

Supporting Information
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Highly Selective Semihydrogenation of Phenylalkynes to (Z)-Styrenes Using Hantzsch Ester 1, 4-Dihydropyridine Catalyzed by Pd/C

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Experimental Section

General information

^1H and ^{13}C NMR spectra were recorded on a Bruker Avance III 400 spectrometer in CDCl_3 with TMS as internal standard. Mass spectra were determined on a Hewlett Packard 5988A spectrometer by direct inlet at 70 eV. All starting materials and products were identified by ^1H and ^{13}C NMR and MS, unless otherwise indicated; all starting materials were purchased from Alfa aesar and used without further purification.

Starting materials 1b, 1c, 1d, 1e, 1f, 1g, 1h¹⁻⁹ and product 2a-n¹⁰⁻²⁸ are known compounds cited in the references, and their spectral data were in agreement with those reported in literature. NMR spectral and MS data is provided below.

Typical procedure

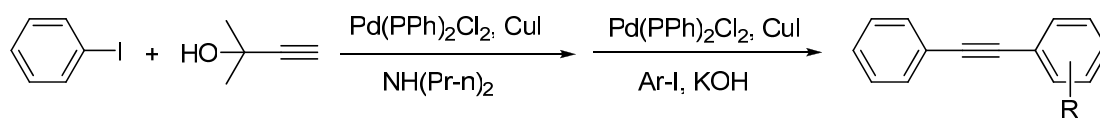
Diphenylacetylene (36mg, 0.2 mmol, 1.0equiv), HEH (Diethyl 2, 6-dimethyl-1, 4-dihydropyridine-3, 5-dicarboxylate) (61mg, 0.24 mmol, 1.2equiv), Pd/C (7mg, 20%), were added in ethanol (20 mL). The mixture was reflux under N_2 for 12 h, then was cooled, filtered and concentrated in vacuum. Chromatographic separation gave the pure product (Z)-1, 2-diphenylethene (30mg, 0.166mmol; 83%).

Synthesis of Starting Materials

General Procedure for Preparation of alkynes 1b-h

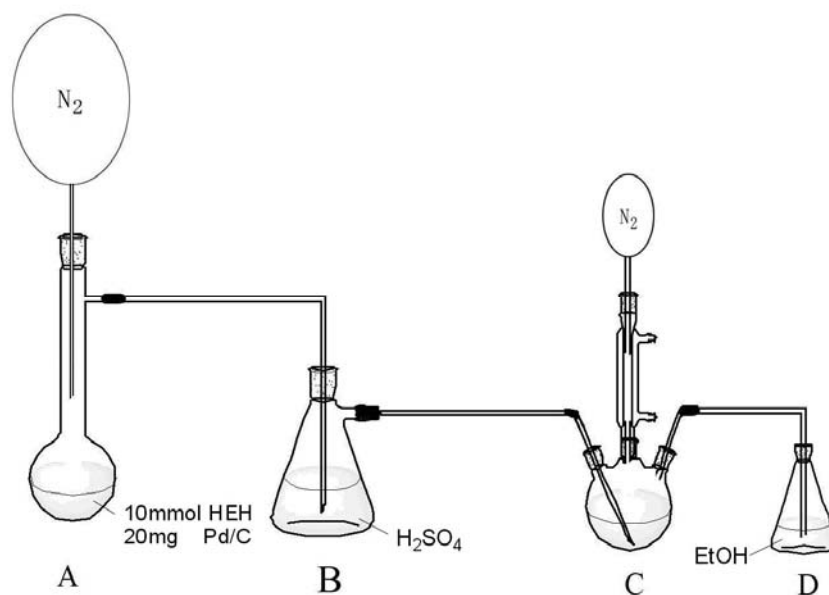
10 mmol aryl halide, 351 mg $\text{PdCl}_2(\text{PPh}_3)_2$ (0.5 mmol, 5%) and 95 mg CuI (0.5 mmol, 5%) were placed into a flame dried Schlenk flask. 20 mL diisopropylamine was added to the flask followed by 1.26mL 2-methyl-3-butyn-2-ol (13 mmol, 1091mg). The reaction mixture was stirred under argon for one hour at 50°C . Then 4.48 g KOH (80 mmol), 351 mg $\text{PdCl}_2(\text{PPh}_3)_2$ (0.5 mmol, 25%), 95 mg CuI (0.5 mmol, 5%) and 10 mmol aryl halide were added and the reaction mixture was heated for five hours in a 110°C oil bath. After cooling to room temperature the KOH was neutralized with 1M HCl, and then the mixture was extracted with DCM. The combined organic phases were dried over MgSO_4 then evaporated. The crude product was purified by column chromatography using hexane-ethyl acetate mixtures.

Table 1 Preparation of alkynes 1b-h.



	Alkynes	Ar-I	Yield (%)
b			80
1c			65
1d			70
1e			86
1f			72
1g			60
1h			95

The equipment mentioned in reference 10 of article text.

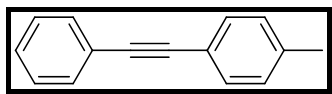


References

1. Godt, A., *J. Org. Chem.* **1997**, *62* (21), 7471-7474.
2. Leadbeater, N. E.; Tominack, B. J., *Tetrahedron Lett.* **2003**, *44* (48), 8653-8656.
3. Liang, Y.; Xie, Y.-X., et al., *J. Org. Chem.* **2005**, *71* (1), 379-381.
4. Nguyen, P.; Yuan, Z., et al., *Inorg. Chim. Acta* **1994**, *220* (1-2), 289-296.
5. Novak, Z.; Nemes, P., et al., *Org. Lett.* **2004**, *6* (26), 4917-4920.
6. Rubin, M.; Trofimov, A., et al., *J. Am. Chem. Soc.* **2005**, *127* (29), 10243-10249.
7. Shirakawa, E.; Kitabata, T., et al., *Tetrahedron* **2005**, *61* (41), 9878-9885.
8. Yelamagad, C. V.; Shanker, G., *Tetrahedron* **2008**, *64* (17), 3760-3771.
9. Zhang, L.; Li, P., et al., *Lett. Org. Chem.* **2006**, *3* (4), 282-285.
10. Yu, J.-Y.; Kuwano, R., *Angew. Chem. Int. Ed.* **2009**, *48* (39), 7217-7220.
11. Wolan, A.; Cadoret, F., et al., *Tetrahedron* **2009**, *65* (36), 7429-7439.
12. Shimasaki, T.; Konno, Y., et al., *Org. Lett.* **2009**, *11* (21), 4890-4892.
13. Pavlakos, E.; Georgiou, T., et al., *Org. Lett.* **2009**, *11* (20), 4556-4559.
14. Njera, C., *J. Org. Chem.* **2009**, *74* (6), 2321-2327.
15. Guo, X.; Wang, J., et al., *J. Am. Chem. Soc.* **2009**, *131* (42), 15092-15093.
16. Zhao, H.; Wang, Y., et al., *Tetrahedron* **2008**, *64* (32), 7517-7523.
17. Ngwendson, J.; Schultze, C., et al., *Can. J. Chem.* **2008**, *86* (7), 668-675.
18. Denmark, S. E.; Butler, C. R., *J. Am. Chem. Soc.* **2008**, *130* (11), 3690-3704.
19. Cahiez, G.; Gager, O., et al., *Org. Lett.* **2008**, *10* (22), 5255-5256.
20. Cadoret, F.; Six, Y., *Tetrahedron Lett.* **2007**, *48* (31), 5491-5495.
21. Berardi, S.; Bonchio, M., et al., *J. Org. Chem.* **2007**, *72* (23), 8954-8957.
22. Gavryushin, A.; Kofink, C., et al., *Tetrahedron* **2006**, *62* (32), 7521-7533.
23. Xiong, Z.; Wang, N., et al., *Org. Lett.* **2004**, *6* (19), 3337-3340.
24. Aggarwal, V. K.; Fulton, J. R., et al., *J. Am. Chem. Soc.* **2003**, *125* (20), 6034-6035.
25. Wan, P.; Davis, M. J., et al., *J. Org. Chem.* **1989**, *54* (6), 1354-1359.
26. Wheeler, O. H.; Pabon, H. N. B. d., *J. Org. Chem.* **1965**, *30* (5), 1473-1477.
27. Oyamada, J.; Hashimoto, T., et al., *J. Organomet. Chem.* **2009**, *694* (22), 3626-3632.
28. Walter, C.; Oestreich, M., *Angew. Chem. Int. Ed.* **2008**, *47* (20), 3818-3820.
29. Barbe, G.; Charette, A. B., *J. Am. Chem. Soc.* **2007**, *130* (1), 18-19.
30. Zolfigol, M. A.; Safaiee, M., *Synlett* **2004**, (5), 827-828.
31. Vanden Eynde, J. J.; Delfosse, F., et al., *Tetrahedron* **1995**, *51* (23), 6511-6516.

Physical data for the following Starting Materials

1-Methyl-4-(2-phenylethynyl)-benzene

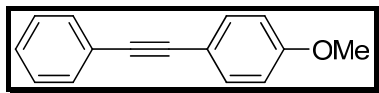


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.58 – 7.46 (m, 2H), 7.43 (d, $J = 8.1$, 2H), 7.38 – 7.28 (m, 3H), 7.15 (d, $J = 7.9$, 2H), 2.36 (s, 3H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 138.37, 132.49, 131.53, 131.48, 129.10, 128.43, 128.30, 128.05, 123.46, 120.17, 89.54, 88.70, 21.49

MS (EI): m/z (%): 192(M^+ , 100), 165(15), 139(5), 115(8), 82(7), 63(8), 51(8), 39(13).

1-Methoxy-4-(2-phenylethynyl)-benzene

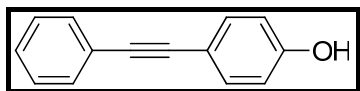


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.51 (dd, $J = 7.8, 1.7$, 2H), 7.48 – 7.45 (m, 2H), 7.32 (dt, $J = 3.6, 1.1$, 3H), 3.81 (s, 3H).

$^{13}\text{CNMR}$ (100MHz, CDCl_3) δ 159.61, 133.02, 131.42, 128.27, 127.89, 123.60, 115.38, 113.98, 89.36, 88.05, 55.25

MS (EI): m/z (%): 208(M^+ , 100), 193(51), 165(62), 139(17), 115(9), 104(6), 87(7), 63(10), 51(7), 39(15).

4-(phenylethynyl)-phenol

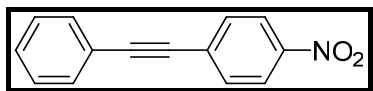


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.57 – 7.47 (m, 2H), 7.46 – 7.39 (m, 2H), 7.38 – 7.27 (m, 3H), 6.80 (d, $J = 8.4$, 2H), 4.90 (s, 1H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 155.51, 133.26, 131.43, 128.30, 127.98, 123.44, 115.67, 115.47, 89.18, 88.10

MS (EI): m/z (%): 194(M^+ , 100), 165(25), 139(8), 115(4), 97(7), 51(7), 39(14).

1-Nitro-4-(2-Phenylethynyl)-benzene

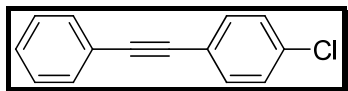


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 8.26 – 8.18 (m, 2H), 7.70 – 7.63 (m, 2H), 7.60 – 7.51 (m, 2H), 7.43 – 7.34 (m, 3H)

^{13}C NMR (100 MHz, CDCl_3) δ 146.97, 132.24, 131.82, 130.24, 129.25, 128.51, 123.61, 122.09, 94.69, 87.53

MS (EI): m/z (%):223(M^+ , 100), 193(28), 176(68), 165(30), 151(27), 150(21), 126(10), 77(6), 63(8), 51(9), 39(8).

1-Chloro-4-phenylethynyl-benzene

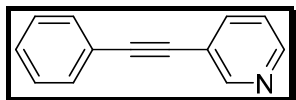


^1H NMR (400 MHz, CDCl_3) δ 7.52 (dd, $J = 4.2, 3.1$, 2H), 7.46 (d, $J = 8.3$, 2H), 7.39 – 7.29 (m, 5H).

^{13}C NMR (101 MHz, CDCl_3) δ 134.23, 132.78, 132.48, 131.57, 129.19, 128.67, 128.46, 128.42, 128.37, 122.90, 121.75, 90.30, 88.22

MS (EI): m/z (%):212(M^+ , 100), 214($\text{M}+2$, 30), 202(13), 176(27), 151(9), 88(7), 75(8), 51(7), 39(7).

3-Phenylethynyl-pyridin

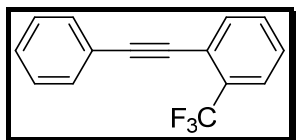


^1H NMR (400 MHz, CDCl_3) δ 8.77 (d, $J = 1.5$, 1H), 8.55 (dd, $J = 4.9, 1.6$, 1H), 7.81(d, $J=8$, 1H), 7.53-7.56 (m, 2H), 7.36-7.37 (m, 3H), 7.28-7.30 (m, 1H).

^{13}C NMR (101 MHz, CDCl_3) δ 152.16, 148.45, 138.43, 131.66, 128.78, 128.41, 128.21, 123.01, 122.47, 120.47, 93.81, 82.09

MS (EI): m/z (%):179(M^+ , 100), 151(10), 126(18), 87(6), 76(15), 63(10), 51(9), 39(7).

1-(Phenylethynyl)-2-(trifluoromethyl)-benzene



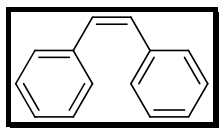
^1H NMR (400 MHz, CDCl_3) δ 7.67 (t, $J = 7.3$, 2H), 7.59 – 7.47 (m, 3H), 7.44 – 7.32 (m, 4H).

^{13}C NMR (101 MHz, CDCl_3) δ 133.68, 131.68, 131.38, 131.37, 128.80, 128.38, 127.89, 125.90, 125.85, 122.72, 94.92, 85.35

MS (EI): m/z (%):246(M^+ , 100), 225(14), 196(5), 169(6), 151(4), 98(5), 75(4), 51(4), 39(4).

Physical data for the following products

Z-stilbene

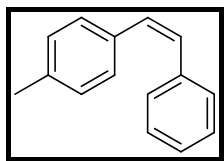


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.27 – 7.18 (m, 9H), 6.59 (s, 2H)

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 137.21, 131.59, 130.22, 128.84, 128.18, 127.06

MS (EI): m/z (%):180(M^+ ,89), 165(38), 152(11), 115(4), 102(8), 89(16), 76(16), 63(10), 51(18), 39(10).

(Z)-1-methyl-4-styrylbenzene

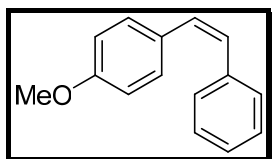


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.29 – 7.17 (m, 5H), 7.15 (dd, $J = 9.2, 5.7$, 2H), 7.02 (d, $J = 8.0$, 2H), 6.55 (s, 2H), 2.30 (s, 3H).

$^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 137.52, 136.85, 134.28, 130.20, 129.56, 128.89, 128.84, 128.78, 128.17, 126.95, 21.20

MS (EI): m/z (%):194(M^+ , 81), 179(100), 115(23), 89(19), 77(15), 63(24), 51(32), 39(39).

(Z)-1-methoxy-4-styrylbenzene

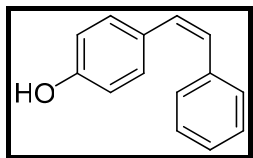


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.29 – 7.14 (m, 7H), 6.74 (t, $J = 5.8$, 2H), 6.57 – 6.45 (s, 2H), 3.77 (s, 3H).

$^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 158.70, 137.64, 130.14, 129.77, 129.68, 128.80, 128.77, 128.21, 126.88, 113.60, 55.17

MS (EI): m/z (%):210(M^+ , 100), 165(51), 152(34), 115(14), 89(18), 63(24), 51(25), 39(31).

(Z)-4-styrylphenol

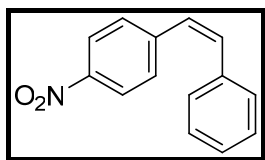


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.49 (d, $J = 7.4$, 2H), 7.41 (d, $J = 8.5$, 2H), 7.35 (t, $J = 7.6$, 2H), 7.23 (d, $J = 7.3$, 1H), 7.01 (q, $J = 16.3$, 2H), 6.83 (d, $J = 8.6$, 2H), 4.81 (s, 1H).

$^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 155.17, 137.55, 130.37, 128.63, 128.09, 127.90, 127.24, 126.69, 126.24, 115.58

MS (EI): m/z (%):196(M^+ , 100), 181(17), 165(42), 149(62), 115(13), 102(10), 77(30), 76(23), 71(18), 63(43), 51(36), 39(69).

(Z)-1-nitro-4-styrylbenzene

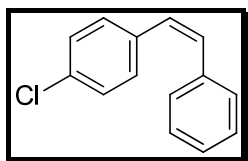


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 8.23 (d, $J = 8.7$, 1H), 8.07 (d, $J = 8.7$, 2H), 7.64 (d, $J = 8.7$, 1H), 7.56 (d, $J = 7.5$, 1H), 7.40 (m, 2H), 7.23 – 7.18 (m, 2H), 6.82 (d, $J = 12.2$, 1H), 6.62 (d, $J = 12.2$, 1H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 136.10, 133.96, 133.93, 129.64, 128.89, 128.78, 128.55, 127.99, 127.95, 127.01, 126.86, 126.29, 124.15, 123.56

MS (EI): m/z (%):225(M^+ , 75), 178(100), 165(17), 152(34), 139(7), 89(29), 76(34), 63(36), 51(50), 39(32).

(Z)-1-chloro-4-styrylbenzene

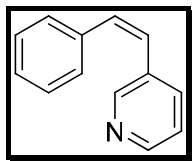


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.25 – 7.13 (m, 9H), 6.58 (dd, $J = 39.5$, 12.2, 2H).

$^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 136.85, 135.63, 133.08, 132.72, 130.93, 130.20, 129.82, 128.91, 128.79, 128.39, 128.32, 127.30

MS (EI): m/z (%):214(M^+ , 29), 179(83), 178(100), 149(14), 125(17), 91(28), 89(22), 76(38), 63(13), 51(22), 39(10).

(Z)-3-styrylpyridine

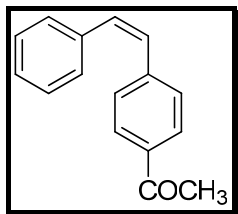


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 8.49 (s, 1H), 8.42 (d, $J = 4.1$, 1H), 7.53 (d, $J = 7.8$, 1H), 7.26 – 7.19 (m, 5H), 7.14 (dd, $J = 7.9$, 4.8, 1H), 6.76 (d, $J = 12.2$, 1H), 6.55 (d, $J = 12.2$, 1H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 149.96, 147.87, 136.43, 135.97, 132.76, 128.66, 128.51, 127.59, 126.30, 123.05

MS (EI): m/z (%):181(M^+ , 60), 180(100), 149(100), 127(7), 126(7), 102(9), 76(23), 63(28), 51(21), 50(17), 43(12), 39(36).

(Z)-4-Acetylstilbene

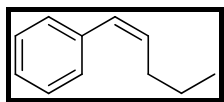


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.81 (d, $J = 8.3$, 2H), 7.32 (d, $J = 8.2$, 2H), 7.25 – 7.18 (m, 5H), 6.73 (d, $J = 12.3$, 1H), 6.61 (d, $J = 12.3$, 1H), 2.57 (s, 3H).

$^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 197.62, 142.26, 136.63, 135.57, 129.08, 129.02, 128.81, 128.35, 128.30, 127.53, 26.54

MS (EI): m/z (%):222(M^+ , 60), 207(100), 179(30), 178(86), 152(17), 115(5), 89(14), 76(14), 51(18), 43(58), 39(12).

(Z)-Pent-1-enylbenzene

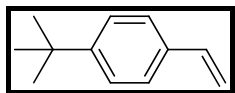


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.38 – 7.28 (m, 4H), 7.23 (t, $J = 7.1$, 1H), 6.43 (d, $J = 11.7$, 1H), 5.68 (dt, $J = 11.7$, 7.3, 1H), 2.33 (m, 2H), 1.30 – 1.23 (m, 2H), 0.96 (t, $J = 7.4$, 3H).

$^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 137.81, 133.05, 128.79, 128.74, 128.07, 126.39, 30.68, 23.15, 13.85

MS (EI): m/z (%): 146(M^+ , 42), 117(100), 115(61), 91(48), 77(11), 65(7), 51(17), 39(11).

1-tert-butyl-4-vinylbenzene

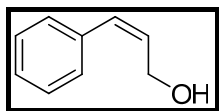


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.36 (m, 4H), 6.70 (dd, $J = 17.6$, 10.9, 1H), 5.71 (d, $J = 17.6$, 1H), 5.20 (d, $J = 10.9$, 1H), 1.32 (s, 9H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 150.87, 136.56, 134.81, 125.90, 125.41, 112.99, 34.57, 31.28

MS (EI): m/z (%): 160(M^+ , 21), 145(100), 117(31), 105(10), 91(13), 77(11), 51(7).

(Z)-Cinnamyl alcohol

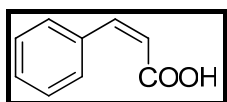


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.35 (t, $J = 7.4$, 2H), 7.26 (dd, $J = 8.7$, 5.8, 1H), 7.21 (d, $J = 7.4$, 2H), 6.58 (d, $J = 11.7$, 1H), 5.96 – 5.81 (m, 1H), 4.45 (d, $J = 6.4$, 2H), 1.53 (s, 1H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 136.48, 131.09, 131.05, 128.75, 128.25, 127.25, 59.71

MS (EI): m/z (%): 134(M^+ , 44), 115(45), 105(49), 92(100), 91(89), 78(59), 77(51), 63(18), 55(23), 51(47), 39(24).

(Z)-3-Phenylacrylic acid

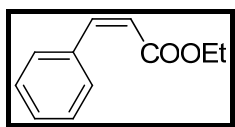


$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 12.55 – 9.77 (s, 1H), 7.60 (dd, $J = 6.5$, 2.7, 2H), 7.40 – 7.30 (m, 3H), 7.06 (d, $J = 12.7$, 1H), 5.96 (d, $J = 12.7$, 1H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 171.29, 145.79, 134.36, 129.93, 129.36, 128.07, 118.68

MS (EI): m/z (%): 148(M^+ , 64), 147(100), 131(18), 103(56), 102(31), 91(41), 77(50), 63(13), 51(38), 50(22), 45(17), 39(10).

(Z)-ethyl 3-phenylacrylate



$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.48 – 7.28 (m, 5H), 6.94 (d, $J = 12.6$, 1H), 5.95 (d, $J = 12.6$, 1H), 4.17 (q, $J = 7.1$, 2H), 1.24 (t, $J = 7.1$, 3H).

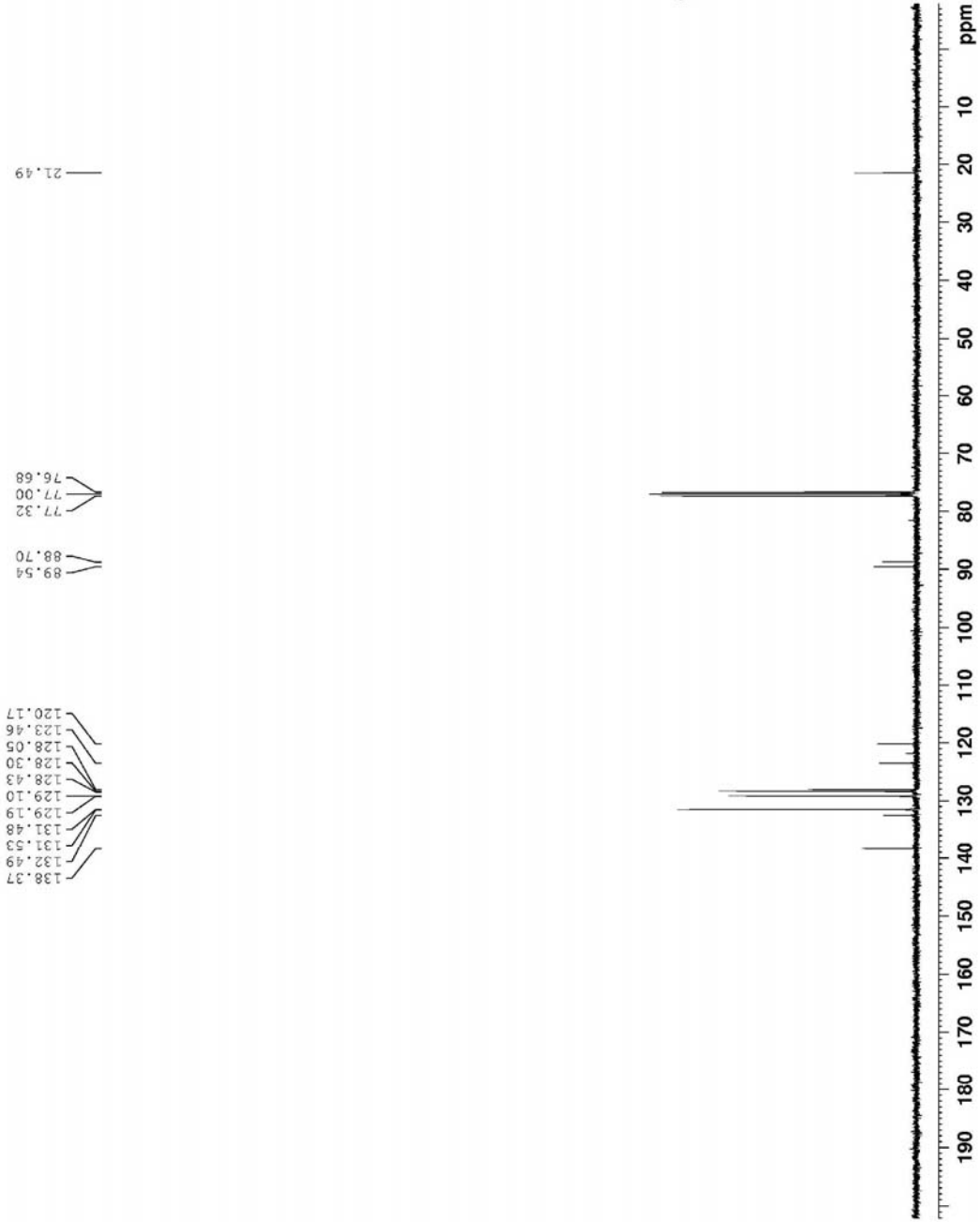
$^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 166.18, 142.94, 132.94, 129.64, 127.94, 119.86, 60.26, 14.06

MS (EI): m/z (%): 176(M^+ , 24), 147(13), 131(100), 129(37), 103(35), 77(24), 51(16).


```

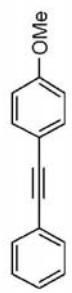
NAME: Ykzhao-p-me-c61cccpa
EXPNO: 11
PROCNO: 1
AQ: 2.00
RG: 260
DS: 4
F2: 71.10
SFOF: 1
INSTRUM: spect
PROBHD: 5 mm F401 90-
PULPROG: zgpg30
TD: 65536
CQ: 0.00000
RG2: 328
AQ2: 12.00
SFOF2: 12.00
SMI: 24038.461 Hz
F1: 500.1362998 MHz
AC: 1.3661988 mm
RG: 2500
AQ: 20.00000000 sec
DP: 295.8 s
D1: 2.00000000 sec
D1.1: 0.00000000 sec
DD: 1
===== CHANNEL f1 =====
NUC1: 13C
P1: 9.40 usec
PL1: -2.00 dB
PL12: 57.32743673 W
SFO1: -90.6228298 MHz
===== CHANNEL f2 =====
CPDPRG2: waltz16
NUC2: 1H
P2: 90.00 usec
PL2: -2.00 dB
PL13: 15.00 dB
PL14: 15.00 dB
PL15: 15.00 dB
PL16: 15.00 dB
PL17: 15.00 dB
PL18: 15.00 dB
PL19: 15.00 dB
PL20: 15.00 dB
PL21: 15.00 dB
PL22: 15.00 dB
PL23: 15.00 dB
PL24: 15.00 dB
PL25: 15.00 dB
PL26: 15.00 dB
PL27: 15.00 dB
PL28: 15.00 dB
PL29: 15.00 dB
PL30: 15.00 dB
PL31: 15.00 dB
PL32: 15.00 dB
PL33: 15.00 dB
PL34: 15.00 dB
PL35: 15.00 dB
PL36: 15.00 dB
PL37: 15.00 dB
PL38: 15.00 dB
PL39: 15.00 dB
PL40: 15.00 dB
PL41: 15.00 dB
PL42: 15.00 dB
PL43: 15.00 dB
PL44: 15.00 dB
PL45: 15.00 dB
PL46: 15.00 dB
PL47: 15.00 dB
PL48: 15.00 dB
PL49: 15.00 dB
PL50: 15.00 dB
PL51: 15.00 dB
PL52: 15.00 dB
PL53: 15.00 dB
PL54: 15.00 dB
PL55: 15.00 dB
PL56: 15.00 dB
PL57: 15.00 dB
PL58: 15.00 dB
PL59: 15.00 dB
PL60: 15.00 dB
PL61: 15.00 dB
PL62: 15.00 dB
PL63: 15.00 dB
PL64: 15.00 dB
PL65: 15.00 dB
PL66: 15.00 dB
PL67: 15.00 dB
PL68: 15.00 dB
PL69: 15.00 dB
PL70: 15.00 dB
PL71: 15.00 dB
PL72: 15.00 dB
PL73: 15.00 dB
PL74: 15.00 dB
PL75: 15.00 dB
PL76: 15.00 dB
PL77: 15.00 dB
PL78: 15.00 dB
PL79: 15.00 dB
PL80: 15.00 dB
PL81: 15.00 dB
PL82: 15.00 dB
PL83: 15.00 dB
PL84: 15.00 dB
PL85: 15.00 dB
PL86: 15.00 dB
PL87: 15.00 dB
PL88: 15.00 dB
PL89: 15.00 dB
PL90: 15.00 dB
PL91: 15.00 dB
PL92: 15.00 dB
PL93: 15.00 dB
PL94: 15.00 dB
PL95: 15.00 dB
PL96: 15.00 dB
PL97: 15.00 dB
PL98: 15.00 dB
PL99: 15.00 dB
PL100: 15.00 dB
=====

```



NAME ykzha0709-
 EXINC 10
 PROCNO 1
 DATE_ 20090721
 TIME 0.13
 INSTRM spect
 PCOBHL 5 B3 FAHRD B3-
 PULPROG zg30
 ID 65316
 SOLVENT CDCl3
 DS 9
 SWH 8223.655 Hz
 F1 DMS 0.75683 Hz
 AQ 3.9846387 sec
 RC -01
 DW 60.000 sec
 DE 20.50 sec
 TE 29.50 sec
 TD 1.0000000 sec
 TR0 1

----- CHANNEL f1 -----
 NUCL1 1H
 P1 14.70 sec
 PL1 0.00 dB
 FLLM 13.75590601 MHz
 SFO1 400.324210 MHz
 SF 400.324210 MHz
 WDW EM
 SSB 0
 GB 0
 PC 1.00

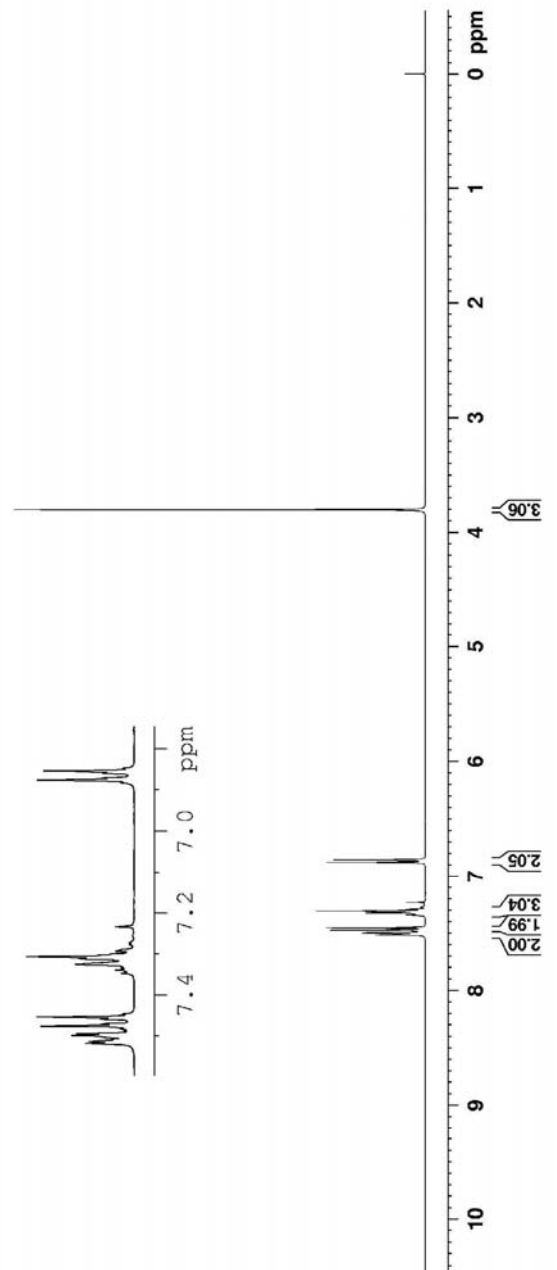


0.000

3.806

7.518
 7.513
 7.502
 7.498
 7.494
 7.476
 7.470
 7.459
 7.453
 7.325
 7.312
 7.307
 7.303
 7.233
 6.877
 6.854

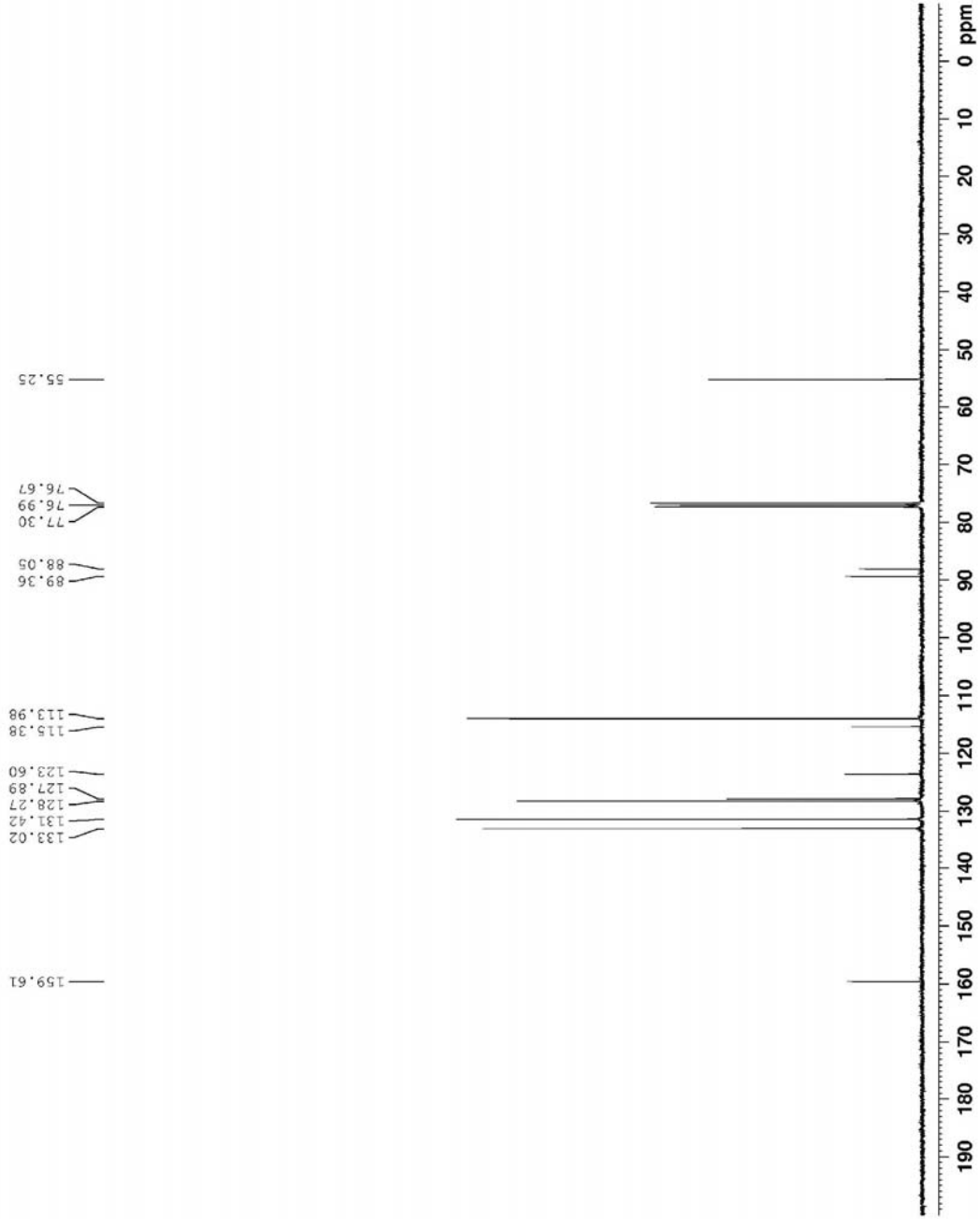
7.518
 7.513
 7.498
 7.494
 7.476
 7.459
 7.453
 7.325
 7.312
 7.307
 7.303
 6.877
 6.854



```

NAME: 4427060728-
EXPNO: 11
PROCNO: 1
Date_ : 20090709
Time: 0.00
INSTRUM: spect
PROBHD: 5 mm PABBO 5B
P1: 4.0000000 sec
PC: 6.5536
SFO: 400.131505 MHz
SOLVENT: CDCl3
NS: 256
DS: 4
SWH: 24038.461 Hz
FIDRES: 0.365798 Hz
AQ: -3.833988 sec
RG: 101
DQ: 20.500 usec
DE: 6.50 usec
TE: 297.5 K
D1: 2.0000000 sec
D11: 0.0300000 sec
D12:
D13:
TD: 1
----- CHANNEL f1 -----
NUC1: 13C
P1: 9.70 usec
PT1: -2.00 dB
PL1W: 56.1331505 W
SFO1: 100.6282698 MHz
----- CHANNEL f2 -----
CJURAG2: wal-zig
NUC2: 1H
PCPD2: 80.00 usec
PL2: -2.10 dB
PL12: 13.30 dB
PL12W: 17.7210223 W
PL12M: 0.4631329 W
PL12W: 0.4631329 W
PL13W: 400.131505 MHz
SFO2: 327.63
SF: 100.612731 MHz
LK
NUC3:
P3:
PT3:
PL3W:
SFO3:
PC:
SFO:
PC:

```



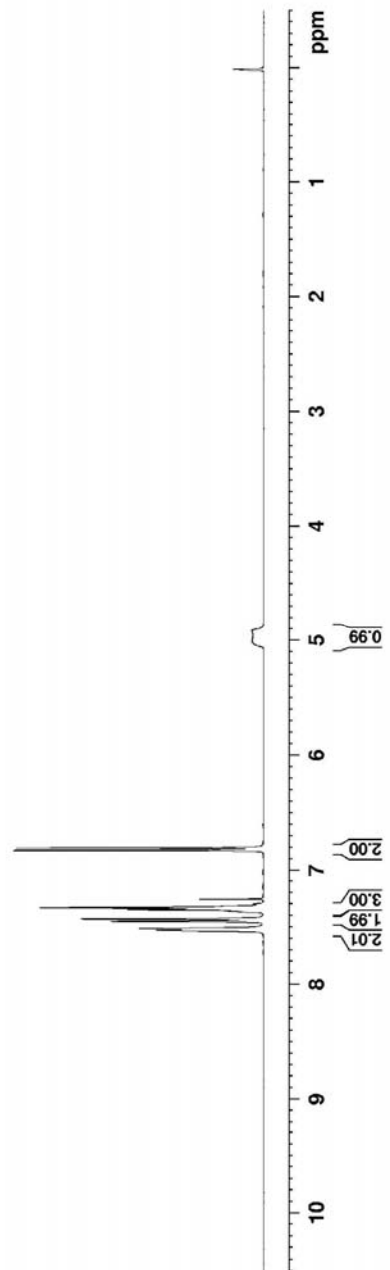
```

NAME: 2Phac 2, on D2 Ph2 O
EXPNO: 10
PROCNO: 1
Date_ 20061225
Time: 9.53
INSTRUM: spect
PROBHD: 5 mm QNP 1H/13
PULPROG: zgpg30
TD: 65536
SOLVENT: CDCl3
NS: 2
DS: 4
AQ: 0.253480 Hz
F2: 125.761 MHz
F1: 500.136 MHz
RG: 3.9846387
AQ: 0.124483 Hz
RG: 228
RG: 60.800 usec
RG: 60.800 usec
RG: 255.0 usec
RG: 1.00000000 usec
DELTA: 1.00000000 usec
===== CHANNEL f1 =====
NUC1: 1H
P1: 2.00 usec
PL1: 3.00 dB
PL12: 22.90423682 MHz
SFO1: 500.1360710 MHz
SI: 32768
SF: 400.1300055 MHz
WDW: EM
SSB: 0
LB: 0.30 Hz
GB: 0
PC: 1.00
  
```

0.012

4.916

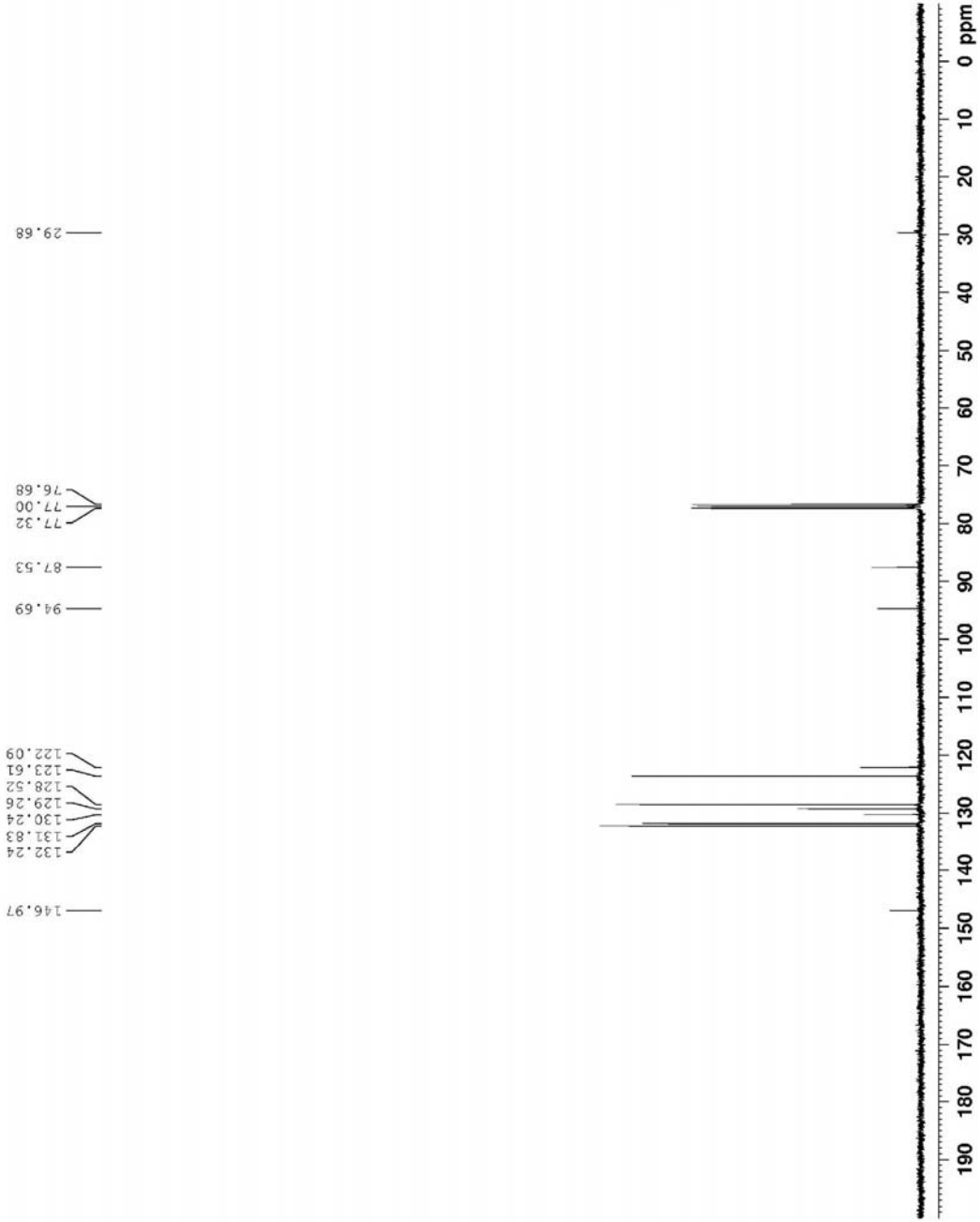
6.806
6.827
7.260
7.333
7.350
7.433
7.450
7.454
7.515
7.532



NAME Yzhaoc-7-NO2-CE.II/CC/h
 EXTNO 11
 PROCNO 1
 DATE_ 20090722
 TIME 4.15
 AS-KUM S/MCL
 PROBHD 5 mm PABEC B3-
 PC-PRGR 9693D
 PULSE 12
 SOLVENT CDCl3
 NS 28
 DS 4
 SRR 24038.471 Hz
 FIDRES 0.350788 Hz
 AQ 1.365988 sec
 RG 3.000000 sec
 LW 20.800000 sec
 DE 6.000000 sec
 TE 300.2 K
 D1 2.000000000 sec
 D11 0.030000000 sec
 T00 1

CHANNEL F1 13C
 NUCL 13C
 P1 9.20 usec
 PL 0
 F1 125.760 MHz
 F2 56.3331005 MHz
 SFO 100.6228238 MHz

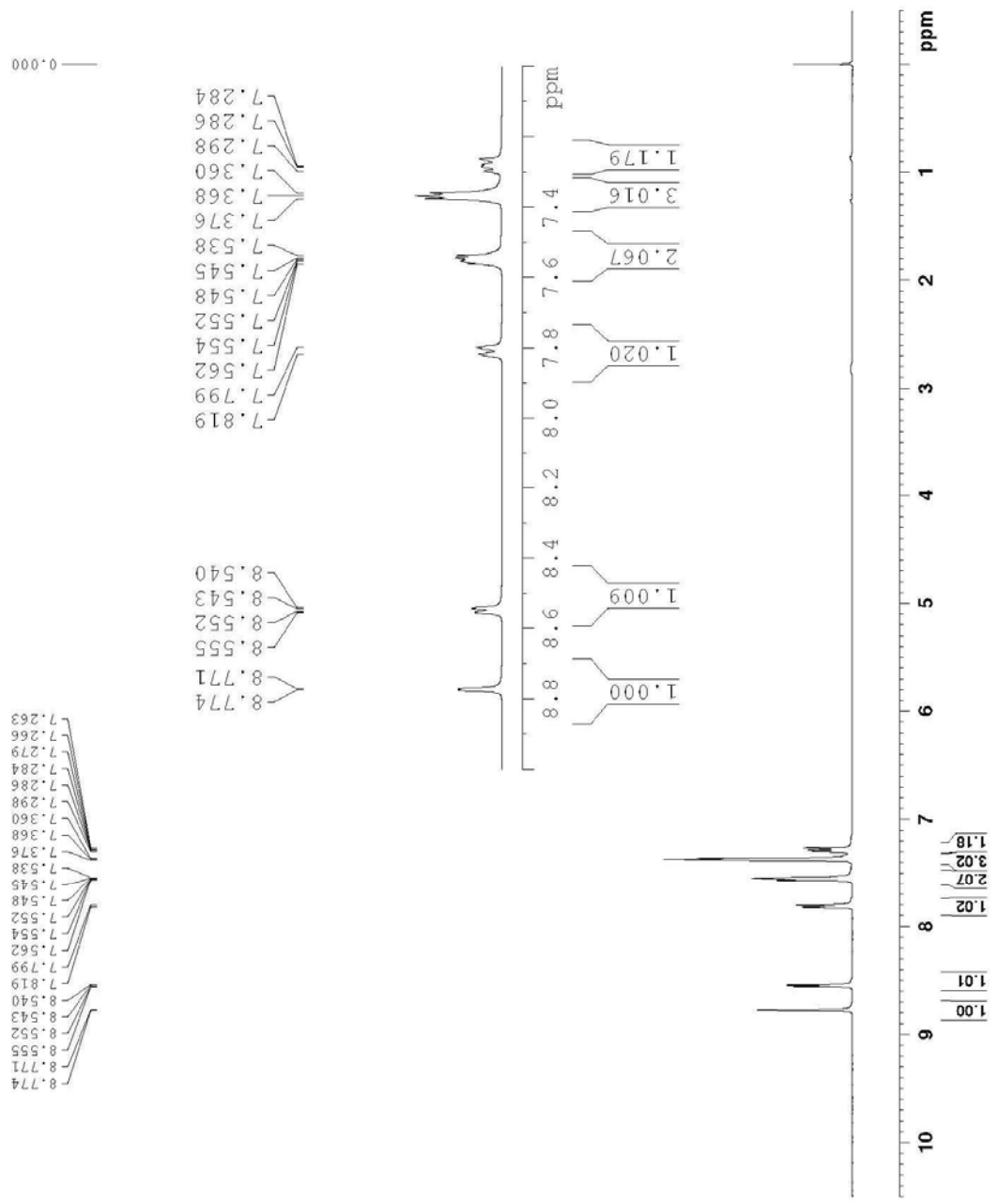
CHANNEL F2 1H
 NUCL 1H
 P1 13.00 usec
 PL 0
 F1 500.136 MHz
 F2 17.72104283 MHz
 SFO 100.6228238 MHz
 F3 0.44538243 MHz
 F4 400.136 MHz
 SF 100.6127713 MHz
 NS 28
 DS 4
 SSB 1.00 Hz
 CB 3
 PC 1.40




```

NAME      ding-090726
EXPNO     10
PROCNO    1
Time      20090721
Time      16:55
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
ID         65536
SOLVENT   CDCl3
DS         2
SWH        8223.685 Hz
FIDRES     0.125483 Hz
AQ         3.9846387 sec
RG         203
DW         60.800 usec
DE         26.50 usec
TE         300.2 K
D1         1.0000000 sec
TD0        1

===== CHANNEL f1 =====
NUC1       1H
P1         14.60 usec
PL1        0.00 dB
PL12       11.4792053 dB
SFO1       400.1324710 MHz
SI         32768
SF         400.1300041 MHz
WDW        EM
SSE        0
GB         0
PC         1.00
  
```

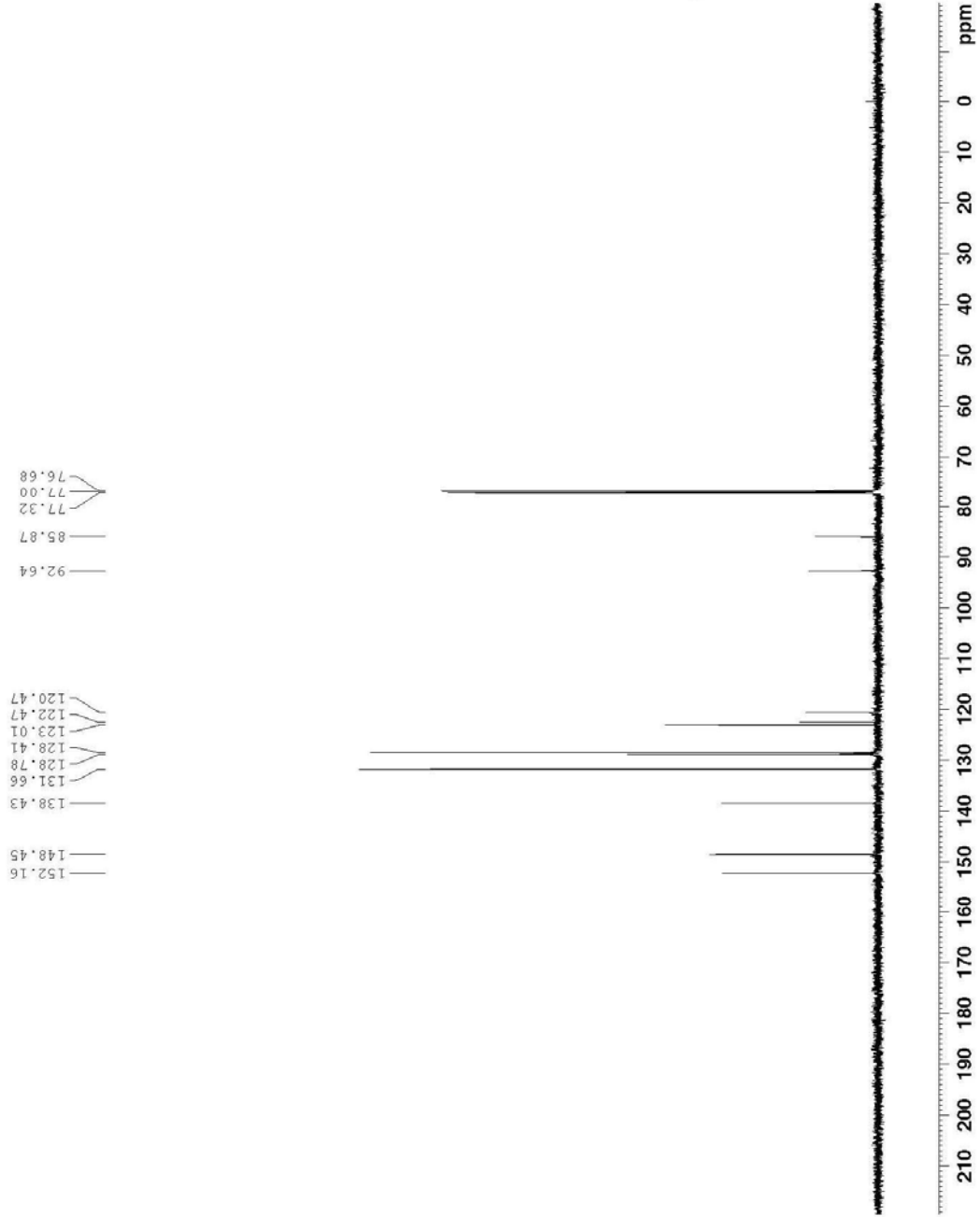


```

NAME      ding-090726
EXPNO    11
PROCNO   1
Date_    20090726
Time     20.00
INSTRUM  spect
PROBHD   5 mm PABBO B3
PULPROG  zgpg30
TD       65536
SOLVENT  CDCl3
NS       256
DS       4
AQ       24038.41 Hz
RG       0.366798 Hz
FIDRES   1.3631988 sec
AQ       2050
RG       2050
LW       20.800 usec
DE       6.50 usec
TE       294.0 K
D1       2.00000000 sec
d11      0.03000000 sec
TD0      1

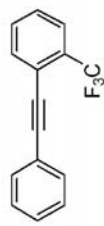
===== CHANNEL f1 =====
NUC1     13C
P1       9.40 usec
PL1     -2.00 dB
FLW     57.32743073 W
SFO1    100.6228296 MHz

===== CHANNEL f2 =====
CPDPRG2  maltz16
NUC2     1H
PCPD2    90.00 usec
PL2     -2.00 dB
FL2     15.50 dB
PL12    18.19349681 W
PL12W   0.32353121 W
PL13W   0.32353121 W
SFO2    400.1316005 MHz
SI       32768
WDW     EM
SSB     0
LB      1.00 Hz
GB      0
FC      1.40
  
```

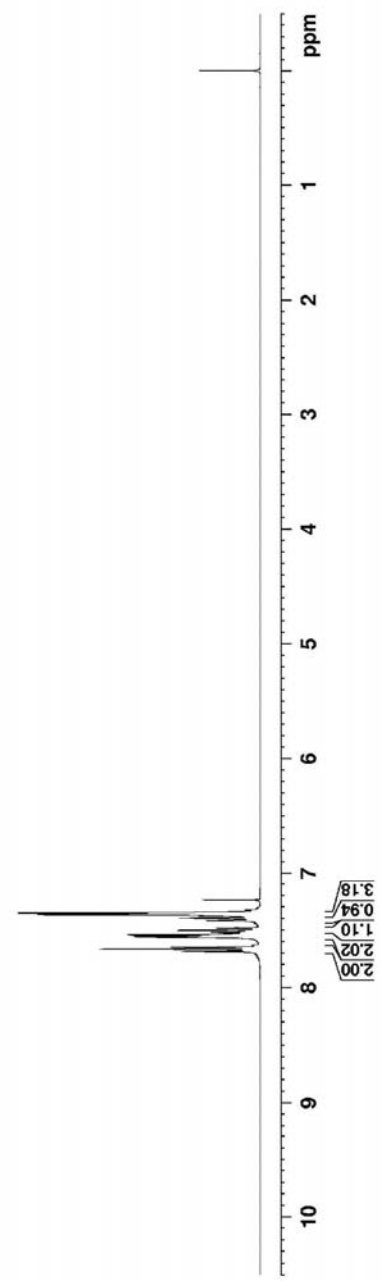
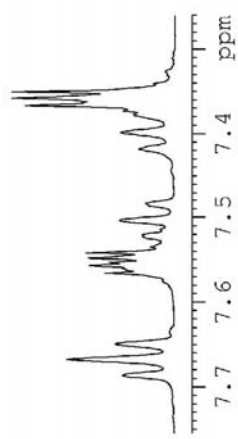
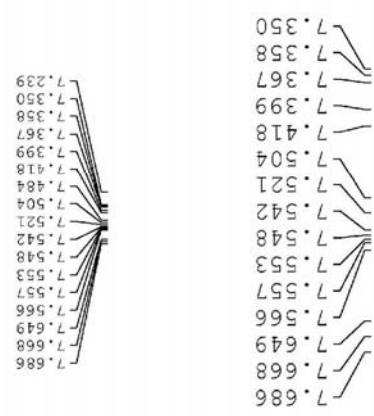


```

NAME      ykzhuo-PECCF--023-0
EXPNO     10
PROCNO    1
PROCRES   20000000
F2        9.728
F3        9.728
INSIPLM   spcst
PROBHD    5 mm EASY 13-
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
DS         1
SS         2
SMH       8223.645 Hz
F1DMS     0.75453 Hz
AQ        3.9846387 sec
RG         28
DW        60.800 usec
DE        5.50 usec
TE        29.70 usec
D1        1.00000000 sec
TD0       1
----- CHANNEL f1 -----
NUC1      13C
P1        14.70 usec
PL1       0.00 dB
PL12      13.75596801 dB
SFO1      400.324710 MHz
SFO2      52.748
SF        400.324710 MHz
WDW       -H
SSB       0
LB        0.50 Hz
GB        0
PC        1.00
  
```



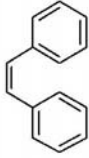
0.000



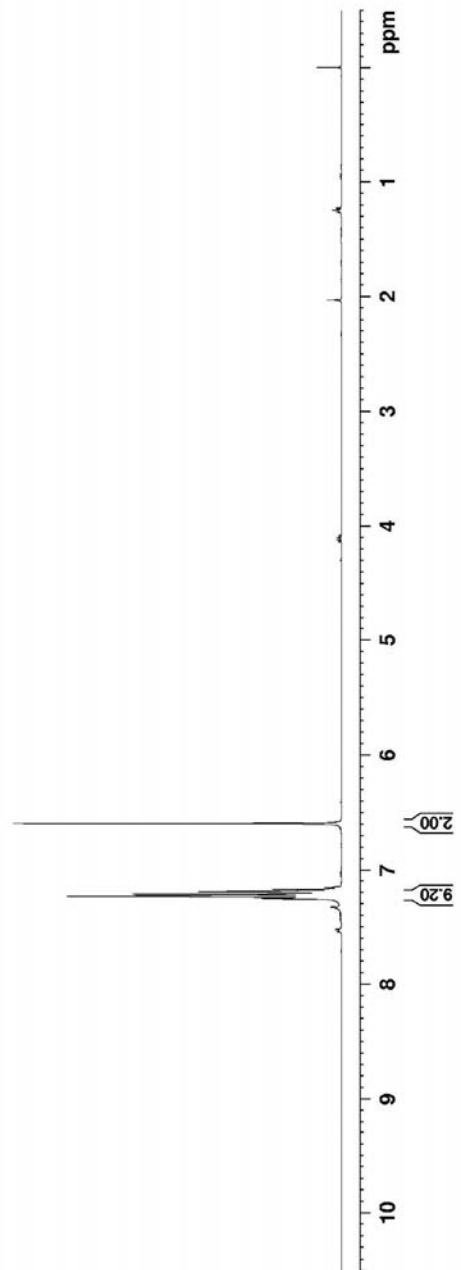

```

NAME: 2Phenyl-2H-chromene-7,7-diol
EXPNO: 10
PROCNO: 2
Date_ 20091225
Time: 7.23
INSTRUM: spect
PROBHD: b H1 2AEB3 BE-
PULPROG: zgpg30
TD: 65536
SOLVENT: CDCl3
NS: 16
DS: 2
AQ: 0.023480 Hz
F2: 0.124483 Hz
AQ: 3.9846387 MHz
RG: 90.5
WDW: 60.800 usec
SSB: 0.0 usec
LB: 0.0 usec
GB: 0.0 usec
PC: 1.00000000 sec
TD0:
===== CHANNEL f1 =====
NUC1: 1H
P1: 4.70 usec
PL1: 1.00 dB
FL1K: 13.7539080 MHz
SFO1: 400.142710 MHz
SI: 32
SF: 400.1300000 MHz
WDW: EM
SSB: 0
LB: 0.30 Hz
GB: 0
PC: 1.00

```



6.593
7.174
7.183
7.186
7.190
7.195
7.209
7.214
7.222
7.229
7.234
7.248
7.254
7.259

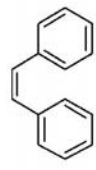
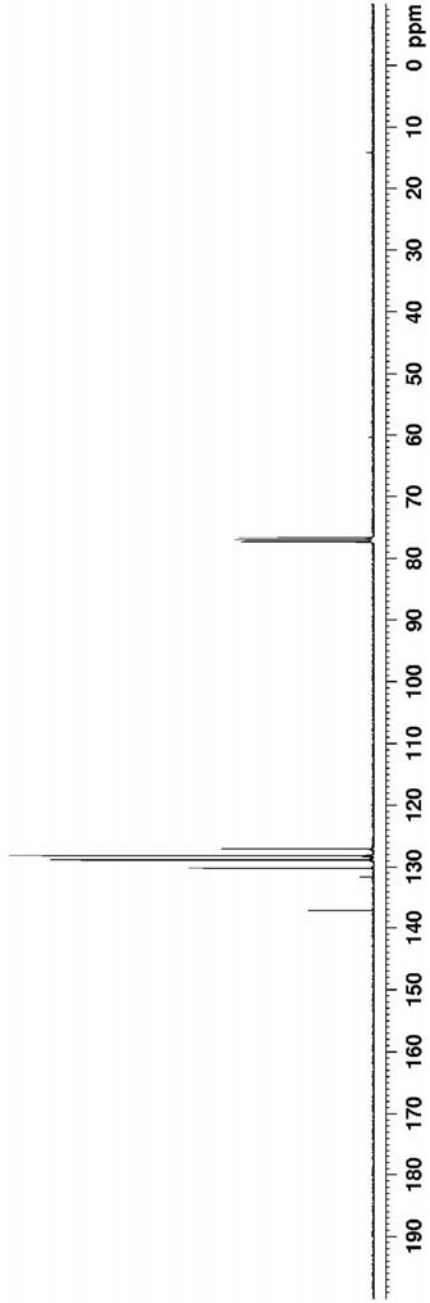


NAME Yzhaeo-PC-C-1225
EXTNO 11
PROCNO 1
DATE 20020205
TIME 4.43
AS-KUM SMCCL
PROBHD 5 mm PABCO B3
PC-PRGR 90P90
PULSE 126
SOLVENT CDCl3
NS 28
DS 4
SMR 24038.461 Hz
X1 0.350000 Jz
X2 1.360000 Jz
RG 7.78
LW 20.800 JREG
DE 6.50 JREG
TE 300.2 K
D1 0.0300000 JREG
D11 0.0300000 JREG
D10 1

===== CHANNEL 1 =====
NUC1 13C
P1 9.70 JREG
F1 125.760 MHz
SFO 56.3331005 W
===== CHANNEL 2 =====
NUC2 1H
P2 90.00 JREG
F2 400.146 MHz
SFO 100.6228239 MHz
===== CHANNEL 3 =====
NUC3 13C
P3 9.70 JREG
F3 125.760 MHz
SFO 56.3331005 W
===== CHANNEL 4 =====
NUC4 1H
P4 90.00 JREG
F4 400.146 MHz
SFO 100.6228239 MHz
===== CHANNEL 5 =====
NUC5 13C
P5 9.70 JREG
F5 125.760 MHz
SFO 56.3331005 W
===== CHANNEL 6 =====
NUC6 1H
P6 90.00 JREG
F6 400.146 MHz
SFO 100.6228239 MHz

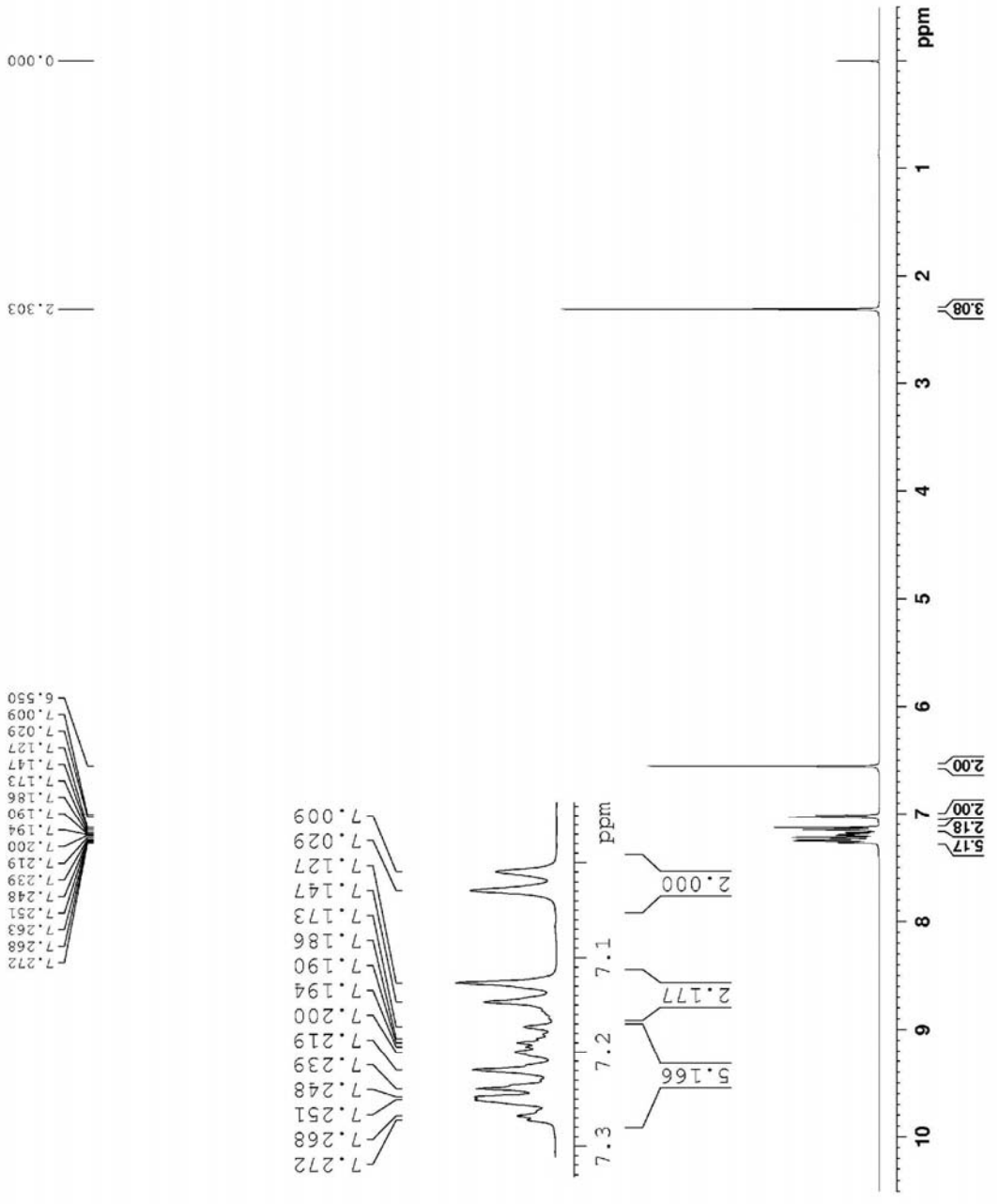
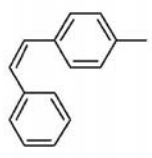
76.68
77.00
77.31

127.06
128.18
128.32
128.84
130.22
131.59
137.21



NAME: Yehua 4-Me D' Ph ara
 EXPNO: 10
 PROCNO: 2
 F2: 200.130033
 Time: 7.36
 INSTRUM: spect
 FPROG: zgpg30
 PULPROG: zgpg30
 SOLVENT: CDCl3
 NS: 16
 DS: 4
 SWH: 8023.602 Hz
 FWHZ: 0.12483 Hz
 AQ: 3.9843877 sec
 RG: 274
 MC: 60.800 usec
 LC: 297.0 usec
 TE: 300.2 K
 DE: 1.00000000.800
 TD: 65536

===== CHANNEL f1 =====
 NUC1: 13C
 P1: 4.70 usec
 PL1: 1.00 dB
 FLL: 13.7559800 MHz
 SFO1: 500.1300330 MHz
 SF: 500.1300330 MHz
 MEW: EM
 SFR: 0
 LF: 0
 GB: 0
 PC: 1.00



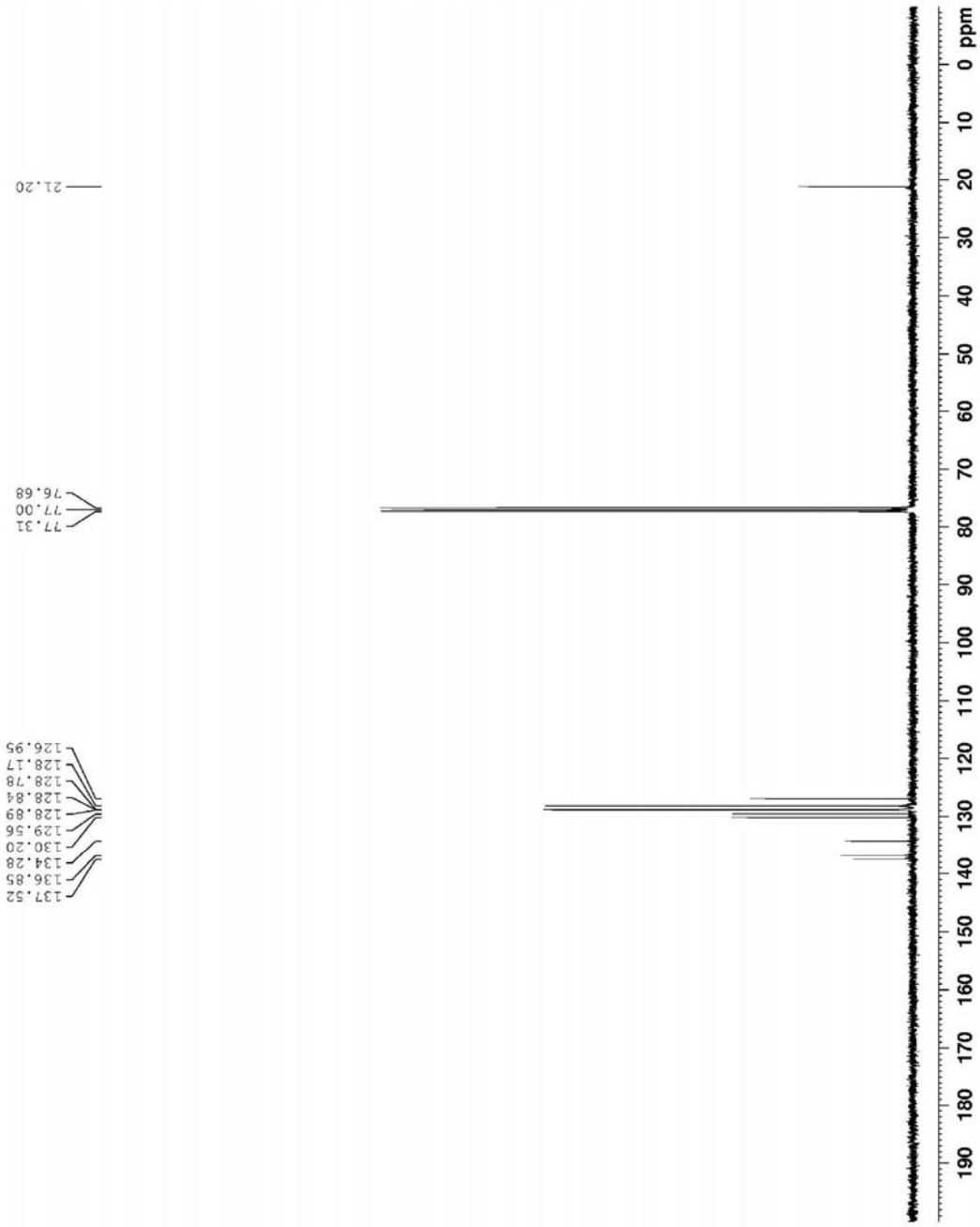
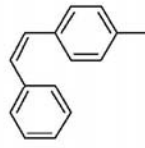
NAME Yzhao-7-ne-11-2-one
EXTNO 11
PROCNO 1
DATE 20021103
TIME 4.53
AS-KUM SFMCL
PROBHD 5 mm PABCO B3-
PC-PRGR 90P90
PULSE 12
SOLVENT CDCl3
NS 256
DS 4
SRH 24038.761 Hz
NUC1 13C
NUC2 13C
RG 1.363198 SEC
RG 724 SEC
LW 20.800 USEC
DE 6.50 USEC
TE 2.0000000 K
D1 0.03000000 SEC
D11 0.03000000 SEC
D10 1

===== CHANNEL F1 =====
NUC1 13C
PULPROG zgpg30
PC 9.70 USEC
PL 0
PT 2.00 dB
P2 56.3331005 W
P3 100.6228238 MHz
SFO 100.6228238 MHz

===== CHANNEL F2 =====
NUC1 13C
PULPROG zgpg30
PC 9.70 USEC
PL 0
PT 2.00 dB
P2 56.3331005 W
P3 100.6228238 MHz
SFO 100.6228238 MHz

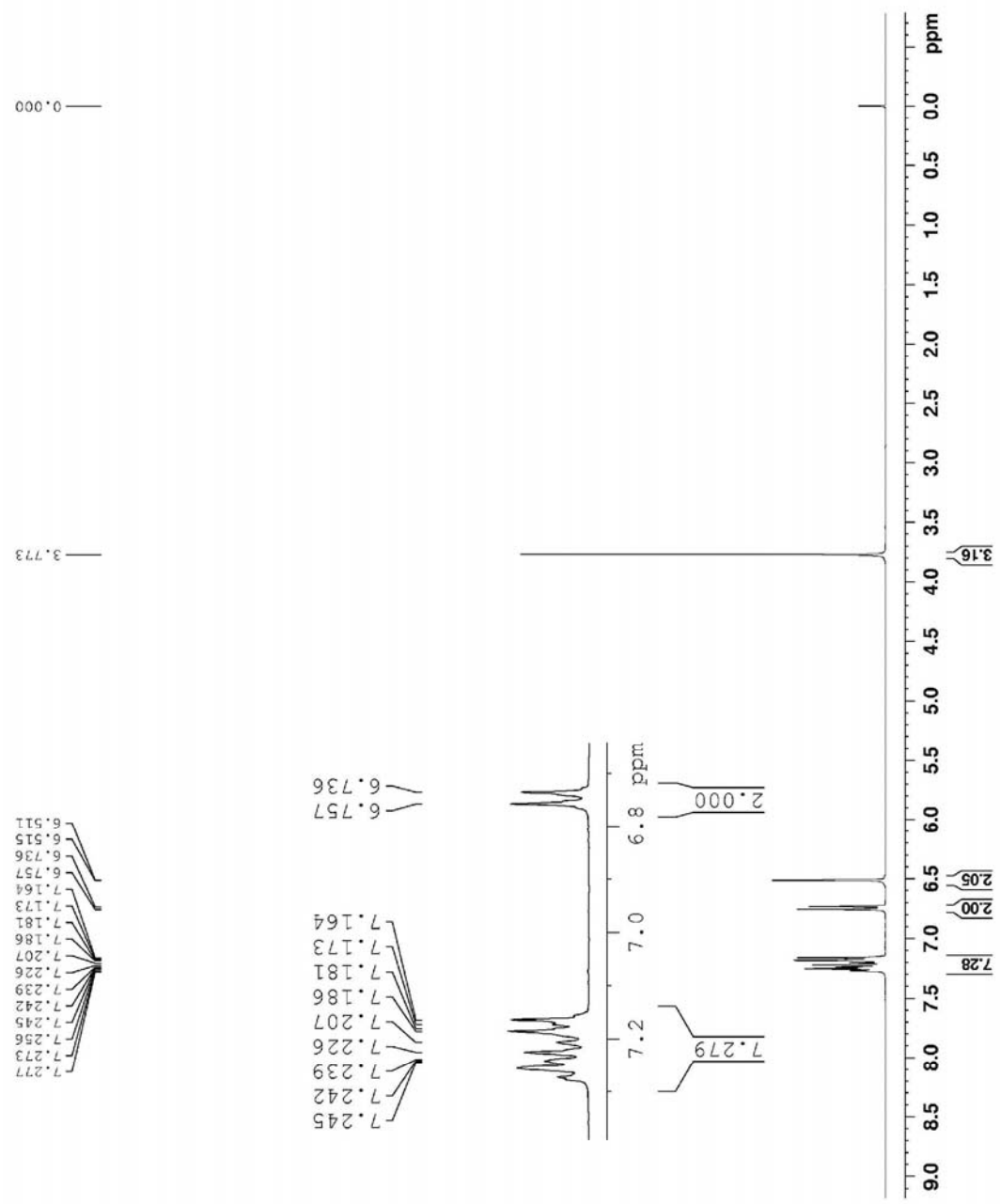
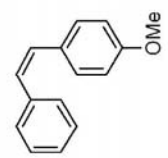
===== CHANNEL F3 =====
NUC1 13C
PULPROG zgpg30
PC 9.70 USEC
PL 0
PT 2.00 dB
P2 56.3331005 W
P3 100.6228238 MHz
SFO 100.6228238 MHz

===== CHANNEL F4 =====
NUC1 13C
PULPROG zgpg30
PC 9.70 USEC
PL 0
PT 2.00 dB
P2 56.3331005 W
P3 100.6228238 MHz
SFO 100.6228238 MHz



NAME Ykz160-4-OMe-C-2-Eth-ome
 EXPNO 1
 F2 - CH2O
 Date_ 20091108
 Time 4.58
 INSTRUM spect
 PULPROG 5 mm PARAGP2
 TD 65536
 SCAZ 13
 SCYPRY 16
 NS 8223.685 4z
 SF 8223.685 4z
 FIDRES 0.125483 Hz
 AQ 5.3846287 sec
 RG 60.000 18sec
 WC 6.50 18sec
 TC 280.3 K
 CL -0.0000000 sec
 DD 1

===== CHANNEL f1 =====
 NUCL 1H
 P1 12.00 sec
 PL 0.00 dB
 F1.FW 13.75594001 MHz
 SFO1 200.1324710 MHz
 SI 32768
 SWH 600.1300188 MHz
 EQ 1K
 SSB 0
 AF 6.20 MHz
 CF 0
 PC 1.00



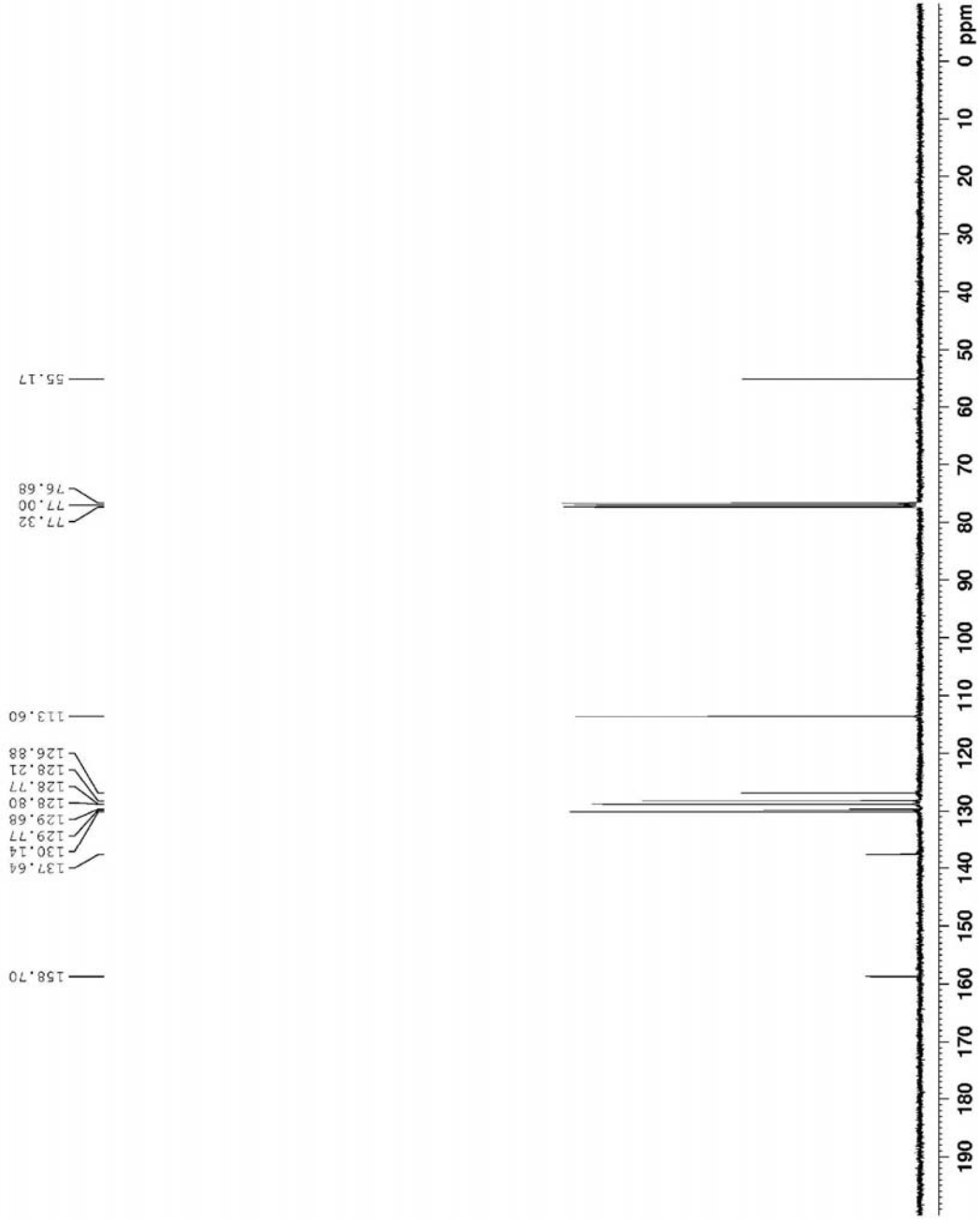
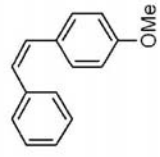
```

NAME          Ykzao 4, OMe 21 Ph ene
EXPNO         11
PROCNO        1
Date_         2009-08
Time          13.14
INSTRUM       spect
PROBHD        5 mm F400 BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CHCl3
NS            256
DS            4
SWH           26330.461 Hz
FIDRES        0.366798 Hz
AQ            1.3632988 sec
RG            724
PC            20.850 usec
DWT           600 usec
GB            0
UF            299.8 K
TD1           2.00000000 sec
D11           0.03000000 sec
-100

===== CHANNEL f1 =====
NUC1          13C
P1            2.70 usec
PL1           0.00 dB
PC1M         56.1341502 W
SF01         100.6262298 MHz

===== CHANNEL f2 =====
CEPRPG2       WALTZ16
NUC2          13C
P2            05.00 usec
PL2           -2.10 dB
PC2M         13.00 usec
SF02         100.6262298 MHz
===== CHANNEL f3 =====
P3            05.00 usec
PL3           -2.10 dB
PC3M         13.00 usec
SF03         100.6262298 MHz
===== CHANNEL f4 =====
P4            17.72104263 W
PL4           0.44513249 W
PC4M         409.1332768 MHz
SI 02
SF           100.6127695 MHz
===== CHANNEL f5 =====
MCH          EM
SSB          0
GB           0
PC           1.40
PC           1.40

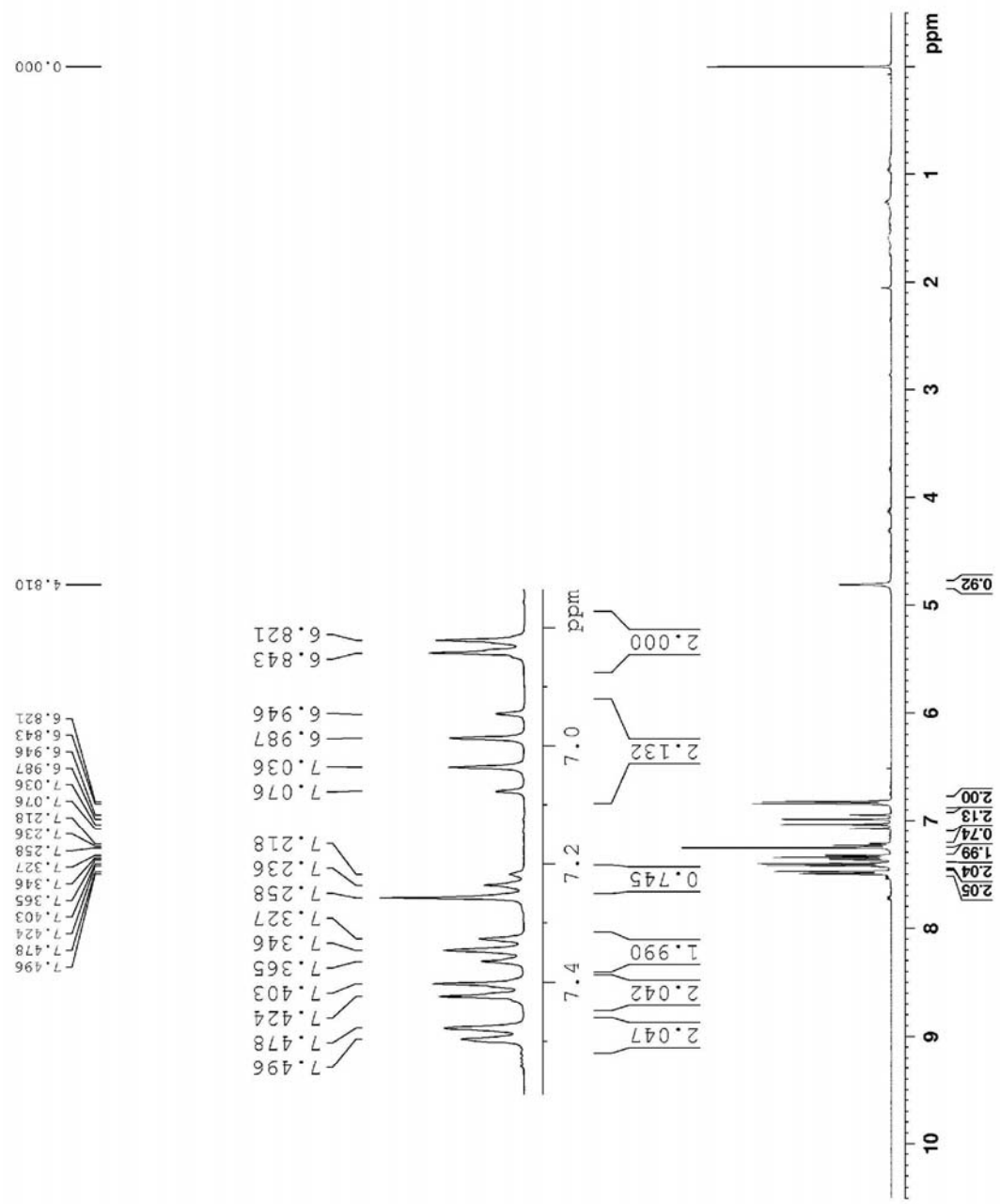
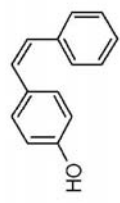
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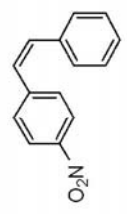
```

NAME      Ykhalao-4-OH-C14H11-one
EXPNO     10
PROCNO    1
F2        20091221
TIME      19.15
INSTRUM   spect
PROBHD    5 mm BBO BB-
PULPROG   zgpg30
AQ        4.0000000
SFO       500.136260
SOLVENT   CDCl3
NS         16
DS         2
SWH        8223.665 Hz
FIDRES     0.22183 Hz
AQ         3.981687 sec
RG          655
JM         60.800 usec
TE         300.2 K
TD         1.00000000 sec
SI         1
SF         500.136260 MHz
SOLVENT   CDCl3
NS         0
DS         0
SWH        3.30 Hz
FIDRES     1.00
SI         1
SF         12.00 MHz
P1         3.00 usec
P2         3.00 usec
P3         3.00 usec
P4         3.00 usec
P5         3.00 usec
P6         3.00 usec
P7         3.00 usec
P8         3.00 usec
P9         3.00 usec
P10        3.00 usec
P11        3.00 usec
P12        3.00 usec
P13        3.00 usec
P14        3.00 usec
P15        3.00 usec
P16        3.00 usec
P17        3.00 usec
P18        3.00 usec
P19        3.00 usec
P20        3.00 usec
P21        3.00 usec
P22        3.00 usec
P23        3.00 usec
P24        3.00 usec
P25        3.00 usec
P26        3.00 usec
P27        3.00 usec
P28        3.00 usec
P29        3.00 usec
P30        3.00 usec
P31        3.00 usec
P32        3.00 usec
P33        3.00 usec
P34        3.00 usec
P35        3.00 usec
P36        3.00 usec
P37        3.00 usec
P38        3.00 usec
P39        3.00 usec
P40        3.00 usec
P41        3.00 usec
P42        3.00 usec
P43        3.00 usec
P44        3.00 usec
P45        3.00 usec
P46        3.00 usec
P47        3.00 usec
P48        3.00 usec
P49        3.00 usec
P50        3.00 usec
P51        3.00 usec
P52        3.00 usec
P53        3.00 usec
P54        3.00 usec
P55        3.00 usec
P56        3.00 usec
P57        3.00 usec
P58        3.00 usec
P59        3.00 usec
P60        3.00 usec
P61        3.00 usec
P62        3.00 usec
P63        3.00 usec
P64        3.00 usec
P65        3.00 usec
P66        3.00 usec
P67        3.00 usec
P68        3.00 usec
P69        3.00 usec
P70        3.00 usec
P71        3.00 usec
P72        3.00 usec
P73        3.00 usec
P74        3.00 usec
P75        3.00 usec
P76        3.00 usec
P77        3.00 usec
P78        3.00 usec
P79        3.00 usec
P80        3.00 usec
P81        3.00 usec
P82        3.00 usec
P83        3.00 usec
P84        3.00 usec
P85        3.00 usec
P86        3.00 usec
P87        3.00 usec
P88        3.00 usec
P89        3.00 usec
P90        3.00 usec
P91        3.00 usec
P92        3.00 usec
P93        3.00 usec
P94        3.00 usec
P95        3.00 usec
P96        3.00 usec
P97        3.00 usec
P98        3.00 usec
P99        3.00 usec
P100       3.00 usec

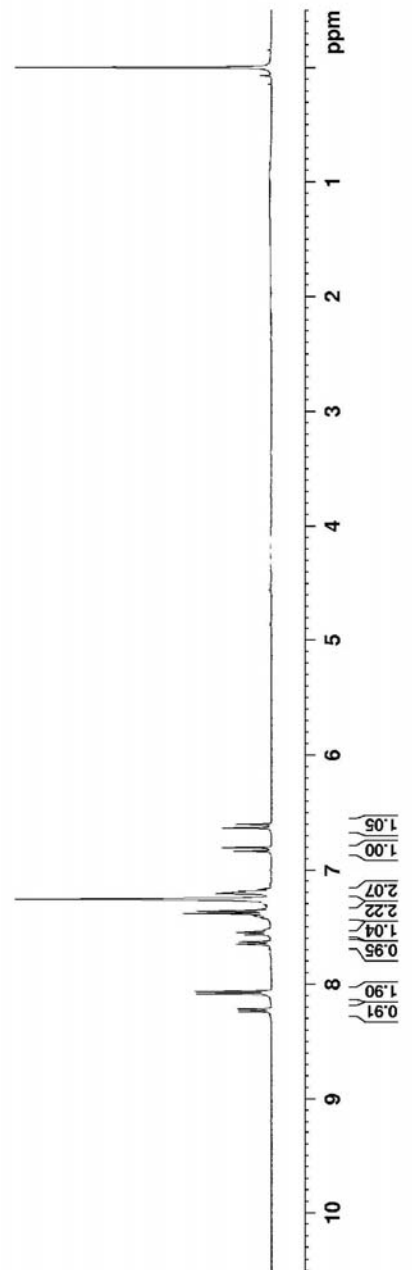
```



NAME: Y18405 / K02 71 PF 0001 1223
 EXPNO: 2
 PROCNO: 20011223
 DATE_01: 12/23/01
 TIME: 12:00:00
 INSTRUM: spect
 F2: 299.9999999
 F1: 500.1360999
 AQ: 5 mm QNP1H1 300
 PRG: zgpg30
 F2: 658.316
 F1: 125.7603333
 CEC: 1
 SFO: 3
 SWH: 8225.685 Hz
 FIDRES: 0.001000000
 AQ: 3.24863187 sec
 RG: 456
 DQ: 456 uspec
 SC: 60.00 uspec
 DC: 60.00 uspec
 SS: 28.00 sec
 DS: 4
 GB: 1.000000000 sec
 EQ2: 1
 SFO2: 125.7603333
 F2: 14.70 uspec
 F1: 14.70 uspec
 FIDRES: 0.001000000
 AQ: 3.24863187 sec
 RG: 456
 DQ: 456 uspec
 SC: 60.00 uspec
 DC: 60.00 uspec
 SS: 28.00 sec
 DS: 4
 GB: 1.000000000 sec
 EQ2: 1
 SFO2: 125.7603333
 F2: 14.70 uspec
 F1: 14.70 uspec
 FIDRES: 0.001000000
 AQ: 3.24863187 sec
 RG: 456
 DQ: 456 uspec
 SC: 60.00 uspec
 DC: 60.00 uspec
 SS: 28.00 sec
 DS: 4
 GB: 1.000000000 sec
 EQ2: 1



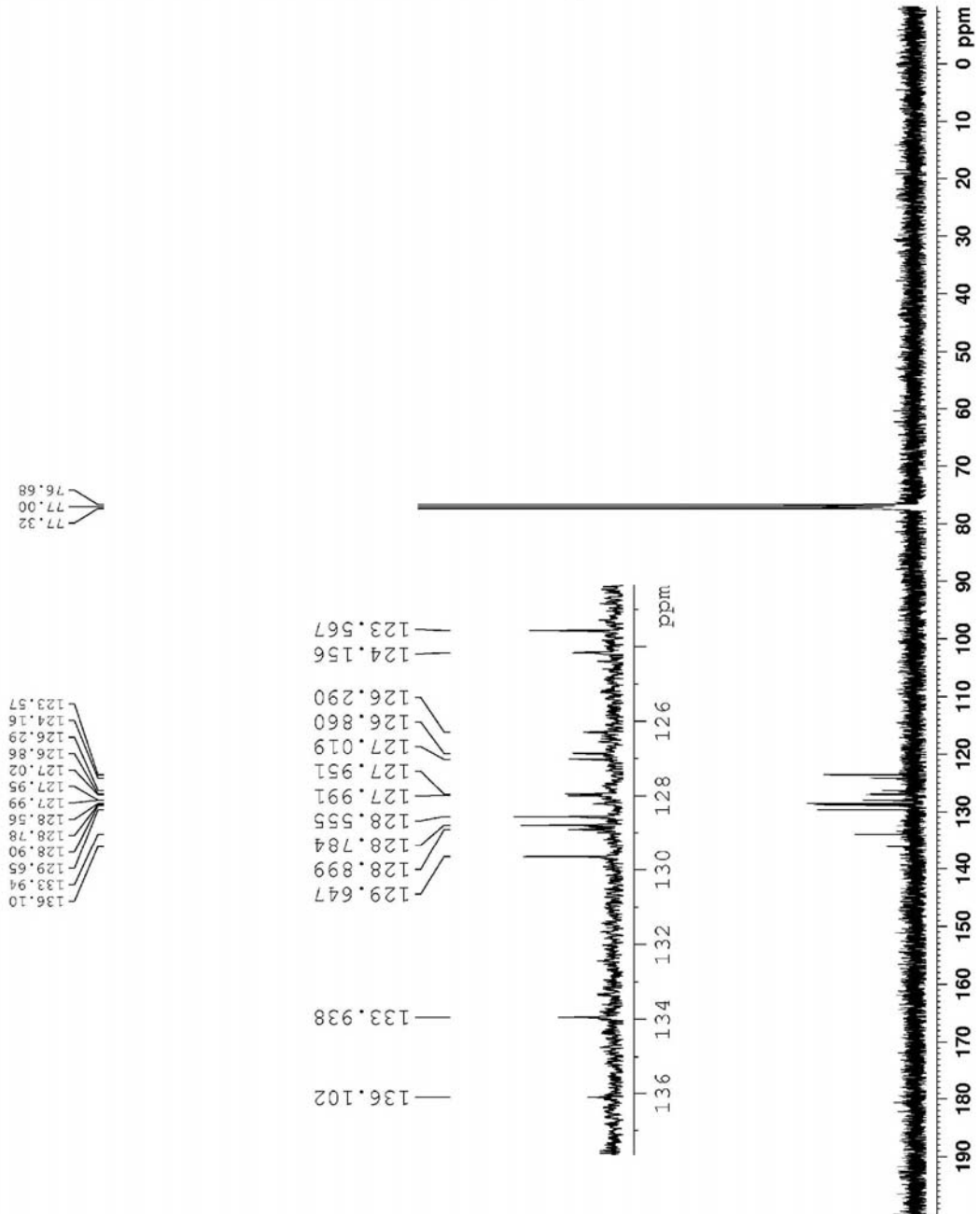
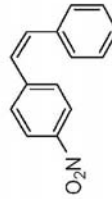
8.239
 8.218
 8.085
 8.063
 7.654
 7.632
 7.568
 7.550
 7.407
 7.385
 7.363
 7.211
 7.203
 7.193
 7.171
 6.834
 6.804
 6.632
 6.602



```

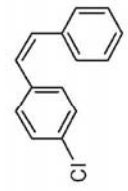
NAME: YZhaao-4-HNO-21-10-2006-2223
PROCNO: 1
DATE_: 20061223
TIME: 13.55
INSTRUM: spect
PROBHD: 5 mm ZABBO BBO
PULPROG: zgpg30
TD: 65536
SFO400: 400.136361 MHz
NUC1: 13C
NUC2: 13C
SOLNT: 7403H.161.HZ
SOLID: 3.855798.HZ
F1: 125.761878 MHz
F2: 125.761878 MHz
AQ: 20.820 usec
RG: 392.8 KHz
TR: 2.20000000 usec
D1: 2.20000000 usec
D2: 0.10000000 usec
D3: 0.35000000 usec
===== CHANNEL f1 =====
NUC1: 13C
P1: 9.72 usec
PL1: 0.00 dB
PL2: 0.00 dB
PL3: 0.00 dB
PL4: 0.00 dB
PL5: 0.00 dB
PL6: 0.00 dB
PL7: 0.00 dB
PL8: 0.00 dB
PL9: 0.00 dB
PL10: 0.00 dB
PL11: 0.00 dB
PL12: 0.00 dB
PL13: 0.00 dB
PL14: 0.00 dB
PL15: 0.00 dB
PL16: 0.00 dB
PL17: 0.00 dB
PL18: 0.00 dB
PL19: 0.00 dB
PL20: 0.00 dB
PL21: 0.00 dB
PL22: 0.00 dB
PL23: 0.00 dB
PL24: 0.00 dB
PL25: 0.00 dB
PL26: 0.00 dB
PL27: 0.00 dB
PL28: 0.00 dB
PL29: 0.00 dB
PL30: 0.00 dB
PL31: 0.00 dB
PL32: 0.00 dB
PL33: 0.00 dB
PL34: 0.00 dB
PL35: 0.00 dB
PL36: 0.00 dB
PL37: 0.00 dB
PL38: 0.00 dB
PL39: 0.00 dB
PL40: 0.00 dB
PL41: 0.00 dB
PL42: 0.00 dB
PL43: 0.00 dB
PL44: 0.00 dB
PL45: 0.00 dB
PL46: 0.00 dB
PL47: 0.00 dB
PL48: 0.00 dB
PL49: 0.00 dB
PL50: 0.00 dB
===== CHANNEL f2 =====
NAME: wal-216
PROCNO: 80.33 usec
P1: 9.72 usec
PL1: 0.00 dB
PL2: 0.00 dB
PL3: 0.00 dB
PL4: 0.00 dB
PL5: 0.00 dB
PL6: 0.00 dB
PL7: 0.00 dB
PL8: 0.00 dB
PL9: 0.00 dB
PL10: 0.00 dB
PL11: 0.00 dB
PL12: 0.00 dB
PL13: 0.00 dB
PL14: 0.00 dB
PL15: 0.00 dB
PL16: 0.00 dB
PL17: 0.00 dB
PL18: 0.00 dB
PL19: 0.00 dB
PL20: 0.00 dB
PL21: 0.00 dB
PL22: 0.00 dB
PL23: 0.00 dB
PL24: 0.00 dB
PL25: 0.00 dB
PL26: 0.00 dB
PL27: 0.00 dB
PL28: 0.00 dB
PL29: 0.00 dB
PL30: 0.00 dB
PL31: 0.00 dB
PL32: 0.00 dB
PL33: 0.00 dB
PL34: 0.00 dB
PL35: 0.00 dB
PL36: 0.00 dB
PL37: 0.00 dB
PL38: 0.00 dB
PL39: 0.00 dB
PL40: 0.00 dB
PL41: 0.00 dB
PL42: 0.00 dB
PL43: 0.00 dB
PL44: 0.00 dB
PL45: 0.00 dB
PL46: 0.00 dB
PL47: 0.00 dB
PL48: 0.00 dB
PL49: 0.00 dB
PL50: 0.00 dB
===== CHANNEL f3 =====
NAME:
PROCNO:
P1:
PL1:
PL2:
PL3:
PL4:
PL5:
PL6:
PL7:
PL8:
PL9:
PL10:
PL11:
PL12:
PL13:
PL14:
PL15:
PL16:
PL17:
PL18:
PL19:
PL20:
PL21:
PL22:
PL23:
PL24:
PL25:
PL26:
PL27:
PL28:
PL29:
PL30:
PL31:
PL32:
PL33:
PL34:
PL35:
PL36:
PL37:
PL38:
PL39:
PL40:
PL41:
PL42:
PL43:
PL44:
PL45:
PL46:
PL47:
PL48:
PL49:
PL50:

```



NAME Ykzhaio-2-351
 EXINC 10
 PROCNO 1
 DATE_ 2009/11
 TIME 12.54
 TAC
 INSTRUM spect
 PROBHD 5 EI FAREO B3-
 PULPROG ZG30
 ID 65316
 SOLVENT CDCl3
 DS 12
 SWH 8223.655 Hz
 F1 DMS 0.75633 Hz
 AQ 3.9846337 sec
 RC 322
 DW 60.800 sec
 DE 29.150 sec
 TE 29.50
 DI 1.0000000 sec
 TD0 1

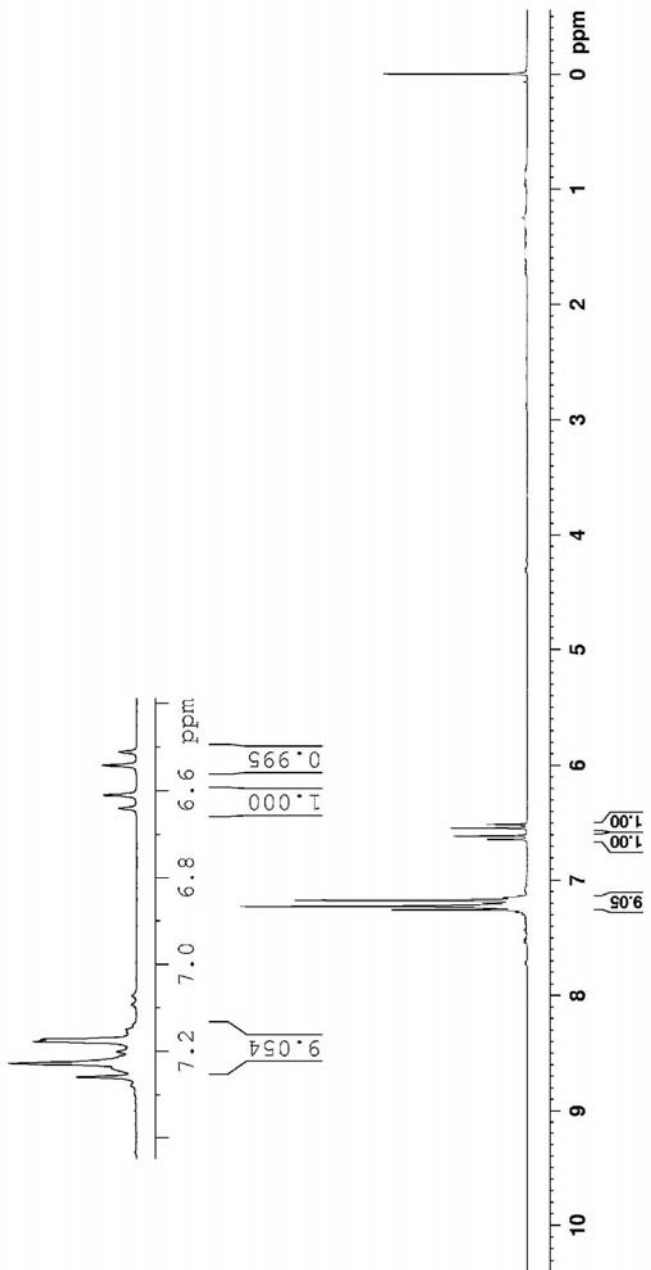
----- CHANNEL f1 -----
 NUCL1 1H
 P1 14.70 sec
 PL1 0.00
 FLLM 13.7559060 MHz
 SFO1 400.324710 MHz
 SF 52768
 SF 400.340059 MHz
 MW 5M
 SSH 0
 GB 0.50 Hz
 PC 1.00



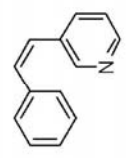
0.000

7.258
 7.238
 7.227
 7.200
 7.176
 7.172
 6.640
 6.610
 6.542
 6.511

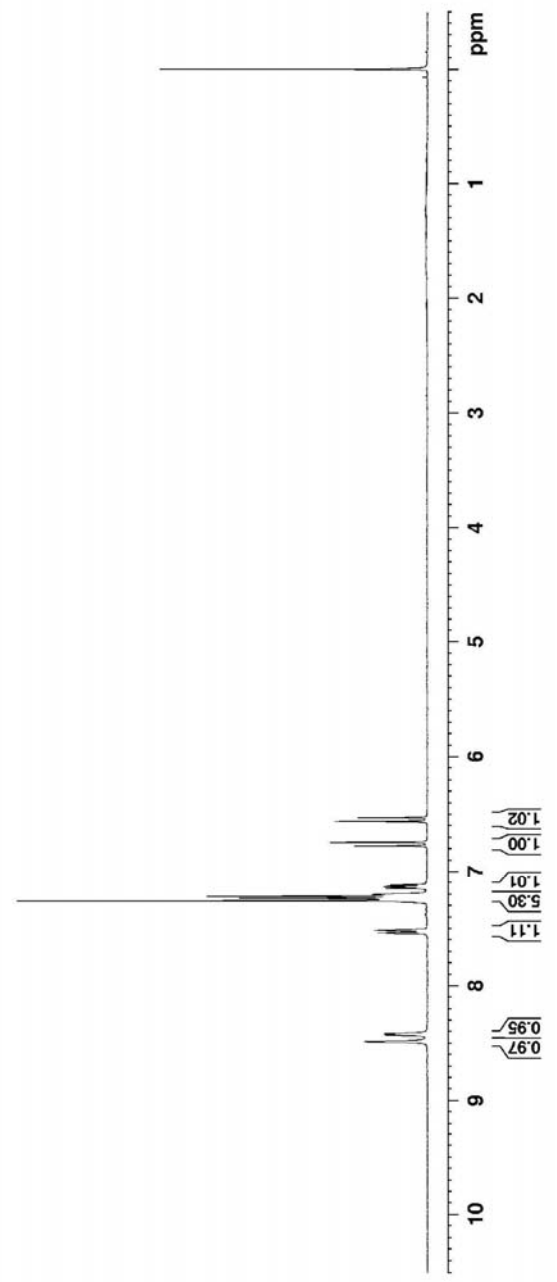
7.258
 7.238
 7.227
 7.200
 7.176
 7.172
 6.640
 6.610
 6.542
 6.511



NAME YK1140-EUCB-CH2-12.82
EXPNO 1
PROCNO 2001222
Date_ 9.00
Time 9.00
INSTRUM spect
PROBHD 5 mm PABBO-1H30
PULPROG zgpg30
TD 65536
F2 65536
SOLVENT CDCl3
NUC1 13
NUC2 13
SFO 823.685 Hz
FIDRES 0.125483 Hz
AQ 3.9946397 sec
RG 320
WM 60.000 usec
LB 6.50 usec
GB 209.3 Hz
PC 1.00000000 sec
LDD 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL 0.00 dB
PC 22.9025692 sec
PLW 206.1329713 MHz
SFO1 500.1360000 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00

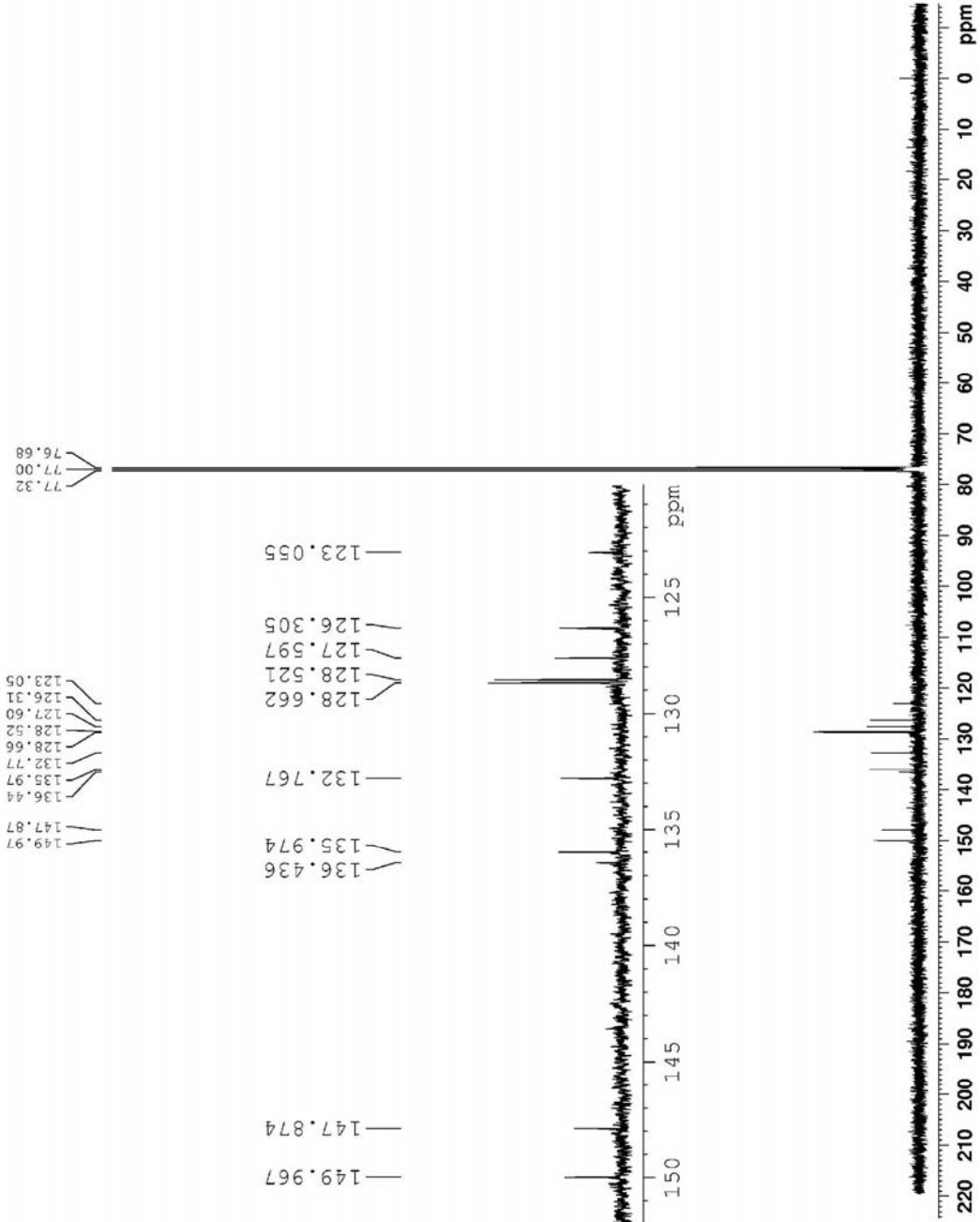


8.486
8.428
8.418
7.537
7.518
7.263
7.240
7.233
7.224
7.153
7.141
7.134
7.122
6.779
6.748
6.565
6.535

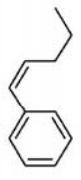


```

NAME          Ykzhaao FacIL=CHFY .218C
EXPNO        11
PROCNO       11
Date_         22091222
Time         1.22
INSTRUM      spect
PROBHD       5 mm F400 BB-
PULPROG      zgpg30
TD            65536
SOLVENT      CHCl3
NS            400
DS            4
SS            26330.461 Hz
AQ            0.366788 Hz
RG            1.3637988 sec
PC            2.7
DE            20.800 usec
TE            289.3 K
D1            2.00000000 sec
D11          0.03000000 sec
D10          1
----- CHANNEL #1 -----
NUC1         -13C
P1           2.40 usec
PL           0.00 dB
PC1M        57.22745073 W
SF01        100.6285298 MHz
----- CHANNEL #2 -----
CEPRPG2     WALTZ16
NUC2         1H
P2           96.00 usec
PL2          -2.00 dB
PC2M        1.20 usec
PL2M        1.20 dB
PC2M        18.19833661 W
P21M        0.22335221 W
P21M        0.22335221 W
SI 02       400.1327112 MHz
SI 02       100.6127112 MHz
MCH         EM
SSB         0
GB          0
PC          1.40
  
```

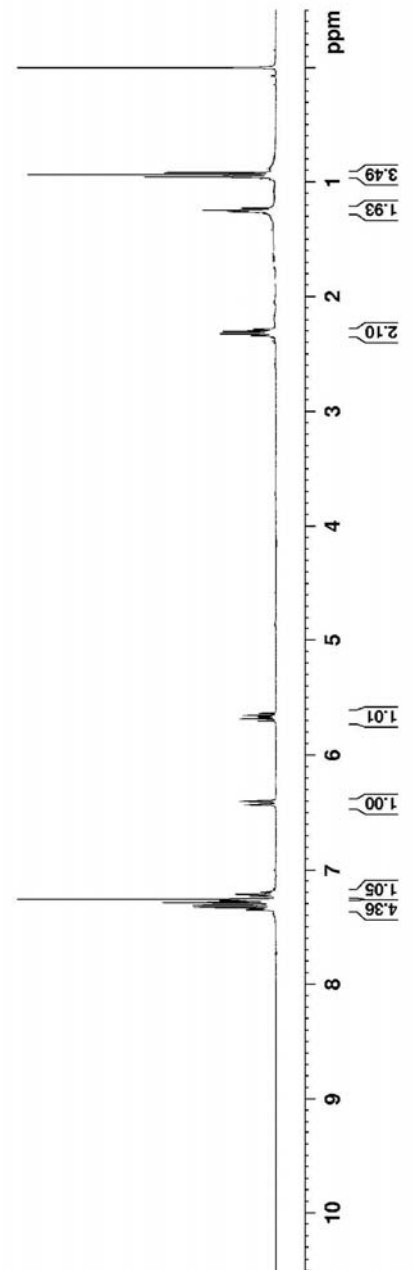


NAME y1zbac-EthB-C12-2F-1219C
 PROCNO 1
 F1 F1
 DATE_ 2003/2/3
 TIME 7.27
 INSTRUM spect
 PULPROG zgpg30
 ID 65536
 CD 1
 SOLVENT CDCl3
 NS 2
 DS 2
 SWH 8223.832 Hz
 FIDRES 0.112483 Hz
 AQ 1.991488 sec
 RG 106
 W 63.800 MHz
 ZG 2.00 sec
 ZD 0.00 sec
 ZC 1.0000000 sec
 LDC -
 CHANNEL #1
 NUCL1 13C
 P1 14.70 usec
 PL1 0.00 dB
 FWHM 13.755000 MHz
 SFO1 100.626150 MHz
 SC 32768
 SP 400.320000 MHz
 SWH 32768.000 MHz
 LB 0.00 Hz
 GB 0
 PC 1.00

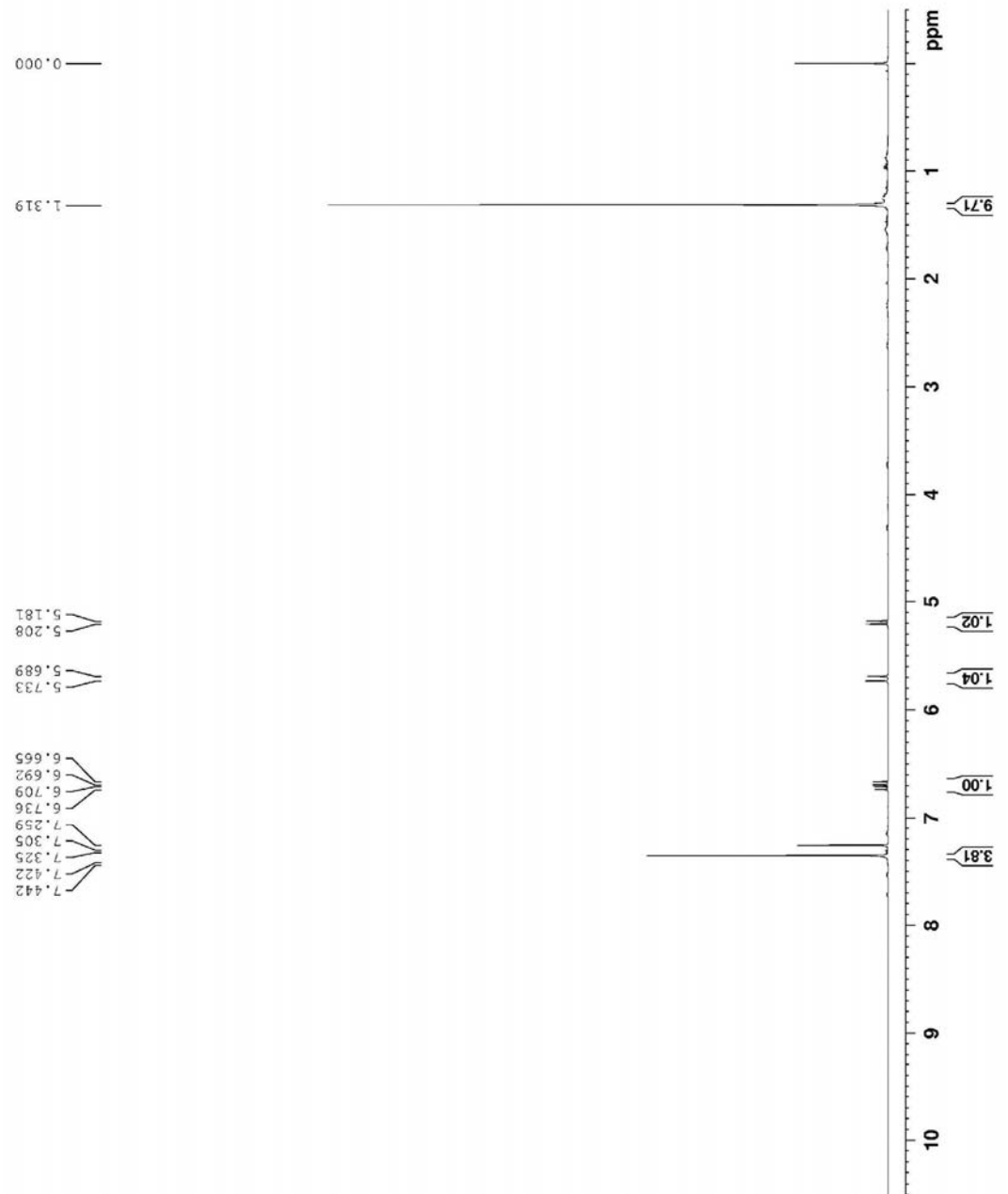
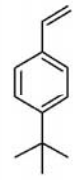


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 0.957
 1.229
 1.247
 1.252
 1.264
 2.284
 2.288
 2.303
 2.307
 2.321
 2.325
 2.340
 2.344

5.638
 5.656
 5.667
 5.674
 5.685
 5.703
 6.402
 6.431
 7.199
 7.217
 7.235
 7.261
 7.272
 7.290
 7.314
 7.332
 7.351



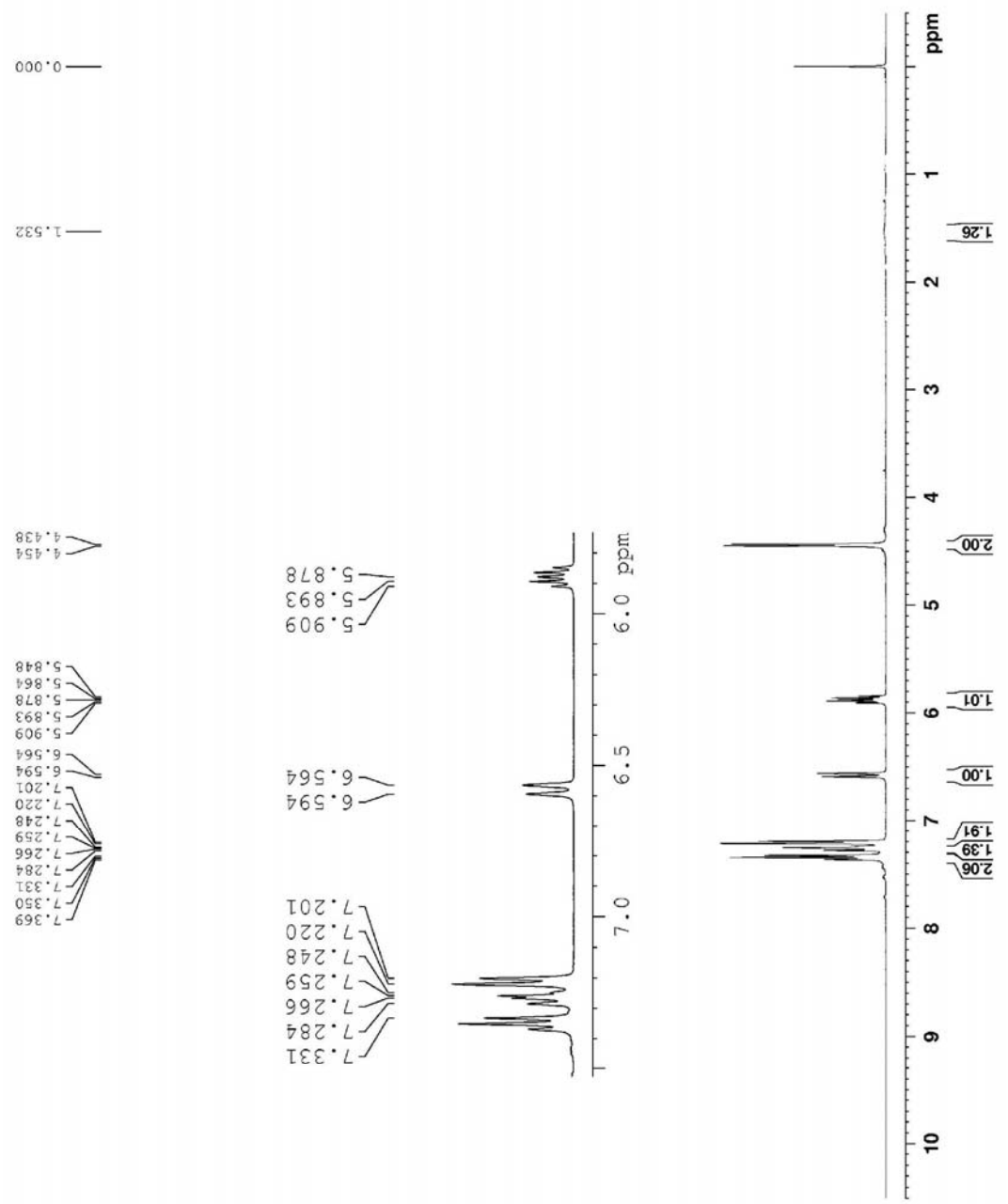
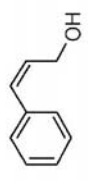
NAME YXzhaoo-3-3-PhCl=C12
EXPNO 10
PROCNO 1
F2 -
DATE_ 20081225
TIME 1.23
INSTR spect
PROBHD 5 DE PABHO RB-
P1_4530
P2_4530
P3_4530
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.225183 Hz
AQ 3.984636 sec
RG 327.6
W 60.800 uscc
TR 6.00 uscc
TE 281.2 K
TI 1.00000000 sec
TD 1
----- CHANNEL f1 -----
NUC1 1H
P1 14.70 uscc
P2 -1.00 dB
M 15.7533611 MHz
SFO 400.1463611 MHz
SI 32768
SF 400.146361104 MHz
RF 1.00
NUC2 13C
SSB 0
WDW 0
GB 0
PC 1.40



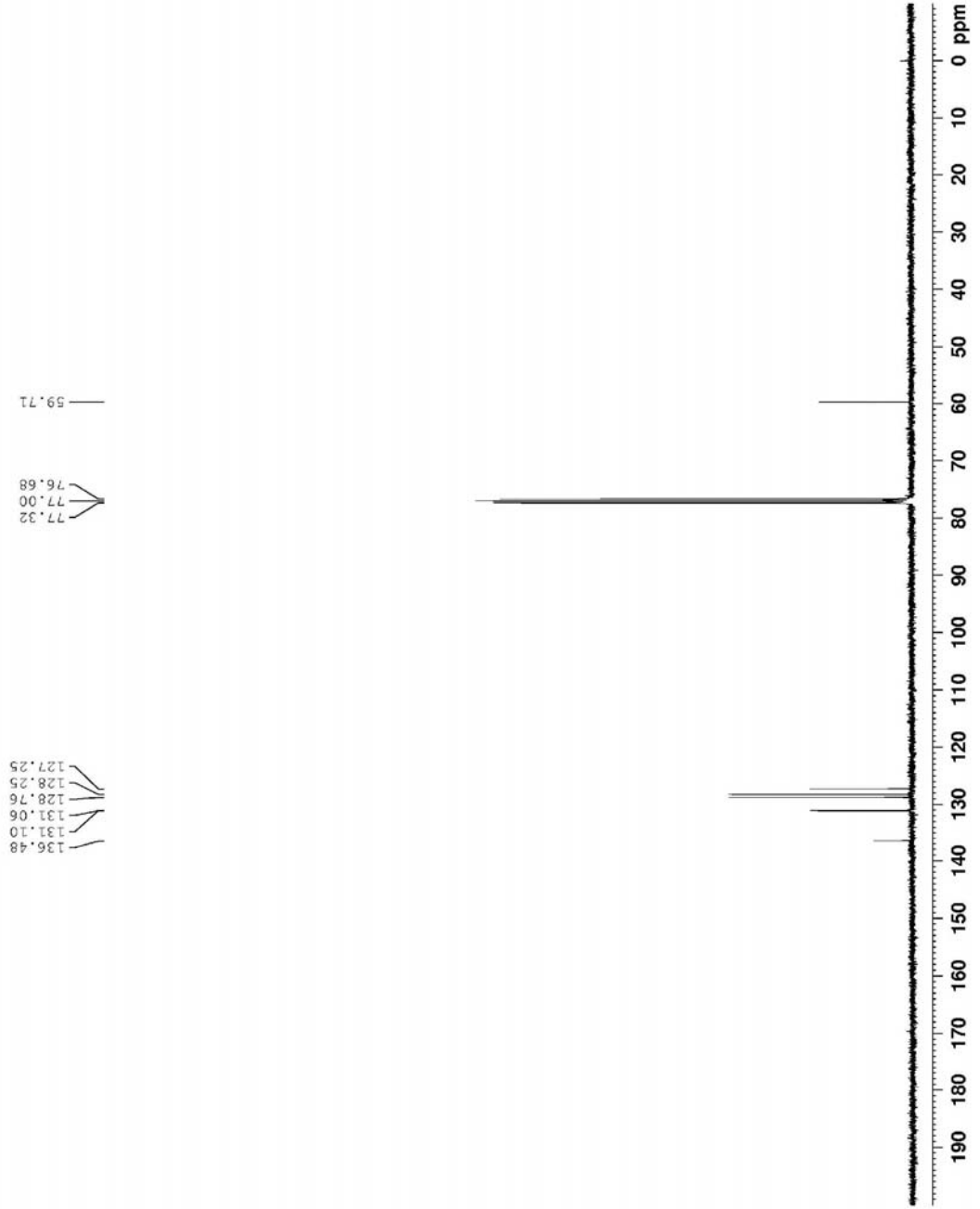
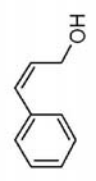

```

NAME          13C-NMR-CHC=CHOE-1217B
EXPNO         1
PROCNO        1
PROCRES       20
PROBHD        5 mm PABBO/PA
PULPROG       zgpg30
SOLVENT       CDCl3
NS            16
DS            1
SF            92.25 MHz
FIDRES        0.225483 Hz
AQ            3.9846387 sec
RG            60.000 usec
DE            6.50 usec
TE            300.2 K
D1            1.00000000 sec
TD            1

===== CHANNEL f1 =====
NUC1          13C
P1            14.70 usec
PL1          -1.00 dB
NUC2          1H
P2            3.75594000 usec
PL2          -1.00 dB
NUC3          13C
P3            14.70 usec
PL3          -1.00 dB
=====
  
```

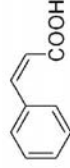


NAME yk4uu-21cb-e02205-217b
 EXPNO 1
 PROCNO 1
 DATE_ 20091226
 TIME 20.29
 F2 500.136261
 PULPROG zgpg30
 TD 65536
 SFO 500.136261
 AQ 0.050000
 RG 327.500000
 DB 6.500000
 DE 232.5 K
 TE 300.2 K
 FID 1
 SFC 0.000000
 SF 100.612705 MHz
 Channel F1
 NUC1 13C
 P 9.740000
 PL 0.000000
 PM 55.611000
 SFO 100.622825 MHz
 Channel F2
 NUC2 13C
 P 9.740000
 PL 0.000000
 PM 55.611000
 SFO 100.622825 MHz
 Channel F3
 NUC3 13C
 P 9.740000
 PL 0.000000
 PM 55.611000
 SFO 100.622825 MHz



NAME 3HCH-CH-COOH-0124
 EXPR 10
 PROCNO 1
 F2 20° C0° Hz
 T1 15.49
 T2 15.49
 INSTALM spect
 PROBLJ 5 mm FAHQD B3-
 PULPROG zg30
 ID 65536
 SOLVENT CDCl3
 DS 1
 RS 1
 SMH 8223.685 Hz
 F1DMS 0.75433 Hz
 AQ 3.9846387 sec
 RC -61
 DW 60.800 sec
 DE 55.0 sec
 TE 29.5 Hz
 TD 1.0000000 sec
 TEO 1

----- CHANNEL F1 -----
 NUC1 1H
 P1 12.00 sec
 PL1 0.00 dB
 FWH 22.90425652 MHz
 SFO1 400.324710 MHz
 S- 32768
 SF 400.324710 MHz
 WFW -H
 SSH 0
 LB 0.30 Hz
 GB 0
 PC 1.00

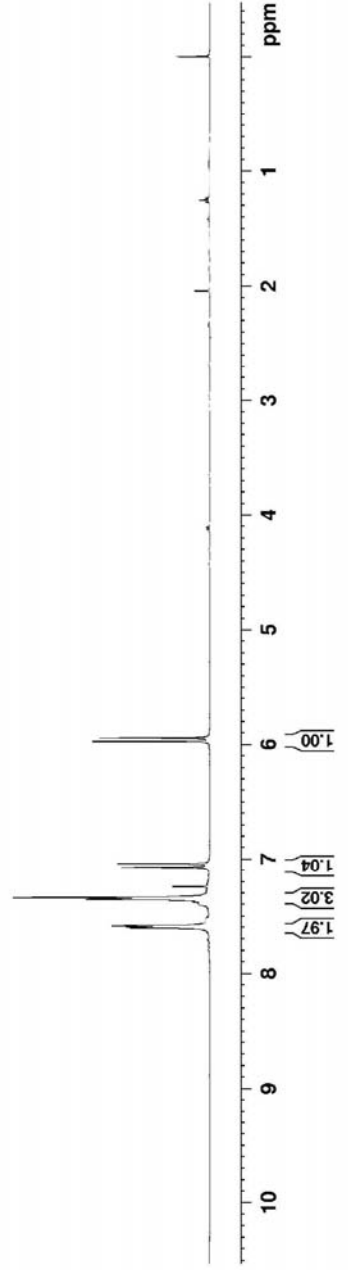
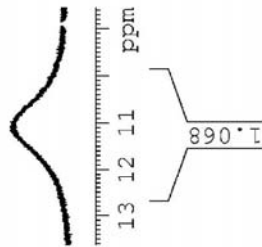


0.00

5.978
5.947

7.609
7.600
7.590
7.586
7.360
7.355
7.347
7.342
7.249
7.078
7.047

11.098



NAME ykzhae-PECH-CHOOEt
 EXTCO ZP
 PROCNO 1
 DATE 20100811
 TIME 10:48
 INSTRUM spect
 PROBLJ 5 M FAHRF B3-
 PULPROG zgpg
 IP 65536
 SOLVENT CDCl3
 DS 1
 SWH 8223.645 Hz
 F1 DMS 0.75453 Hz
 AC 3.9846387 sec
 RC -20
 DW 60.800 sec
 DE 55.0 sec
 TE 29.0 sec
 D1 1.00000000 sec
 TD 1
 ----- CHANNEL f1 -----
 NUC1 1H
 P1 12.00 sec
 PL 0.00 dB
 FWH 22.90425652 MHz
 SFO1 400.324710 MHz
 SF 32768
 SF 400.324710 MHz
 WSW -H
 SSW 0
 LB 0.50 Hz
 GB 0
 PC 1.00

