

Supporting Information

Copper-catalyzed Three-component Synthesis of Benzothiazolethiones from *o*-Iodoanilines, Isocyanide, and Potassium sulfide

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Contents

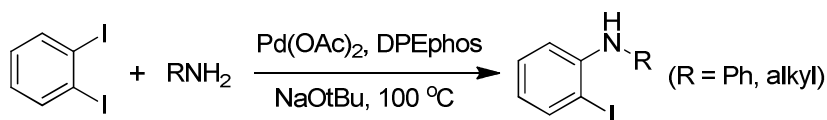
1) General Information	S2
2) Synthesis of Starting Materials	S2-S3
3) Typical Procedures	S3-S4
4) Characterization Data	S4-S10
5) References	S11
6) Scanned ¹ H NMR and ¹³ C NMR Spectra of All New Compounds	S12-S38

1) General Information

NMR spectra of the products **2a-2l** were recorded using Bruker Avance-500 instruments, calibrated to residual DMSO- d_6 as the internal reference (2.50 ppm for ^1H NMR spectra and 40.00 ppm for ^{13}C NMR spectra). NMR spectra of the products **4a-4m**, **5**, **6** were obtained using Bruker Avance-500 instruments, calibrated to TMS (^1H NMR spectra) and $\text{CD}(\text{H})\text{Cl}_3$ (^{13}C NMR spectra) as the internal reference (0.00 ppm for ^1H NMR spectra and 77.00 ppm for ^{13}C NMR spectra). High-resolution mass spectra (HRMS) were recorded on a Bruker Apex IV FTMS mass spectrometer using ESI (electrospray ionization). Melting points were measured. Reactions were monitored by thin-layer chromatography. Column chromatography (petroleum ether/ethyl acetate) was performed on silica gel (200-300 mesh).

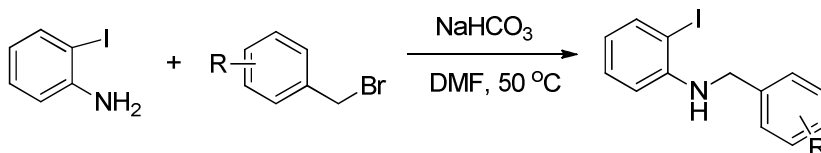
2) Synthesis of Starting Materials

Preparation of **3b-3d**, **3j**:¹



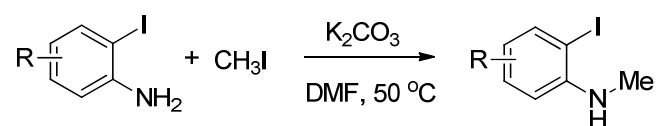
The sealed Schlenk tube was charged with 1,2-diiodobenzene (3 mmol), the corresponding amine (1.5 equiv), $\text{Pd}(\text{OAc})_2$ (0.5 mol %), DPEphos (0.75 mol %), NaOtBu (1.5 equiv) and toluene (8 mL). Then under the protection of nitrogen atmosphere, the mixture was stirred at 100 $^\circ\text{C}$ (oil bath temperature). Heating was continued for 24 h. Then, cooled to room temperature. The mixture was filtered by a crude column with ethyl acetate as the eluent, and concentrated under reduced pressure. The residue was purified by flash column chromatography on silica gel using petroleum ether/ethyl acetate as the eluent.

Preparation of **3e-3i**:²



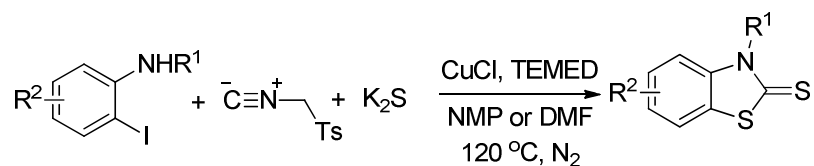
An oven-dried flask was charged with o-iodoaniline (2.6 mmol), the corresponding benzyl bromide (2 mmol), NaHCO₃ (4 mmol), and DMF (5 mL). The mixture was stirred at 50 °C, until complete consumption of starting material was indicated by TLC. Then cooled to room temperature, the mixture was quenched with water and the organic layer extracted with ethyl acetate. The combined extracts were washed with brine, dried over Na₂SO₄, concentrated under reduced pressure and purified by column chromatography to afford the pure product.

Preparation of 3k-3m:³



An oven-dried flask was charged with the corresponding o-iodoaniline (1.2 equiv), iodomethane (2 mmol), K₂CO₃ (2 equiv) and DMF (5 mL). The resulting mixture was stirred at 50 °C, until complete consumption of starting material was indicated by TLC. The mixture was quenched with water and the organic layer extracted with ethyl acetate. The combined extracts were washed with brine, dried over Na₂SO₄, concentrated under reduced pressure and purified by column chromatography to afford the pure product.

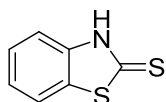
3) Typical Procedures



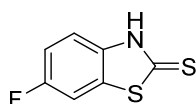
The sealed Schlenk tube was charged with tosylmethyl isocyanide (0.3 mmol), o-iodoanilines (0.3 mmol), K₂S (5 equiv), CuCl (20 mol %), TEMED (40 mol-%) and DMF or NMP (2 mL). Then under the protection of nitrogen atmosphere, the mixture was stirred at 120 °C (oil bath temperature). After the reaction was finished, the reaction mixture was cooled to room temperature, quenched by water and extracted with ethyl acetate. The combined organic layer was washed with brine, and dried over

Na₂SO₄, and concentrated in vacuum, and the resulting residue was purified by silica gel column chromatography (petroleum ether/ethyl acetate) to afford the pure product.

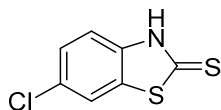
4) Characterization Data



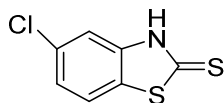
Benzo[d]thiazole-2(3H)-thione (2a):⁴ White solid (39 mg, 78%); mp: 190.2-191.9 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 7.26-7.31 (m, 2H), 7.39 (t, J = 7.5 Hz, 1H), 7.67 (d, J = 7.5 Hz, 1H), 13.77 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 112.9, 122.3, 124.8, 127.7, 129.9, 141.8, 190.4.



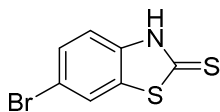
6-fluorobenzo[d]thiazole-2(3H)-thione (2b):^{4,5} White solid (38 mg, 68%); mp: 219.5-220.8 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 7.23-7.28 (m, 2H), 7.64 (d, J = 8.5 Hz, 1H), 13.79 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 109.4 (d, J = 27.5 Hz), 113.9 (d, J = 9.1 Hz), 115.2 (d, J = 24.5 Hz), 131.3 (d, J = 10.6 Hz), 138.5, 159.6 (d, J = 240.3 Hz), 190.5.



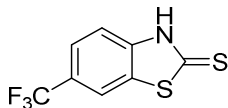
6-chlorobenzo[d]thiazole-2(3H)-thione (2c):⁶ White solid (41 mg, 67%); mp: 238.5-240.5 °C (decomposition); ¹H NMR (DMSO-d₆, 500 MHz) δ = 7.28 (d, J = 8.5 Hz, 1H), 7.44 (dd, J = 9.0 Hz, 2.0 Hz, 1H), 7.85 (d, J = 2.0 Hz, 1H), 13.86 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 114.0, 121.9, 127.8, 129.1, 131.6, 140.7, 190.7.



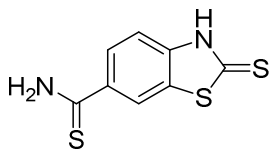
5-chlorobenzo[d]thiazole-2(3H)-thione (2d):⁶ White solid (51 mg, 85%); mp: 204.6-205.9 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 7.28 (s, 1H), 7.35 (dd, J = 8.5 Hz, 1.5 Hz, 1H), 7.72 (d, J = 8.5 Hz, 1H), 13.84 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 112.4, 123.7, 124.5, 128.7, 132.3, 142.7, 191.4.



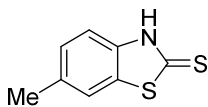
6-bromobenzo[d]thiazole-2(3H)-thione (2e):⁴ White solid (50 mg, 67%); mp: > 260.0 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 7.22 (d, J = 6.5 Hz, 1H), 7.55 (d, J = 8.0 Hz, 1H), 7.97 (s, 1H), 13.83 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 114.3, 116.9, 124.6, 130.5, 131.9, 141.0, 190.6.



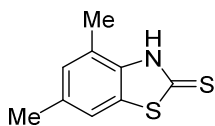
6-(trifluoromethyl)benzo[d]thiazole-2(3H)-thione (2f):⁷ White solid (43 mg, 61%); mp: 219.8-222.4 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 7.43 (d, J = 8.5 Hz, 1H), 7.71 (d, J = 8.5 Hz, 1H), 8.16 (s, 1H), 14.03 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 113.2, 119.8 (d, J = 3.9 Hz), 122.5 (q, J = 270.2 Hz), 124.7 (d, J = 3.5 Hz), 125.3 (q, J = 32.4 Hz), 130.6, 144.6, 192.2.



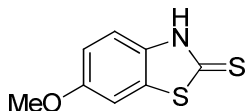
2-thioxo-2,3-dihydrobenzo[d]thiazole-6-carbothioamide (2g): yellow solid (25 mg, 37%); mp: 249.8-252.6 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 7.29 (d, J = 9.0 Hz, 1H), 7.93 (dd, J = 8.5 Hz, 2.0 Hz, 1H), 8.19 (s, 1H), 9.51 (s, 1H), 9.88 (s, 1H), 13.93 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 111.8, 121.4, 127.4, 129.5, 136.0, 143.7, 191.6, 199.2; HRMS (ESI, m/z) calcd for [C₈H₆N₂S₃]⁺H⁺: 226.9766; found 226.9766.



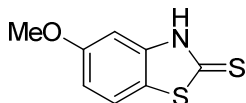
6-methylbenzo[d]thiazole-2(3H)-thione (2h):⁴ White solid (42 mg, 78%); mp: 180.5-181.6 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 2.32 (s, 3H), 7.18 (s, 2H), 7.45 (s, 1H), 13.65 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 21.2, 112.6, 122.0, 128.6, 129.9, 134.3, 139.7, 189.7.



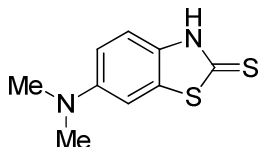
4,6-dimethylbenzo[d]thiazole-2(3H)-thione (2i): White solid (44 mg, 75%); mp: 209.5 °C (decomposition); ¹H NMR (DMSO-d₆, 500 MHz) δ = 2.29 (s, 3H), 2.39 (s, 3H), 7.00 (s, 1H), 7.28 (s, 1H), 13.48 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 17.9, 21.0, 119.2, 122.7, 129.7, 129.8, 134.2, 138.6, 190.0; HRMS (ESI, m/z) calcd for [C₉H₉NS₂]⁺: 196.0249; found 196.0247.



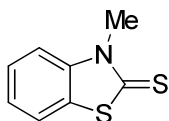
6-methoxybenzo[d]thiazole-2(3H)-thione (2j):⁸ White solid (43 mg, 73%); mp: 199.5-201.6 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 3.75 (s, 3H), 6.98 (d, *J* = 8.5 Hz, 1H), 7.20 (d, *J* = 8.5 Hz, 1H), 7.32 (s, 1H), 13.61 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 56.2, 106.4, 113.6, 115.3, 131.2, 135.7, 157.1, 188.8.



5-methoxybenzo[d]thiazole-2(3H)-thione (2k):⁸ White solid (44 mg, 75%); mp: 196.8-197.5 °C; ¹H NMR (DMSO-d₆, 500 MHz) δ = 3.77 (s, 3H), 6.81 (s, 1H), 6.90 (d, *J* = 8.5 Hz, 1H), 7.54 (d, *J* = 9.0 Hz, 1H), 13.59 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 56.0, 97.7, 112.5, 121.1, 122.8, 142.8, 159.5, 191.1.

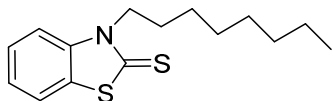


6-(dimethylamino)benzo[d]thiazole-2(3H)-thione (2l):⁹ yellow solid (45 mg, 71%); mp: 201.6 °C (decomposition); ¹H NMR (DMSO-d₆, 500 MHz) δ = 2.88 (s, 6H), 6.81 (dd, *J* = 8.5 Hz, 2.5 Hz, 1H), 6.98 (d, *J* = 2.5 Hz, 1H), 7.13 (d, *J* = 9.0 Hz, 1H), 13.43 (s, 1H); ¹³C NMR (DMSO-d₆, 125 MHz) δ = 40.9, 104.6, 113.0, 113.2, 131.6, 132.6, 148.6, 187.0.

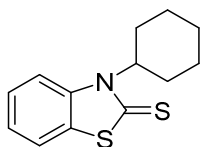


3-methylbenzo[d]thiazole-2(3H)-thione (4a):⁴ White solid (50 mg, 93%); mp: 100.3-101.9 °C; ¹H NMR (CDCl₃, 500 MHz) δ = 3.84 (s, 3H), 7.20 (d, *J* = 8.5 Hz,

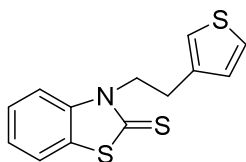
1H), 7.27-7.32 (m, 1H), 7.40-7.43 (m, 1H), 7.47 (d, $J = 8.0$ Hz, 1H); ^{13}C NMR (CDCl_3 , 125 MHz) $\delta = 33.1, 112.2, 121.2, 124.8, 126.9, 127.4, 141.9, 189.3$.



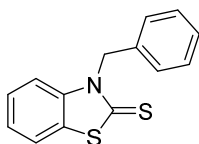
3-octylbenzo[d]thiazole-2(3H)-thione (4b):¹⁰ yellow oil (67 mg, 80%); ^1H NMR (CDCl_3 , 500 MHz) $\delta = 0.88$ (t, $J = 7.0$ Hz, 3H), 1.27-1.34 (m, 6H), 1.35-1.38 (m, 2H), 1.42-1.48 (m, 2H), 1.78-1.84 (m, 2H), 4.41 (t, $J = 8.0$ Hz, 2H), 7.21 (d, $J = 8.0$ Hz, 1H), 7.29 (td, $J = 8.0$ Hz, 1.0 Hz, 1H), 7.41 (td, $J = 8.0$ Hz, 1.0 Hz, 1H), 7.48 (d, $J = 7.0$ Hz, 1H); ^{13}C NMR (CDCl_3 , 125 MHz) $\delta = 13.9, 22.5, 26.7, 26.8, 29.1, 29.2, 31.7, 46.4, 112.3, 121.3, 124.5, 126.8, 127.9, 141.5, 188.9$.



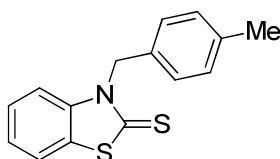
3-cyclohexylbenzo[d]thiazole-2(3H)-thione (4c):¹⁰ yellow solid (43 mg, 60%); mp: 115.6-116.8 °C; ^1H NMR (CDCl_3 , 500 MHz) $\delta = 1.30$ -1.36 (m, 1H), 1.56 (q, $J = 12.5$ Hz, 2H), 1.82 (d, $J = 13.0$ Hz, 1H), 1.90 (d, $J = 11.5$ Hz, 2H), 1.96 (d, $J = 13.5$ Hz, 2H), 2.24 (q, $J = 12.0$ Hz, 2H), 5.75 (t, $J = 12.5$ Hz, 1H), 7.25 (d, $J = 7.5$ Hz, 1H), 7.35 (t, $J = 7.5$ Hz, 1H), 7.46 (d, $J = 8.0$ Hz, 1H), 7.68 (d, $J = 8.5$ Hz, 1H); ^{13}C NMR (CDCl_3 , 125 MHz) $\delta = 25.3, 25.9, 28.5, 58.4, 113.9, 121.2, 123.9, 126.1, 127.3, 140.6, 189.2$.



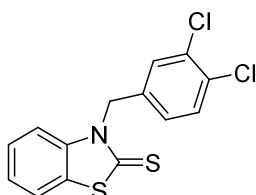
3-(2-(thiophen-3-yl)ethyl)benzo[d]thiazole-2(3H)-thione (4d): yellow solid (65 mg, 79%); mp: 101.2-102.5 °C; ^1H NMR (CDCl_3 , 500 MHz) $\delta = 3.34$ (t, $J = 7.5$ Hz, 2H), 4.64 (t, $J = 7.0$ Hz, 2H), 6.90 (d, $J = 15.0$ Hz, 2H), 7.08-7.16 (m, 2H), 7.27 (t, $J = 7.5$ Hz, 1H), 7.35 (t, $J = 7.5$ Hz, 1H), 7.47 (d, $J = 7.5$ Hz, 1H); ^{13}C NMR (CDCl_3 , 125 MHz) $\delta = 26.7, 47.5, 111.9, 121.3, 124.3, 124.6, 125.9, 126.8, 127.1, 127.5, 139.1, 141.3, 188.8$; HRMS (ESI, m/z) calcd for $[\text{C}_{13}\text{H}_{11}\text{NS}_3]\text{H}^+$: 278.0126; found 278.0127.



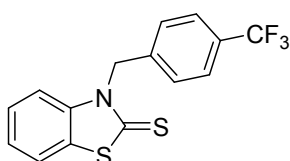
3-benzylbenzo[d]thiazole-2(3H)-thione (4e):¹⁰ yellow solid (63 mg, 82%); mp: 145.6-146.9 °C; ¹H NMR (CDCl₃, 500 MHz) δ = 5.67 (s, 2H), 7.09 (d, J = 7.5 Hz, 1H), 7.21-7.26 (m, 3H), 7.29 (d, J = 4.5 Hz, 4H), 7.44 (d, J = 7.5 Hz, 1H); ¹³C NMR (CDCl₃, 125 MHz) δ = 49.3, 112.9, 121.1, 124.7, 126.8, 126.9, 127.3, 127.8, 128.7, 134.2, 141.3, 189.9.



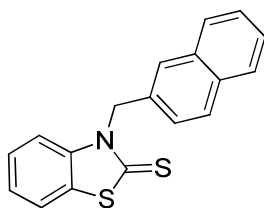
3-(4-methylbenzyl)benzo[d]thiazole-2(3H)-thione (4f): yellow solid (61 mg, 75%); mp: 131.5-132.7 °C; ¹H NMR (CDCl₃, 500 MHz) δ = 2.29 (s, 3H), 5.64 (s, 2H), 7.10-7.12 (m, 3H), 7.20 (d, J = 8.0 Hz, 2H), 7.24-7.26 (m, 1H), 7.27-7.29 (m, 1H), 7.44-7.46 (m, 1H); ¹³C NMR (CDCl₃, 125 MHz) δ = 21.0, 49.2, 113.0, 121.2, 124.7, 126.9, 127.0, 127.5, 129.5, 131.2, 137.6, 141.4, 189.9; HRMS (ESI, m/z) calcd for [C₁₅H₁₃NS₂]⁺: 272.0562; found 272.0564.



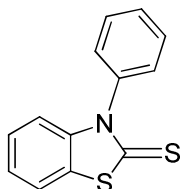
3-(3,4-dichlorobenzyl)benzo[d]thiazole-2(3H)-thione (4g): yellow solid (88 mg, 90%); mp: 189.8-191.5 °C; ¹H NMR (CDCl₃, 500 MHz) δ = 5.64 (s, 2H), 7.06 (d, J = 8.0 Hz, 1H), 7.14 (dd, J = 8.5 Hz, 1.5 Hz, 1H), 7.28-7.35 (m, 2H), 7.38-7.41 (m, 2H), 7.51 (d, J = 8.0 Hz, 1H); ¹³C NMR (CDCl₃, 125 MHz) δ = 48.3, 112.6, 121.5, 125.1, 126.5, 127.1, 127.5, 129.1, 130.9, 132.3, 133.1, 134.5, 141.0, 190.2.



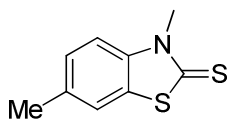
3-(4-(trifluoromethyl)benzyl)benzo[d]thiazole-2(3H)-thione (4h): yellow solid (60 mg, 71%); mp: 112.7-113.9 °C; ¹H NMR (CDCl₃, 500 MHz) δ = 5.75 (s, 2H), 7.05-7.06 (m, 1H), 7.27-7.33 (m, 2H), 7.41 (d, *J* = 8.0 Hz, 2H), 7.50-7.52 (m, 1H), 7.58 (d, *J* = 8.5 Hz, 2H); ¹³C NMR (CDCl₃, 125 MHz) δ = 48.9, 112.6, 121.5, 122.7 (q, *J* = 270.6 Hz), 125.0, 125.9 (q, *J* = 3.6 Hz), 127.1, 127.3, 127.5, 130.2 (q, *J* = 32.5 Hz), 138.3, 141.1, 190.3; HRMS (ESI, *m/z*) calcd for [C₁₅H₁₀F₃NS₂]⁺H⁺: 326.0279; found 326.0283.



3-(naphthalen-1-ylmethyl)benzo[d]thiazole-2(3H)-thione (4i): yellow solid (77 mg, 84%); mp: 162.5-163.8 °C; ¹H NMR (CDCl₃, 500 MHz) δ = 5.85 (s, 2H), 7.13-7.15 (m, 1H), 7.23-7.25 (m, 2H), 7.43-7.48 (m, 4H), 7.70 (s, 1H), 7.75-7.80 (m, 3H); ¹³C NMR (CDCl₃, 125 MHz) δ = 49.7, 113.1, 121.3, 124.7, 124.8, 125.9, 126.2, 126.4, 126.9, 127.5, 127.7, 127.8, 128.9, 131.8, 132.8, 133.2, 141.1, 190.2; HRMS (ESI, *m/z*) calcd for [C₁₈H₁₃NS₂]⁺H⁺: 308.0562; found 308.0568.

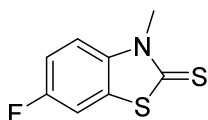


3-phenylbenzo[d]thiazole-2(3H)-thione (4j):¹¹ yellow viscous oil (28 mg, 39%); ¹H NMR (CDCl₃, 500 MHz) δ = 6.72 (d, *J* = 8.0 Hz, 1H), 7.24-7.25 (m, 1H), 7.28-7.31 (m, 1H), 7.38-7.39 (m, 2H), 7.50 (d, *J* = 7.5 Hz, 1H), 7.55-7.58 (m, 1H), 7.63 (t, *J* = 7.0 Hz, 2H); ¹³C NMR (CDCl₃, 125 MHz) δ = 113.4, 121.1, 124.9, 126.8, 127.9, 128.3, 129.8, 130.2, 136.7, 143.4, 190.5.

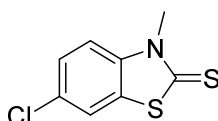


3,6-dimethylbenzo[d]thiazole-2(3H)-thione (4k):⁴ yellow solid (46 mg, 79%); mp: 125.2-126.8 °C; ¹H NMR (CDCl₃, 500 MHz) δ = 2.41 (s, 3H), 3.81 (s, 3H), 7.08 (d, *J*

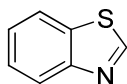
= 8.5 Hz, 1H), 7.21 (d, J = 8.0 Hz, 1H), 7.26 (s, 1H); ^{13}C NMR (CDCl_3 , 125 MHz) δ = 20.9, 33.0, 111.9, 121.3, 127.4, 127.9, 134.9, 139.9, 188.7.



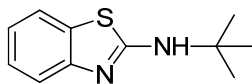
6-fluoro-3-methylbenzo[d]thiazole-2(3H)-thione (4l):⁵ yellow solid (46 mg, 81%); mp: 132.6-133.8 °C; ^1H NMR (CDCl_3 , 500 MHz) δ = 3.83 (s, 3H), 7.15 (d, J = 6.5 Hz, 2H), 7.22 (d, J = 7.0 Hz, 1H); ^{13}C NMR (CDCl_3 , 125 MHz) δ = 33.2, 108.4 (d, J = 26.8 Hz), 112.8 (d, J = 8.6 Hz), 114.5 (d, J = 24.4 Hz), 128.6 (d, J = 10.0 Hz), 138.4, 160.1 (d, J = 244.6 Hz), 188.9.



6-chloro-3-methylbenzo[d]thiazole-2(3H)-thione (4m):¹² yellow solid (39 mg, 60%); mp: 130.8-132.2 °C; ^1H NMR (CDCl_3 , 500 MHz) δ = 3.82 (s, 3H), 7.11 (d, J = 8.5 Hz, 1H), 7.39 (dd, J = 8.5 Hz, 2.0 Hz, 1H), 7.46 (d, J = 7.5 Hz, 1H); ^{13}C NMR (CDCl_3 , 125 MHz) δ = 33.2, 112.8, 120.9, 127.2, 128.7, 130.7, 140.6, 189.2.



Benzo[d]thiazole (5):¹³ light yellow liquid; ^1H NMR (CDCl_3 , 500 MHz) δ = 7.41 (t, J = 7.5 Hz, 1H), 7.49 (t, J = 7.5 Hz, 1H), 7.93 (d, J = 8.5 Hz, 1H), 8.14 (d, J = 8.0 Hz, 1H), 8.97 (s, 1H). ^{13}C NMR (CDCl_3 , 125 MHz) δ = 121.7, 123.5, 125.4, 126.0, 133.5, 153.1, 153.8.

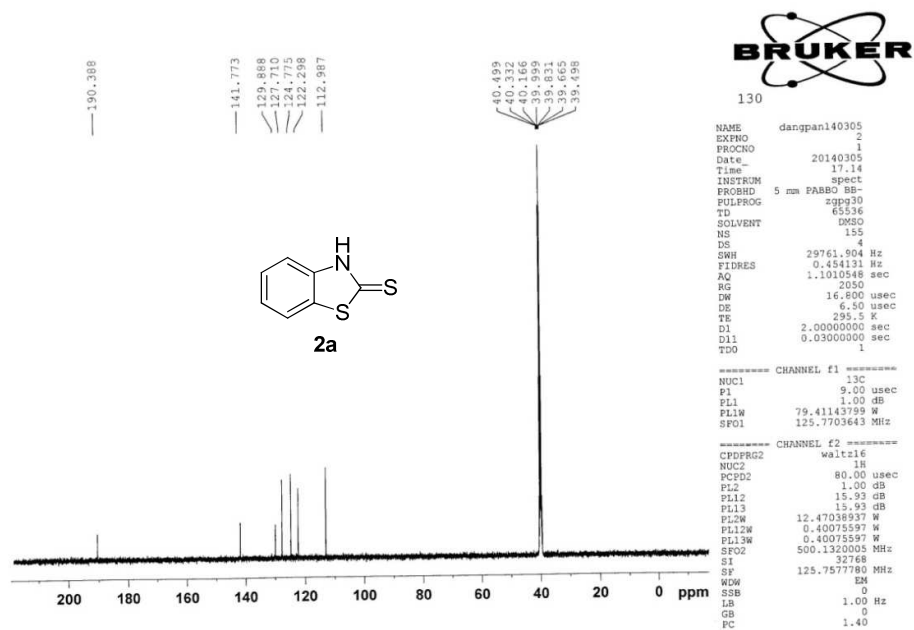
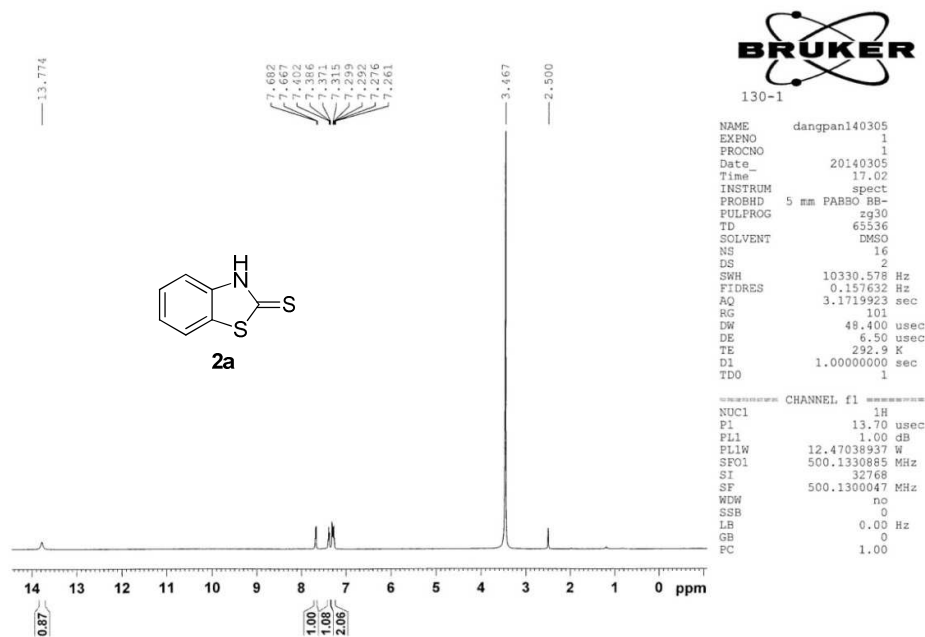


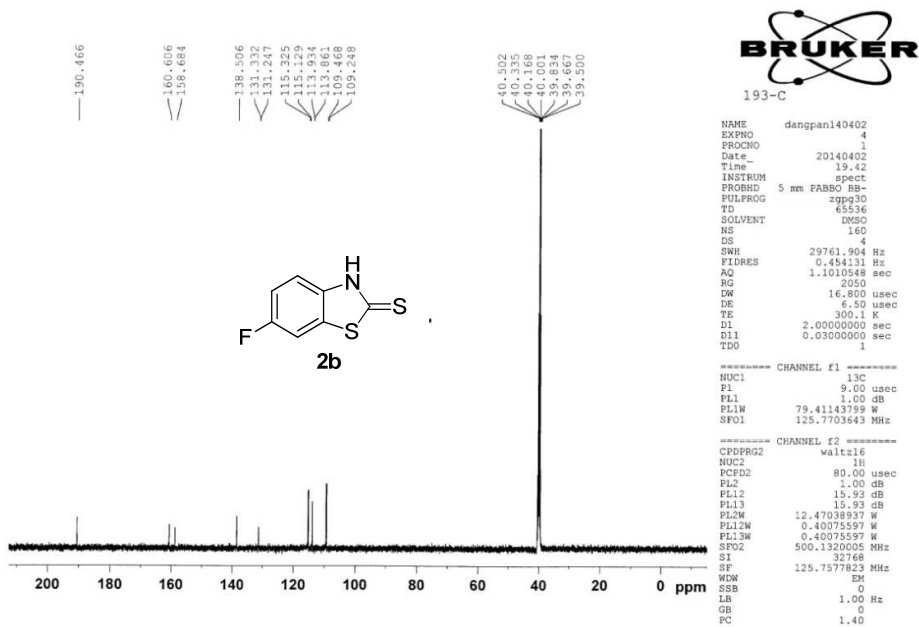
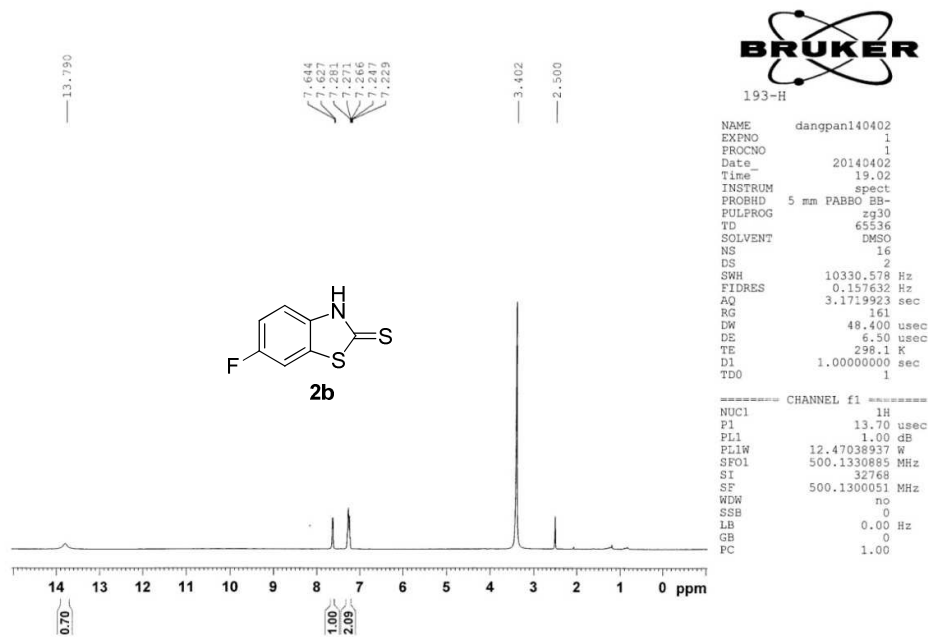
N-(tert-butyl)benzo[d]thiazol-2-amine (6):¹⁴ yellow solid (23 mg, 37%); ^1H NMR (CDCl_3 , 500 MHz) δ = 1.49 (s, 9H), 5.88 (s, 1H), 7.08 (td, J = 7.5 Hz, 0.5 Hz, 1H), 7.29 (td, J = 7.5 Hz, 1.0 Hz, 1H), 7.55 (dd, J = 8.0 Hz, 6.5 Hz, 2H). ^{13}C NMR (CDCl_3 , 125 MHz) δ = 28.9, 53.5, 118.4, 120.5, 121.7, 125.9, 129.7, 150.6, 164.8.

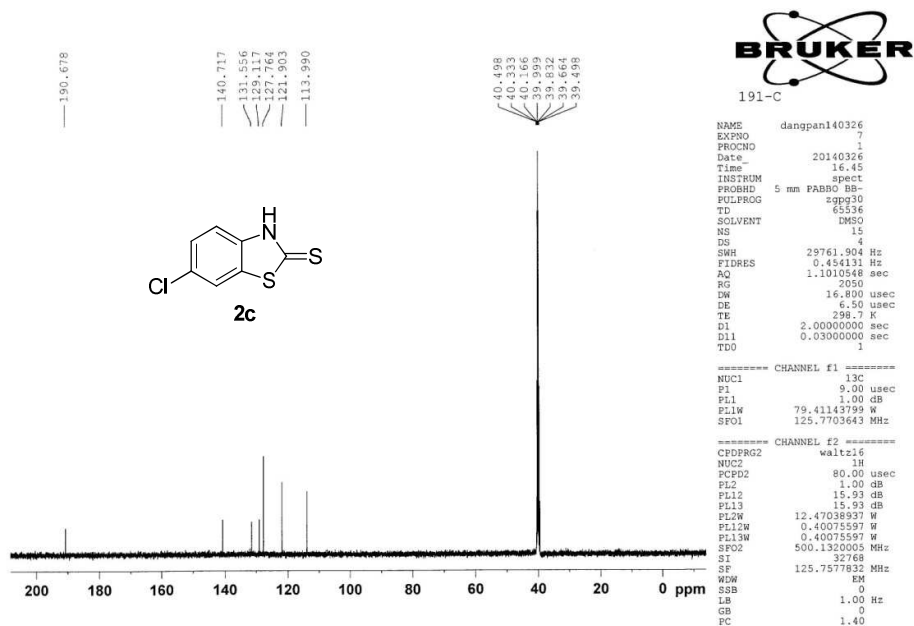
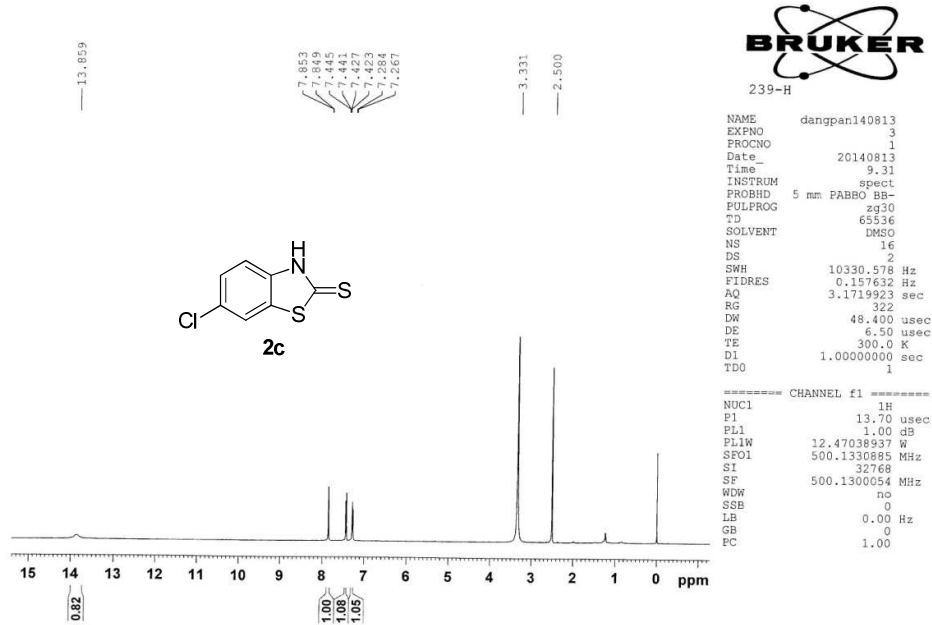
5) References

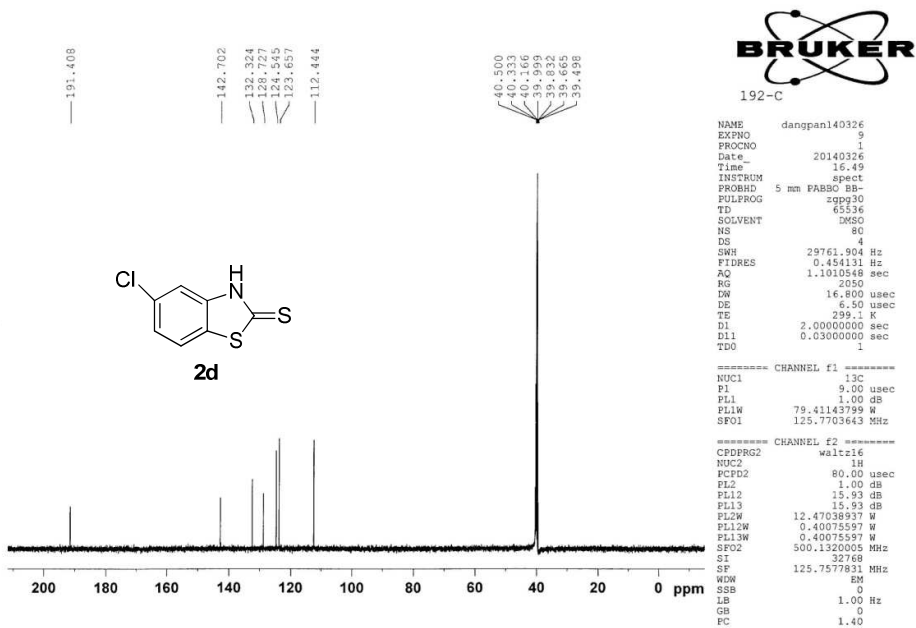
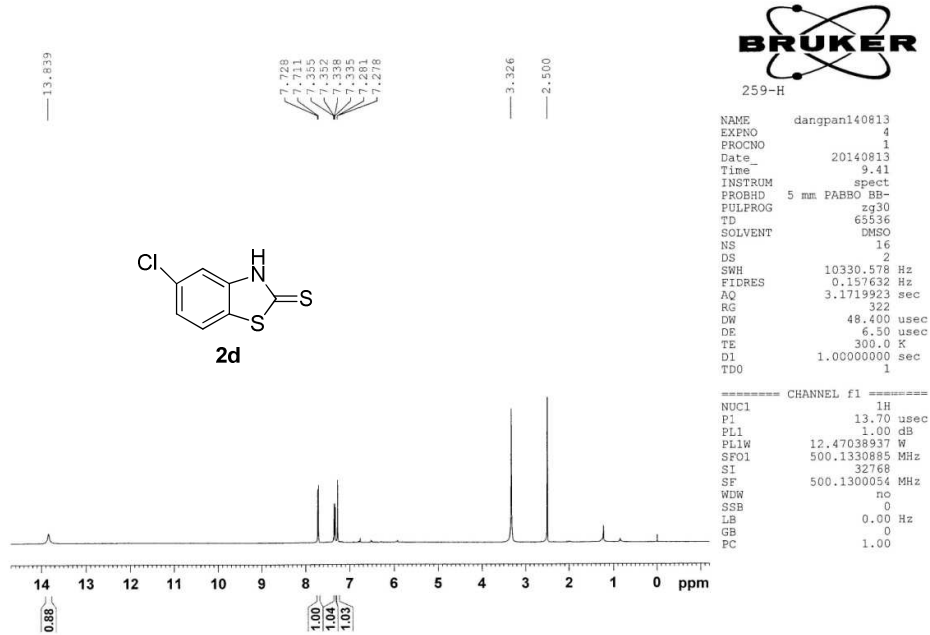
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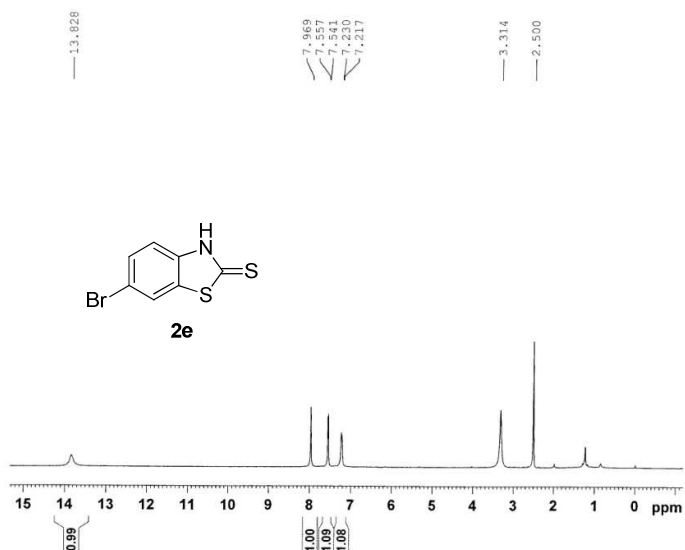
6) Scanned ^1H NMR and ^{13}C NMR Spectra of All New Compounds







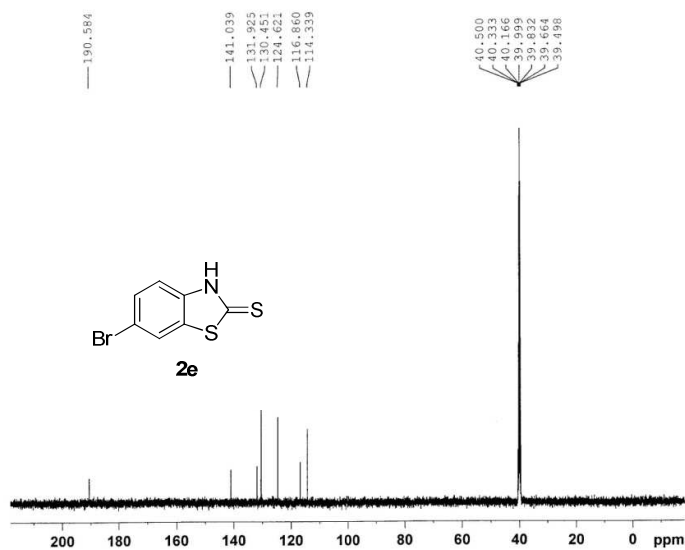




256-H

NAME dangpan140814
EXPNO 6
PROCNO 1
Date_ 20140814
Time_ 17.24
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.171923 sec
RG 287
DW 48.400 usec
DE 6.50 usec
TE 300.0 K
D1 1.00000000 sec
TD0 1

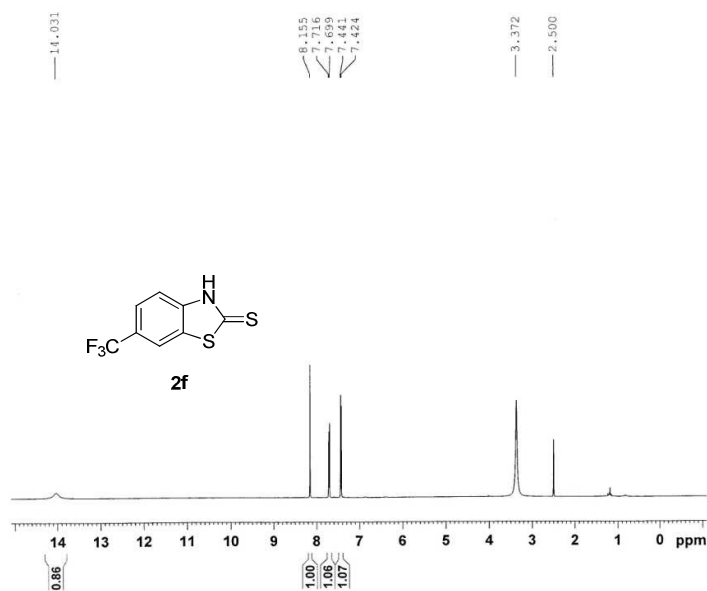
===== CHANNEL f1 =====
NUC1 1H
P1 13.70 usec
PL1 1.00 dB
PL1W 12.47038937 W
SFO1 500.1330885 MHz
SI 32768
SF 500.1300058 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00



213-C

NAME dangpan140406
EXPNO 2
PROCNO 1
Date_ 20140406
Time_ 10.33
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 80
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 2050
DW 16.800 usec
DE 6.50 usec
TE 300.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 1.00 dB
PL1W 79.41143799 W
SFO1 125.7703643 MHz
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
FL2 1.00 dB
FL12 15.93 dB
FL13 15.93 dB
FL2W 12.47038937 W
PL12W 0.40075597 W
PL13W 0.40075597 W
SFO2 500.1320005 MHz
SI 32768
SF 125.7577868 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



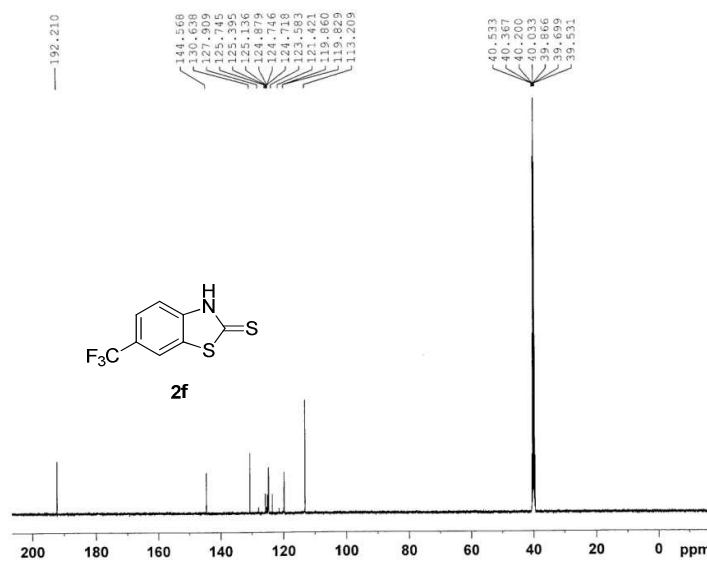
194-H

```

NAME   dangpan140406
EXPNO   5
PROCNO   1
Date_    20140406
Time     16.59
INSTRUM  spect
PROBHD   5 mm PABBO BB-
PULPROG  zg30
TD       65536
SOLVENT  DMSO
NS       2
DS       4
SWH      10330.578 Hz
FIDRES   0.157632 Hz
AQ       3.1719923 sec
RG       181
DW       48.400 usec
DE       6.50 usec
TE       299.5 K
D1       1.00000000 sec
TD0      1
  
```

```

===== CHANNEL f1 =====
NUC1    1H
P1      13.70 usec
PL1     1.00 dB
PL1W    12.47038937 W
SF01    500.1330885 MHz
SI      32768
SF      500.1300054 MHz
WDW      no
SSB      0
LB      0.00 Hz
GB      0
PC      1.00
  
```



194-C

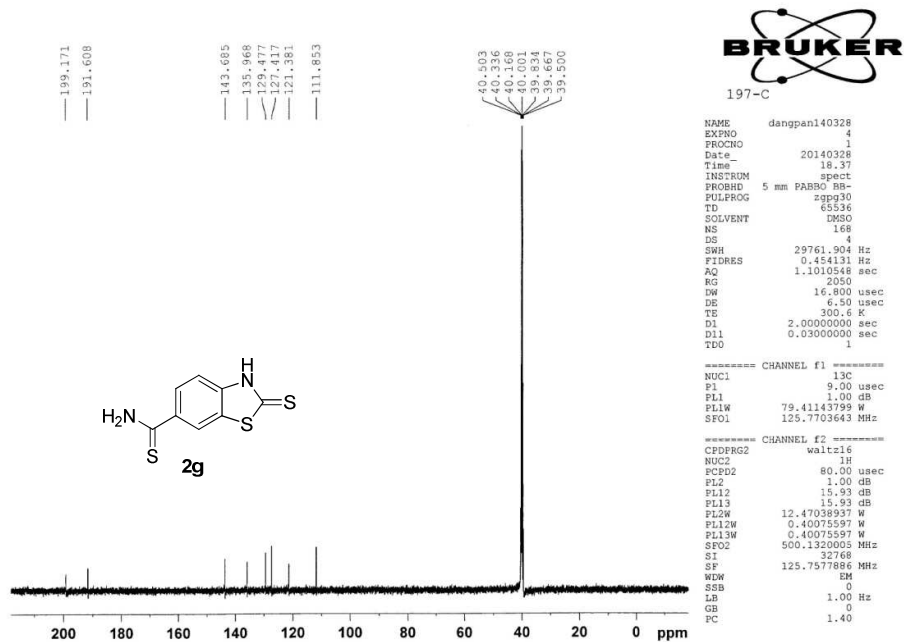
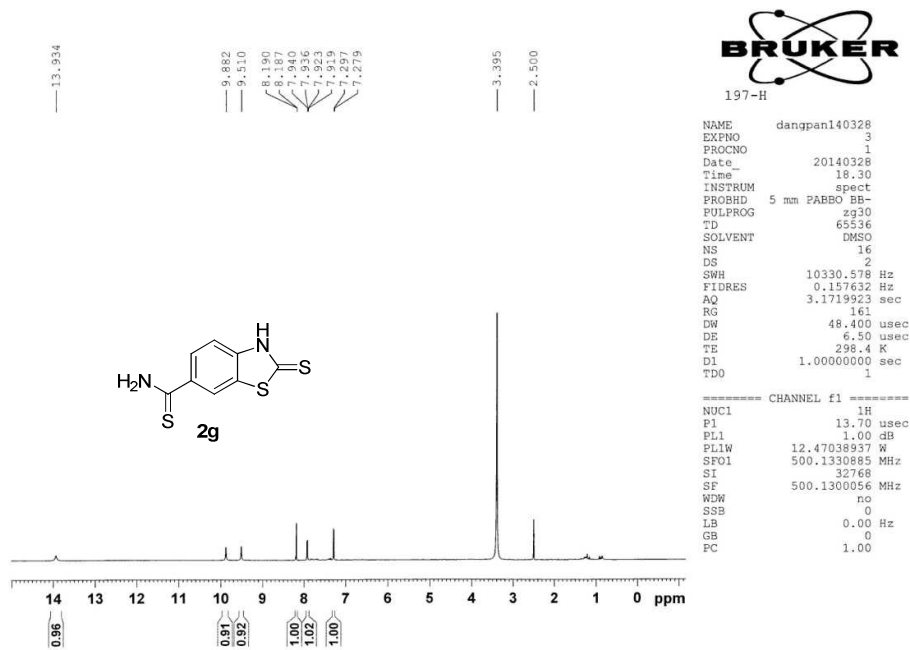
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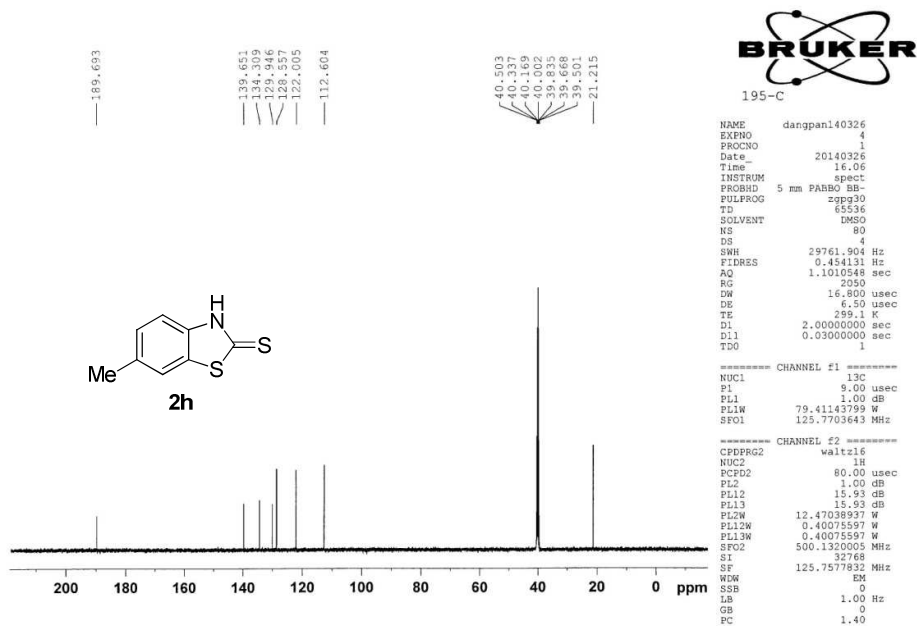
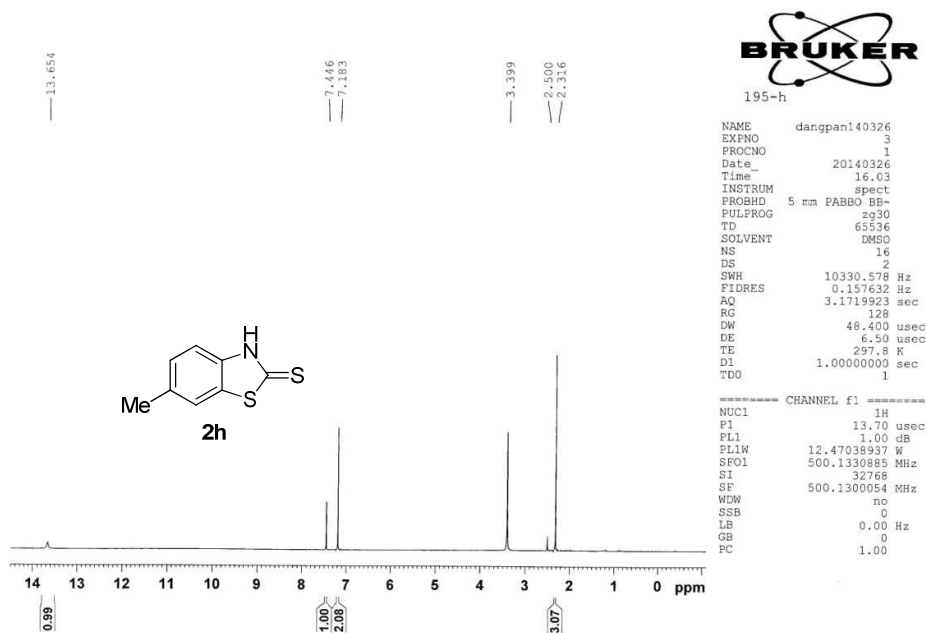
NAME   dangpan140406
EXPNO   6
PROCNO   1
Date_    20140406
Time     17.02
INSTRUM  spect
PROBHD   5 mm PABBO BB-
PULPROG  zgpg30
TD       65536
SOLVENT  DMSO
NS       4
DS       4
SWH      29761.904 Hz
FIDRES   0.454131 Hz
AQ       1.1010548 sec
RG       2050
DW       16.800 usec
DE       6.50 usec
TE       300.8 K
D1       2.00000000 sec
D11      0.03000000 sec
TD0      1
  
```

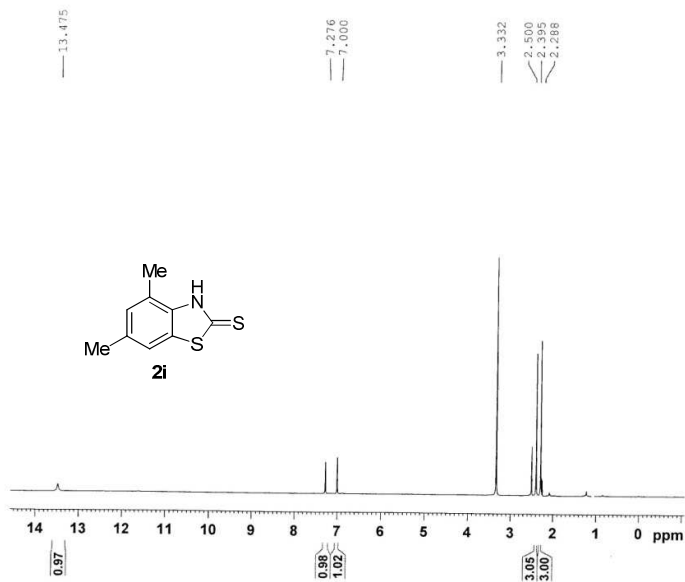
```

===== CHANNEL f1 =====
NUC1    13C
P1      9.00 usec
PL1     1.00 dB
PL1W    79.41143799 W
SF01    125.7703643 MHz

===== CHANNEL f2 =====
CPDPRG2  waltz16
NUC2     1H
PCPD2    80.00 usec
PL2      1.00 dB
PL12     13.83 dB
PL13     13.93 dB
PL2W    12.47038937 W
PL12W    0.40075597 W
PL13W    0.40075597 W
SF02    500.1320005 MHz
SI      32768
SF      125.7577877 MHz
WDW      EM
SSB      0
LB      1.00 Hz
GB      0
PC      1.40
  
```







255-H

```

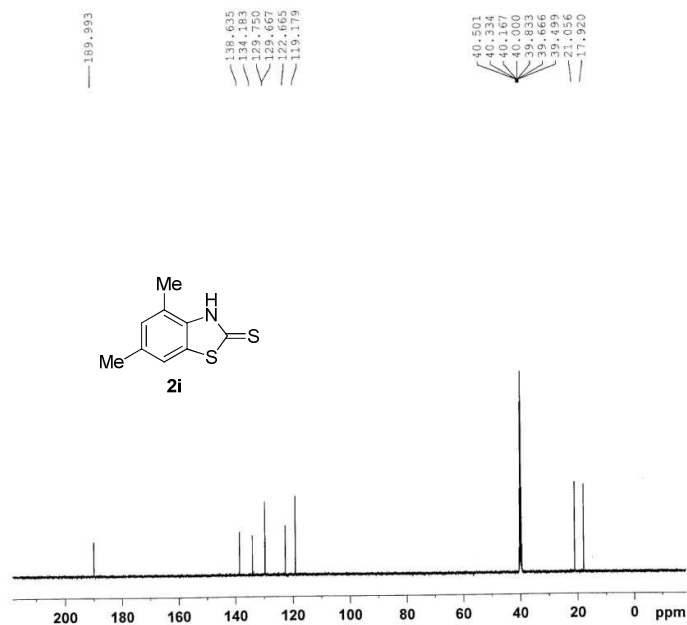
NAME dangpan140814
EXPNO 8
PROCNO 1
Date 20140814
Time 17.37
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 228
DW 48.400 usec
DE 6.50 usec
TE 300.0 K
D1 1.0000000 sec
TDO 1

```

```

===== CHANNEL f1 =====
NUC1 1H
P1 13.70 usec
PL1 1.00 dB
PL1W 12.47038937 W
SFO1 500.130885 MHz
SI 32768
SF 500.1300054 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

```



198-C

```

NAME dangpan140328
EXPNO 10
PROCNO 1
Date 20140328
Time 19.22
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 97
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 2050
DW 16.800 usec
DE 6.50 usec
TE 300.1 K
D1 2.0000000 sec
D11 0.0300000 sec
TDO 1

```

```

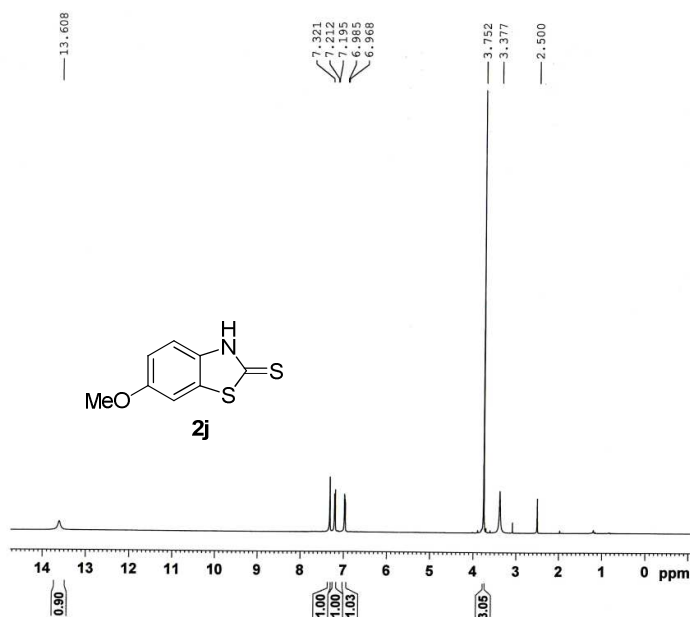
===== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 1.00 dB
PL1W 79.41143709 W
SFO1 125.7703643 MHz

```

```

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.00 dB
PL12 15.93 dB
PL13 15.93 dB
PL2W 12.47038937 W
PL12W 0.40075597 W
PL13W 0.40075597 W
SFO2 500.1320005 MHz
SI 32768
SF 125.7577841 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

```



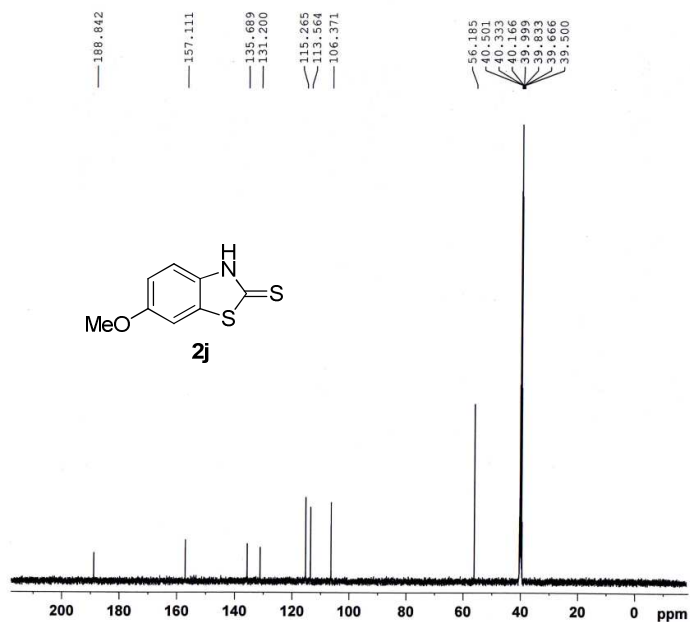
476-H

```

NAME      dangpan141008
EXPNO     3
PROCNO    1
Date_     20141008
Time      17.08
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD         65536
SOLVENT   DMSO
NS         16
DS         2
SWH        10330.578 Hz
FIDRES     0.157632 Hz
AQ         3.1719923 sec
RG         161
DW         48.400 usec
DE         6.50 usec
TE         297.1 K
D1         1.00000000 sec
TDO        1
  
```

```

===== CHANNEL f1 =====
NUC1      1H
P1        13.70 usec
PL1       1.00 dB
PL1W      12.47038937 W
SFO1      500.1330885 MHz
SI        32768
SF        500.1300053 MHz
WDW        no
SSB        0
LB         0.00 Hz
GB         0
PC         1.00
  
```



476-C

```

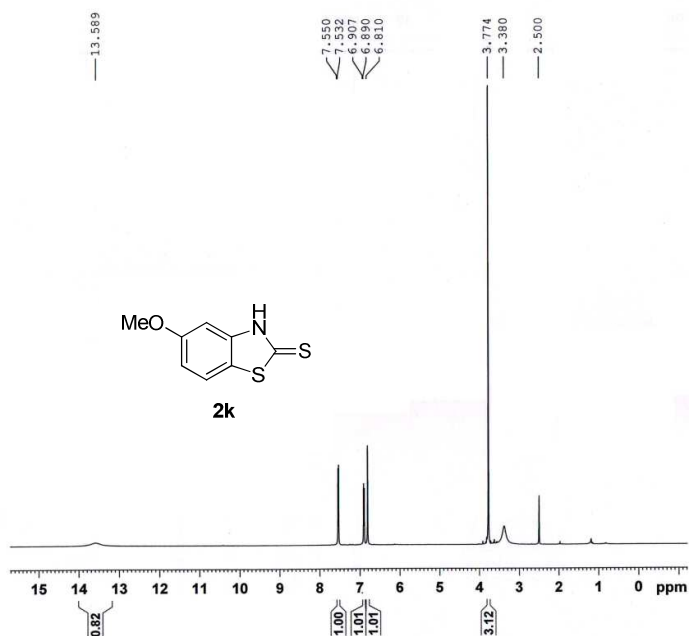
NAME      dangpan141008
EXPNO     4
PROCNO    1
Date_     20141008
Time      17.12
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD         65536
SOLVENT   DMSO
NS         32
DS         4
SWH        29761.904 Hz
FIDRES     0.454131 Hz
AQ         1.1010548 sec
RG         2050
DW         16.800 usec
DE         6.50 usec
TE         298.0 K
D1         2.00000000 sec
D11        0.03000000 sec
TDO        1
  
```

```

===== CHANNEL f1 =====
NUC1      13C
P1        9.00 usec
PL1       1.00 dB
PL1W      79.41143799 W
SFO1      125.7703643 MHz
  
```

```

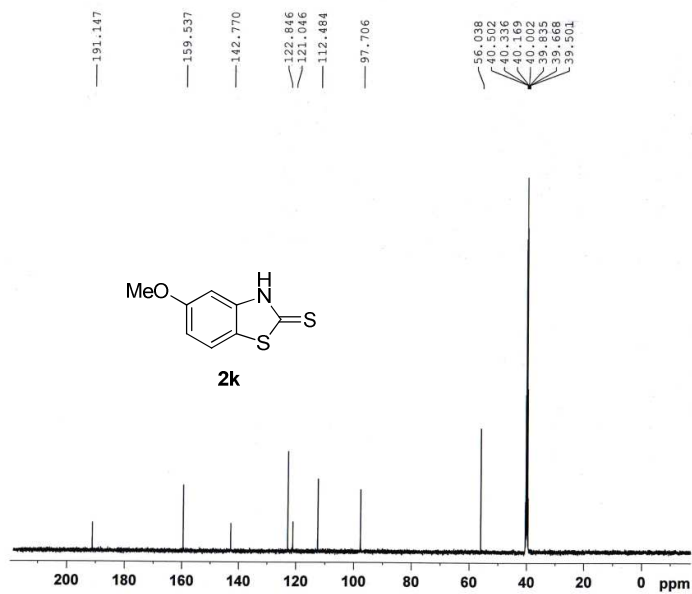
===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
PL2       1.00 dB
PL12      15.93 dB
PL13      15.93 dB
PL2W      12.47038937 W
PL12W     0.40075597 W
PL13W     0.40075597 W
SFO2      500.1320005 MHz
SI        32768
SF        125.7577850 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
```



480-H

NAME dangpan1410098
EXPNO 1
PROCNO 1
Date_ 20141009
Time_ 17.41
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 144
DW 48.400 usec
DE 6.50 usec
TE 297.5 K
D1 1.00000000 sec
TD0 1

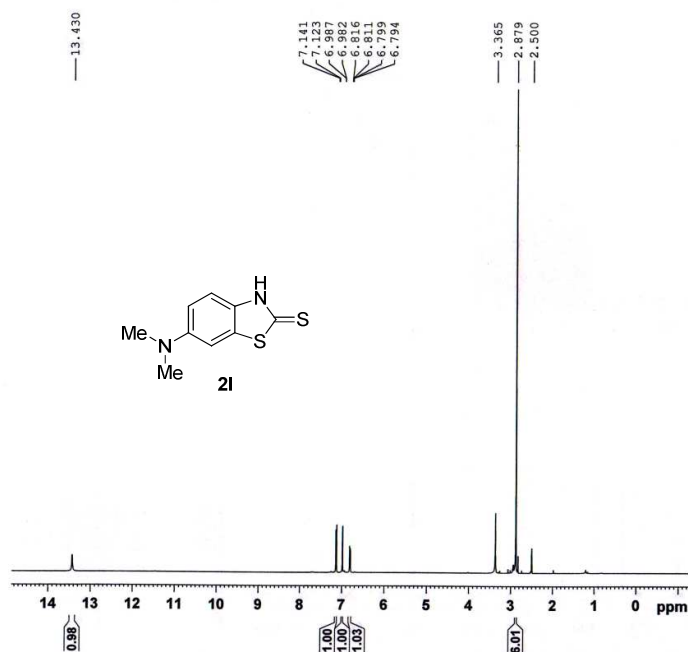
===== CHANNEL f1 =====
NUC1 1H
P1 13.70 usec
PL1 1.00 dB
PL1W 12.47038937 W
SFO1 500.1330885 MHz
SI 32768
SF 500.1300054 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00



480-C

NAME dangpan141009
EXPNO 2
PROCNO 1
Date_ 20141009
Time_ 17.48
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 96
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 2050
DW 16.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

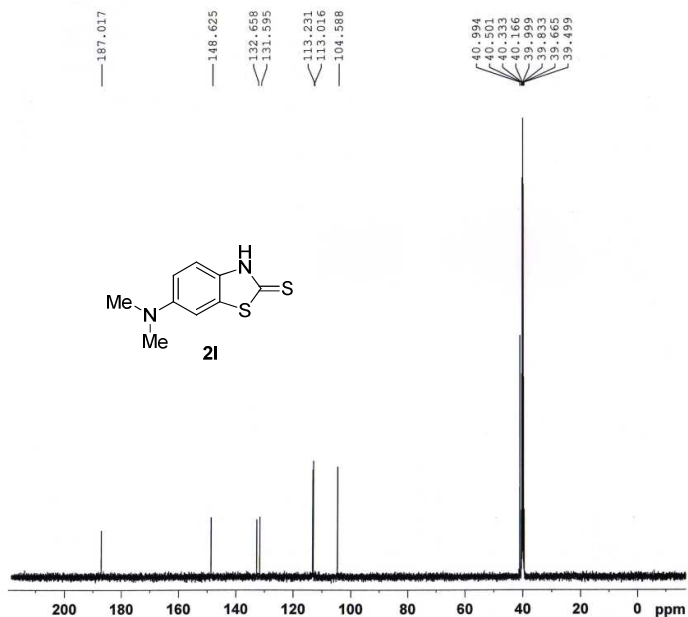
===== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 1.00 dB
PL1W 79.41143799 W
SFO1 125.7703643 MHz
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.00 dB
PL12 15.93 dB
PL13 15.93 dB
PL2W 12.47038937 W
PL12W 0.40075597 W
PL13W 0.40075597 W
SFO2 500.1320005 MHz
SI 32768
SF 125.7577859 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



513-H

NAME dangpan141026
EXPNO 1
PROCNO 1
Date 20141027
Time 11.06
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 144
DW 48.400 usec
DE 6.50 usec
TE 296.4 K
D1 1.00000000 sec
TD0 1

CHANNEL f1
NUC1 1H
P1 13.70 usec
PL1 1.00 dB
PL1W 12.47038937 W
SFO1 500.1330885 MHz
SI 32768
SF 500.1300054 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

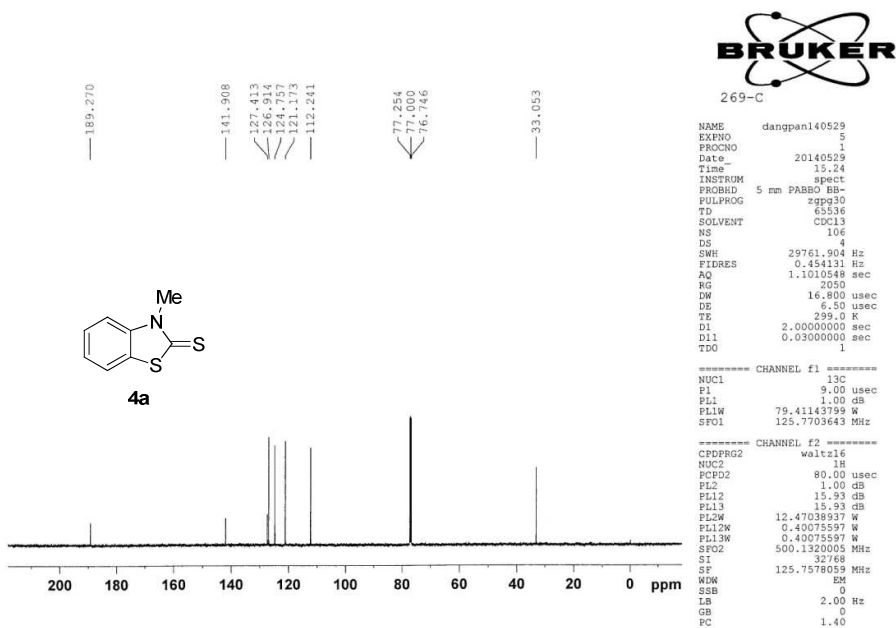
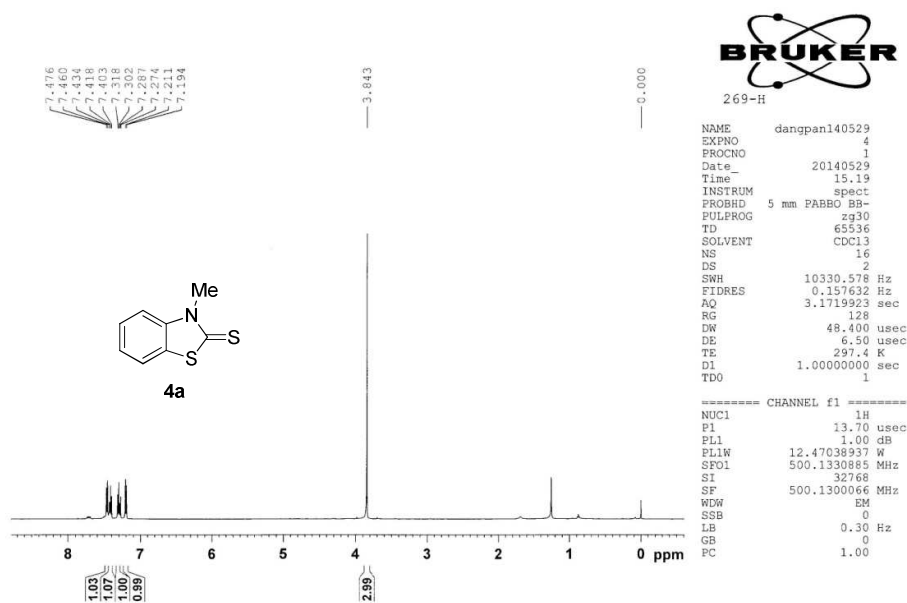


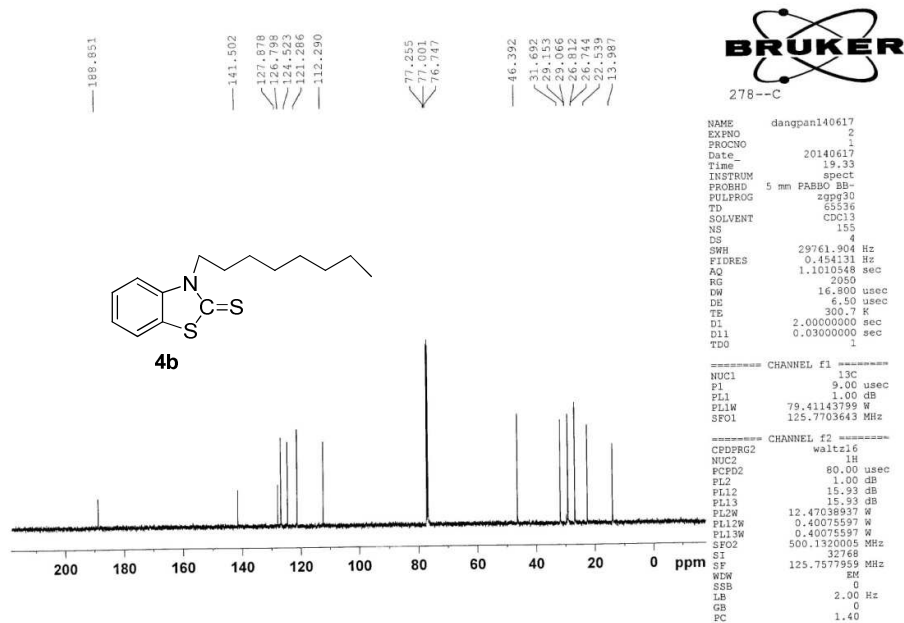
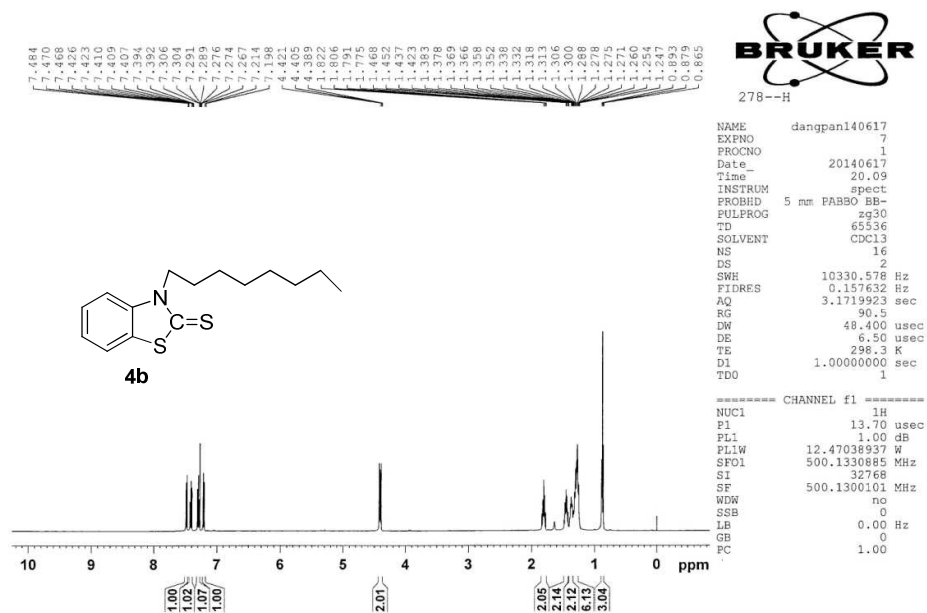
513-C

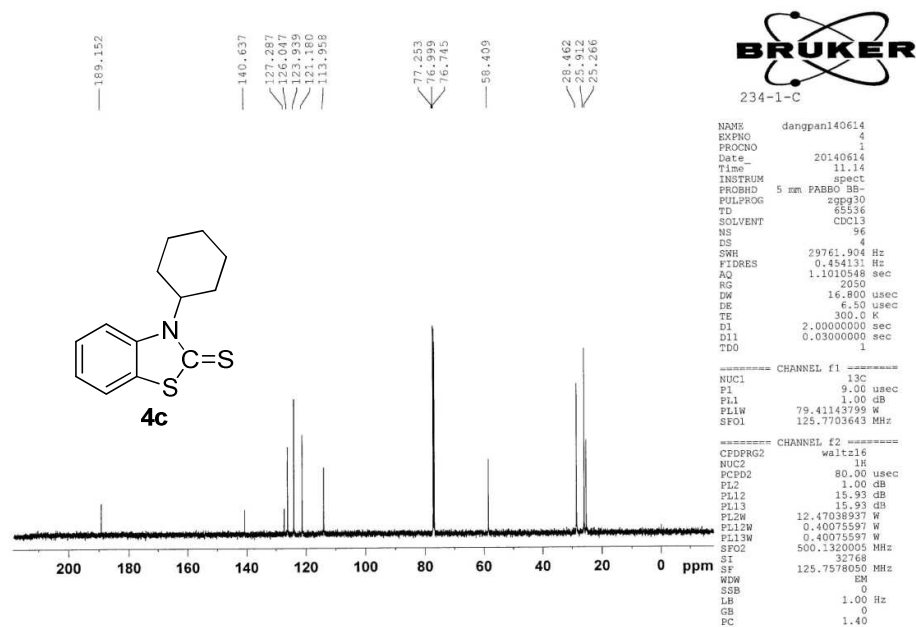
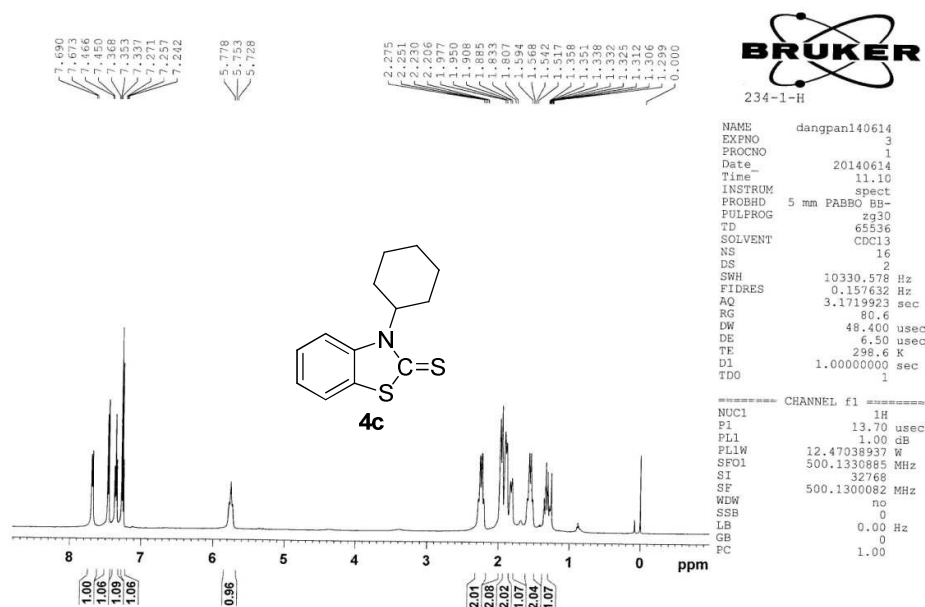
NAME dangpan141026
EXPNO 2
PROCNO 1
Date 20141027
Time 11.12
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 66
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 2050
DW 16.800 usec
DE 6.50 usec
TE 297.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 3

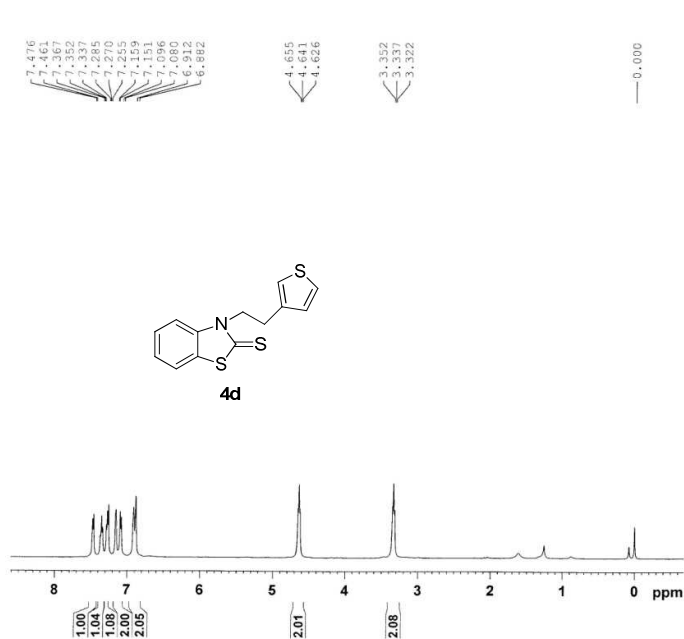
CHANNEL f1
NUC1 13C
P1 9.00 usec
PL1 1.00 dB
PL1W 79.41143799 W
SFO1 125.7703643 MHz

CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.00 dB
PL12 15.93 dB
PL13 15.93 dB
PL2W 12.47038937 W
PL12W 0.40075597 W
PL13W 0.40075597 W
SFO2 500.1320005 MHz
SI 32768
SF 125.7577868 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40









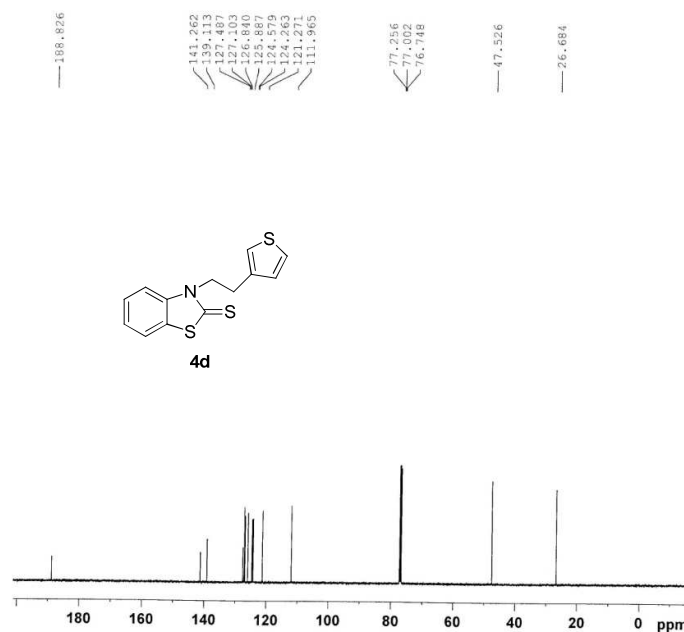
277-H

```

NAME      dangpan140813
EXPNO     2
PROCNO    1
Date_     20140813
Time      9.19
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         16
DS         2
SWH        10330.578 Hz
FIDRES     0.157632 Hz
AQ         3.1719923 sec
RG         161
DW         48.400 usec
DE         6.50 usec
TE         300.0 K
D1         1.00000000 sec
TD0        1
  
```

```

===== CHANNEL f1 =====
NUC1       1H
P1         13.70 usec
PL1        1.00 dB
PL1W       12.47038937 W
SFO1       500.1330685 MHz
SI         32768
SF         500.1300168 MHz
WDW        no
SSB        0
LB         0.00 Hz
GB         0
PC         1.00
  
```



252-C

```

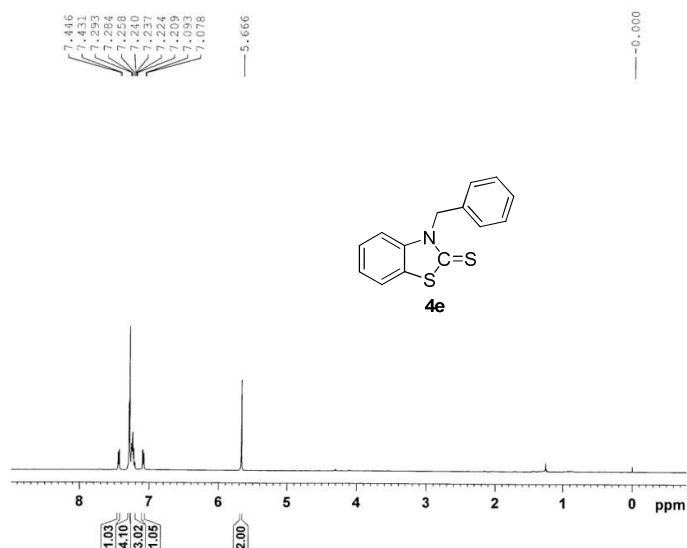
NAME      dangpan140507
EXPNO     2
PROCNO    1
Date_     20140507
Time      10.16
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         110
DS         4
SWH        29761.904 Hz
FIDRES     0.454131 Hz
AQ         1.1010548 sec
RG         2050
DW         16.800 usec
DE         6.50 usec
TE         298.3 K
D1         2.00000000 sec
D11        0.03000000 sec
TD0        1
  
```

```

===== CHANNEL f1 =====
NUC1       13C
P1         9.00 usec
PL1        1.00 dB
PL1W       79.41143799 W
SFO1       125.77031643 MHz
  
```

```

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
PL2        1.00 dB
PL12       15.93 dB
PL13       15.93 dB
PL1W       12.47038937 W
PL12W      0.40075597 W
PL13W      0.40075597 W
SFO2       500.1320005 MHz
SI         32768
SF         125.7578086 MHz
WDW        DE
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
```



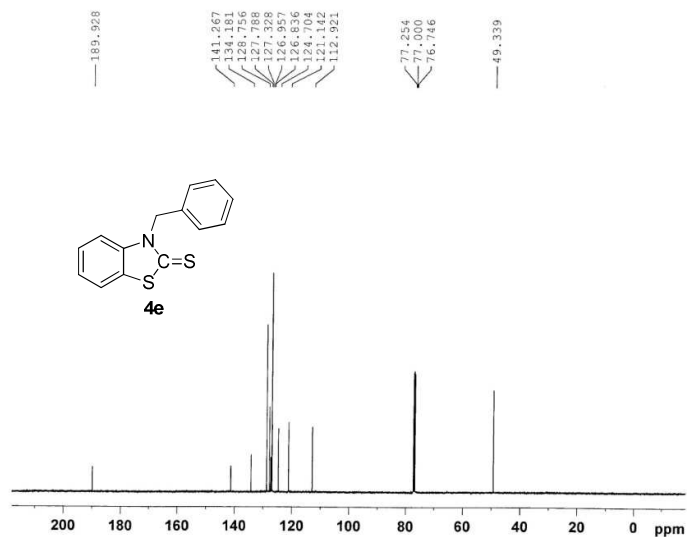
201-H

```

NAME      dangpan140326
EXPNO     1
PROCNO    1
Date_     20140326
Time      15.51
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         16
DS         2
SWH        10330.578 Hz
FIDRES     0.157632 Hz
AQ         3.1719923 sec
RG         50.8
DW         48.400 usec
DE         6.50 usec
TE         297.8 K
D1         1.00000000 sec
TD0        1
  
```

```

===== CHANNEL f1 =====
NUC1      1H
P1         13.70 usec
PL1        1.00 dB
PL1W      12.47038937 W
SFO1      500.1330885 MHz
SI         32768
SF         500.1300255 MHz
WDW        no
SSB        0
LB         0.00 Hz
GB         0
PC         1.00
  
```



201-C

```

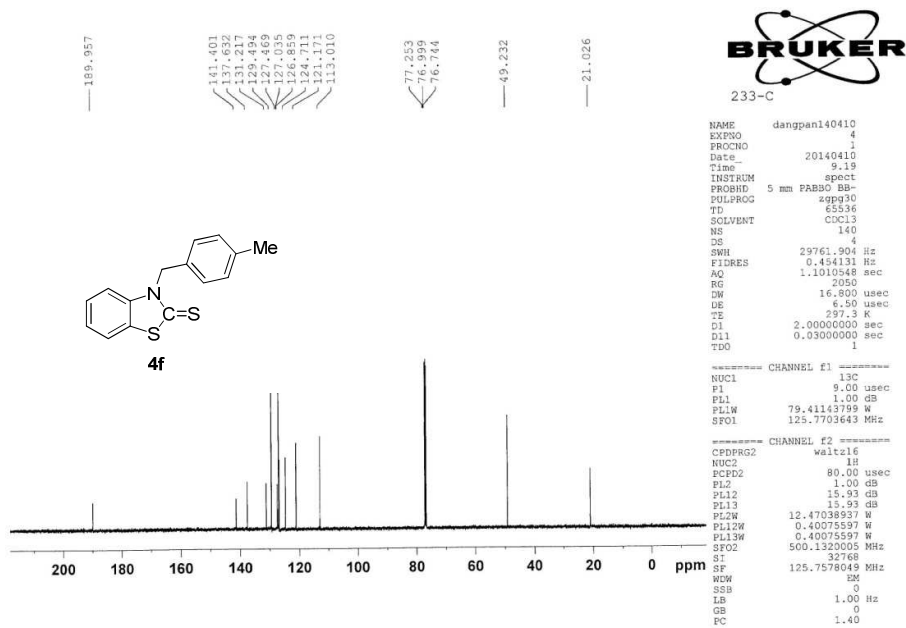
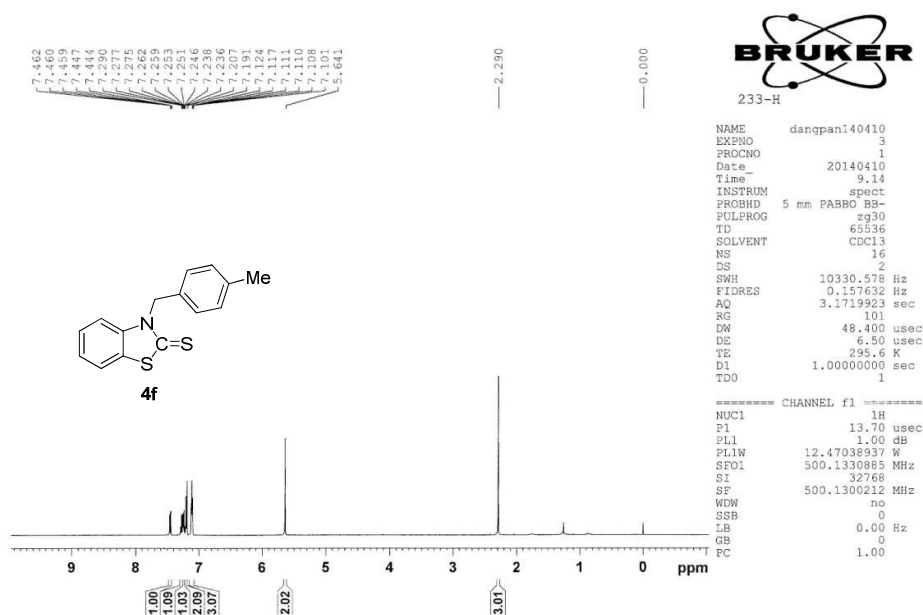
NAME      dangpan140326
EXPNO     2
PROCNO    1
Date_     20140326
Time      15.56
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         107
DS         4
SWH        29761.904 Hz
FIDRES     0.454131 Hz
AQ         1.1010548 sec
RG         2050
DW         16.800 usec
DE         6.50 usec
TE         299.7 K
D1         2.00000000 sec
D11        0.03000000 sec
TD0        1
  
```

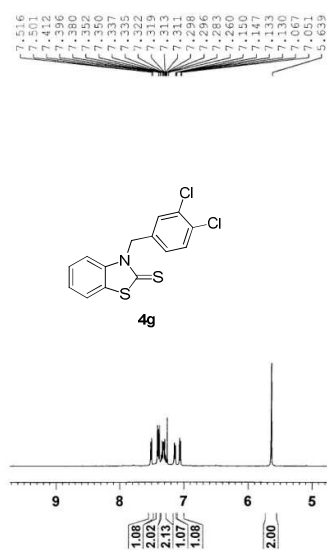
```

===== CHANNEL f1 =====
NUC1      13C
P1         9.00 usec
PL1        1.00 dB
PL1W      79.41143799 W
SFO1      125.7703643 MHz
  
```

```

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2        1.00 dB
PL12       15.93 dB
PL13       15.93 dB
PL1W      12.47038937 W
PL12W      0.40075597 W
PL13W      0.40075597 W
SFO2      500.1320005 MHz
SI         32768
SF         125.7578158 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
```



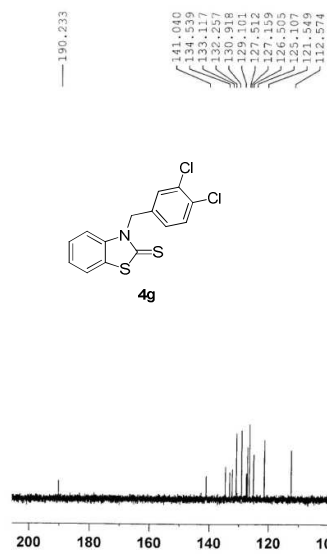


273-H

```

NAME      dangpan140506
EXPNO     1
PROCNO    1
Date_     20140506
Time      17.25
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         16
DS         2
SWH        10330.578 Hz
FIDRES     0.157632 Hz
AQ         3.1719923 sec
RG         181
DW         48.400 usec
DE         6.50 usec
TE         296.7 K
D1         1.00000000 sec
TD0        1

===== CHANNEL f1 =====
NUC1       1H
P1         13.70 usec
PL1        1.00 dB
PL1W       12.47038937 W
SFO1       500.1330885 MHz
SI         32768
SF         500.1300136 MHz
WDW        no
SSB        0
LB         0.00 Hz
GB         0
PC         1.00
  
```



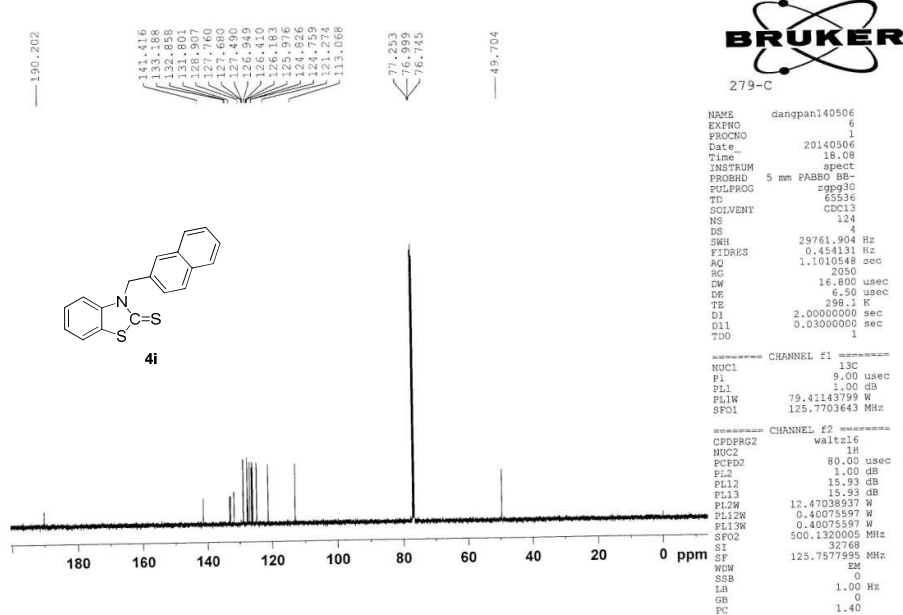
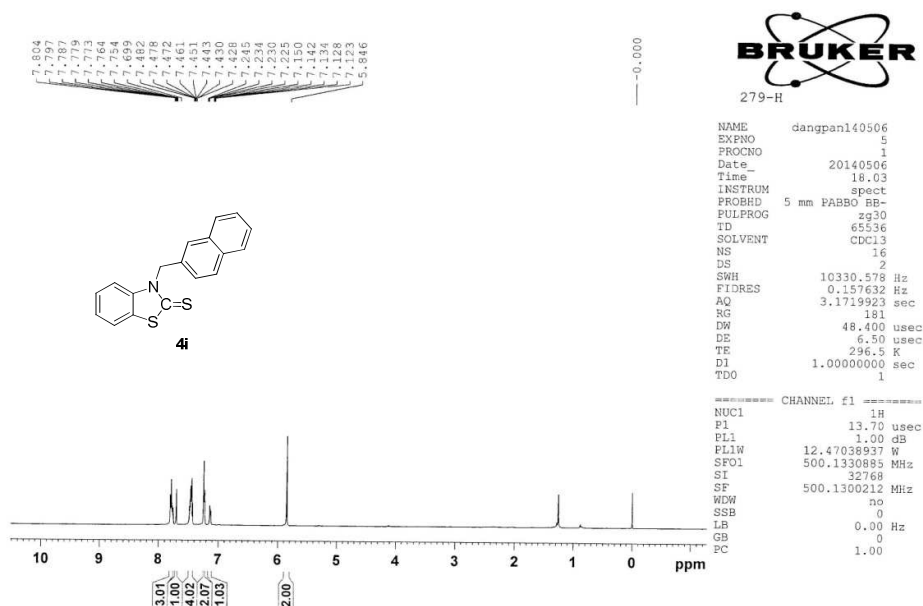
273-C

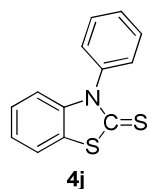
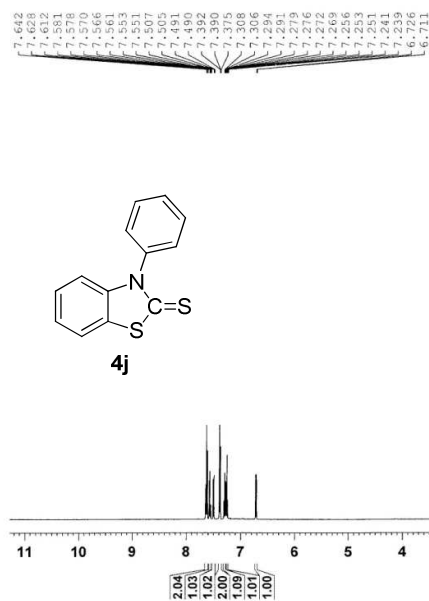
```

NAME      dangpan140506
EXPNO     2
PROCNO    1
Date_     20140506
Time      17.31
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         140
DS         4
SWH        29761.904 Hz
FIDRES     0.454131 Hz
AQ         1.1010548 sec
RG         2050
DW         16.800 usec
DE         6.50 usec
TE         298.8 K
D1         2.00000000 sec
D11        0.03000000 sec
TD0        3

===== CHANNEL f1 =====
NUC1       13C
P1         9.00 usec
PL1        1.00 dB
PL1W       79.41143799 W
SFO1       125.7703643 MHz

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
FL2        1.00 dB
FL12       15.93 dB
FL13       15.93 dB
FL1W       12.47038937 W
FL12W      0.40075597 W
FL13W      0.40075597 W
SFO2       500.1320005 MHz
SI         32768
SF         125.7577949 MHz
WDW        RM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
```

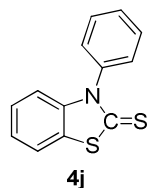
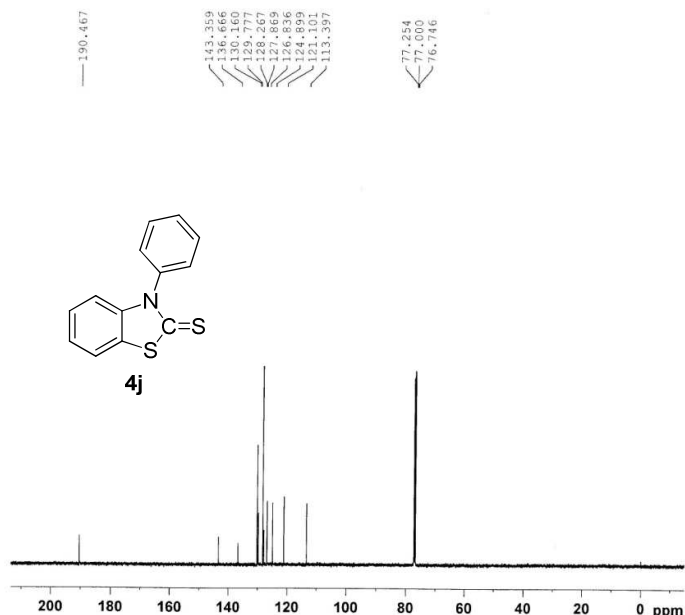





229

NAME dangpan140814
EXPNO 3
PROCNO 1
Date_ 20140814
Time 15.31
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 161
DW 48.400 usec
DE 6.50 usec
TE 300.0 K
D1 1.00000000 sec
TDO 1

***** CHANNEL f1 *****
NUC1 1H
P1 13.70 usec
PL1 1.00 dB
PL1W 12.47038937 W
SFO1 500.1330885 MHz
SI 32768
SF 500.1300180 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

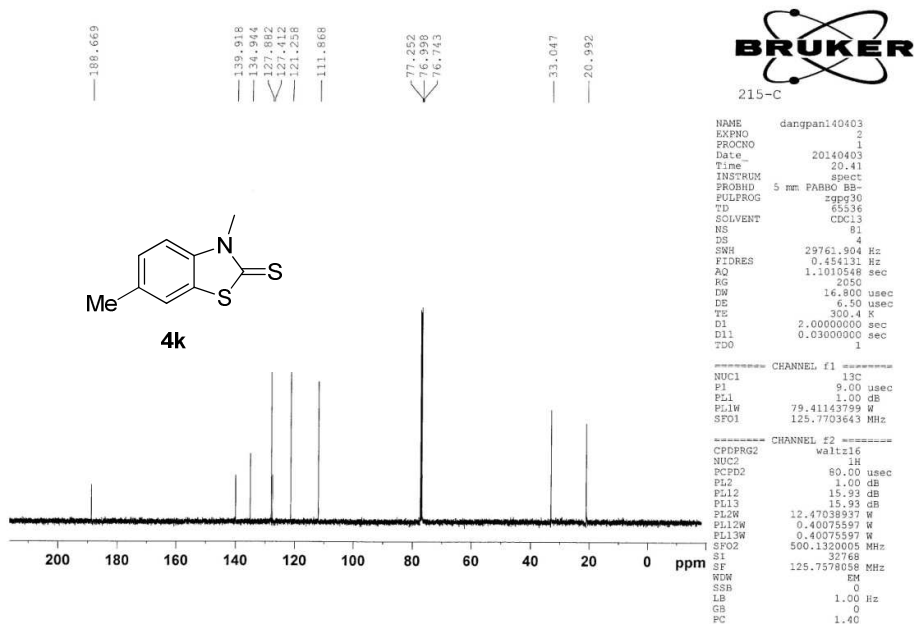
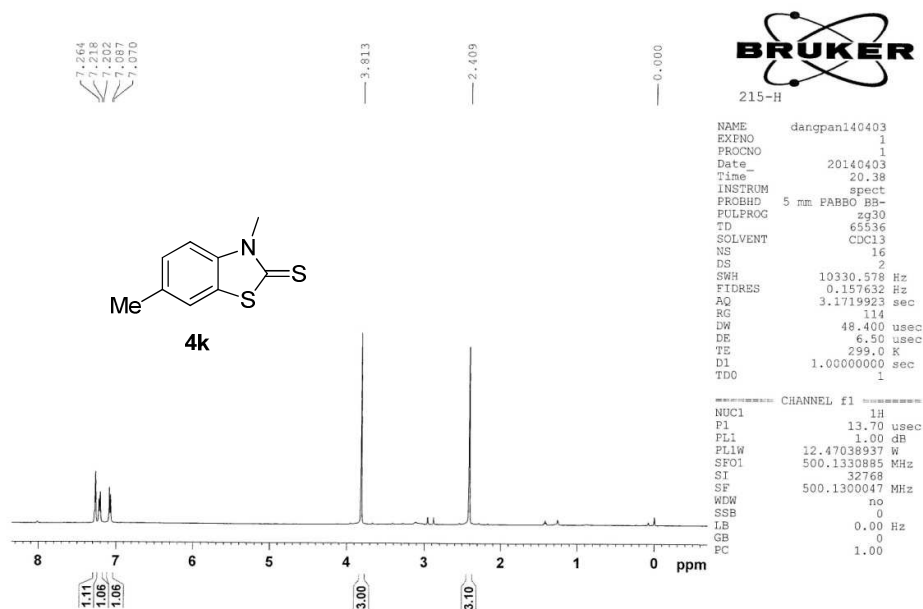


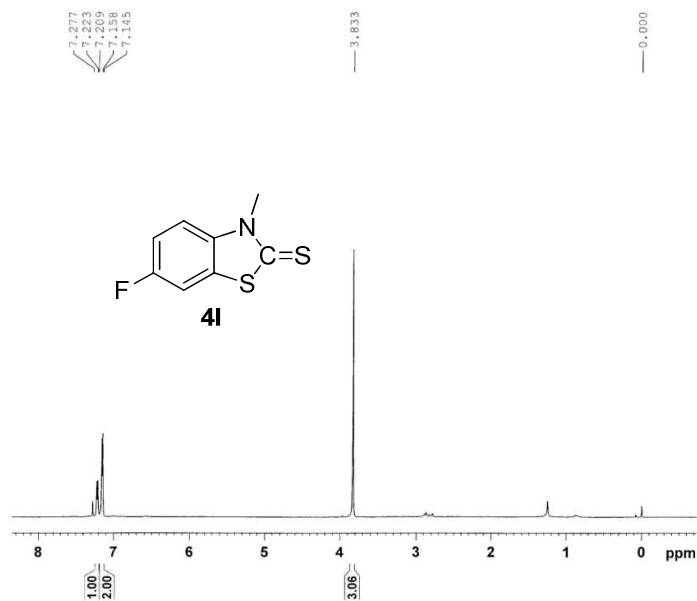
229-C

NAME dangpan140410
EXPNO 2
PROCNO 1
Date_ 20140410
Time 9.05
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 160
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 2050
DW 16.800 usec
DE 6.50 usec
TE 297.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TDO 1

***** CHANNEL f1 *****
NUC1 13C
P1 9.00 usec
PL1 1.00 dB
PL1W 79.41143799 W
SFO1 125.7703443 MHz

***** CHANNEL f2 *****
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.00 dB
PL12 15.93 dB
PL13 15.93 dB
PL12W 12.47038937 W
PL13W 0.40075597 W
SFO2 500.1320005 MHz
SI 32768
SF 125.7578008 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





216-H

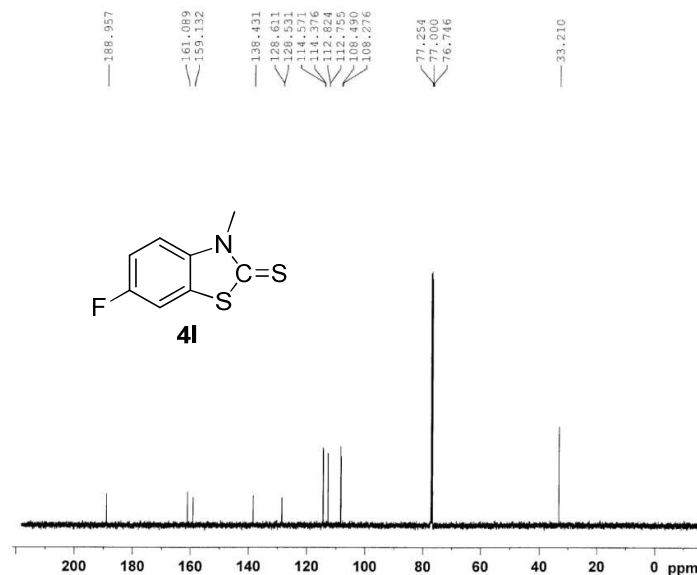
```

NAME      dangpan140403
EXPNO     5
PROCNO    1
Date_     20140403
Time      21.00
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         16
DS         2
SWH        10330.578 Hz
FIDRES     0.157632 Hz
AQ         3.1719923 sec
RG         161
DW         48.400 usec
DE         6.50 usec
TE         299.1 K
D1         1.00000000 sec
TDO        1
  
```

===== CHANNEL f1 =====

```

NUC1      1H
P1        13.70 usec
PL1       1.00 dB
PL1W      12.47038937 W
SFO1      500.1330885 MHz
SI        32768
SF        500.1300057 MHz
WDW       no
SSB       0
LB        0.00 Hz
GB        0
PC        1.00
  
```



216-C

```

NAME      dangpan140403
EXPNO     6
PROCNO    1
Date_     20140403
Time      21.03
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         81
DS         4
SWH        29761.904 Hz
FIDRES     0.454131 Hz
AQ         1.1010548 sec
RG         2050
DW         16.800 usec
DE         6.50 usec
TE         300.5 K
D1         2.00000000 sec
D11        0.03000000 sec
TDO        1
  
```

===== CHANNEL f1 =====

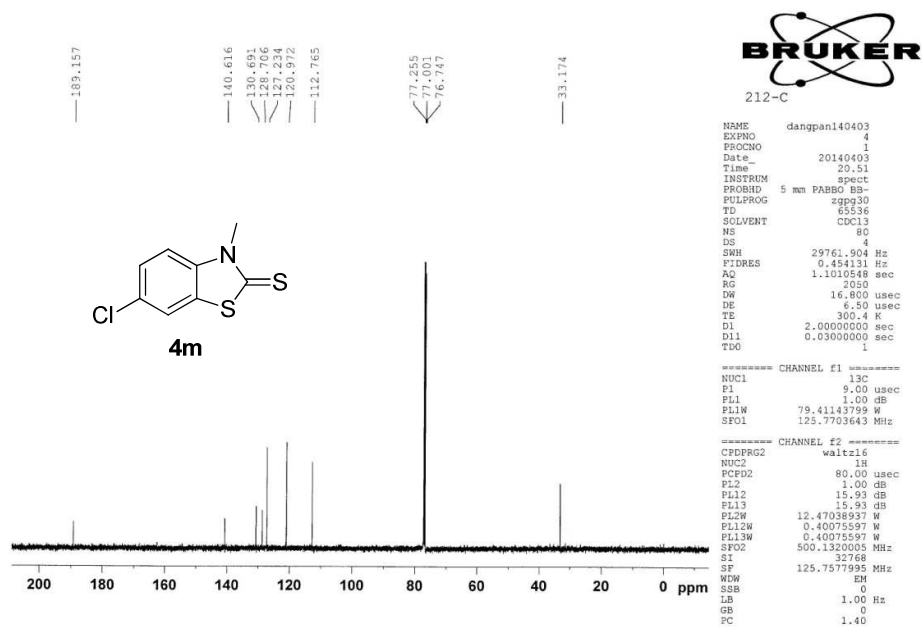
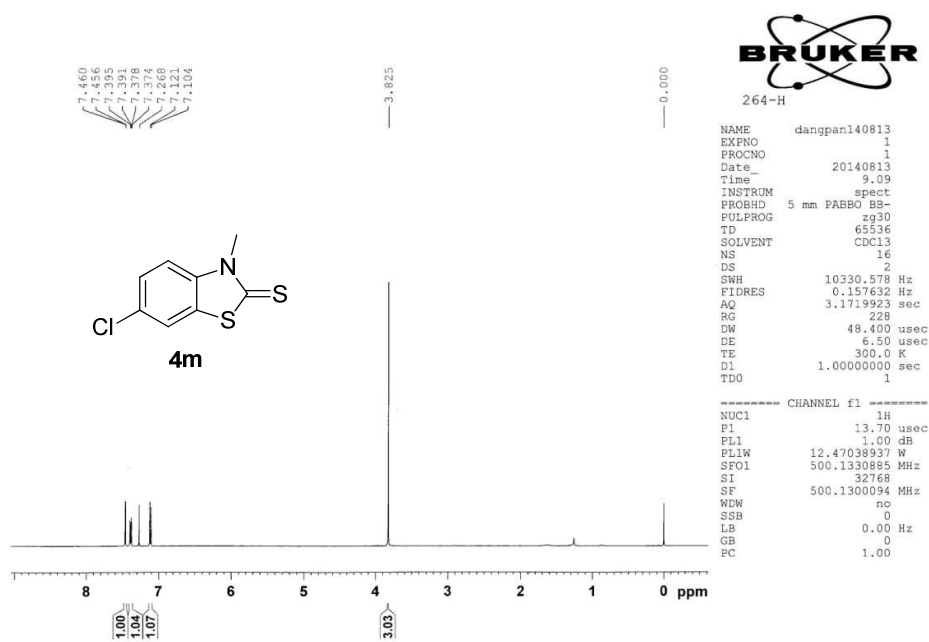
```

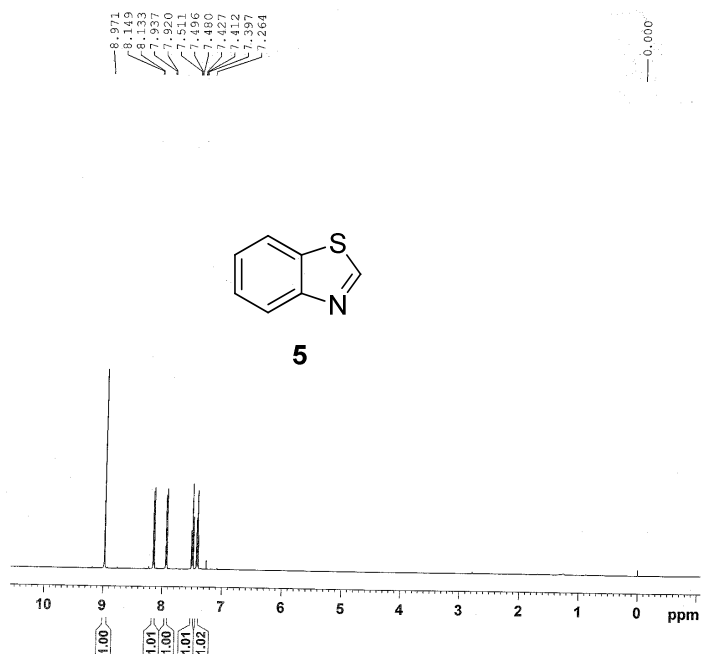
NUC1      13C
P1        9.00 usec
PL1       1.00 dB
PL1W      79.41143799 W
SFO1      125.7703643 MHz
  
```

===== CHANNEL f2 =====

```

CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2        1.00 dB
PL12      15.93 dB
PL13      15.93 dB
PL2W      12.47038937 W
PL12W     0.40075597 W
PL13W     0.40075597 W
SFO2      500.1320005 MHz
SI        32768
SF        125.7578022 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
  
```



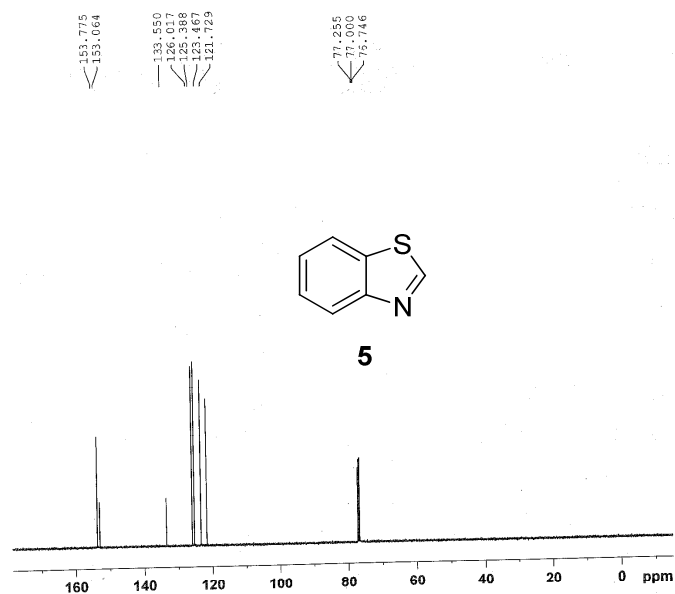


dangpan-H

NAME dangpan141105
EXPNO 1
PROCNO 1
Date 20141105
Time 11.06
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 101
DW 48.400 usec
DE 6.50 usec
TE 299.0 K
D1 1.00000000 sec
TDO 1

CHANNEL f1

NUC1 1H
P1 13.70 usec
PL1 1.00 dB
PL1W 12.47038937 W
SF01 500.1330985 MHz
SI 32768
SF 500.1300114 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00



dangpan-C

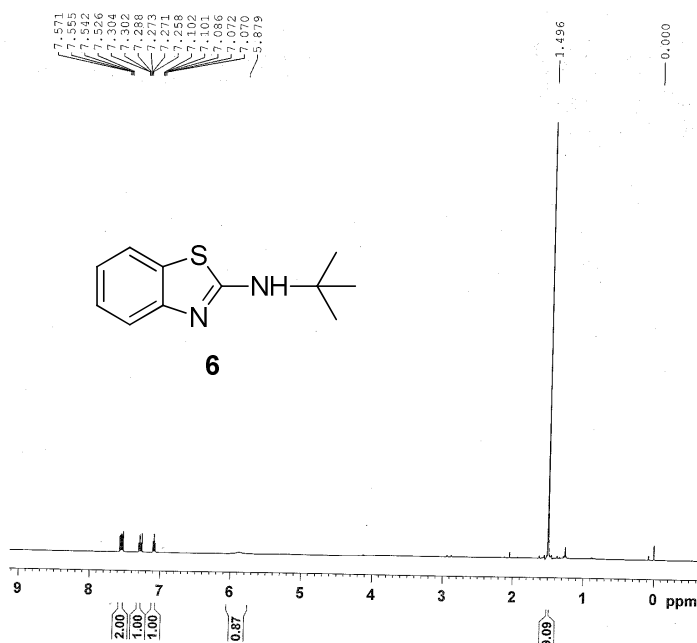
NAME dangpan141105
EXPNO 2
PROCNO 1
Date 20141105
Time 11.12
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 60
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 2050
DW 16.800 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TDO 1

CHANNEL f1

NUC1 13C
P1 9.00 usec
PL1 1.00 dB
PL1W 79.41143799 W
SF01 125.7703643 MHz

CHANNEL f2

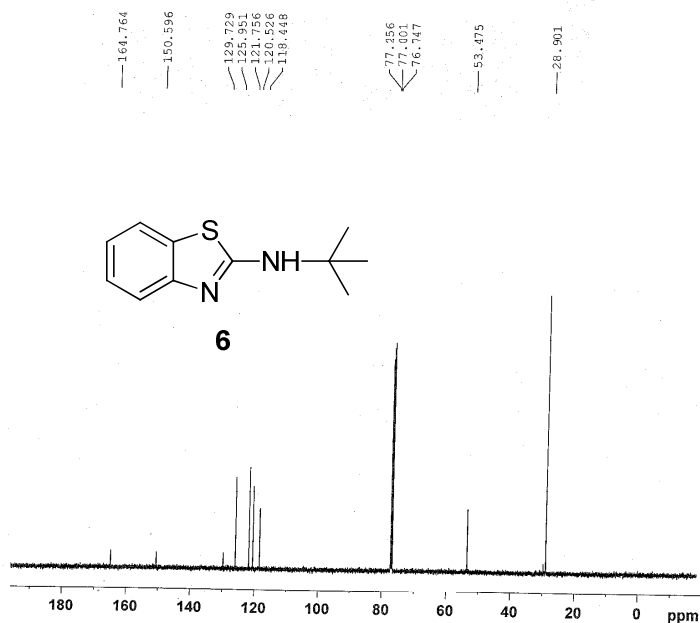
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.00 dB
PL12 15.93 dB
PL13 15.93 dB
PL12W 12.47038937 W
PL13W 0.40075597 W
SF02 500.1330003 MHz
SI 32768
SF 125.7578096 MHz
WDW SW
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



247-H

NAME dangpan140416
EXPNO 1
PROCNO 1
Date 20140416
Time 8.45
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.575 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 128
DW 48.400 usec
DE 6.50 usec
TE 294.6 K
D1 1.00000000 sec
TD0 1

CHANNEL f1
NUC1 1H
P1 13.70 usec
PL1 1.00 dB
PL1W 12.47038937 W
SFO1 500.1330895 MHz
SI 32768
SF 500.1300145 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00



247-C

NAME dangpan140416
EXPNO 2
PROCNO 1
Date 20140416
Time 8.49
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 193
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 2050
DW 16.800 usec
DE 6.50 usec
TE 296.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

CHANNEL f1
NUC1 13C
P1 9.00 usec
PL1 1.00 dB
PL1W 79.41143799 W
SFO1 125.7703643 MHz

CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 1.00 dB
PL12 15.93 dB
PL13 15.93 dB
PL1W 12.47038937 W
PL12W 0.40075597 W
PL13W 0.40075597 W
SFO2 500.1320005 MHz
SI 32768
SF 125.7577986 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40