Supporting Information

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Experimental

Unless otherwise stated, all reactions were carried out under on oxygen free nitrogen atmosphere using pre-dried solvents and standard Schlenk techniques, subsequent chromatographic and work up procedures were performed in air. ^{1}H (400.1 MHz), ^{13}C (100.6 MHz), ^{31}P-{^{1}H} (162.0 MHz) and ^{77}Se-{^{1}H} (51.4 MHz referenced to external Me_2Se) NMR spectra were recorded at 25 $^{\circ}C$ (unless stated otherwise) on Bruker Advance II 400s and JEOL GSX 270. IR spectra were recorded as KBr pellets in the range of 4000-250 cm^{-1} on a Perkin-Elmer 2000 FTIR/Raman spectrometer. Mass spectrometry was performed by the EPSRC National Mass Spectrometry Service Centre, Swansea.

X-ray crystal data for compounds **4**, **5**, **7**, **8**, **9**, **10**, **13**, **14** and **15** were collected using Rigaku SCXMini Mercury CCD system at -100 C. Intensity data were collected using ω steps accumulating area detector images spanning at least a hemisphere of reciprocal space. All data were corrected for Lorentz polarization effects. Absorption effects were corrected based on multiple equivalent reflections or by semi-empirical methods. Structures were solved by direct methods and refined by full-matrix least-squares against F^2 by using the program SHELXTL.[1] Hydrogen atoms were assigned riding isotropic displacement parameters and constrained to idealized geometries. CCDC 1509501 (for compound **5**), CCDC 1509502 (for compound **13**), CCDC 1509503 (for compound **4**), CCDC 1509504 (for compound **9**), CCDC 1509505 (for compound **14**), CCDC 1509506 (for compound **15**), CCDC 1509507 (for compound **10**), CCDC 1509508 (for compound **7**) and CCDC 1509509 (for compound **8**) contain the supplementary crystallographic data for this paper. These data can be obtained free of charge from The Cambridge Crystallographic Data Centre via www.ccdc.cam.ac.uk/data_request/cif.

General procedure for the synthesis of compounds 4–6. A mixture of *N*,*N*-dialkylcyanamide (2.0 mmol) and Woollins' reagent (1.07 g, 2.0 mmol) in dry toluene (20 mL) was refluxed for 20 h. Upon cooling to room temperature and removing unreacted insoluble solid and drying in vacuo, the organic residue was purified by silica gel column (1:5 dichloromethane/hexane as eluent) to give the corresponding compounds **4**–**6**.

4-(Dicyclohexylamino)-2,5-diphenyl-1,3,2,5-selenazadiphosphole 2,5-diselenide (4): Brightly yellow solid (1.06 g, 80%). M.p. 150-152°C. Selected IR (KBr, cm^{-1}): 1558, 1553, 1450, 1436, 1388, 1348, 1303, 1258, 1176, 1120, 1087, 992, 915, 870, 787, 745, 731, 687, 633, 548, 520, 500, 462. ^{1}H NMR ($CDCl_3$, δ), 8.18-7.98 (m, 4H), 7.53-7.43 (m, 6H), 2.74-2.62 (m, 2H), 2.04-0.76 (m, 20H) ppm. ^{13}C NMR ($CDCl_3$, δ), 133.24, 132.6, 132.4, 131.7, 131.5, 129.6, 129.4, 128.9, 128.7, 61.7, 30.1, 26.5, 25.5 ppm. ^{31}P NMR ($CDCl_3$, δ), 82.3 (d, ^{2}J(P, P) = 14.1 Hz, J(P-Se) = 465 Hz, J(P=Se) = 786 Hz), 59.1 (d, ^{2}J(P, P) = 16.4 Hz, J(P-Se) = 455 Hz, J(P=Se) = 812 Hz) ppm. ^{77}Se NMR ($CDCl_3$, δ), 675.7 (dd, J(P-Se) = 455, 465 Hz), 15.0 (d, J(P=Se) = 815 Hz), -75.4 (d, J(P=Se) = 782 Hz) ppm. HRMS (CI^+, m/z): found 660.9625 $[M+H]^+$, calculated mass for $C_{25}H_{32}N_2P_2SeH$: 660.9627.

4-(Dibenzylamino)-2,5-diphenyl-1,3,2,5-selenazadiphosphole 2,5-diselenide (5): Brightly yellow solid (1.16 g, 86%). M.p. 170-172°C. Selected IR (KBr, cm^{-1}): 1548, 1433, 1349, 1210, 1140, 1087, 905, 857, 741, 697, 589, 538, 494, 380, 352. ^{1}H NMR ($CDCl_3$, δ), 8.28-8.22 (m, 2H), 8.12-8.04 (m, 2H), 7.54-7.46 (m, 6H), 7.33-7.28 (m, 4H), 7.23-7.17 (m, 4H), 6.78-6.75 (m, 2H), 5.32 (s, 4H). ^{13}C NMR ($CDCl_3$, δ), 163.7 (d, J(P, C) = 29.5 Hz), 137.1 (d, J(P, C) = 93.5 Hz), 134.4 (d, J(P, C) = 110.2 Hz), 133.1 (d, J(P, C) = 3.1 Hz), 132.5, 132.4 (d, J(P, C) = 3.1 Hz), 131.4 (d, J(P, C) = 13.6 Hz), 129.3 (d, J(P, C) = 13.6 Hz), 128.8 (d, J(P, C) = 12.7 Hz), 128.4, 128.3 (d, J(P, C) = 12.7 Hz), 128.0, 127.4, 54.7 ppm. ^{31}P NMR ($CDCl_3$, δ), 76.6 (d, ^{2}J(P, P) = 9.4 Hz, J(P-Se) = 460 Hz, J(P=Se) = 791 Hz), 60.5 (d, ^{2}J(P, P) = 9.4 Hz, J(P-Se) = 310 Hz, J(P=Se) = 822 Hz) ppm. ^{77}Se NMR ($CDCl_3$, δ), 497.4 (dd, J(P-Se) = 460, 460 Hz), 12.1 (d, J(P=Se) = 825 Hz), -70.0 (d, J(P=Se) = 794 Hz) ppm. HRMS (CI^+, m/z): found 678.8986 $[M+H]^+$, calculated mass for $C_{28}H_{25}N_2P_2Se_3H$: 678.8989.

4-(Benzyl(phenethyl)amino)-2,5-diphenyl-1,3,2,5-selenazadiphosphole 2,5-diselenide (6): Brightly yellow solid (1.02 g, 74%). M.p. 68-70°C. Two isomers were found in *ca*. 2:1 intensity ratio in multi-NMR spectra. Selected IR (KBr, cm^{-1}): 1549, 1495, 1452, 1435, 1357, 1304, 1143, 1084, 868, 743, 698,

686, 552, 540, 500. ^{1}H NMR ($CDCl_3$, δ), 8.32-8.19 (m, 8H), 8.08-7.96 (m, 2H), 7.63-7.58 (m, 4H), 7.52-7.43 (m, 4H), 7.28-7.18 (m, 16H), 7.09 (d, *J*(H, H) = 7.2 Hz, 2H), 6.83 (d, *J*(H, H) = 7.0 Hz, 2H), 6.75 (d, *J*(H, H) = 7.2 Hz, 2H), 5.16 (s, 2H), 5.12 (s, 2H), 3.83-3.55 (m, 4H), 2.96-2.81 (m, 4H) ppm. ^{13}C NMR ($CDCl_3$, δ), 163.6 (d, *J*(P, C) = 31.2 Hz), 162.0 (d, *J*(P, C) = 29.8 Hz), 137.4 (d, *J*(P, C) = 107.0 Hz), 137.3 (d, *J*(P, C) = 96.7 Hz), 137.2 (d, *J*(P, C) = 100.0 Hz), 133.3 (d, *J*(P, C) = 3.1 Hz), 133.0 (d, *J*(P, C) = 3.1 Hz), 132.5, 132.4, 132.3, 132.2, 131.5, 131.2, 129.5, 129.4, 129.2, 129.1, 128.9, 128.7, 128.6, 128.5, 128.4, 128.2, 128.1, 127.7, 127.6, 126.9, 126.7, 55.9, 55.5, 53.7, 51.4, 33.8, 32.8 ppm. ^{31}P NMR ($CDCl_3$, δ), 77.2 (d, ^{2}*J*(P, P) = 9.4 Hz, *J*(P-Se) = 464 Hz, *J*(P=Se) = 794 Hz), 76.1 (d, ^{2}*J*(P, P) = 11.7 Hz, *J*(P-Se) = 455 Hz, *J*(P=Se) = 789 Hz), 61.8 (d, ^{2}*J*(P, P) = 9.4 Hz, *J*(P-Se) = 315 Hz, *J*(P=Se) = 817 Hz), 61.3 (d, ^{2}*J*(P, P) = 9.4 Hz, *J*(P-Se) = 315 Hz, *J*(P=Se) = 817 Hz) ppm. ^{77}Se NMR ($CDCl_3$, δ), 507.4 (dd, *J*(P-Se) = 458, 460 Hz), 490,9 (dd, *J*(P-Se) = 455, 460 Hz), 17.7 (d, *J*(P=Se) = 815 Hz), 10.8 (d, *J*(P=Se) = 818 Hz), -64.9 (d, *J*(P=Se) = 806 Hz), -69.6 (d, *J*(P=Se) = 794 Hz) ppm. HRMS (CI^+, m/z): found 690.9157 $[M+H]^+$, calculated mass for $C_{28}H_{26}N_2P_2SeH$: 690.9158.

General procedure for the synthesis of compounds 7–11. A suspension of 4-(dialkylamino)-2,5-diphenyl-1,3,2,5-selenazadiphosphole 2,5-diselenide (1.0 mmol) and water (1 mL) in dry toluene (20 mL) was refluxed for 1 h. After cooling to room temperature and removing the solvent, the residue was extracted with dichloromethane (3 x 20 mL), combined the organic layers and washed with water and brine and dried over $MgSO_4$. Upon removing the solvent the organic residue was purified by silica gel column to give 1,1-dialkylselenoureas **7**–**9** (dichloromethane as eluent) and ((dialkylamino)(iminio)methyl)(phenyl)phosphinodiselenoates **10** and **11** (dichloromethane as eluent).

1,1-Dicyclohexylselenourea (7): Red solid (0.205 g, 71%). M.p. 146-148°C. Selected IR (KBr, cm^{-1}): 2927, 2851, 1624, 1591, 1548, 1506, 1455, 1346, 1320, 1174, 1115, 1086, 984, 896, 704, 576. ^{1}H NMR ($CDCl_3$, δ), 6.22 (s, 2H), 5.33-5.24 (m, 2H), 1.80-0.97 (m, 20H) ppm. ^{13}C NMR ($CDCl_3$, δ), 178.7, 67.8, 31.1, 26.7, 25.8 ppm. ^{77}Se NMR ($CDCl_3$, δ), 251.7 ppm. HRMS (CI^+, m/z): found 289.1180 $[M+H]^+$, calculated mass for $C_{13}H_{24}N_2SeH$: 289.1177.

1,1-Dibenzylselenourea (8): Greyish white solid (0.160 g, 53%). M.p. 168-170°C. Selected IR (KBr, cm^{-1}): 1622, 1543, 1452, 1349, 1243, 1150, 964, 732, 693, 585, 552, 507, 443. ^{1}H NMR ($CDCl_3$, δ), 7.41-7.31 (m, 10H), 6.23 (s, 2H), 5.10 (s, 4H) ppm. ^{13}C NMR ($CDCl_3$, δ), 209.1, 131.5, 129.6, 129.1,

129.1, 53.2 ppm. ^{77}Se NMR ($CDCl_3$, δ), 238.9 ppm. HRMS (CI^+, m/z): found 305.0545 $[M+H]^+$, calculated mass for $C_{15}H_{16}N_2SeH$: 305.0552.

1-Benzyl-1-phenethylselenourea (9): Greenish yellow paste (0.175 g, 28%). Selected IR (KBr, cm^{-1}): 1550, 1495, 1453, 1435, 1359, 1094, 1021, 906, 872, 744, 697, 553, 495. ^{1}H NMR (CD_2Cl_2, δ), 7.54-7.21 (m, 10H), 6.41 (s, 2H), 4.90 (s, 2H), 3.61 (t, *J*(H, H) = 7.0 Hz, 2H), 2.87 (t, *J*(H, H) = 7.0 Hz, 2H) ppm. ^{13}C NMR (CD_2Cl_2, δ), 180.2, 137.0, 136.7, 131.2, 130.8, 129.4, 129.2, 128.9, 128.0, 55.8, 54.9, 31.4 ppm. ^{77}Se NMR ($CDCl_3$, δ), 236.7 ppm. HRMS (CI^+, m/z): found 319.0705 $[M+H]^+$, calculated mass for $C_{16}H_{18}N_2SeH$: 319.0708.

((Dicyclohexylamino)(iminio)methyl)(phenyl)phosphinodiselenoate (10): White paste (0.075 g, 16%). Selected IR (KBr, cm^{-1}): 2930, 2855, 2197, 1552, 1451, 1372, 1346, 1264, 1213, 1102, 894, 531. ^{1}H NMR ($CDCl_3$, δ), 9.88 (s, 2H), 7.47-7.32 (m, 5H), 2.75-2.65 (m, 2H), 1.88-1.05 (m, 20H) ppm. ^{13}C NMR ($CDCl_3$, δ), 142.6, 131.3, 131.1, 128.7, 116.1, 55.6, 32.3, 25.7, 25.5 ppm. ^{31}P NMR ($CDCl_3$, δ), 32.5 (s, *J*(P, Se) = 695 Hz) ppm. ^{77}Se NMR ($CDCl_3$, δ), 165.7 (d, *J*(P, Se) = 695 Hz) ppm. HRMS (CI^+, m/z): found 477.0472 $[M+H]^+$, calculated mass for $C_{19}H_{29}N_2PSe_2H$: 477.0475.

((Benzyl(phenethyl)amino)(iminio)methyl)(phenyl)phosphinodiselenoate (11): Greenish yellow paste (0.255 g, 25%). Selected IR (KBr, cm^{-1}): 1613, 1603, 1516, 1452, 1352, 1135, 1076, 1028, 1007, 953, 747, 699, 556, 497, 476. Two isomers were found in *ca*. 2:1 intensity ratio in multi-NMR spectra. ^{1}H NMR ($CDCl_3$, δ), 9.91 (d, *J*(P, H) = 5.1 Hz, 4H), 9.69 (d, *J*(P, H) = 4.8 Hz, 4H), 7.51-6.77 (m, 22H), 4.95 (s, 2H), 4.64 (s, 2H), 4.01 (t, *J*(H, H) = 7.0 Hz, 2H), 3.69 (t, *J*(H, H) = 7.0 Hz, 2H), 2.89 (t, *J*(H, H) = 7.0 Hz, 2H), 2.60 (t, *J*(H, H) = 7.0 Hz, 2H) ppm. ^{13}C NMR ($CDCl_3$, δ), 164.0 (d, *J*(H, H) = 21.5 Hz), 163.5 (d, *J*(H, H) = 21.5 Hz), 136.8, 136.6, 135.9, 132.8), 131.6 , 131.2, 131.1, 130.9, 129.5, 129.0, 128.9, 128.8, 128.7, 128.6, 128.5, 128.4, 128.3, 127.2, 126.9, 126.4, 56.0, 55.5, 54.6, 51.9, 32.9, 31.5 ppm. ^{31}P NMR ($CDCl_3$, δ), 29.0 (s, *J*(P=Se) = 685 Hz), 28.2 (s, *J*(P=Se) = 685 Hz) ppm. ^{77}Se NMR ($CDCl_3$, δ), 27.8 (d, *J*(P=Se) = 685 Hz), 27.5 (d, *J*(P=Se) = 685 Hz) ppm. HRMS (CI^+, m/z): found 507.0005 $[M+H]^+$, calculated mass for $C_{22}H_{23}N_2PSe_2H$: 507.0008.

General procedure for the synthesis of 4-substituted-1,3-selenazol-2-amines 12–15. A mixture of *α*-haloketone (0.3 mmol) in 20 mL of ethanol was added dropwise to a refluxing solution of 1,1-

dicyclohexylselenourea (0.087 g, 0.3 mmol) in 20 mL of ethanol in course of 1 h. The reaction mixture was then refluxed for another 2 h. Upon cooling to room temperature; a rotary evaporator concentrated the mixture. The residue was neutralized with 5% aqueous ammonia (30 mL) and extracted with dichloromethane (30 mL x 3), combined organic layers and washed with water (20 mL x 3) and dried over $MgSO_4$. After filtering and drying to remove solvent the organic residue was purified by a silica gel column (1 : 5 dichloromethane/hexane to dichloromethane as eluent) to give the expected products **12**–**15**.

***N,N*-Dicyclohexyl-4-(4-methoxyphenyl)-1,3-selenazol-2-amine (12)**: Yellow solid (0.120 g, 96%). M.p. 162-164°C. Selected IR (KBr, cm^{-1}): 1608, 1540, 1490, 1452, 1380, 1300, 1281, 1246, 1229, 1169, 1106, 1033, 941, 893, 833, 710, 662, 617. ^{1}H NMR (CD_2Cl_2, δ), 7.82 (d, *J*(H, H) = 8.8 Hz, 2H), 7.13 (s, 1H), 6.93 (d, *J*(H, H) = 8.8 Hz, 2H), 3.86 (s, 3H), 3.27-3.18 (m, 2H), 2.30-2.16 (m, 8H), 1.92-1.70 (m, 8H), 1.45-1.34 (m, 4H) ppm. ^{13}C NMR (CD_2Cl_2, δ), 167.3, 158.9, 158.7, 130.0, 127.4, 113.7, 100.6, 62.5, 55.2, 30.3, 26.4, 25.6 ppm. ^{77}Se NMR (CD_2Cl_2, δ), 582.1 ppm. HRMS (CI^+, m/z): found 419.1594 $[M+H]^+$, calculated mass for $C_{22}H_{30}N_2OSeH$: 419.1596.

***N,N*-Dicyclohexyl-4-(4-nitrophenyl)-1,3-selenazol-2-amine (13)**: Dark yellow solid (0.120 g, 92%). M.p. 150-152°C. Selected IR (KBr, cm^{-1}): 1604, 1595, 1545, 1516, 1450, 1379, 1338, 1280, 1265, 1108, 1038, 853, 848, 757, 696, 647, 565. ^{1}H NMR (CD_2Cl_2, δ), 8.23 (d, *J*(H, H) = 8.8 Hz, 2H), 8.04 (d, *J*(H, H) = 8.8 Hz, 2H), 7.56 (s, 1H), 3.29-3.21 (m, 2H), 2.29-2.16 (m, 8H), 1.93-1.72 (m, 8H), 1.46-1.24 (m, 4H) ppm. ^{13}C NMR (CD_2Cl_2, δ), 169.3, 150.7, 146.4, 142.3, 126.6, 123.9, 107.5, 62.7, 30.2, 26.4, 25.6 ppm. ^{77}Se NMR (CD_2Cl_2, δ), 582.1 ppm. ^{77}Se NMR (CD_2Cl_2, δ), 604.4 ppm. HRMS (CI^+, m/z): found 434.1339 $[M+H]^+$, calculated mass for $C_{21}H_{27}N_3O_2SeH$: 434.1342.

4-(4-Bromophenyl)-*N,N*-dicyclohexyl-1,3-selenazol-2-amine (14): Yellow solid (0.133 g, 95%). M.p. 168-170°C. Selected IR (KBr, cm^{-1}): 1613, 1589, 1544, 1471, 1451, 1379, 1341, 1264, 1230, 1039, 1008, 938, 891, 831, 746, 717, 707, 658, 626, 588, 497. ^{1}H NMR (CD_2Cl_2, δ), 7.78 (d, *J*(H, H) = 8.5 Hz, 2H), 7.52 (d, *J*(H, H) = 8.5 Hz, 2H), 7.30 (s, 1H), 3.27-3.20 (m, 2H), 2.28-2.16 (m, 8H), 1.92-1.71 (m, 8H), 1.45-1.21 (m, 4H) ppm. ^{13}C NMR (CD_2Cl_2, δ), 169.2, 151.5, 135.4, 131.9, 127.8, 120.8, 103.6, 62.6, 30.3, 26.4, 25.6 ppm. ^{77}Se NMR (CD_2Cl_2, δ), 591.5 ppm. HRMS (CI^+, m/z): found 467.0595 $[M+H]^+$, calculated mass for $C_{21}H_{27}BrN_2SeH$: 467.0594.

***N,N*-dicyclohexyl-4-(2,5-dimethoxyphenyl)-1,3-selenazol-2-amine (15)**: Greyish white solid (0.123 g, 92%). M.p. 141-142°C. Selected IR (KBr, cm^{-1}): 1602, 1602, 1540, 1505, 1499, 1452, 1447, 1438, 1379, 1282, 1217, 1176, 1049, 892, 869, 815, 654, 584. ^{1}H NMR (CD_2Cl_2, δ), 7.82 (s, 1H), 6.93 (s, 1H), 6.82 (d, *J*(H, H) = 8.8 Hz, 1H), 6.81 (d, *J*(H, H) = 8.8 Hz, 1H), 3.91 (s, 3H), 3.85 (s, 3H), 3.26-3.19 (m, 2H), 2.31-2.16 (m, 8H), 1.91-1.71 (m, 8H), 1.46-1.21 (m, 4H) ppm. ^{13}C NMR (CD_2Cl_2, δ), 167.0, 153.5, 151.5, 148.3, 125.5, 115.2, 113.3, 112.5, 108.7, 62.5, 55.9, 55.4, 30.3, 26.4, 25.7 ppm. ^{77}Se NMR (CD_2Cl_2, δ), 585.1 ppm. HRMS (CI^+, m/z): found 449.1699 $[M+H]^+$, calculated mass for $C_{23}H_{32}N_2O_2SeH$: 449.1703.

Details of the X-ray data collections and refinements for compounds 4, 5, 7, 8, 9, 10, 13, 14, 15

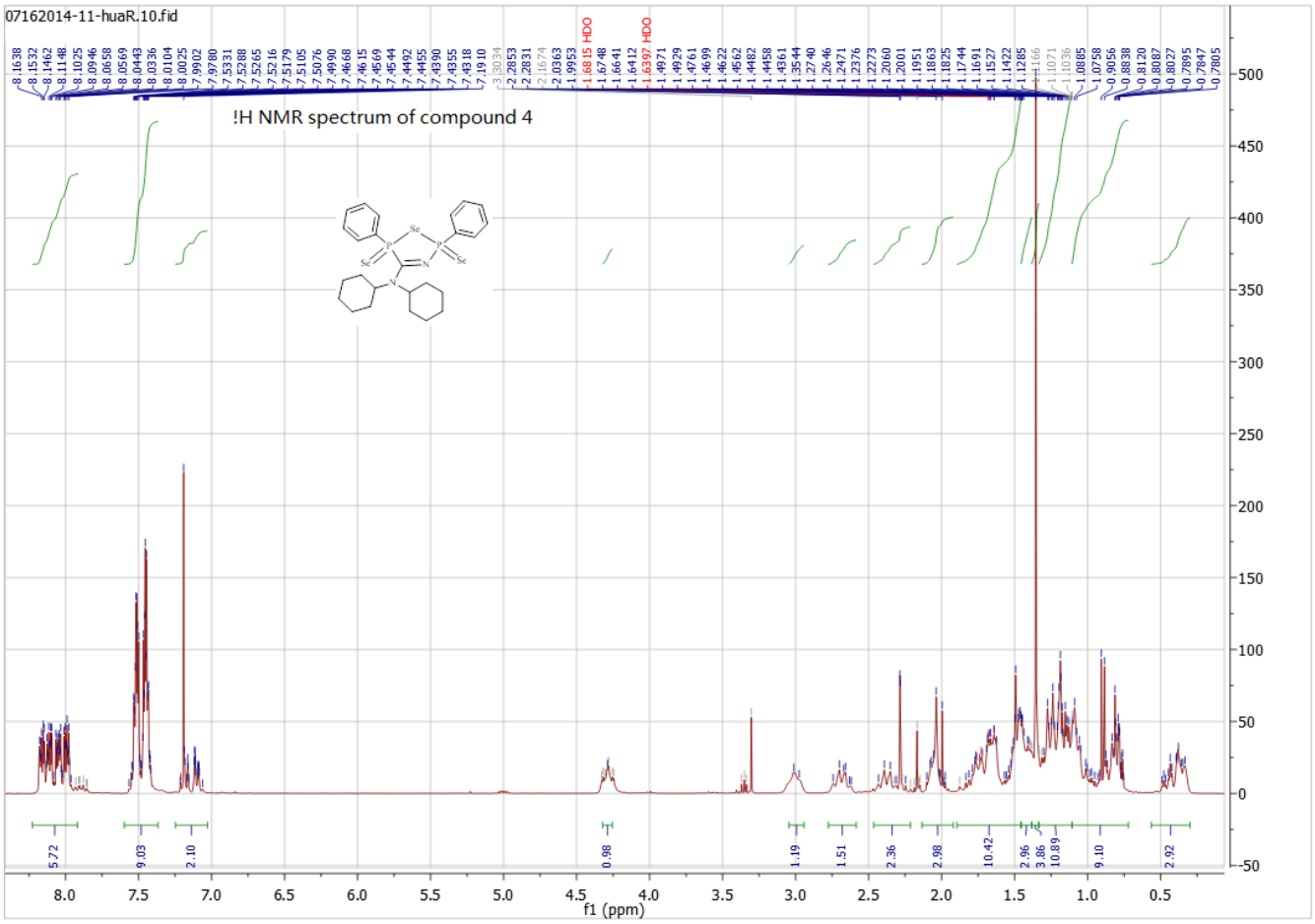
Table S1. Details of the X-ray Data Collections and Refinements for Compounds **4**, **5**, **7** and **8**

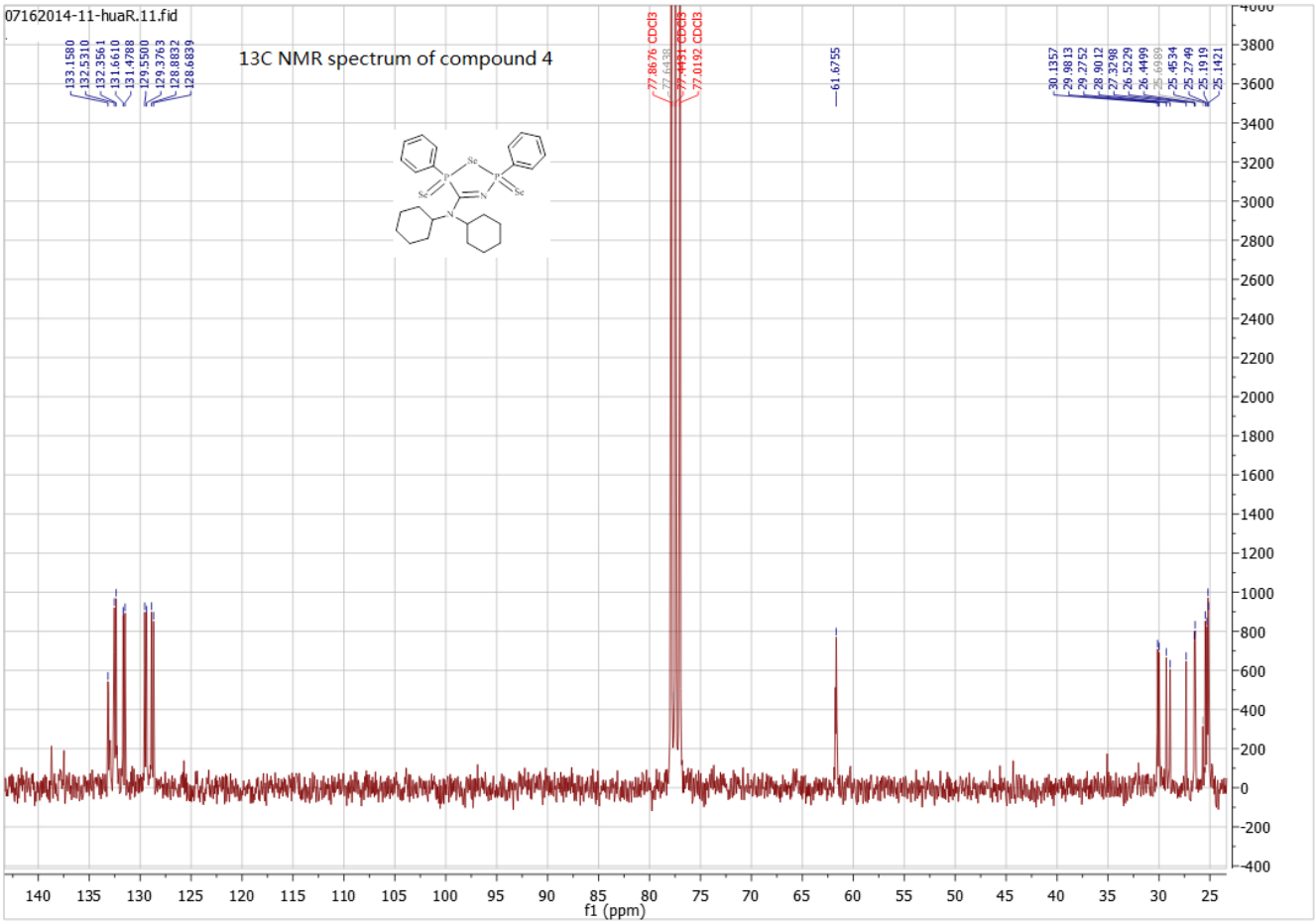
Compound	**4**	**5**	7	**8**
Formula	$C_{25}H_{32}N_2P_2Se_3$	$C_{27}H_{24}N_2P_2Se_3$	$C_{40}H_{74}Cl_2N_6Se_3$	$C_{15}H_{16}N_2Se$
M	659.37	675.33	946.85	303.26
Crystal system	monoclinic	monoclinic	orthorhombic	monoclinic
Space group	*P2₁/n*	*P2₁/c*	*Pccn*	*I2/a*
a/Å	10.2241(7)	15.5514(11)	14.3690(15)	10.498(4)
b/Å	17.6148(11)	10.0461(7)	25.292(2)	8.968(4)
c/Å	30.321(2)	16.8283(11)	26.421(3)	57.17(2)
α	90	90	90	90
β	99.70620	93.574(3)	90	94.212(12)
γ	90	90	90	90
U/A^3	5382.5(6)	2624.0(3)	9601.9(17)	5368(4)
Z	8	4	8	16
μ/cm^{-1}	42.362	43.476	24.423	27.822
Reflections collected	41165	20135	106606	31599
Independent reflections	9429	4585	8807	4928
R_{int}	0.1264	0.1204	0.1187	0.1489
R1	0.0568	0.0477	0.0788	0.0549
wR2 [I > 2σ(I)]	0.1199	0.1006	0.2847	0.1245

Table S2. Details of the X-ray Data Collections and Refinements for Compounds **9**, **10**, **13**, **14** and **15**

Compound	**9**	**10**	**13**	**14**	**15**
Formula	$C_{16}H_{18}N_2Se$	$C_{20}H_{31}Cl_2N_2PSe_2$	$C_{21}H_{27}N_3O_2Se$	$C_{21}H_{27}BrN_2Se$	$C_{23}H_{32}N_2O_2Se$
M	317.29	559.28	432.42	466.32	447.48
Crystal system	monoclinic	orthorhombic	monoclinic	monoclinic	monoclinic
Space group	$P2_1/c$	$P2_12_12_1$	$P2_1/n$	$P2_1/n$	$P2_1/c$
a/Å	11.2150(8)	10.0785(9)	13.8234(10)	10.6605(8)	12.5190(9)
b/Å	9.7290(7)	13.1462(11)	10.6102(8)	15.2625(11)	10.0014(7)
c/Å	27.626(2)	17.9286(15)	15.1033(11)	12.8472(9)	33.985(2)
α	90	90	90	90	90
β	98.580(3)	90	116.047(2)	111.4590(17)	98.028(2)
γ	90	90	90	90	90
U/A^3	2980.6(4)	2375.4(4)	1990.2(3)	1945.4(2)	4213.5(5)
Z	8	4	4	4	2
μ/cm^{-1}	25.086	34.143	19.081	39.970	18.038
Reflections collected	22837	18339	15003	14432	31178
Independent reflections	5416	4170	3485	3410	7367
R_{int}	0.1317	0.1619	0.0775	0.0744	0.0926
R1	0.0619	0.0589	0.0572	0.0418	0.0444
wR2 [I > 2σ(I)]	0.1741	0.0991	0.1595	0.0871	0.0998

^{1}H and ^{13}C NMR spectra of compounds 4-15

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131.6610
131.4788
129.5500
129.3763
128.8832
128.6839
77.8676 CDCl3
77.6438
77.4431 CDCl3
77.0192 CDCl3
61.6755
30.1357
29.9813
29.2752
28.9012
27.3298
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26.4499
25.4534
25.2749
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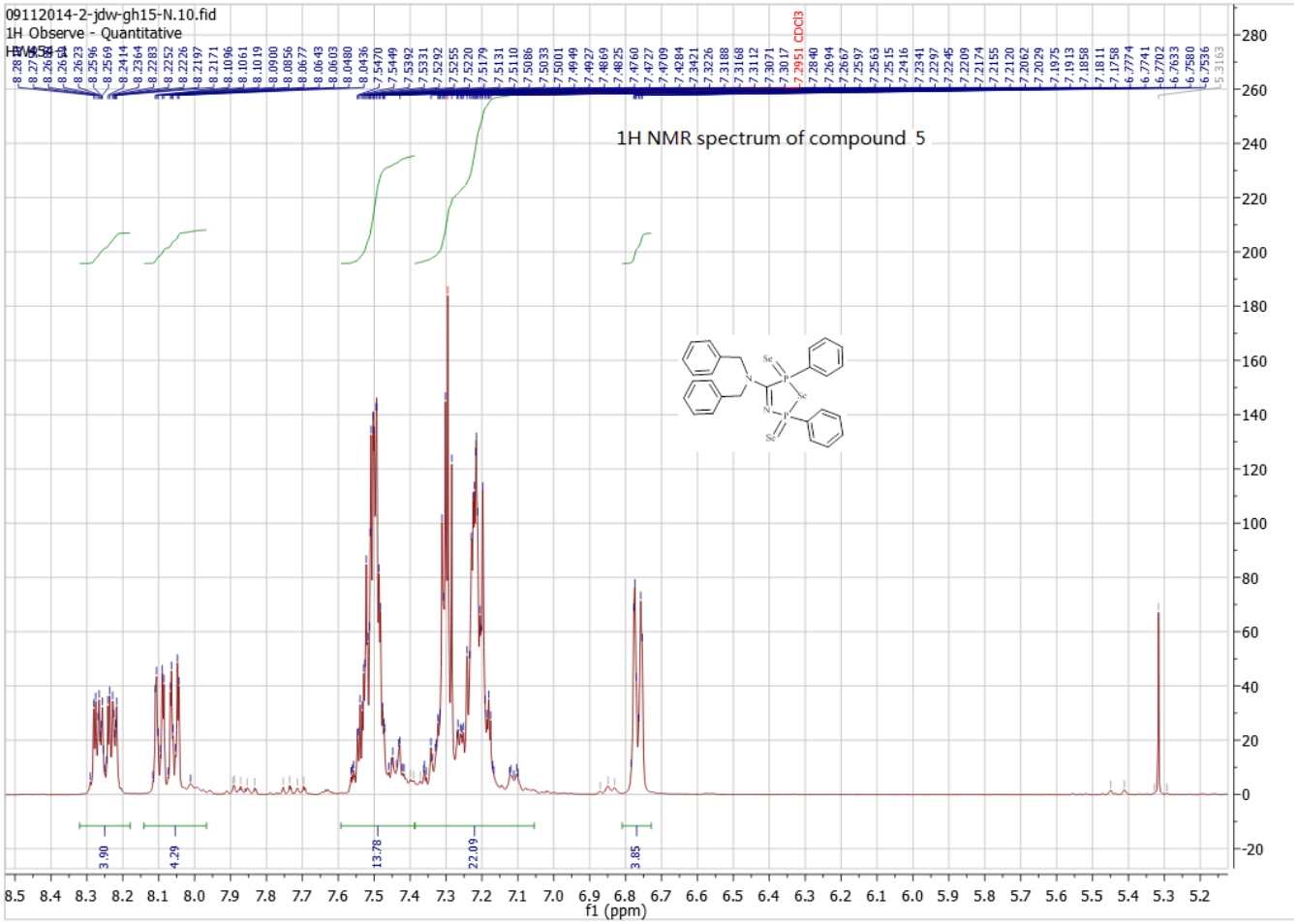
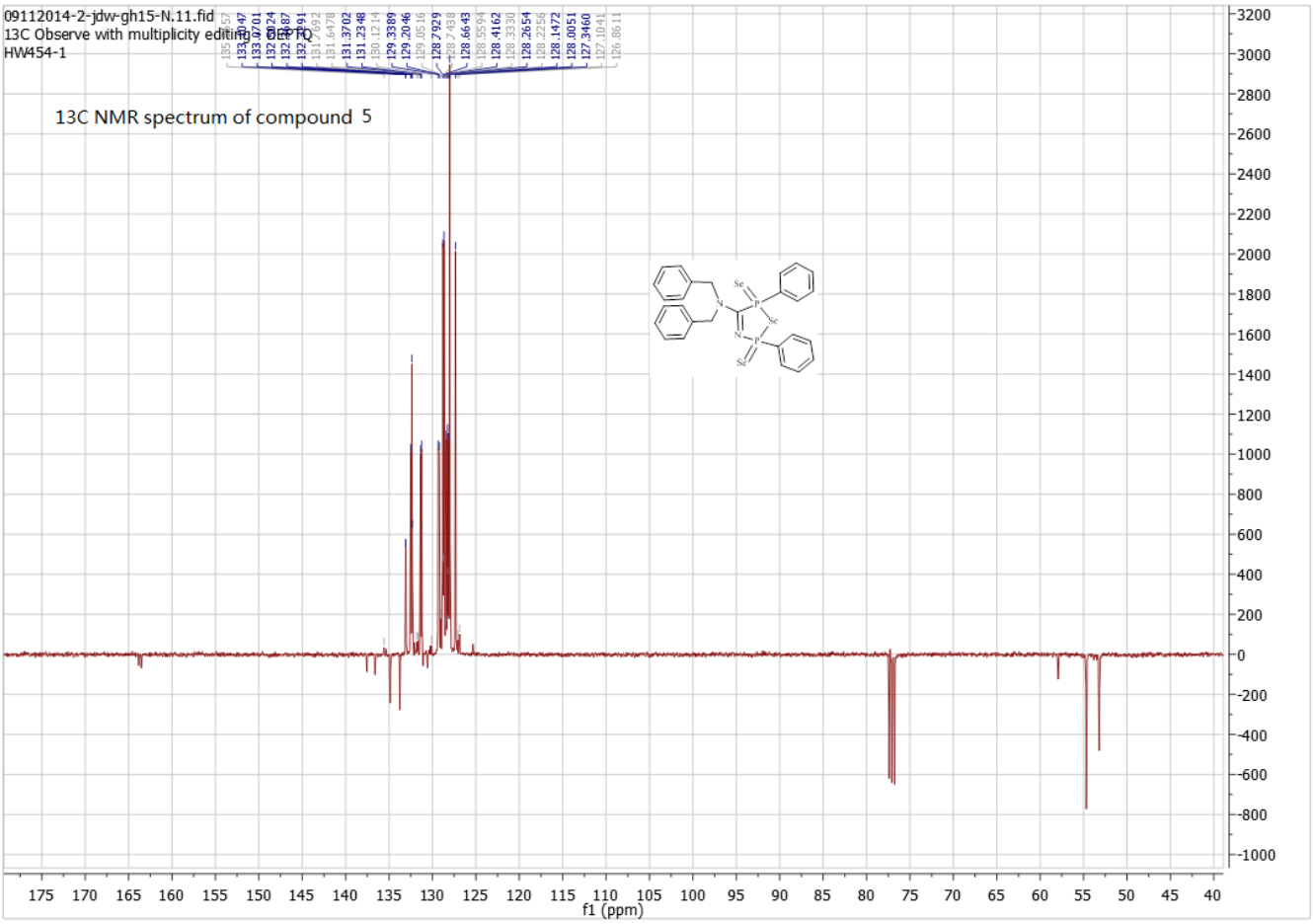
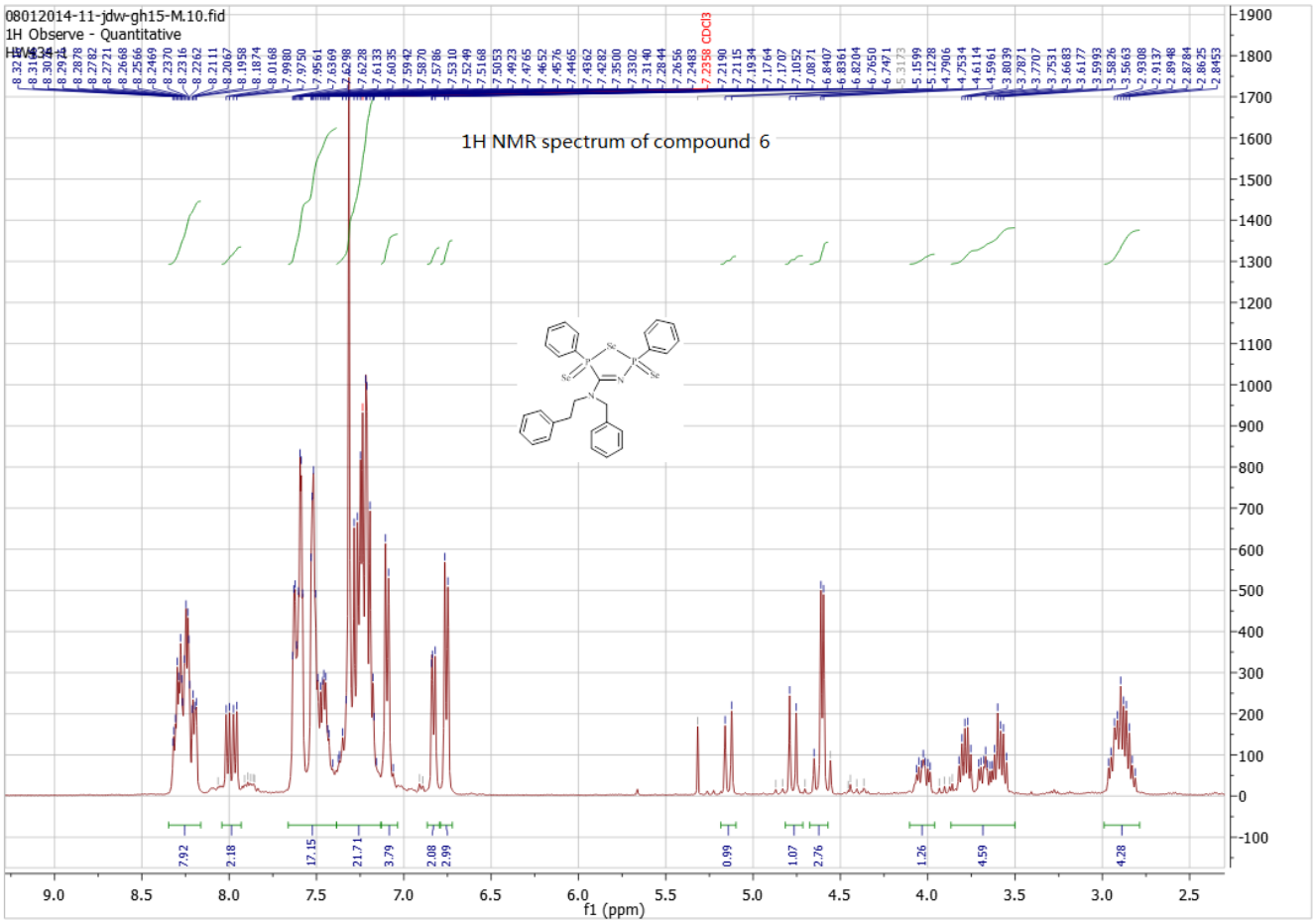
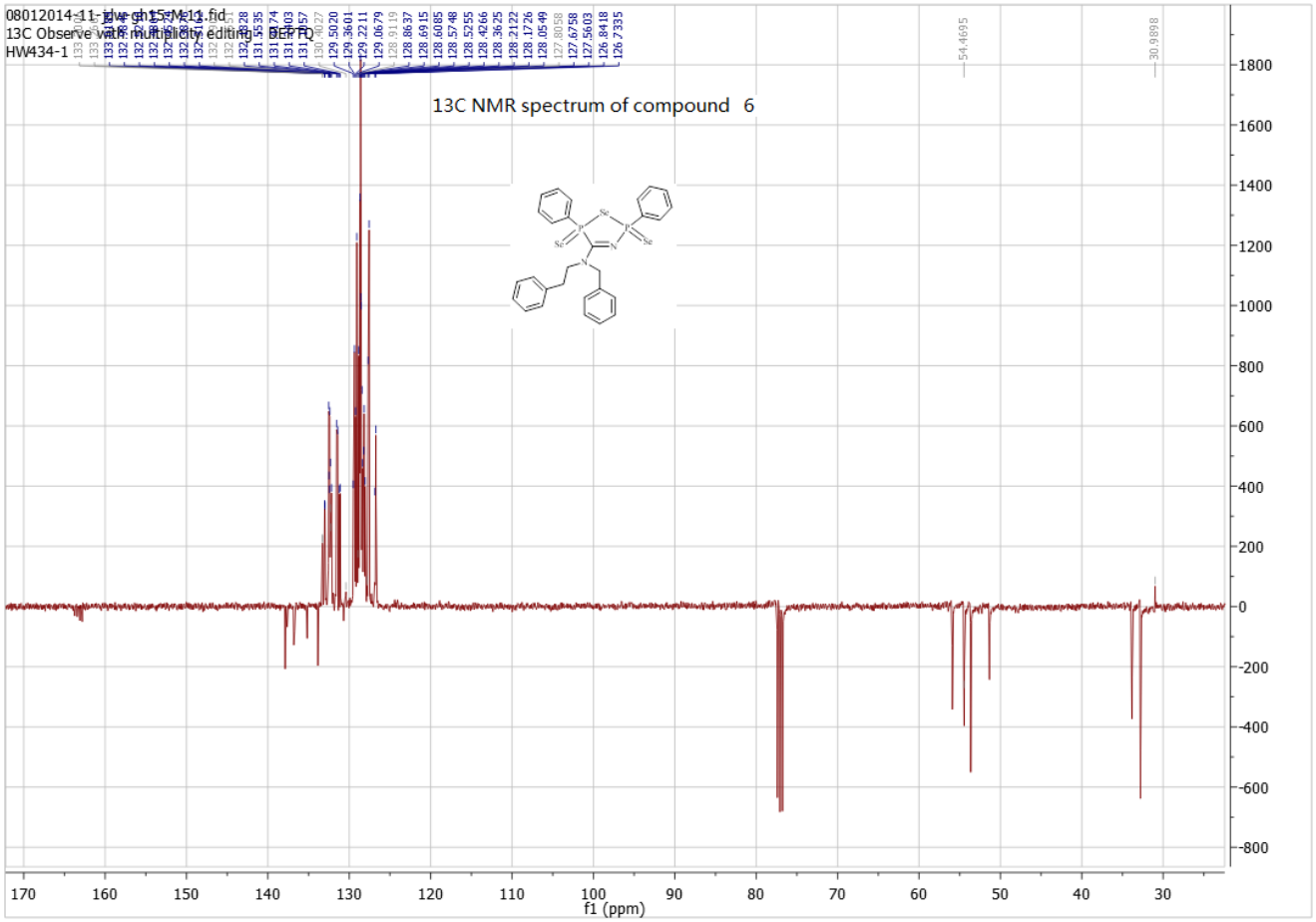
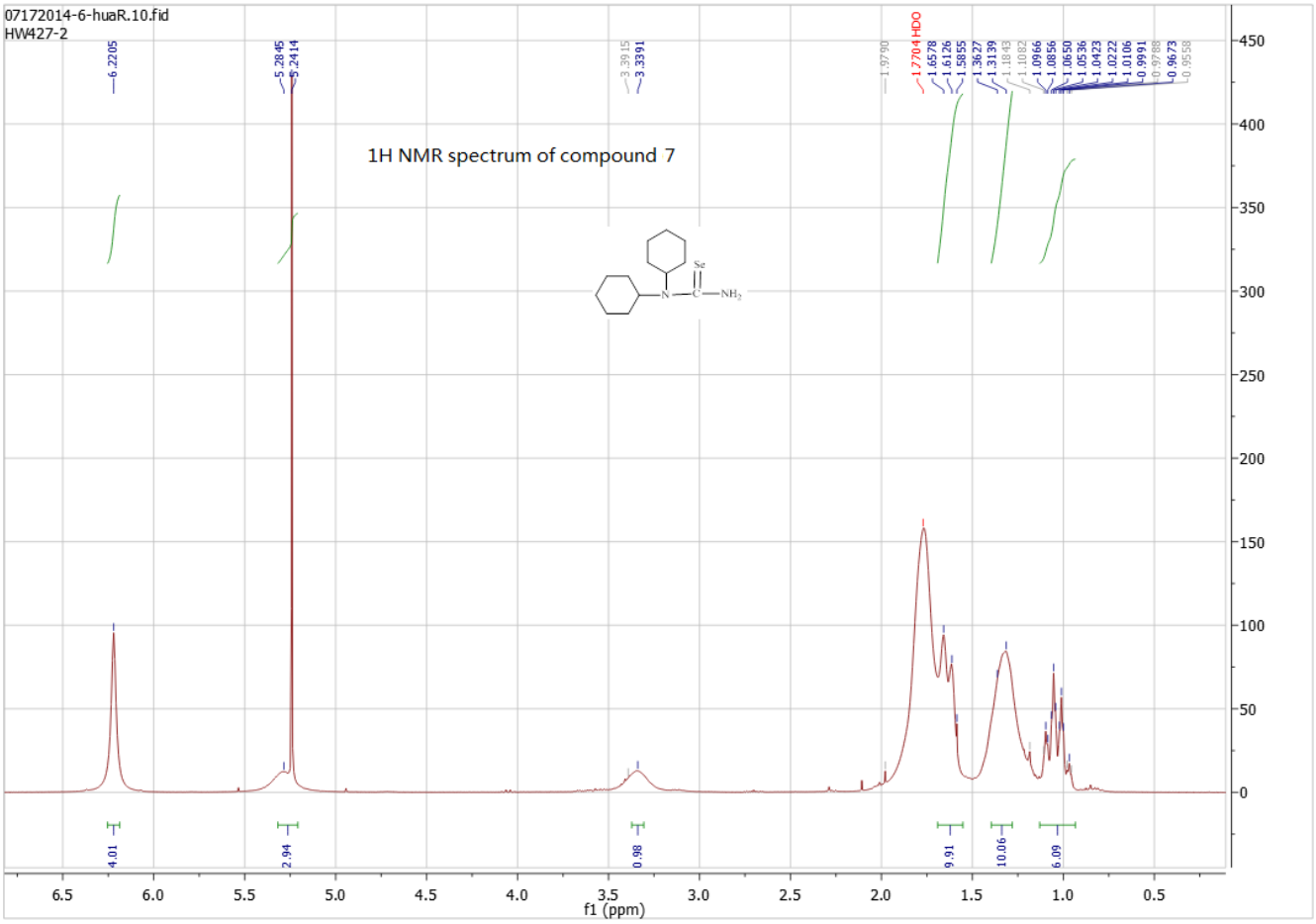
25.1421
f1 (ppm)

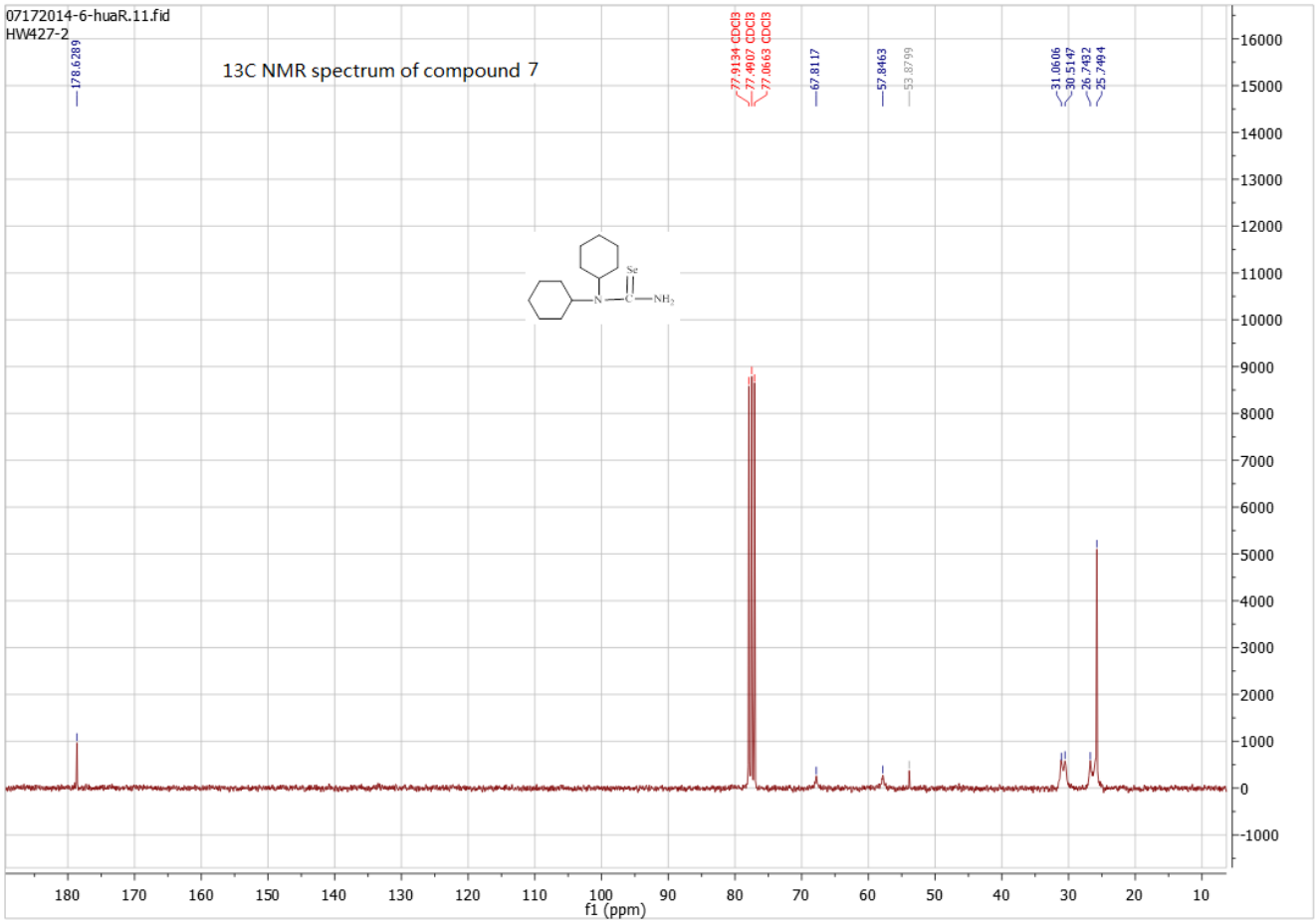

09112014-2-jdw-gh15-N.10.fid
1H Observe - Quantitative
1H NMR spectrum of compound 5
3.90
4.29
13.78
22.09
3.85
f1 (ppm)

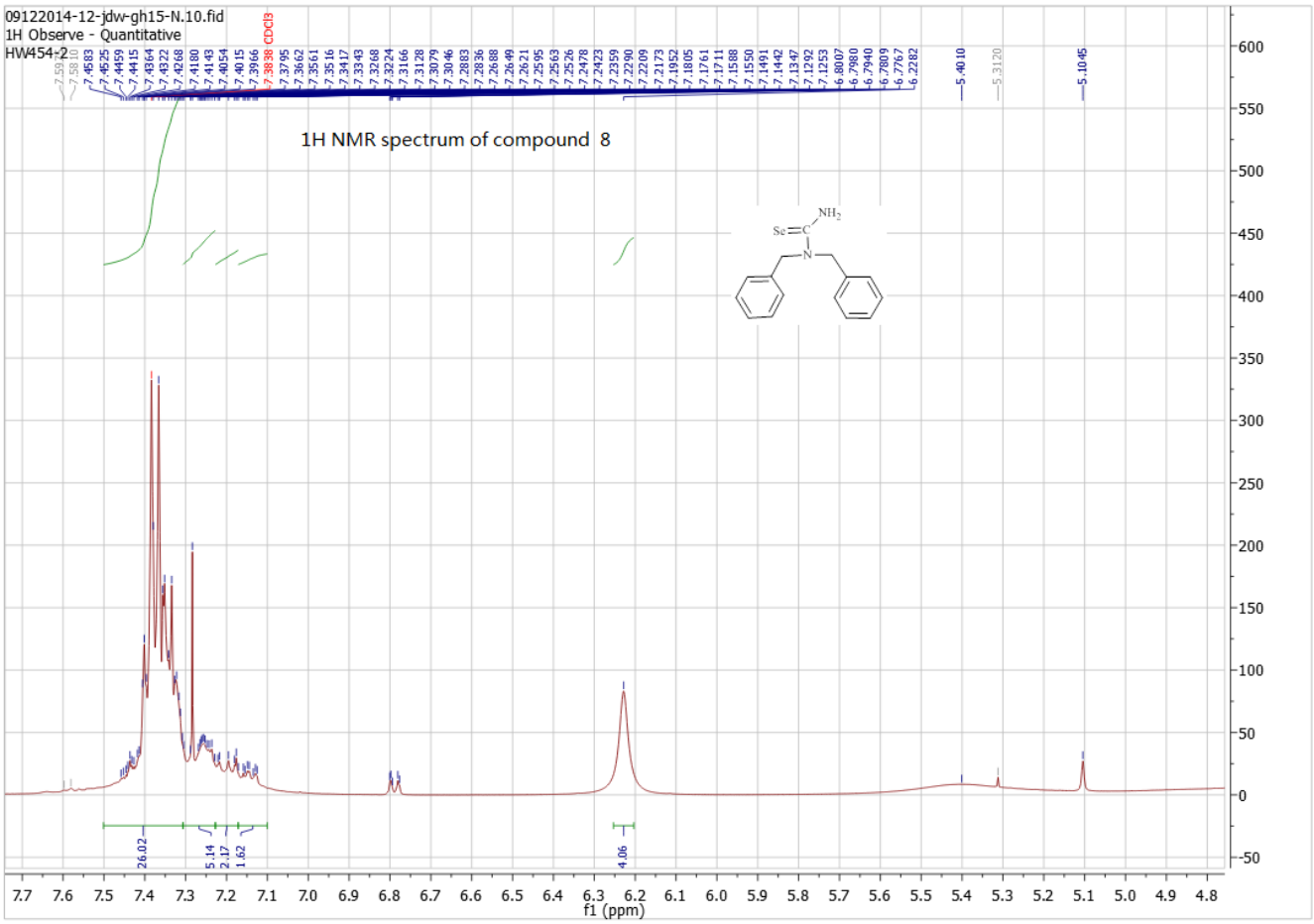

09112014-2-jdw-gh15-N.11.fid
13C Observe with multiplicity editing DEPTO
HW454-1
13C NMR spectrum of compound 5
f1 (ppm)

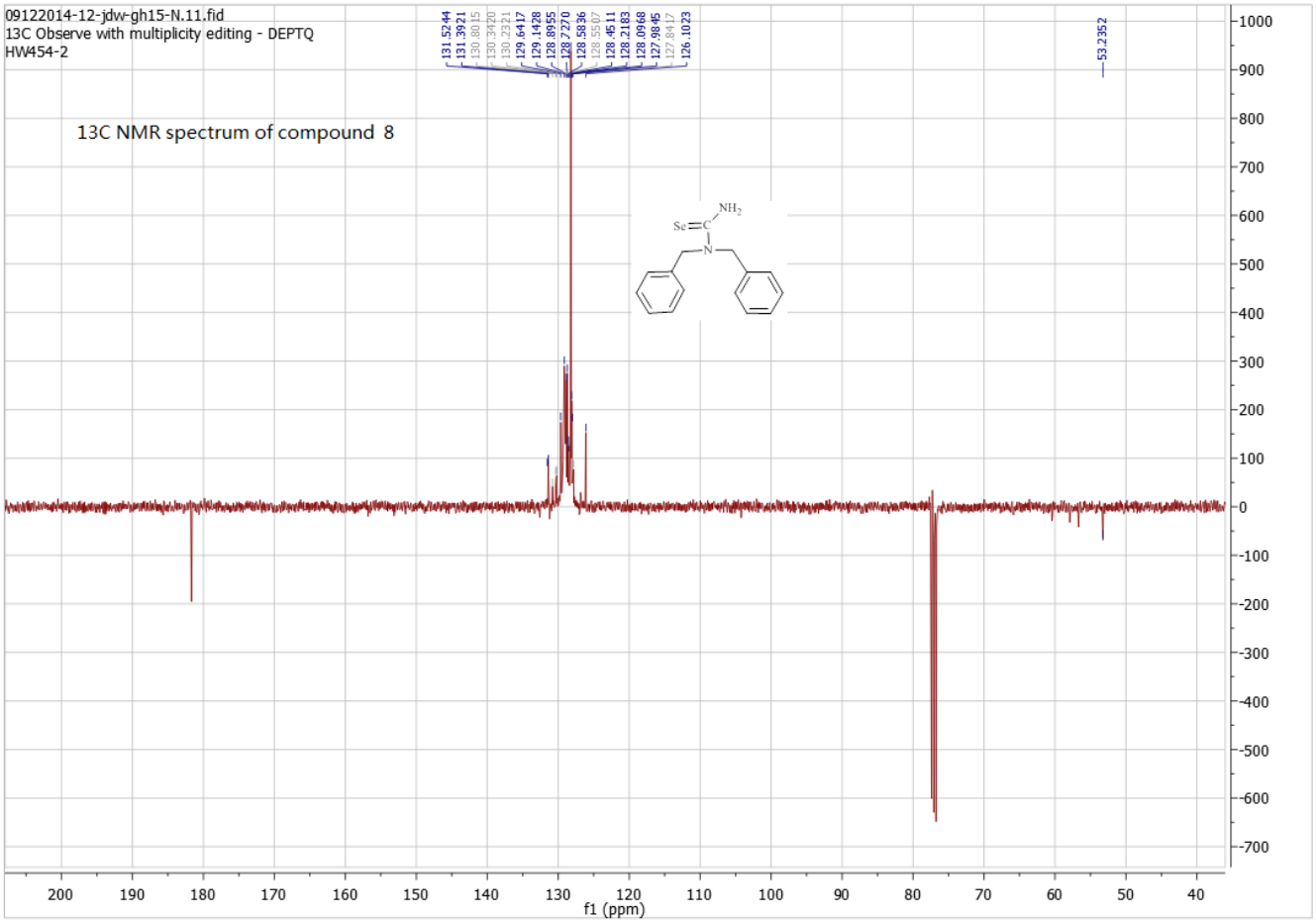

08012014-11-jdw-gh15-M.10.fid
1H Observe - Quantitative
1H NMR spectrum of compound 6
CDCl3
7.92
2.18
17.15
21.71
3.79
2.08
2.99
0.99
1.07
2.76
1.26
4.59
4.28
f1 (ppm)

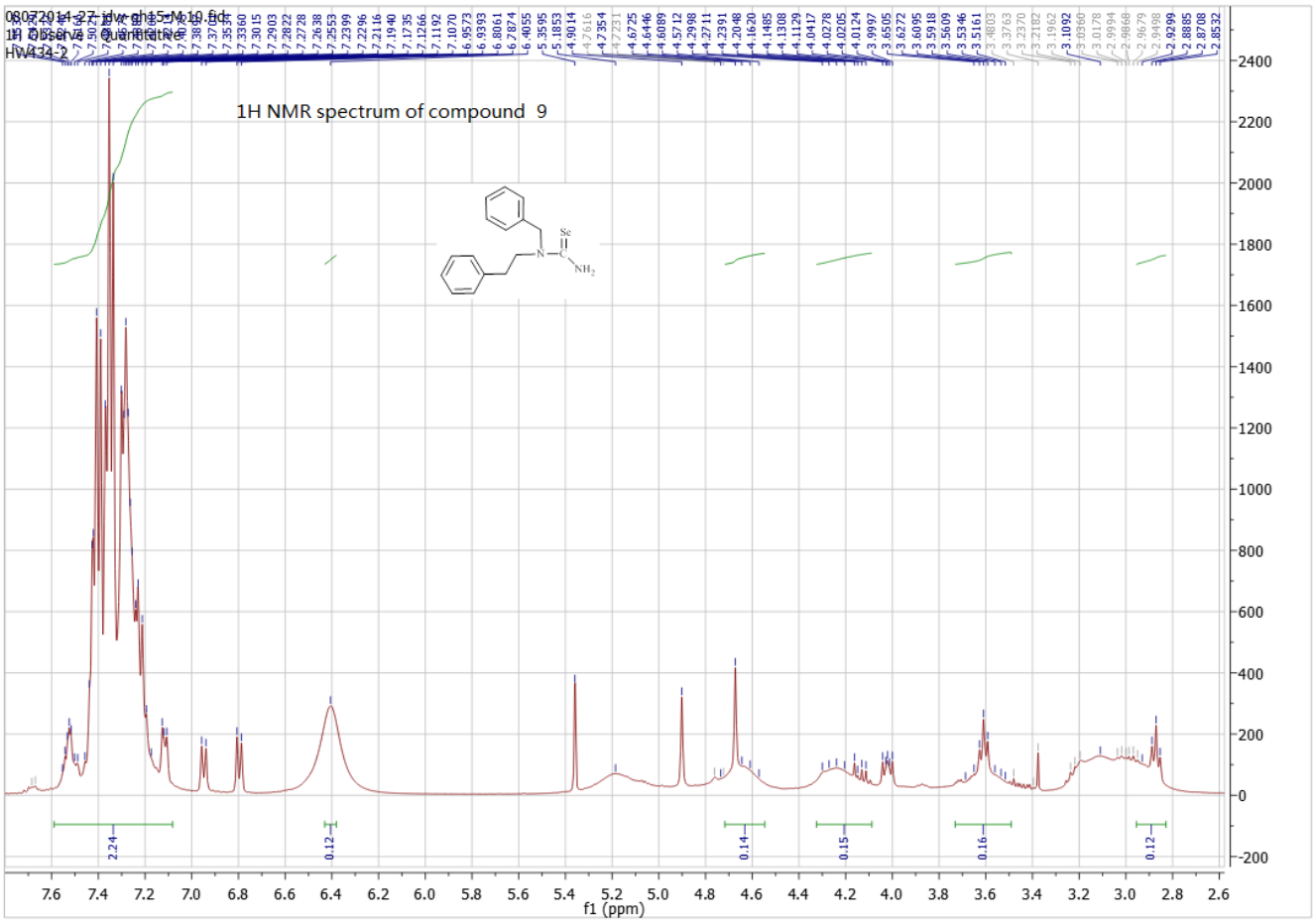

13C NMR spectrum of compound 6
f1 (ppm)

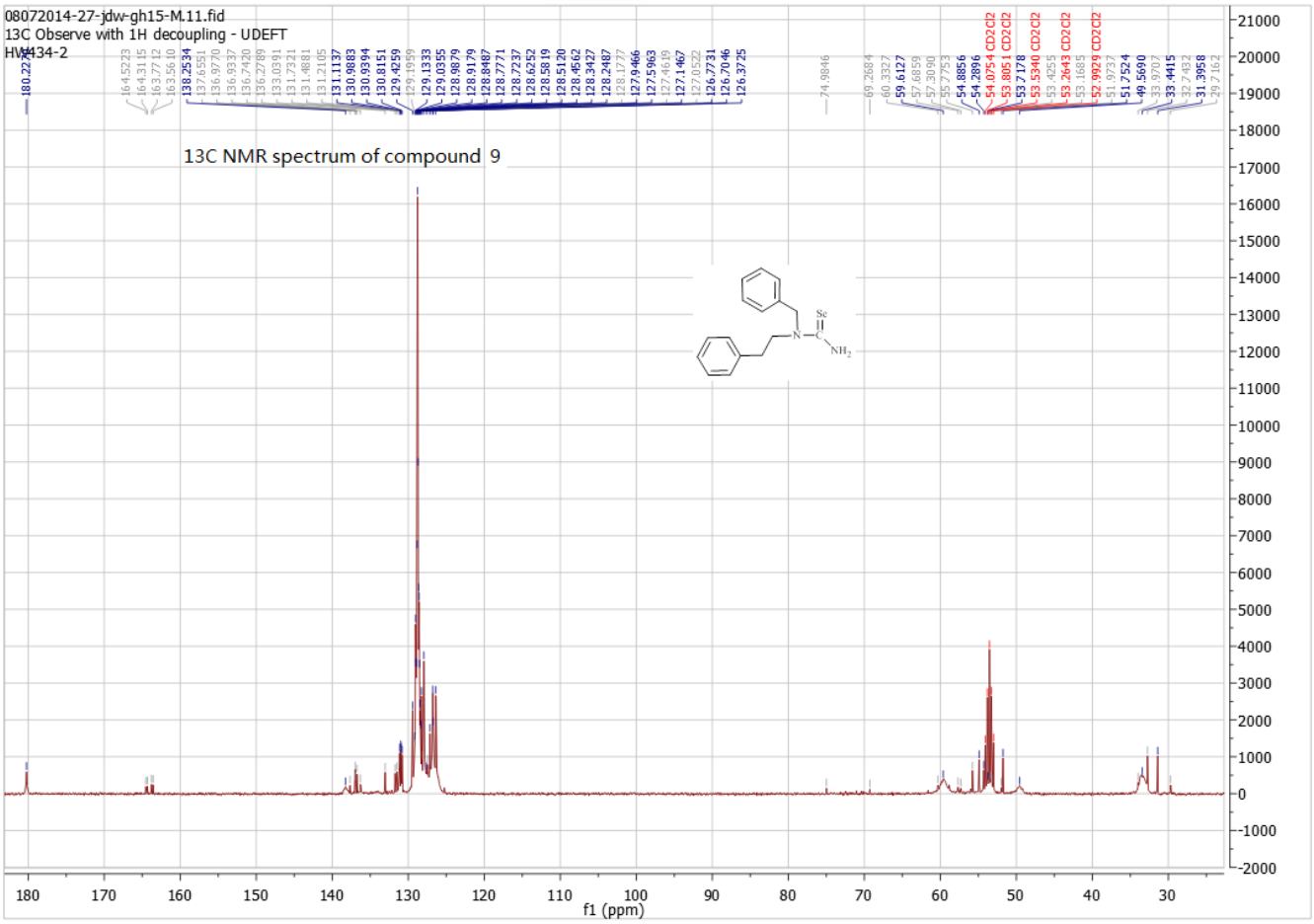

07172014-6-huaR.10.fid
HW427-2
1H NMR spectrum of compound 7
f1 (ppm)

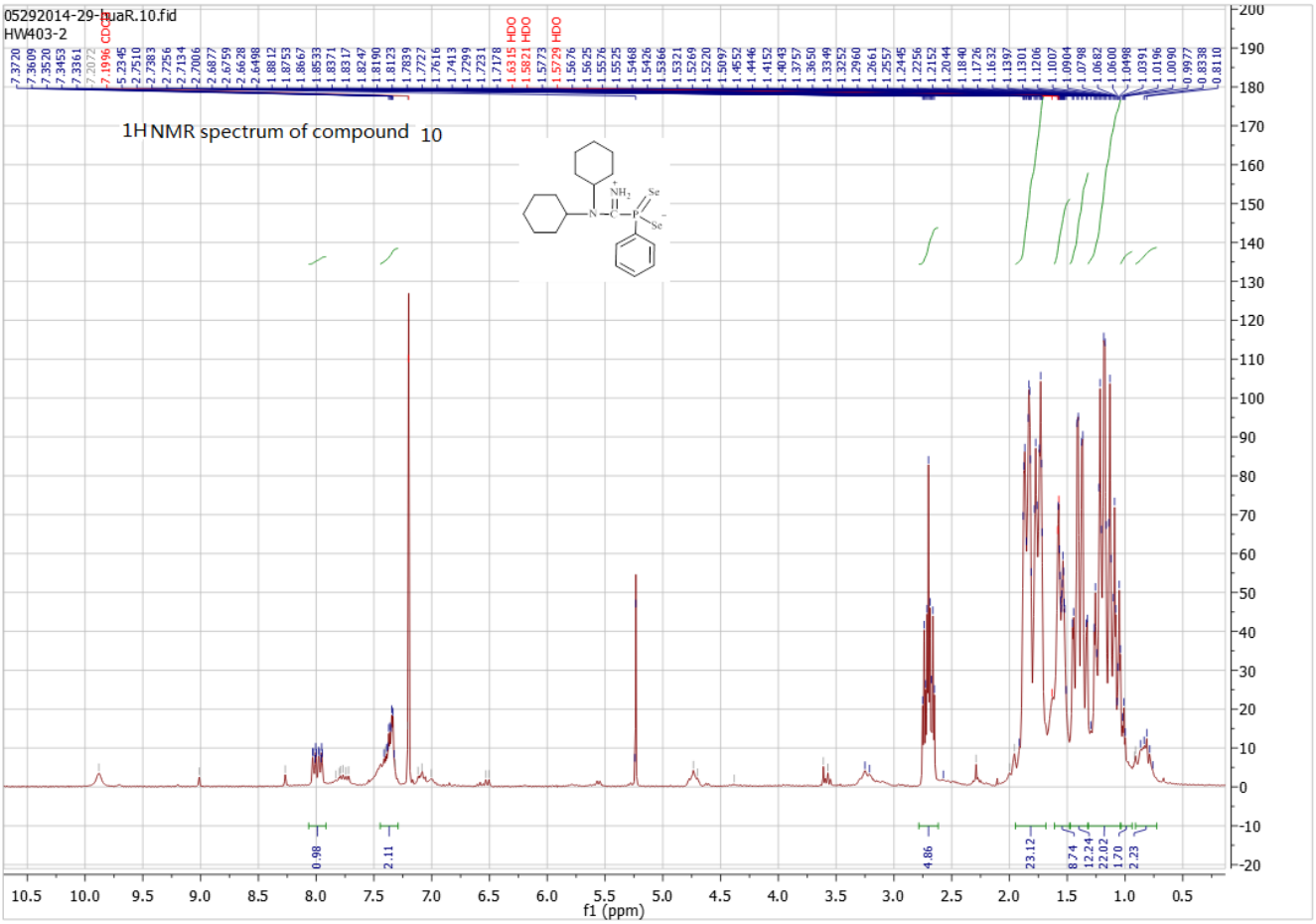

07172014-6-huaR.11.fid
HW427-2
13C NMR spectrum of compound 7
178.6289
77.9134 CDCl3
77.4907 CDCl3
77.0663 CDCl3
67.8117
57.8463
53.8799
31.0606
30.5147
26.7432
25.7494
Se
N
C
NH2
f1 (ppm)

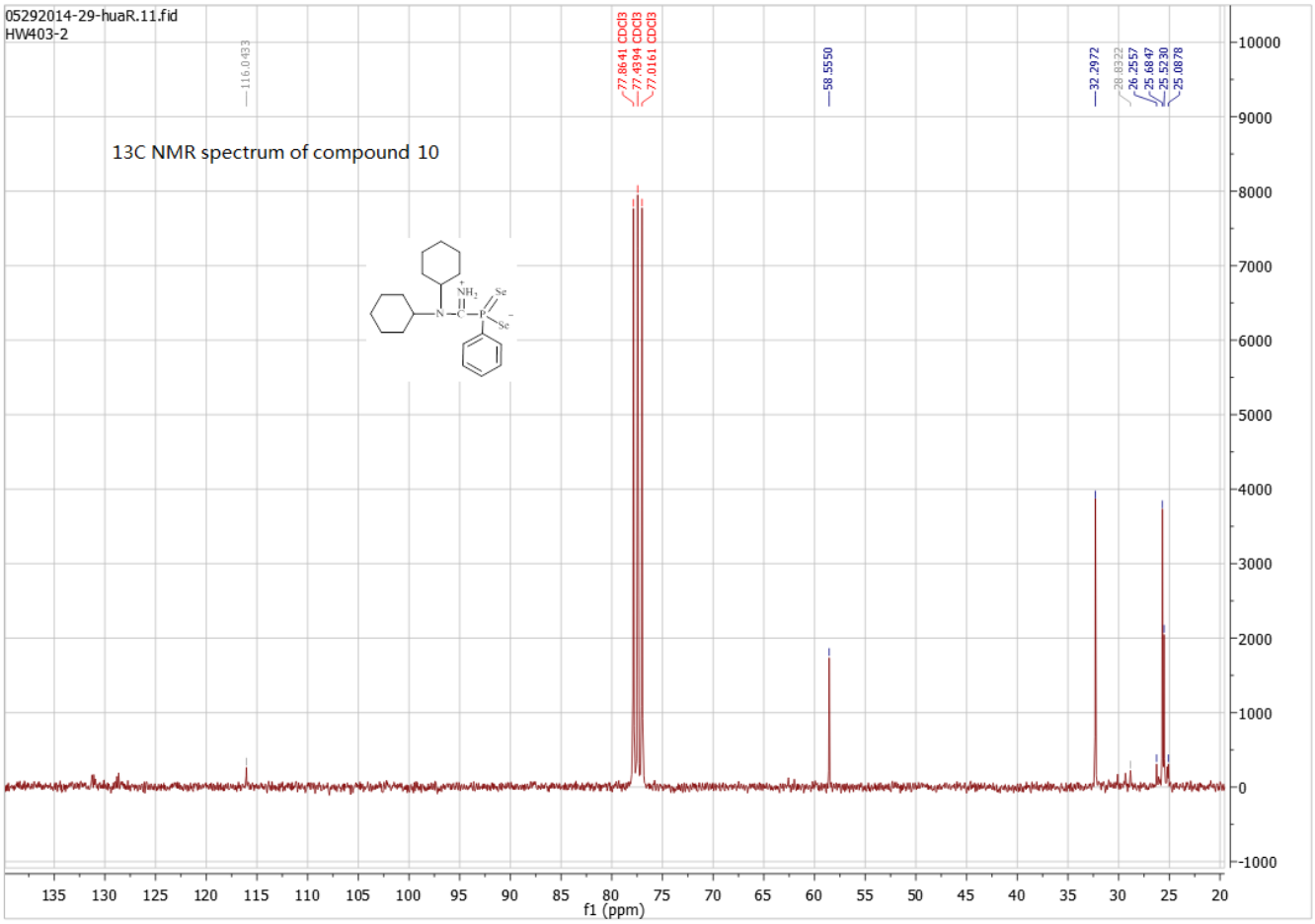

09122014-12-jdw-gh15-N.10.fid
1H Observe - Quantitative
HW454-2
1H NMR spectrum of compound 8
f1 (ppm)

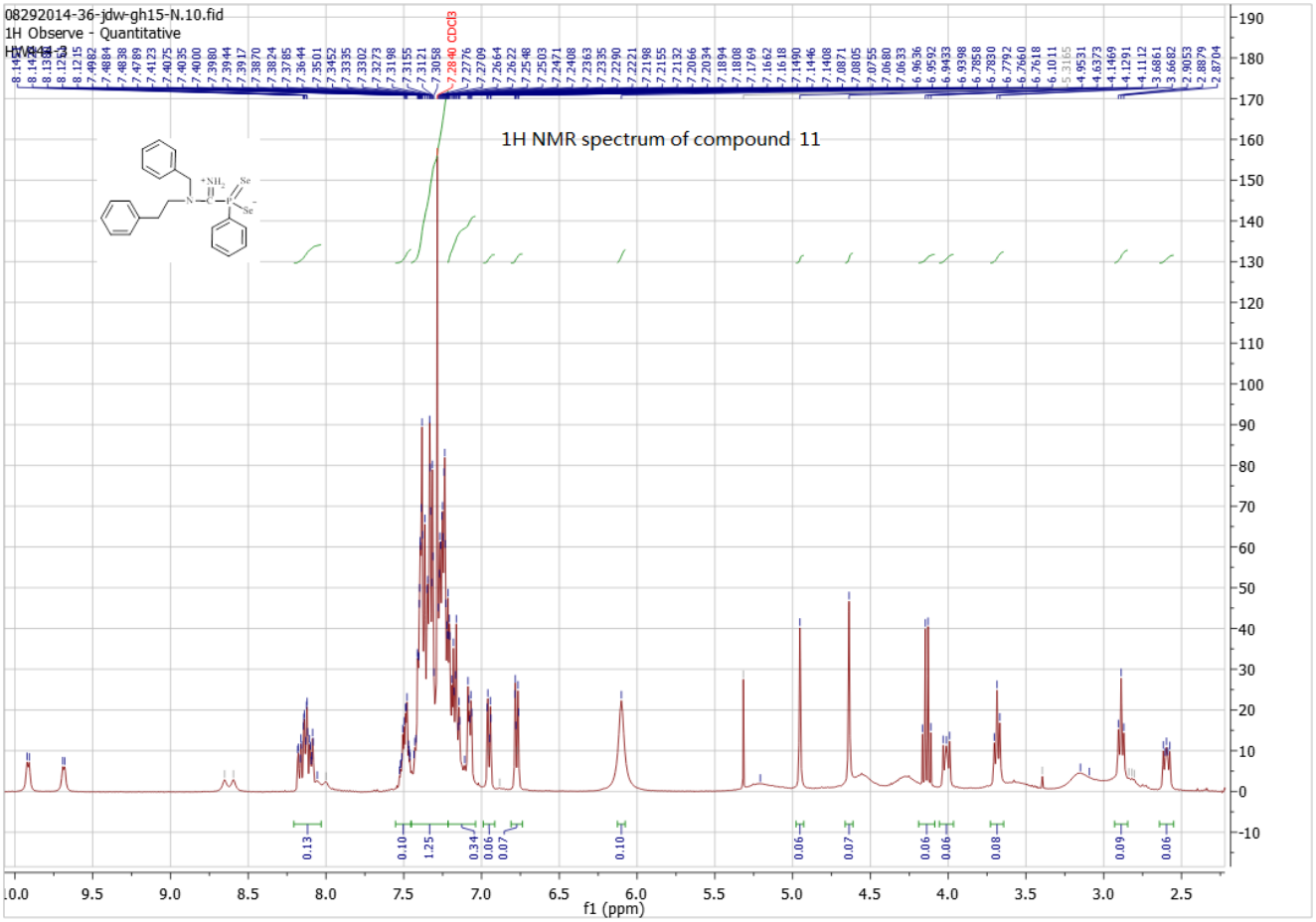

09122014-12-jdw-gh15-N.11.fid
13C Observe with multiplicity editing - DEPTQ
HW454-2
13C NMR spectrum of compound 8
131.5244
131.3921
130.8015
130.3420
130.2321
129.6417
129.1428
128.8955
128.7270
128.5836
128.5507
128.4511
128.2183
128.0968
127.9845
127.8417
126.1023
53.2352
NH2
Se
C
N
f1 (ppm)

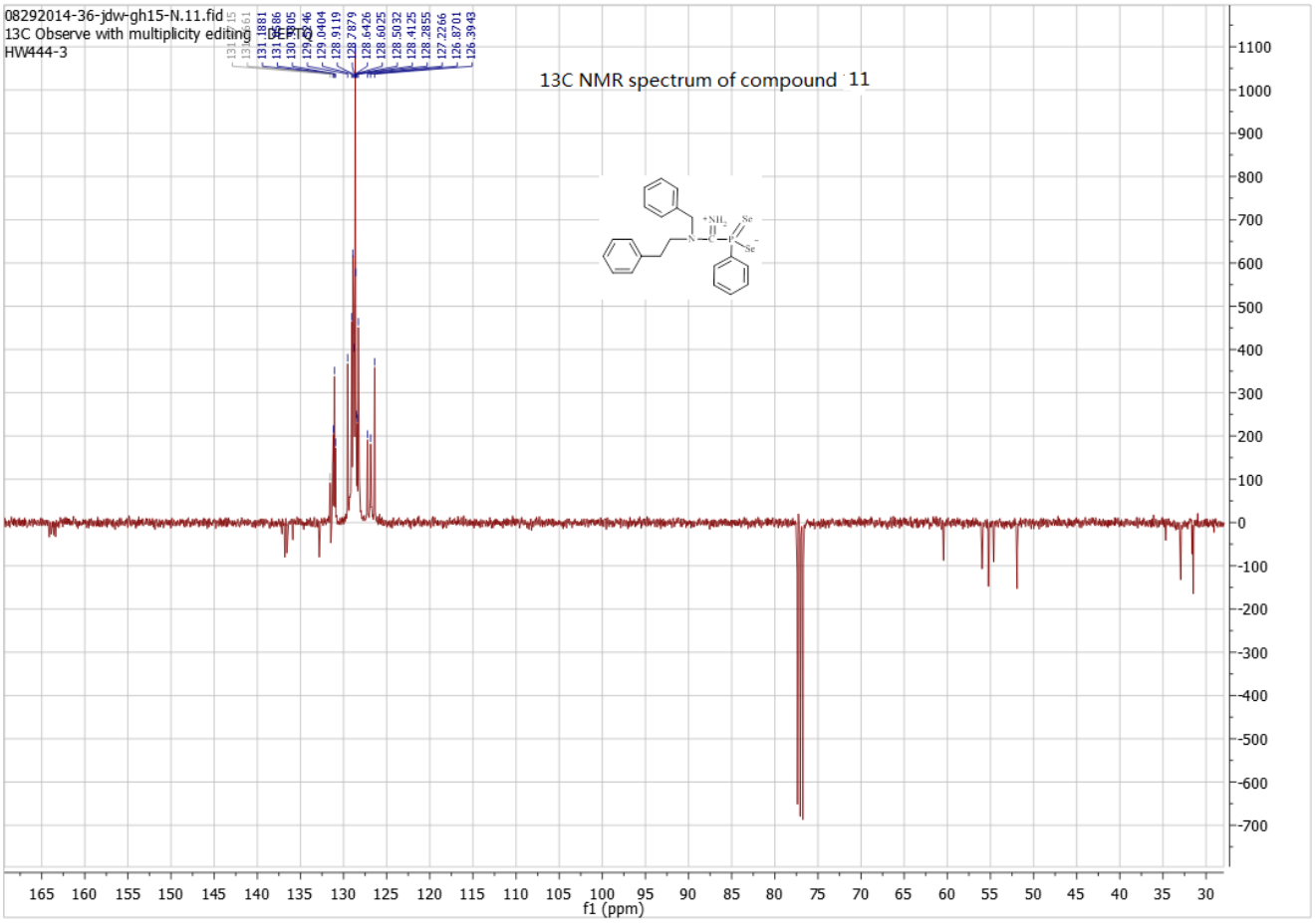

1H NMR spectrum of compound 9
f1 (ppm)

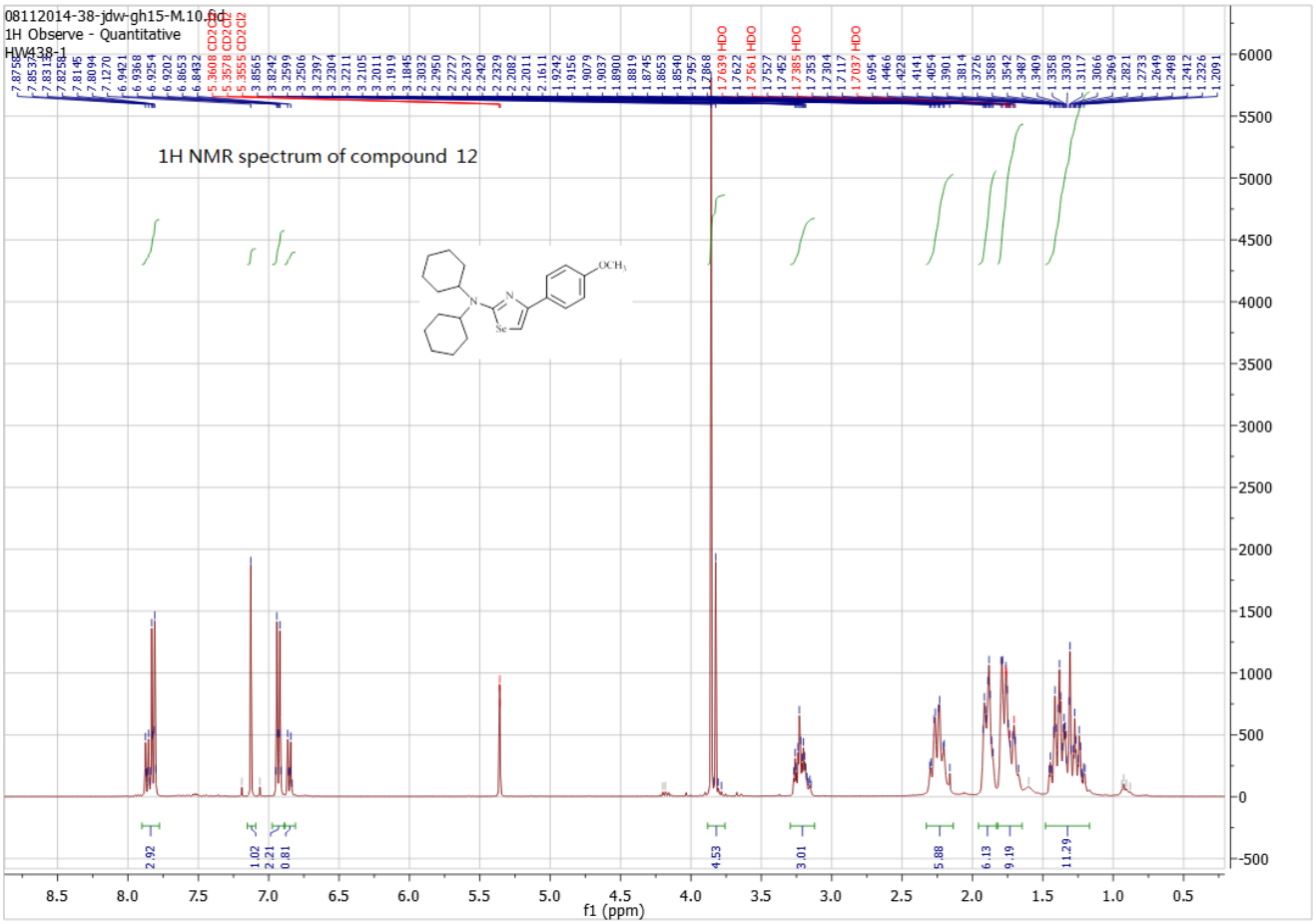

08072014-27-jdw-gh15-M.11.fid
13C Observe with 1H decoupling - UDEFT
HW434-2
13C NMR spectrum of compound 9
Se
N
C
NH2
f1 (ppm)

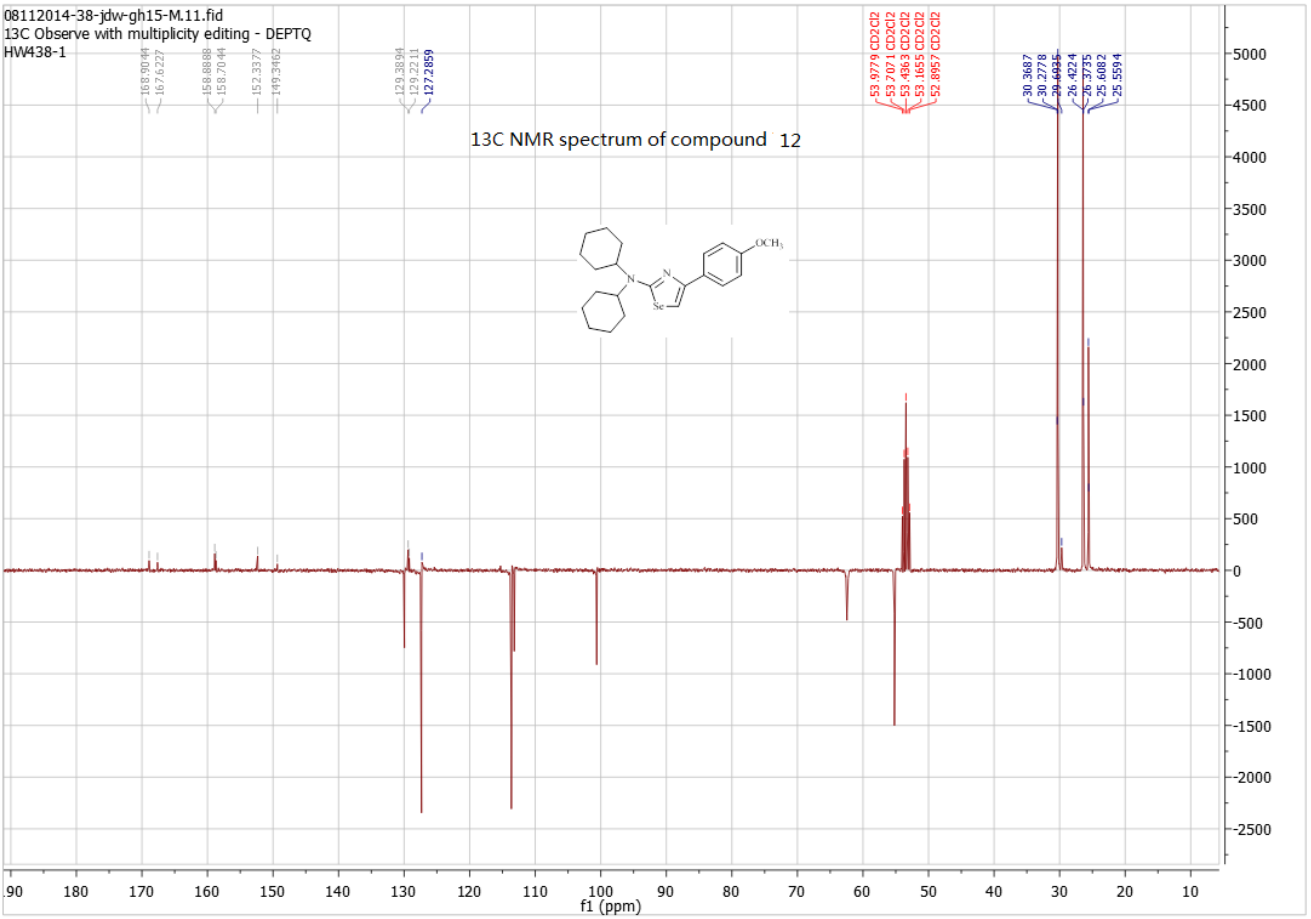

05292014-29-huaR.10.fid
HW403-2
1H NMR spectrum of compound 10
f1 (ppm)

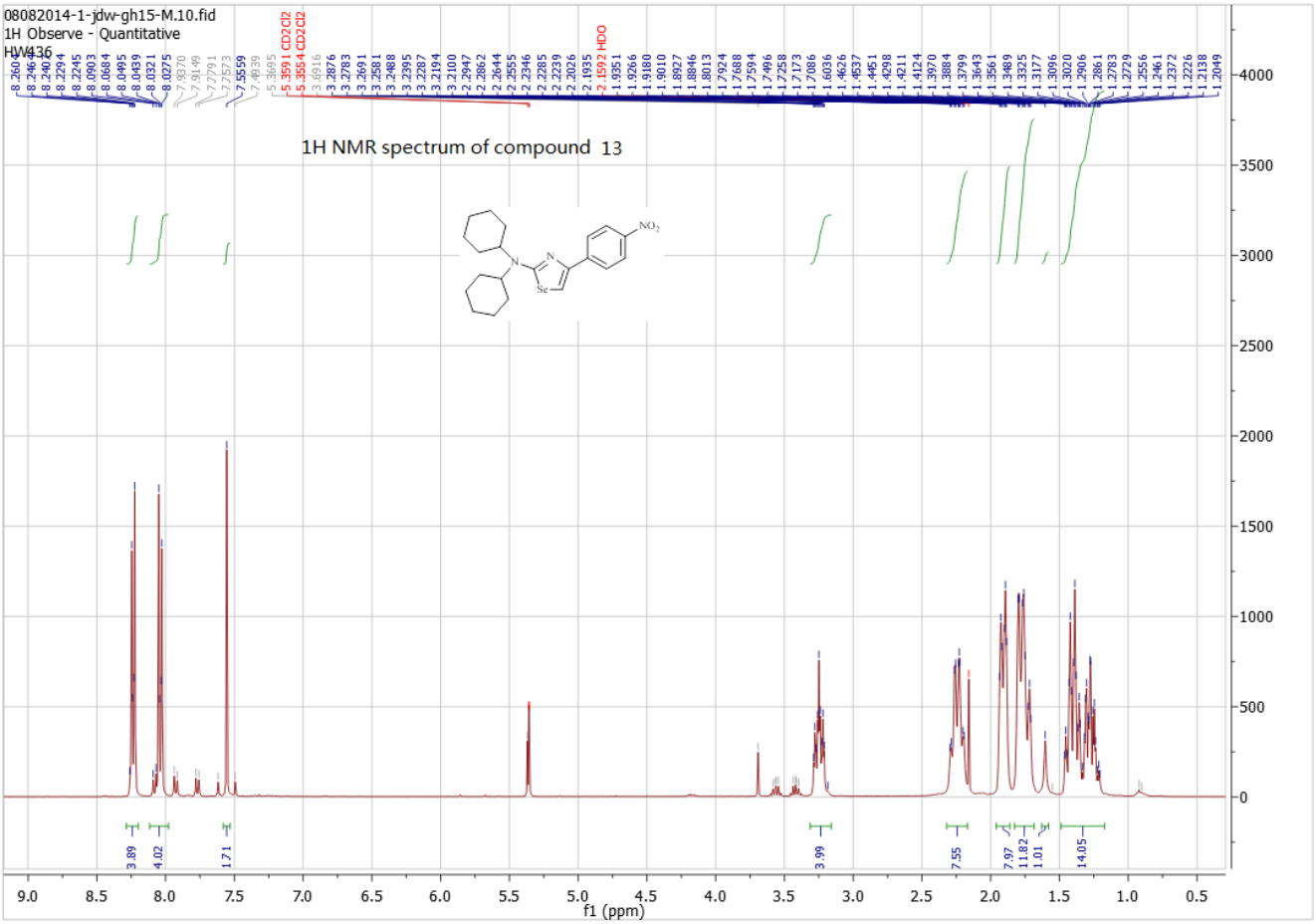

05292014-29-huaR.11.fid
HW403-2
13C NMR spectrum of compound 10
116.0433
77.8641 CDCl3
77.4394 CDCl3
77.0161 CDCl3
58.5550
32.2972
28.8922
26.2557
25.6847
25.5230
25.0878
f1 (ppm)

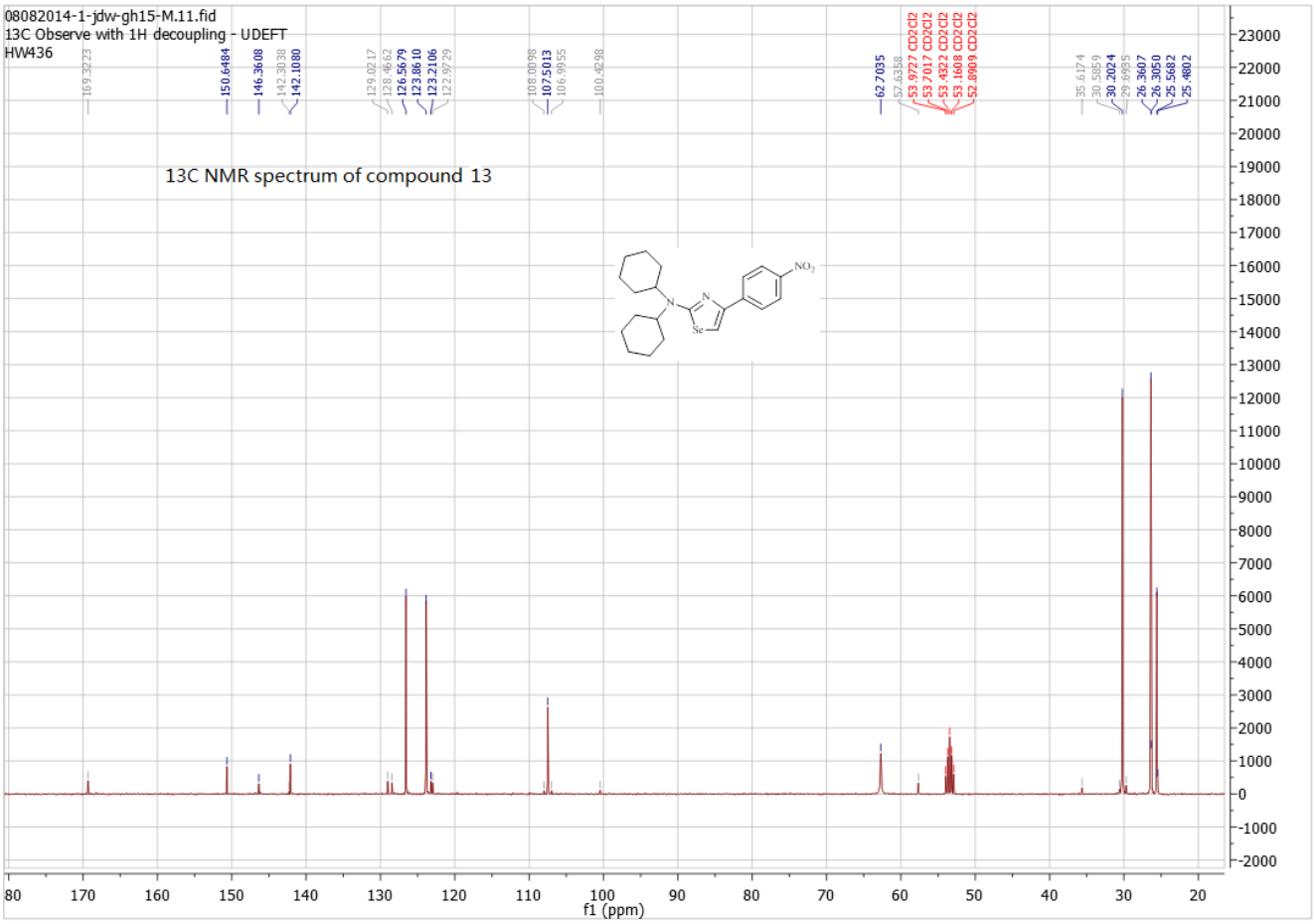

08292014-36-jdw-gh15-N.10.fid
1H Observe - Quantitative
1H NMR spectrum of compound 11
f1 (ppm)

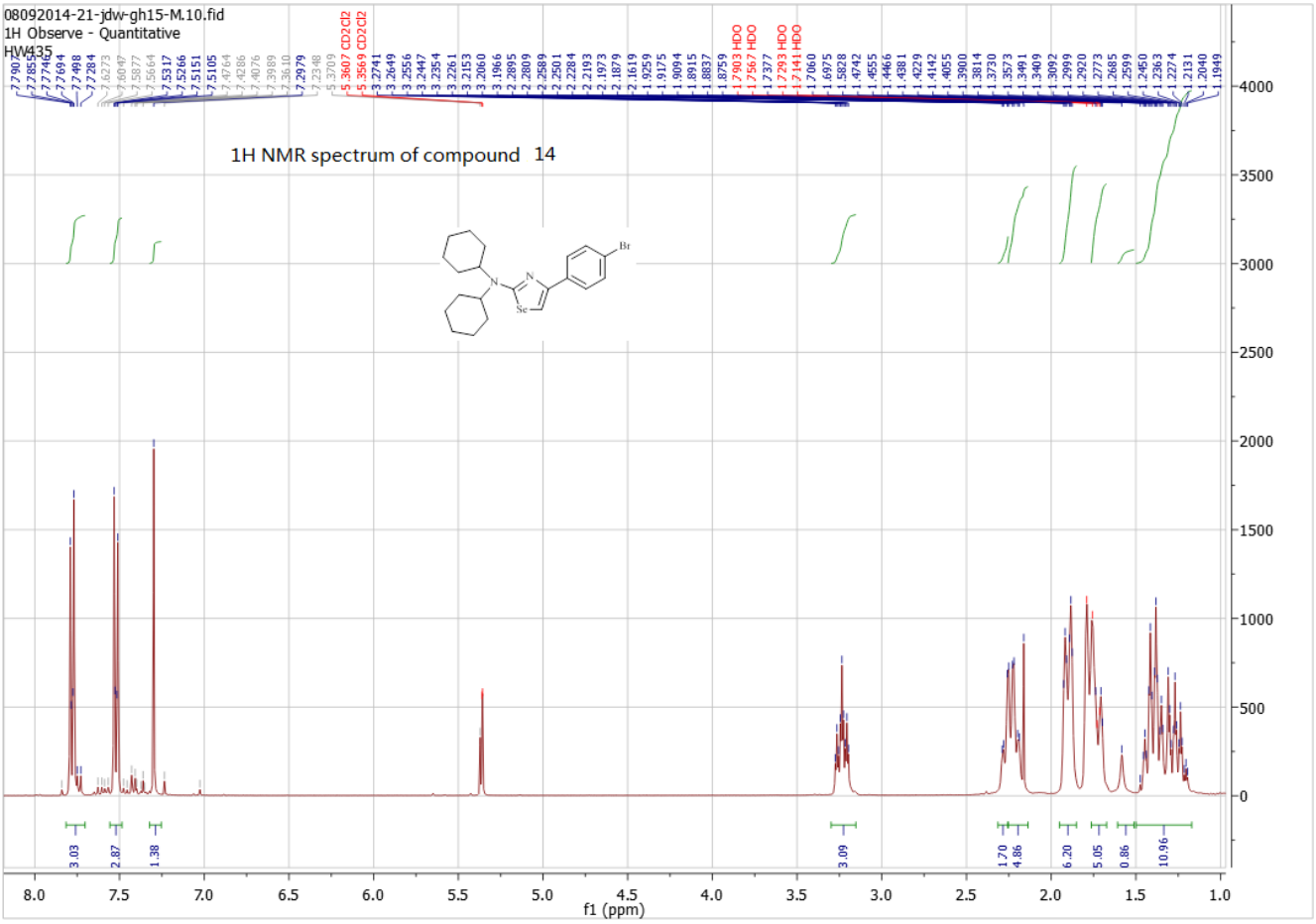

08292014-36-jdw-gh15-N.11.fid
13C Observe with multiplicity editing
HW444-3
13C NMR spectrum of compound 11
f1 (ppm)

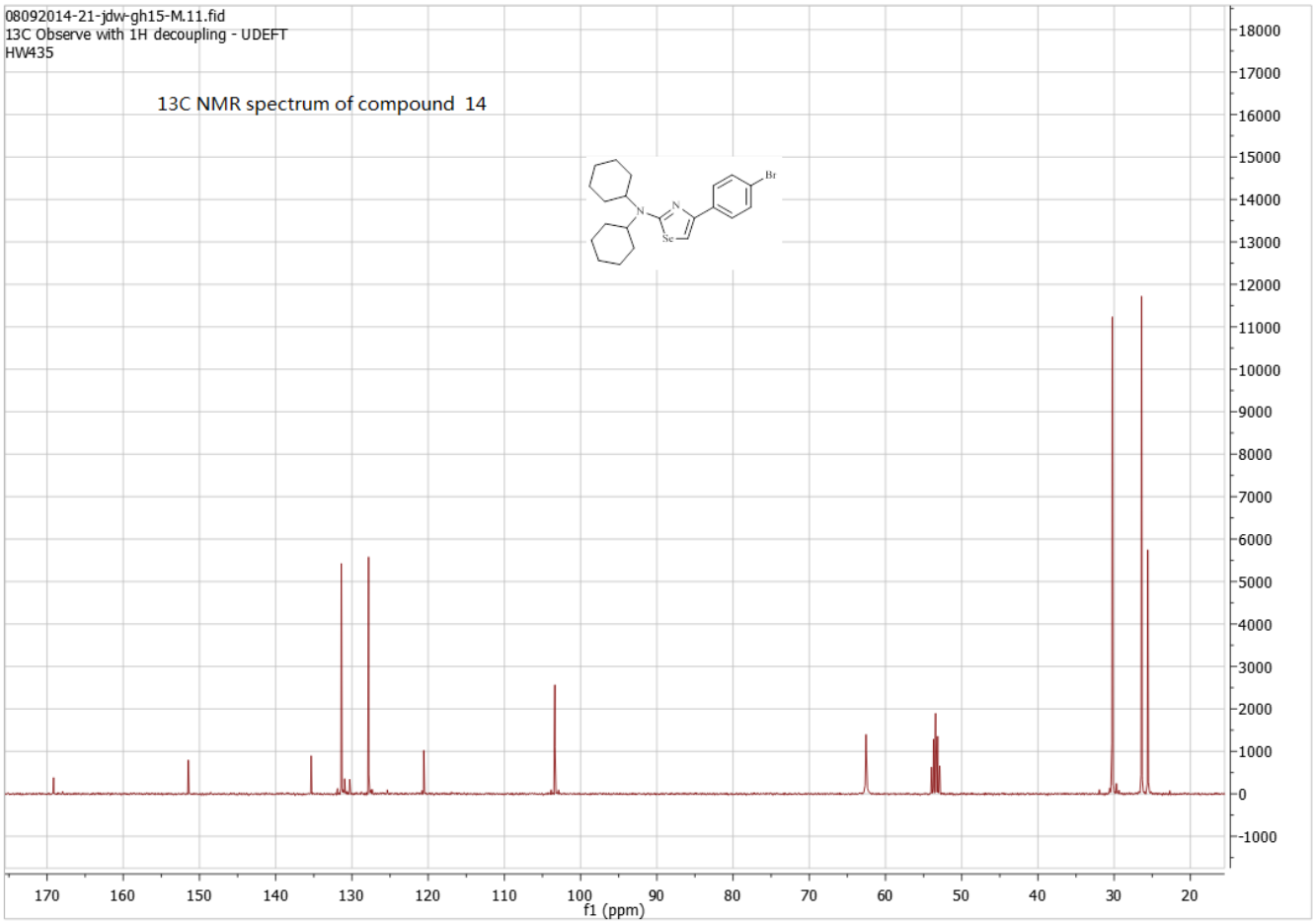

08112014-38-jdw-gh15-M.10.fid
1H Observe - Quantitative
HW438-1
1H NMR spectrum of compound 12
f1 (ppm)

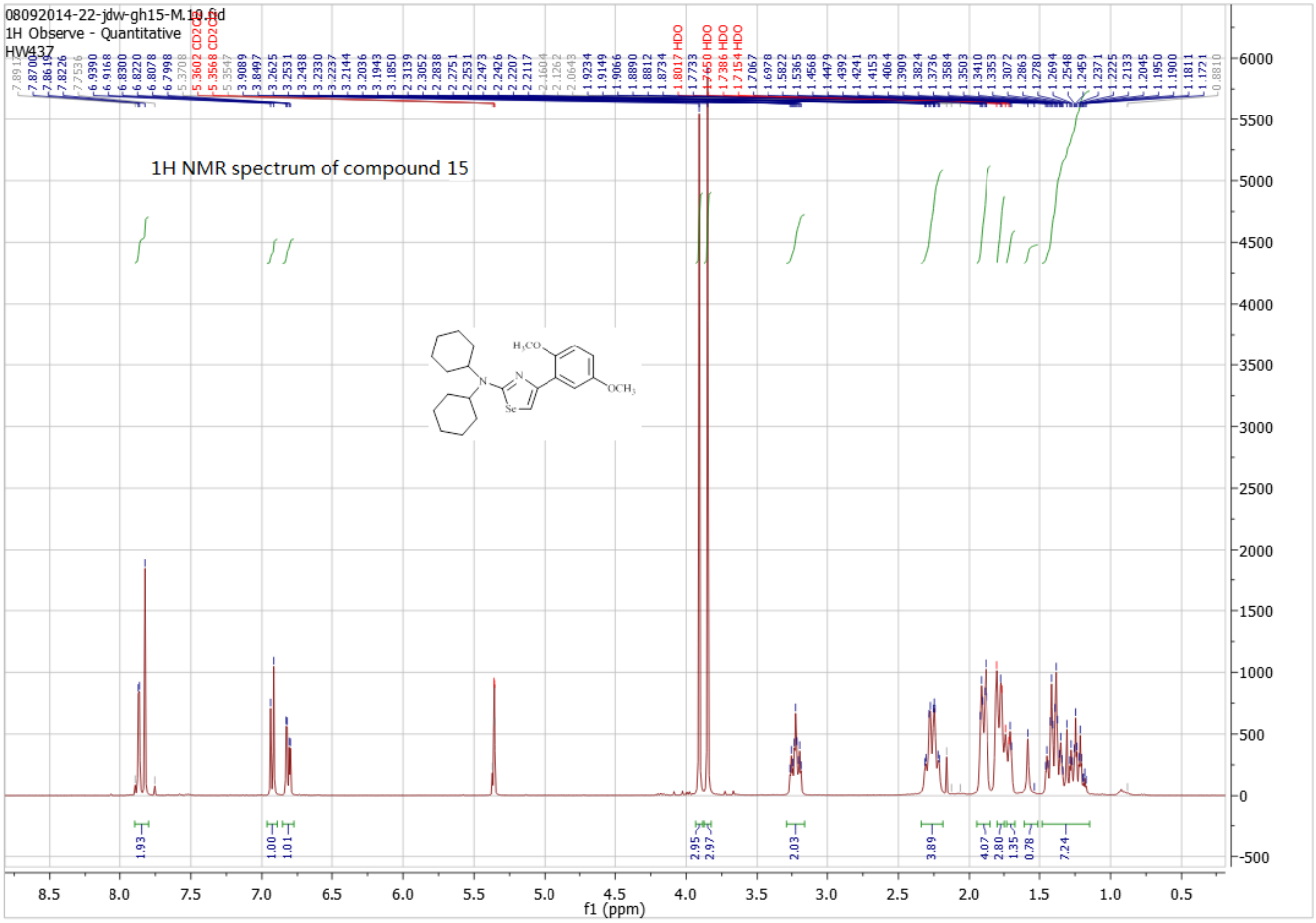

08112014-38-jdw-gh15-M.11.fid
13C Observe with multiplicity editing - DEPTQ
HW438-1
13C NMR spectrum of compound 12
f1 (ppm)

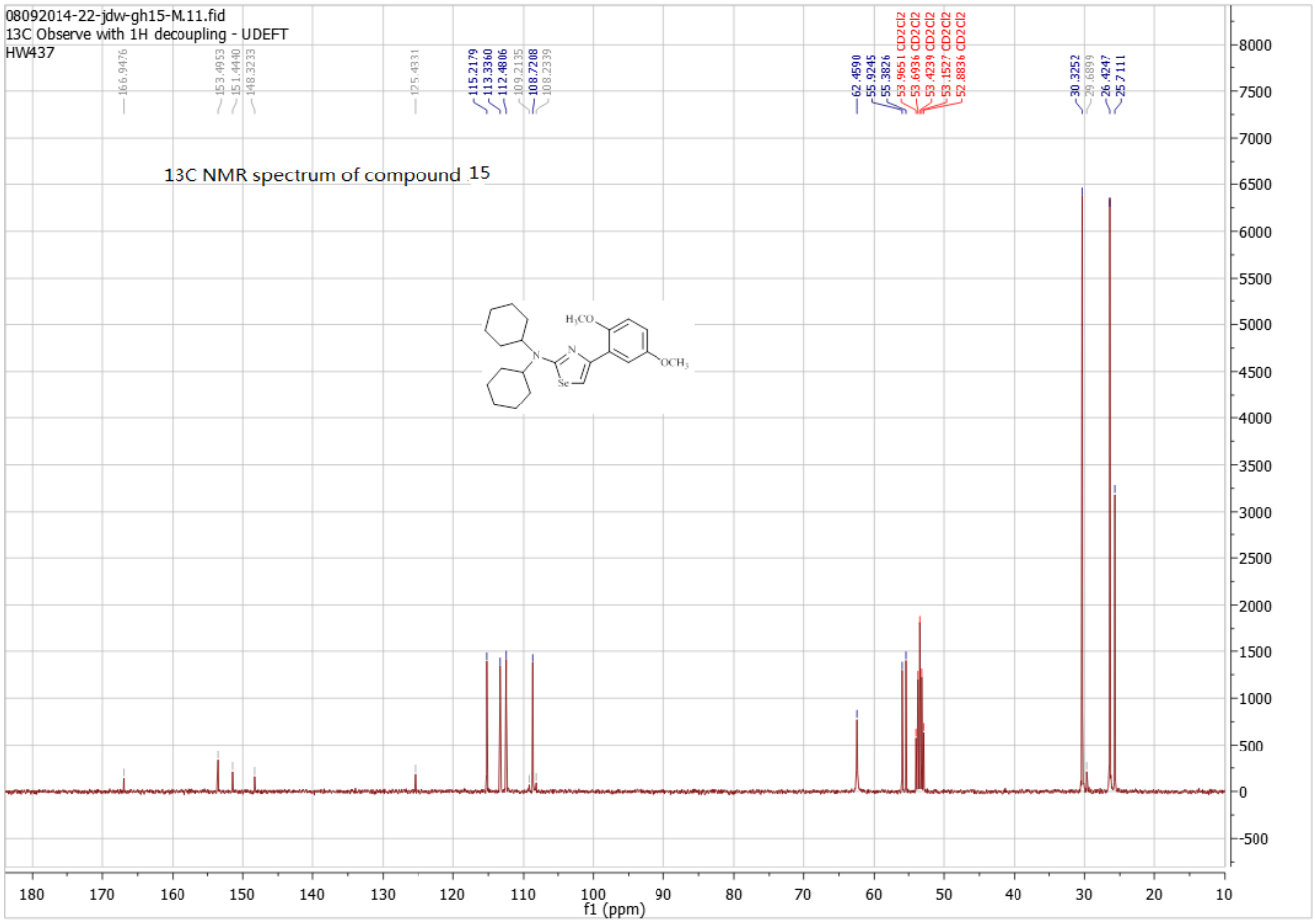

08082014-1-jdw-gh15-M.10.fid
1H Observe - Quantitative
HW436
1H NMR spectrum of compound 13
f1 (ppm)


08082014-1-jdw-gh15-M.11.fid
13C Observe with 1H decoupling - UDEFT
HW436
13C NMR spectrum of compound 13
f1 (ppm)


08092014-21-jdw-gh15-M.10.fid
1H Observe - Quantitative
HW435
1H NMR spectrum of compound 14
f1 (ppm)


08092014-21-jdw-gh15-M.11.fid
13C Observe with 1H decoupling - UDEFT
HW435
13C NMR spectrum of compound 14
Br
N
N
Se
18000
17000
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
-1000
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
f1 (ppm)


08092014-22-jdw-gh15-M.10.fid
1H Observe - Quantitative
HW437
1H NMR spectrum of compound 15
f1 (ppm)



References

1. G. M. Sheldrick, *Acta Crystallogr. Sect. C*. **2015**, *71*, 3-8.