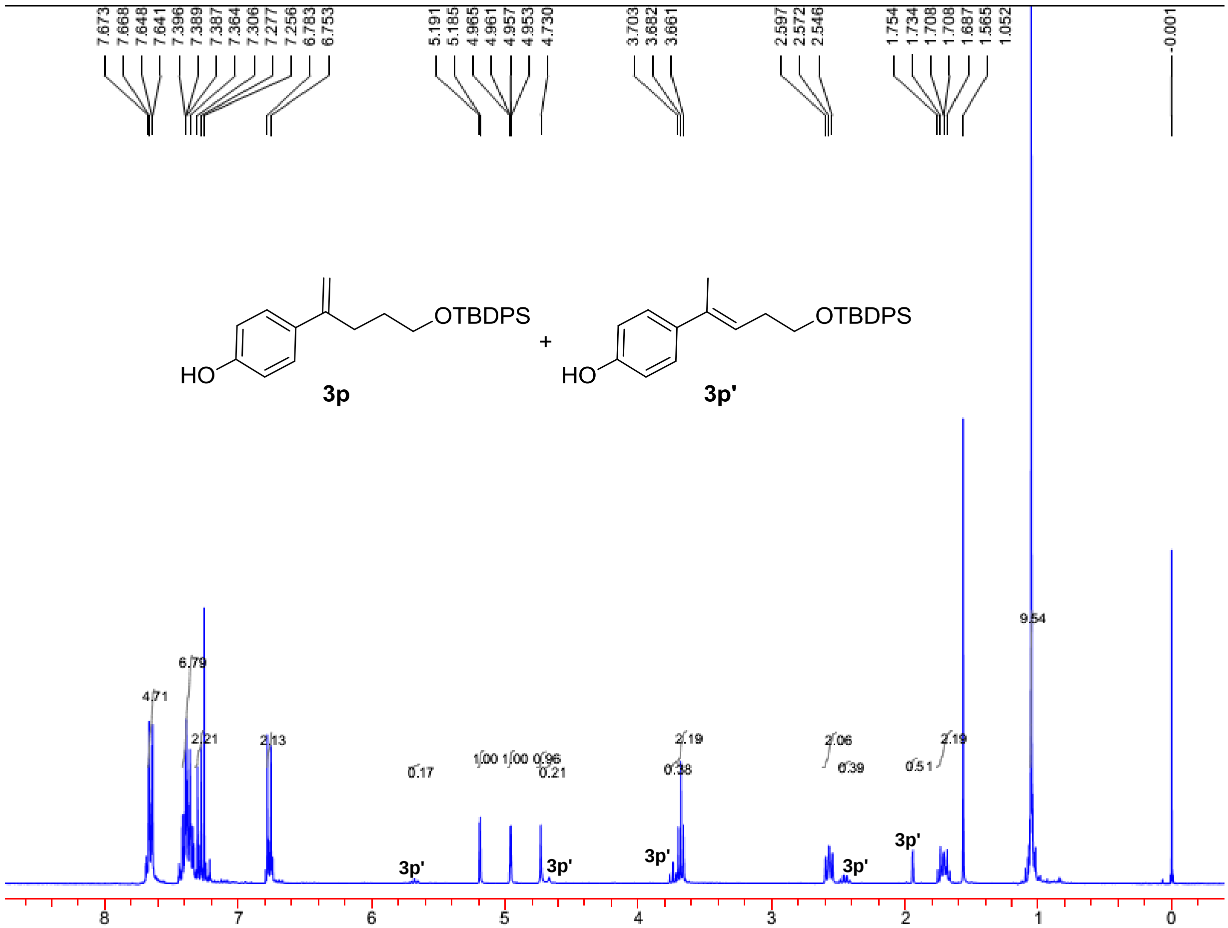
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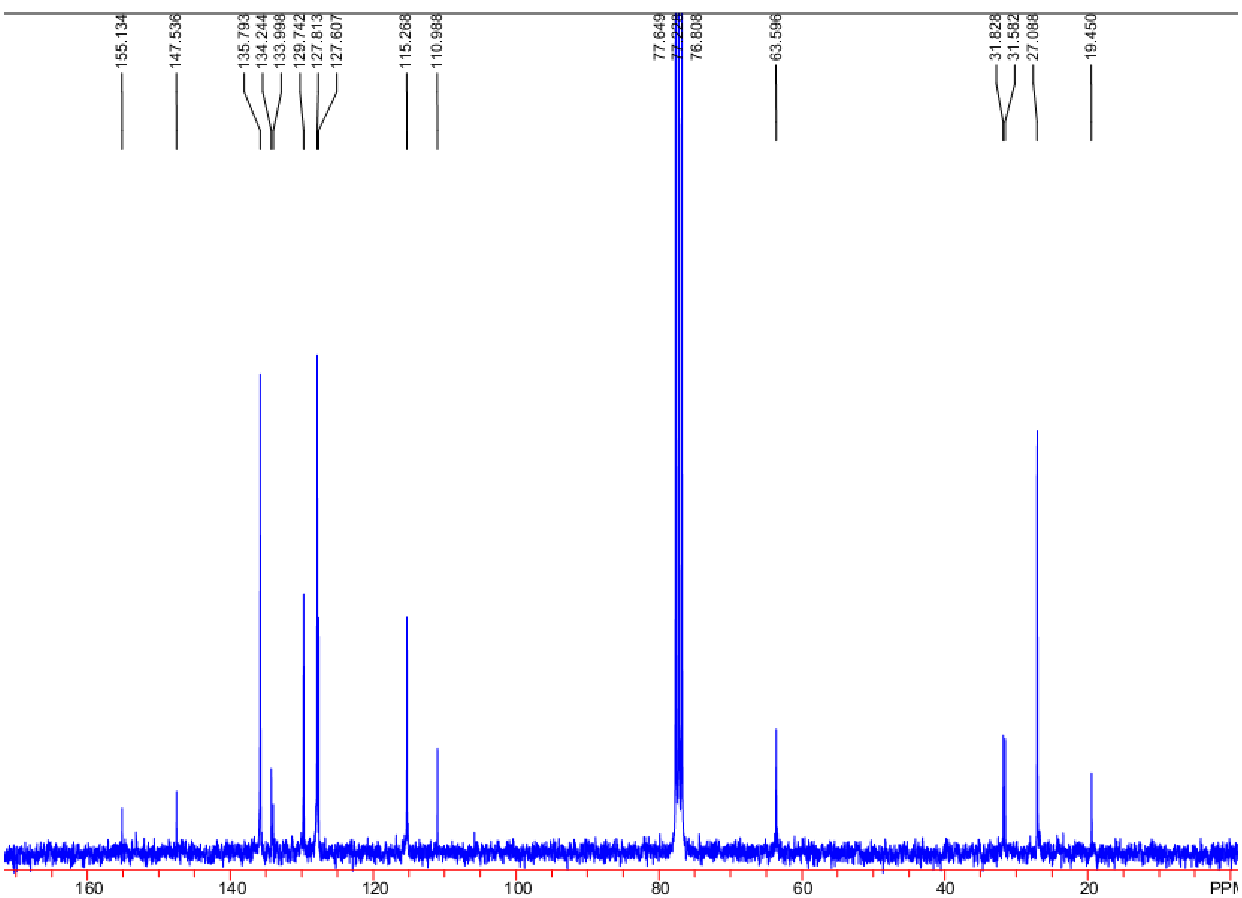
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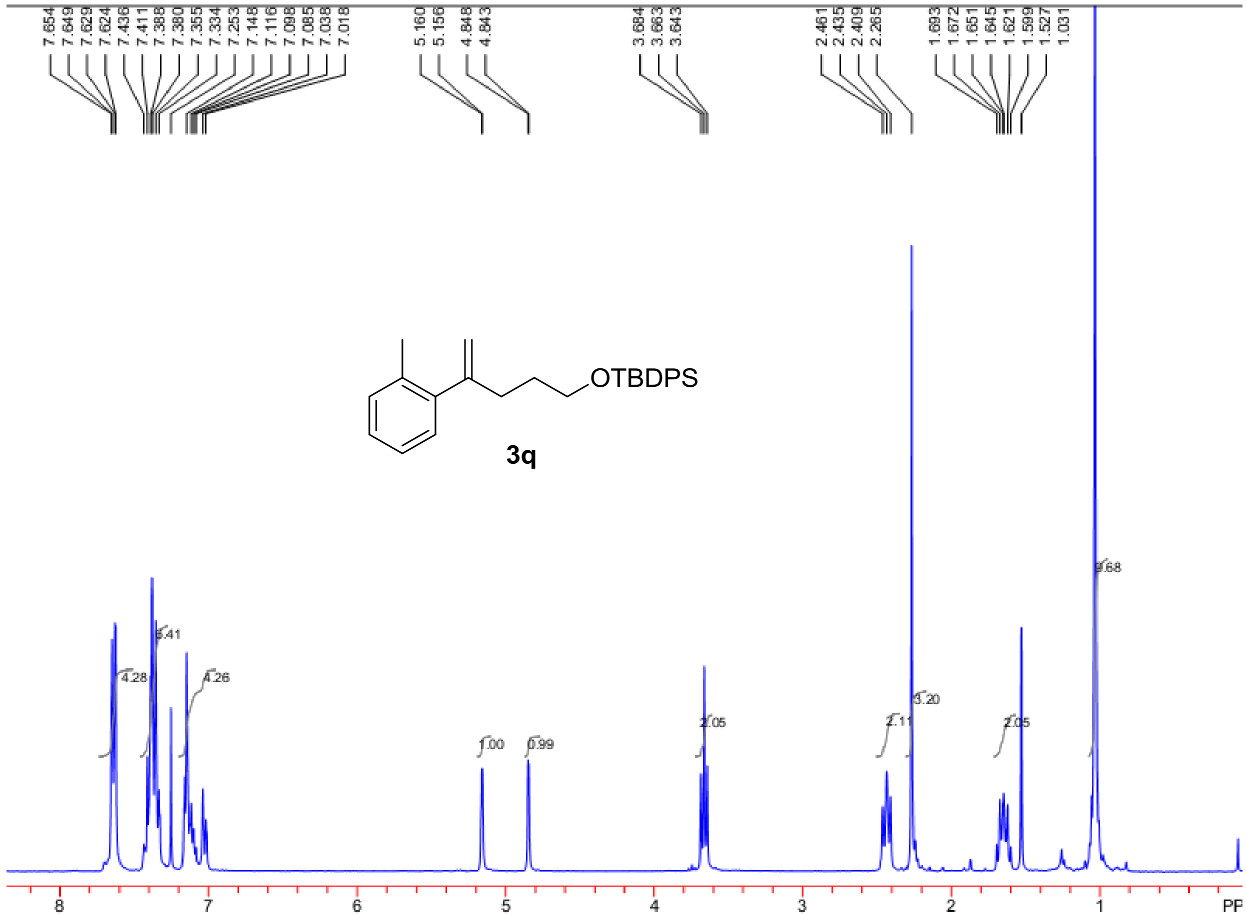
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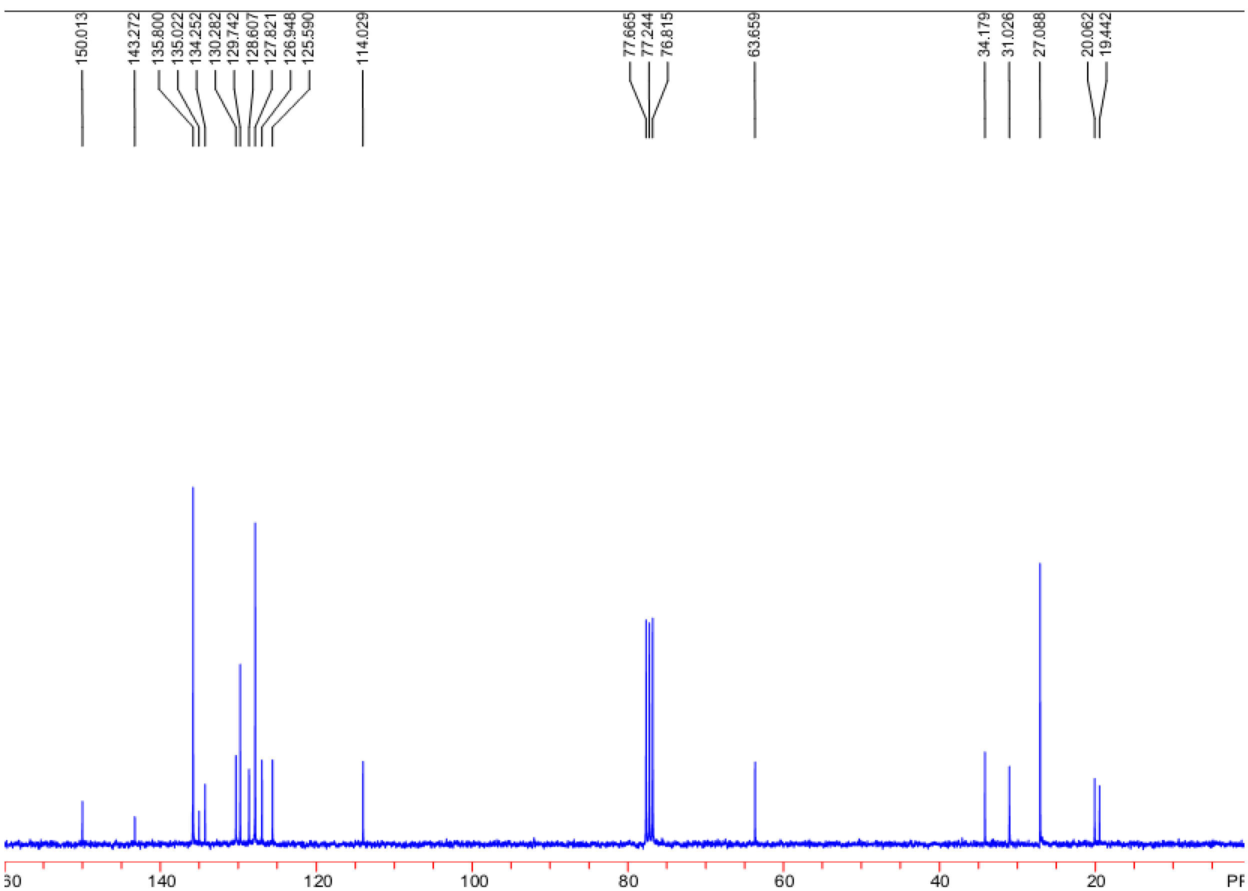
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77.665
77.244
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20.062
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20
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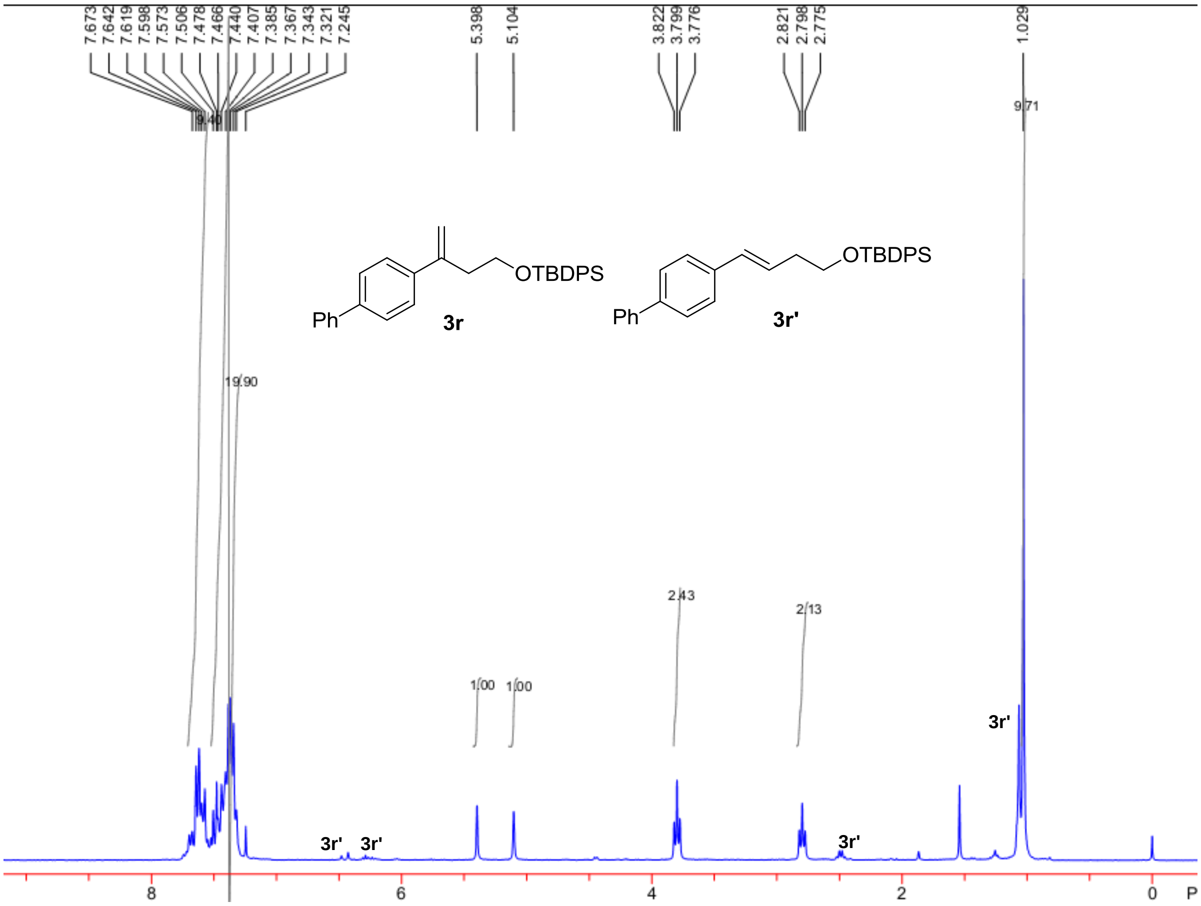
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3.822
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3.776
2.821
2.798
2.775
1.029
9.40
9.71
19.90
2.43
2.13
1.00
1.00
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Ph
3r
OTBDPS
Ph
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3r'
3r'
3r'
3r'
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6
4
2
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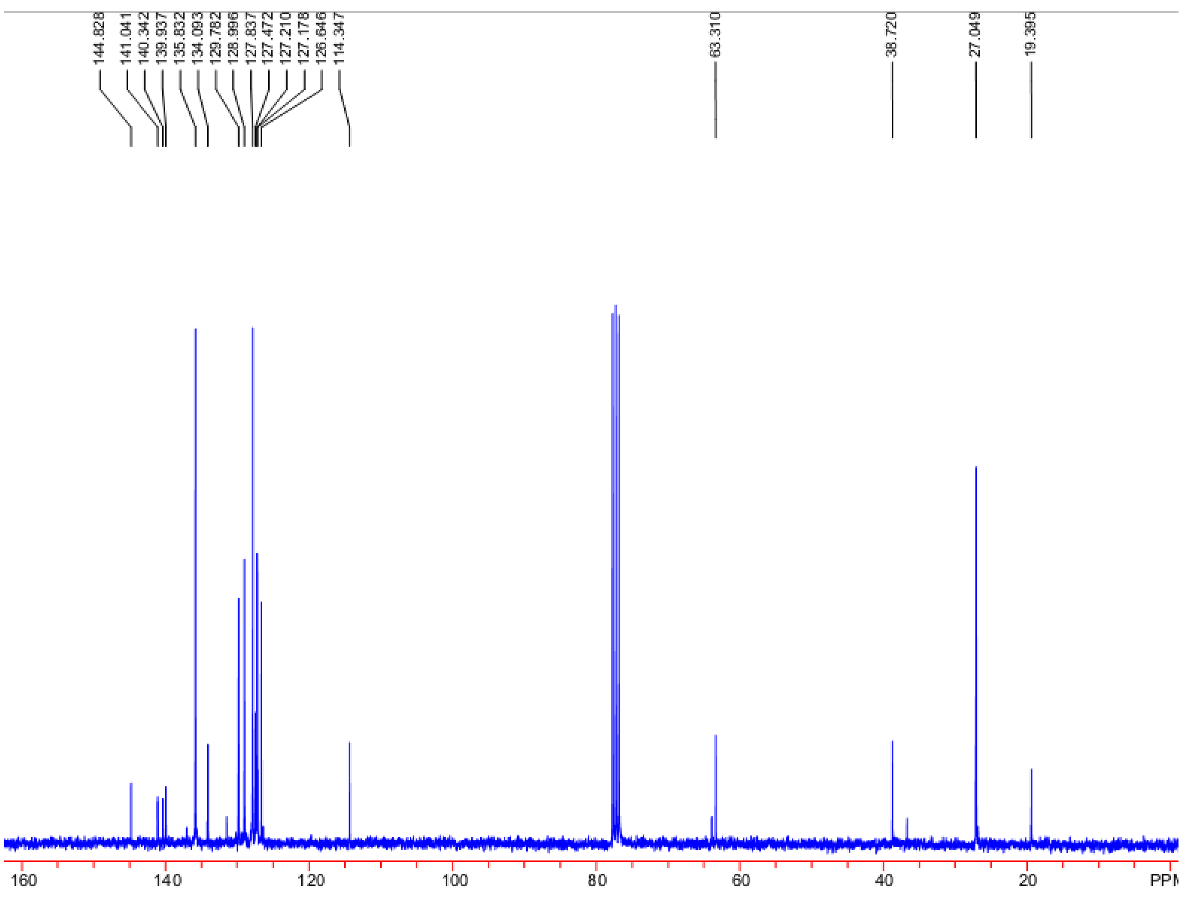
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160
140
120
100
80
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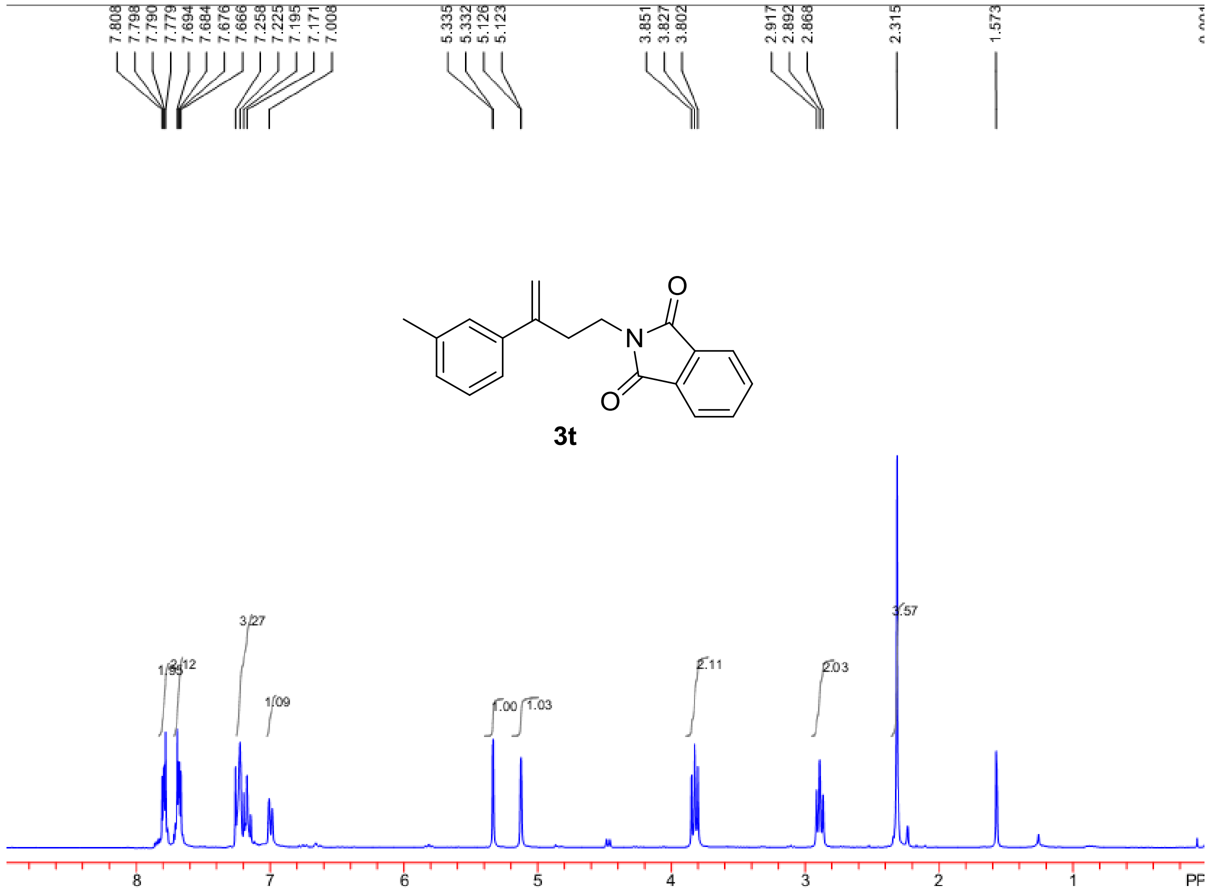
40
20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2.917 2.892 2.868
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1.573
3t
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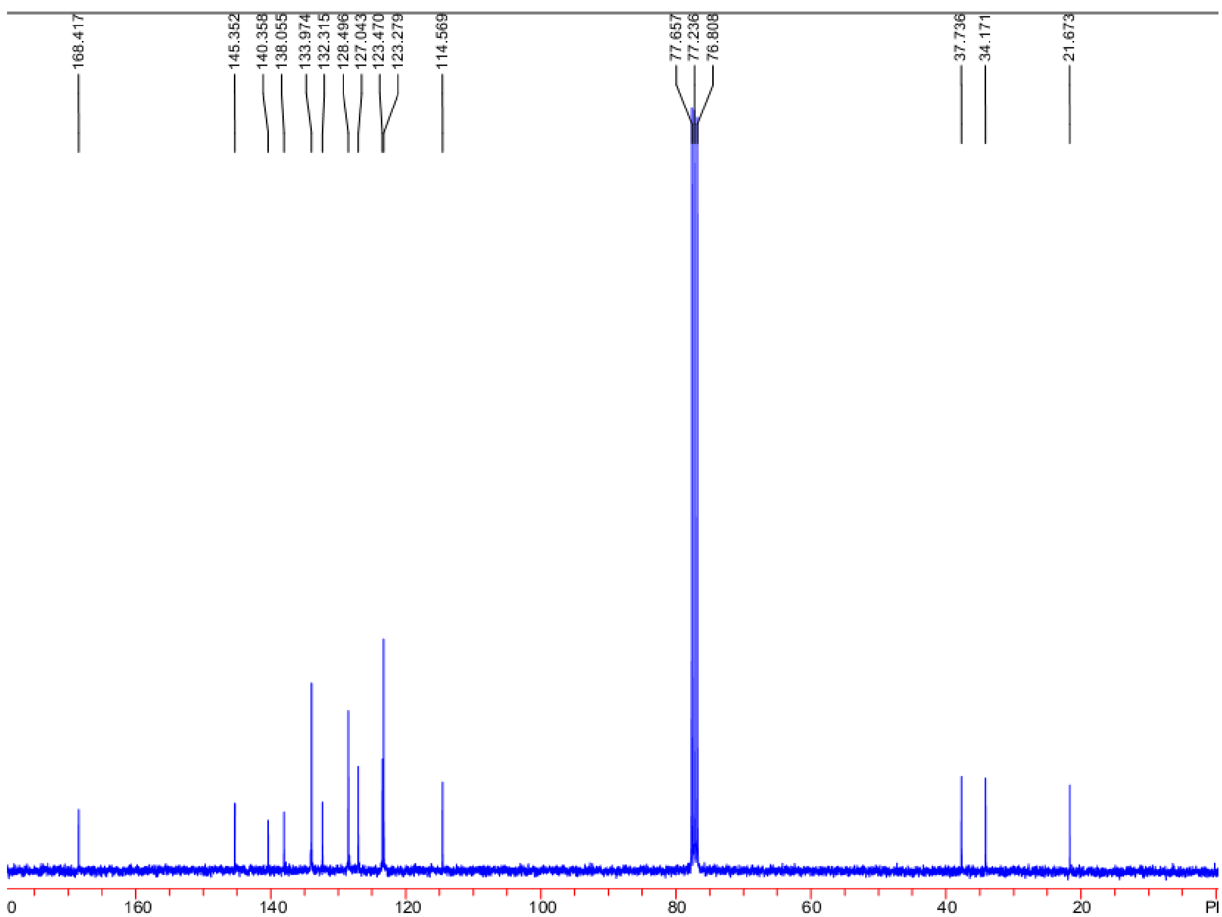
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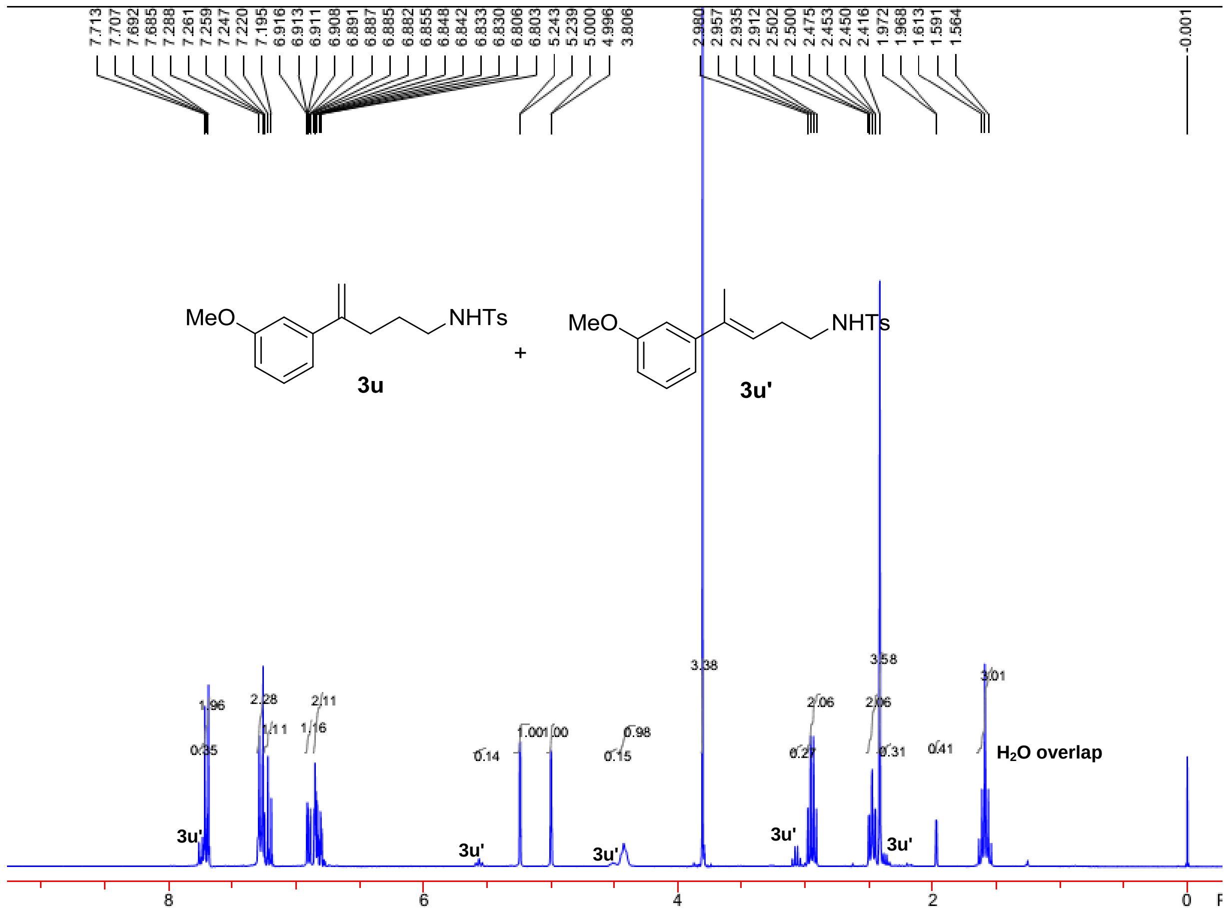
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2.980 2.957 2.935 2.912 2.502 2.500 2.475 2.453 2.450 2.416 1.972 1.968 1.613 1.591 1.564
-0.001
MeO
NHTs
3u
+
MeO
NHTs
3u'
1.96
0.35
2.28
1.11
2.11
1.16
0.14
1.00
1.00
0.98
0.15
3.38
2.06
0.27
3.58
2.06
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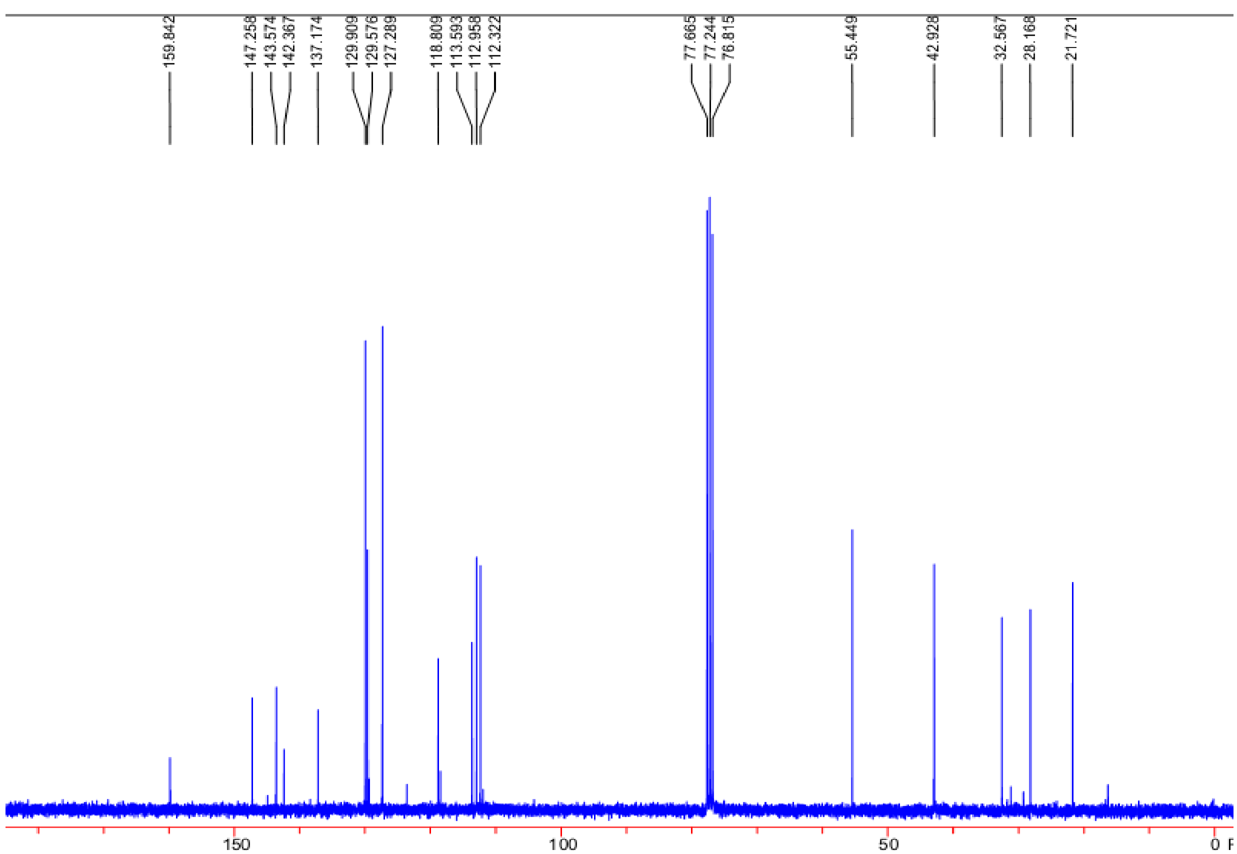
H_2O overlap
3u'
3u'
3u'
3u'
3u'
8
6
4
2
0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32.567 28.168 21.721
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50
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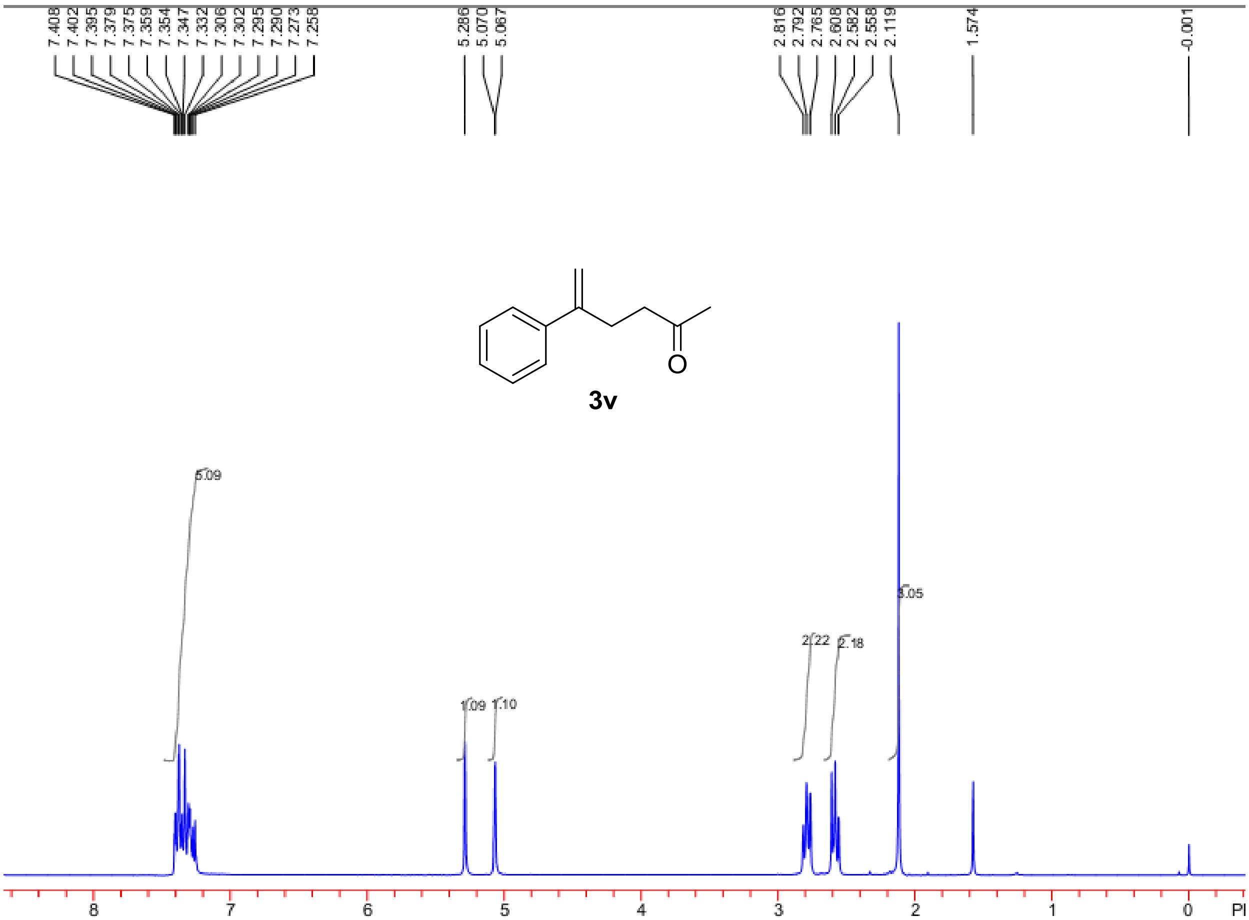
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7.273
7.258
5.286
5.070
5.067
2.816
2.792
2.765
2.608
2.582
2.558
2.119
1.574
-0.001
5.09
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5
4
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2
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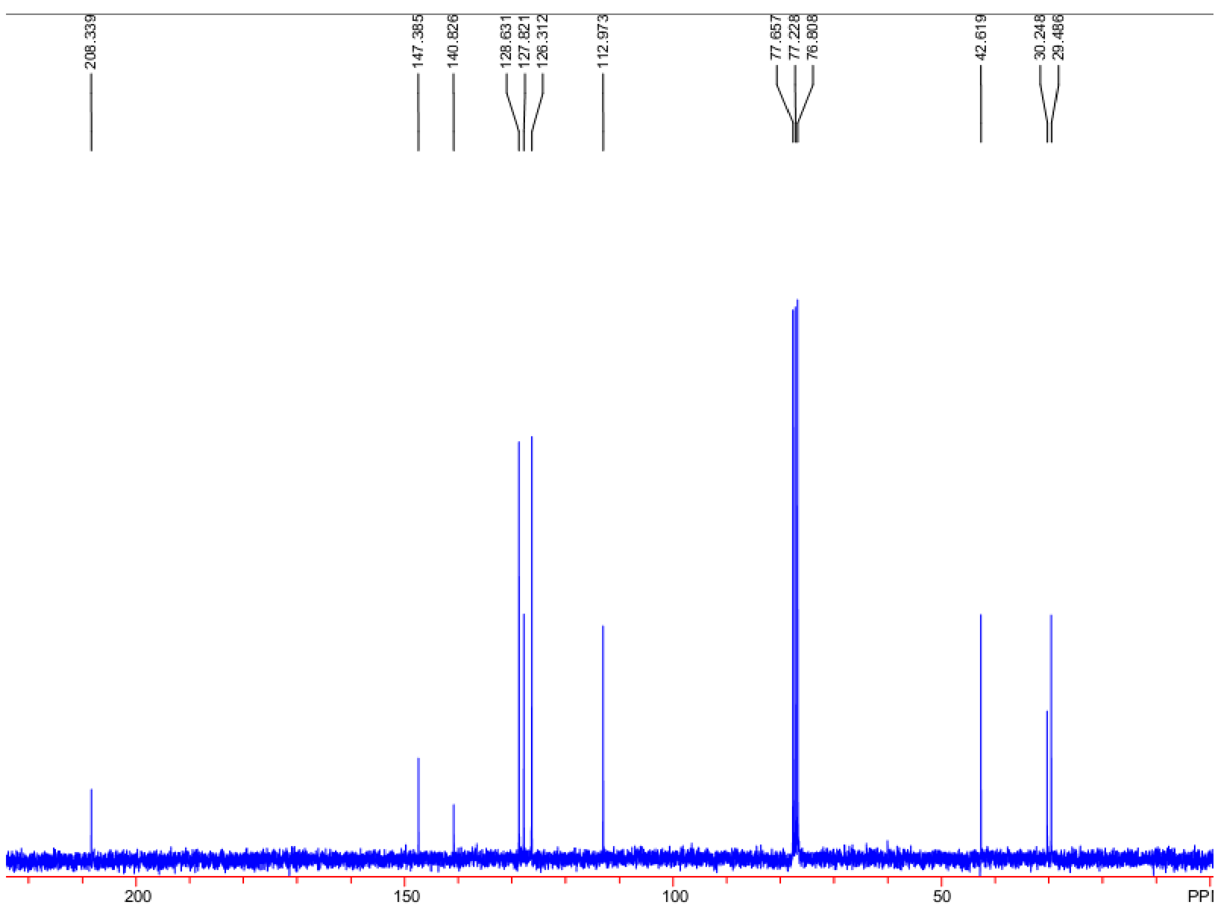
0
PPM

3v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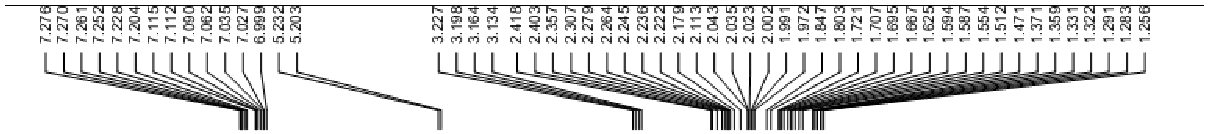
200
150
100
50
PPM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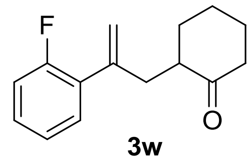
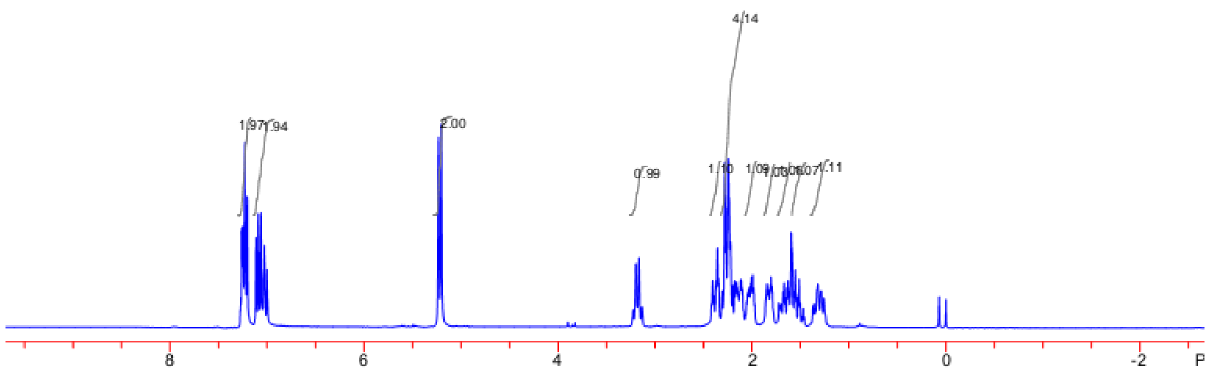
3.227 3.198 3.164 3.134 2.418 2.403 2.357 2.307 2.279 2.264 2.245 2.236 2.222 2.179 2.113 2.043 2.035 2.023 2.002 1.991 1.972 1.847 1.803 1.721 1.707 1.695 1.667 1.625 1.594 1.587 1.554 1.512 1.471 1.371 1.359 1.331 1.322 1.291 1.283 1.256


F
O

3w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0.99
1.10
1.09 1.03 1.06 1.07 1.11
8
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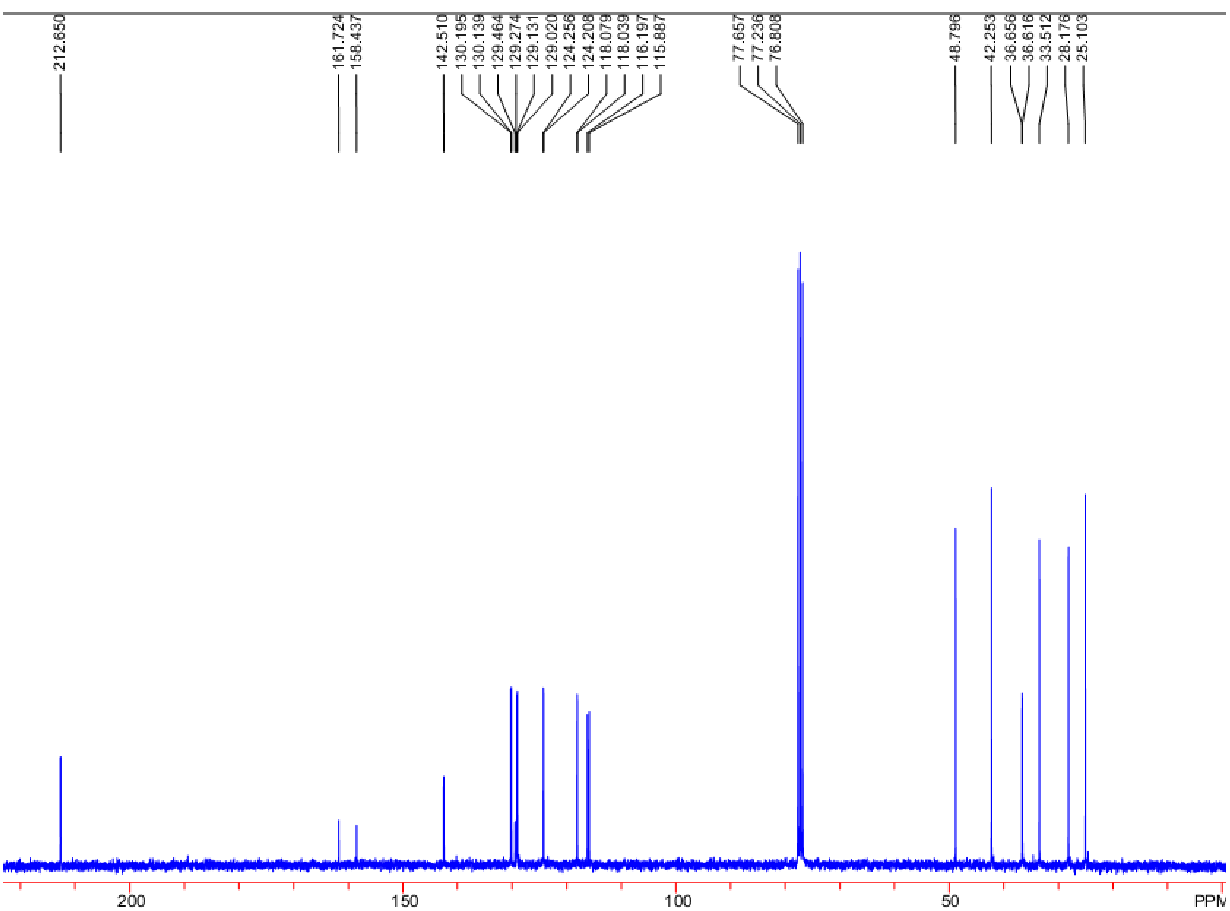
-2
P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161.724 158.437
142.510 130.195 130.139 129.464 129.274 129.131 129.020 124.256 124.208 118.079 118.039 116.197 115.887
77.657 77.236 76.808
48.796
42.253 36.656 36.616 33.512 28.176 25.103
200
150
100
50
PPM