Electronic Supplementary Material (ESI) for CrystEngComm

Electronic Supporting Information

Role of Arene Interactions and Substituents Effect in Conformational Control (syn/anti) of 1,2-Diarylethanes

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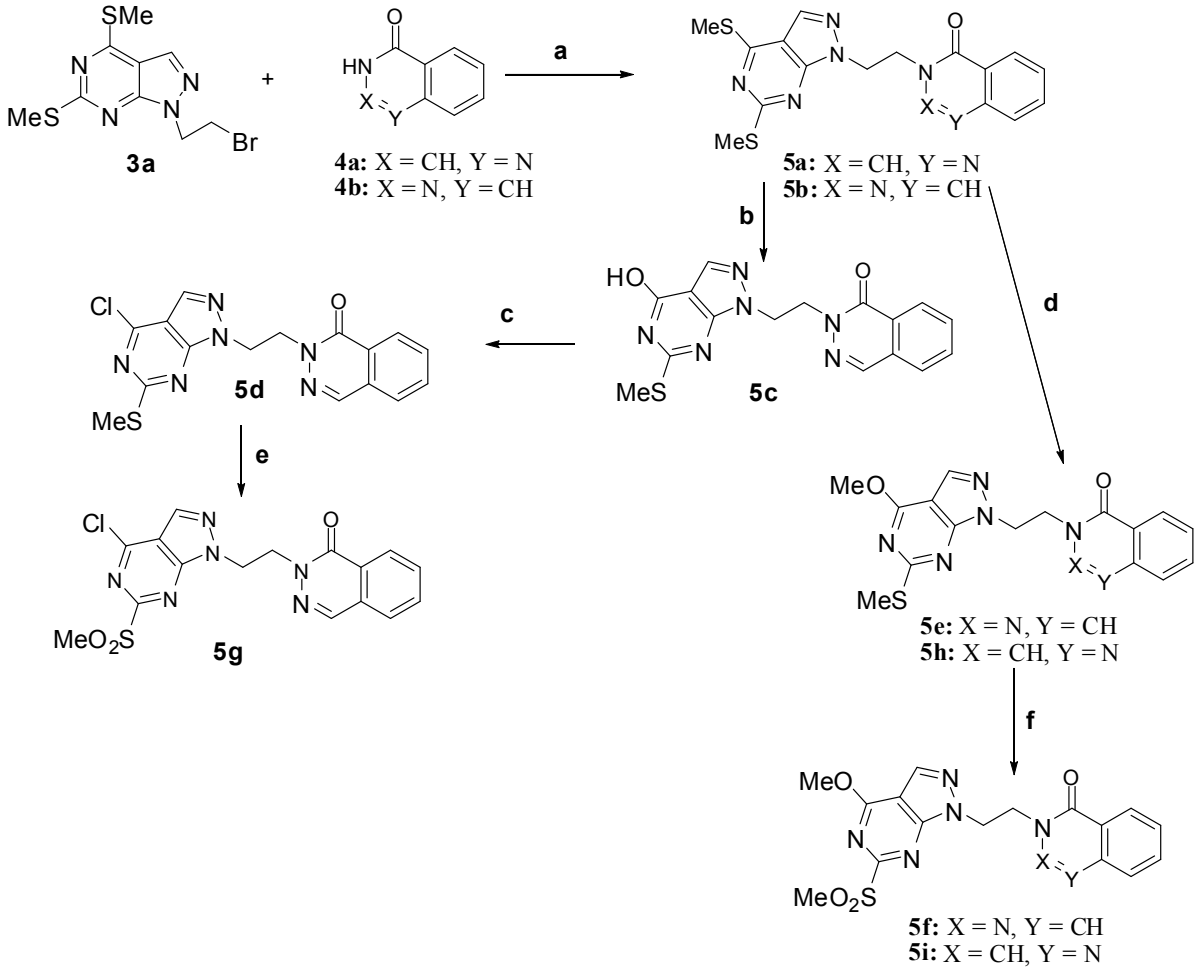
Table of contents

General Information: Analytical grade reagents were used without any further purification. Melting points are uncorrected and were taken on Buchi 530 melting point apparatus. Mass spectra were recorded on Jeol-JMS D-300 spectrophotometer. ^{1}H NMR and ^{13}C NMR were recorded on Bruker DRX-300 instrument at 300 MHz and 75 MHz respectively, using TMS as internal standard. Crystallization of compounds was carried out by the slow evaporation of solvent.

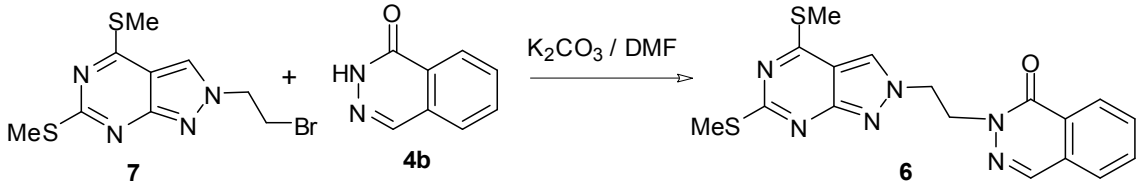
Synthetic Schemes:

Scheme 1:

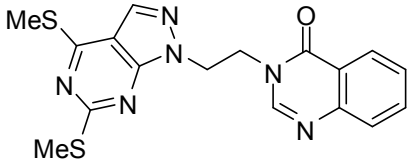


Reagents: (**a**). K_2CO_3 / DMF; (**b**). NaOH (aq.) / MeOH; (**c**). $POCl_3$; (**d**). NaOMe/MeOH; (**e**). $KMnO_4/CH_3COOH/ H_2O$; (**f**). $KMnO_4/ CH_3COOH/ H_2O$.

Scheme 2:



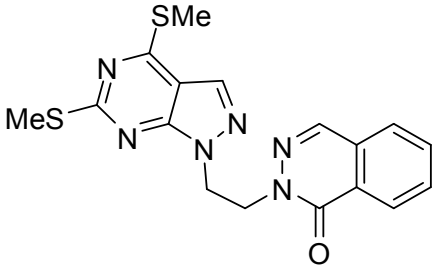
1. Synthesis and characterization of 3-(2-(4,6-bis(methylthio)-1*H*-pyrazolo[3,4-*d*]pyrimidin-1-yl)ethyl)quinazolin-4(3*H*)-one (5a):



To a stirred suspension of quinazolinone (1 g, 6.84 mmol) in DMF (40 ml) at room temperature was added K_2CO_3 (1.89 g, 13.6 mmol). After 30 minutes of stirring, compound **3a** (2.61 g, 8.2 m mol) was added and stirring was continued for 12 h. DMF was removed under reduced pressure and the residue was treated with 200 ml of chloroform-water (1:1) mixture. The organic layer was collected and the aqueous layer was washed two times with 100 ml of chloroform (3 x 50 ml). Organic layers were combined, washed with 400 ml of water (4 x 100 ml) and dried over anhydrous sodium sulphate. The residue obtained by the removal of chloroform under reduced pressure was purified by column chromatography on silica gel using mixture of ethyl acetate-hexane in increasing polarity to give pure **5a.**

5a: Yield 85%; mp 134–136°C; MS (ESI) m/z 385 $[M+H]^+$; ^{1}H NMR (300 MHz, $CDCl_3$) δ (ppm) 2.28 (s, 3H, SCH_3), 2.64 (s, 3H, SCH_3), 4.46-4.50 (m, 2H, NCH_2), 4.80-4.83 (m, 2H, NCH_2), 7.26 (s, 1H, Ar-H), 7.47-7.59 (m, 2H, Ar-H), 7.70-7.76 (m, 1H, Ar-H), 7.93 (s, 1H, Ar-H), 8.30-8.34 (m, 1H, Ar-H); ^{13}C NMR (75 MHz, $CDCl_3$) δ (ppm) 11.79, 13.86, 45.13, 46.68, 109.15, 121.83, 126.51, 127.24, 127.50, 132.76, 134.29, 145.72, 147.95, 152.67, 161.09, 165.22, 169.45; Anal. Calcd. for $C_{17}H_{16}N_6OS_2$: C, 53.11; H, 4.19; N, 21.86; found C, 53.22; H, 4.29; N, 21.90.

2. Synthesis and characterization of 2-(2-(4,6-bis(methylthio)-1*H*-pyrazolo[3,4-*d*]pyrimidin-1-yl)ethyl)phthalazin-1(2*H*)-one (5b):

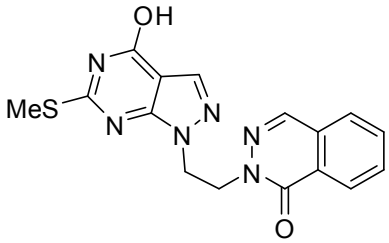


5b was synthesized using the procedure as described for the synthesis of **5a.**

5b: Yield 85%; mp 136–138°C (Ethyl acetate) ; MS (ESI) m/z 385 $[M+H]^+$; ^{1}H NMR (300 MHz, $CDCl_3$) δ (ppm) 2.25 (s, 3H, SCH_3), 2.64 (s, 3H, SCH_3), 4.66-4.70 (m, 2H, NCH_2), 4.85-

4.89 (m, 2H, NCH_2), 7.59-7.62 (m, 1H, Ar-H), 7.72-7.79 (m, 2H, Ar-H), 7.82 (s, 1H, Ar-H), 7.89 (s, 1H, Ar-H) 8.38-8.41(m, 1H, Ar-H) ; ^{13}C NMR (75 MHz, $CDCl_3$) δ (ppm) 11.59, 13.66, 45.20, 50.73, 109.12, 125.87, 126.33, 127.44, 129.40, 131.35, 131.84, 132.91, 137.28, 152.24, 159.37, 164.46, 168.41; Anal. Calcd. for $C_{17}H_{16}N_6OS_2$: C, 53.11; H, 4.19; N, 21.86; found C, 53.18; H, 4.31; N, 21.94.

3. Synthesis and characterization of 2-(2-(4-hydroxy-6-methylthio-1*H*-pyrazolo[3,4-*d*]-pyrimidin-1-yl)ethyl)phthalazin-1(2*H*)-one (5c):

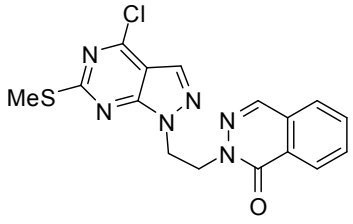


5b (1 g, 0.0026 mole) was dissolved in minimum amount of THF. To it about 100 ml of methanol was added and kept on refluxing with stirring. Aqueous NaOH (10 ml of 2N soln.) was added drop wise to it over 30 minutes. The reaction mixture was further refluxed for 4h and then it was cooled in ice bath and acidified with acetic acid till the pH of the solution is around 6 and kept for another 8-10h so that complete precipitation has occurred. The solid precipitate is filtered, washed with water and air dried at 80 $^{\circ}$C. The resulting product was heated with a mixture of chloroform and hexane (60:40) and filtered hot. Compound (**5c**) was obtained as solid precipitate.

5c: Yield 80%; mp > 250°C ; MS (ESI) m/z 355 $[M+H]^+$; ^1H NMR (300 MHz, $CDCl_3$) δ (ppm) ^1H NMR (300 MHz, $CDCl_3$) 2.26 (s, 3H, SMe), 4.66-4.69 (m, 2H, NCH_2), 4.80-4.83 (m, 2H, NCH_2), 7.61–7.64 (m, 1H, Ar-H), 7.74–7.84 (m, 2H, Ar-H), 7.87 (s, 1H, Ar-H), 7.99 (s, 1H, Ar-H), 8.39–8.42 (m. 1H, Ar-H) ^{13}C NMR (75 MHz, DMSO-d_6) δ (ppm) 13.19, 46.05, 51.69, 103.59, 126.53, 127.63, 127.76, 130.26, 132.87, 134.47, 135.68, 138.48, 153.34, 159.58.

Anal. Calcd. for $C_{17}H_{16}N_6OS_2$: C, 54.23; H, 3.98; N, 23.71; found C, 54.21; H, 3.84; N, 23.75.

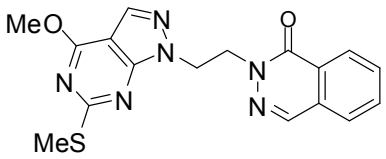
4. Synthesis and characterization of 2-(2-(4-chloro-6-methylthio-1*H*-pyrazolo[3,4-*d*]pyrimidin-1-yl)ethyl)phthalazin-1(2*H*)-one (5d):



Compound **5c** (0.708 g, 0.002 mole) and $POCl_3$ (2 g, 0.013 mole) were refluxed for 3h. Excess of $POCl_3$ was removed under reduced pressure. The reaction mixture was quenched with ice and extracted with 150 ml of chloroform (50 ml x 3) and was dried over sodium sulfate. The residue obtained by the removal of chloroform under reduced pressure was purified by column chromatography on silica gel using mixture of ethyl acetate-hexane in increasing polarity to give pure **5d.**

5d: Yield 85%; mp 210–212°C (Chloroform + Ethyl acetate) ; MS (ESI) m/z 373 $[M+H]^+$; ^1H NMR (300 MHz, $CDCl_3$) δ (ppm) 2.23 (s, 3H, SMe), 4.67–4.70 (m, 2H, NCH_2), 4.91–4.93 (m, 2H, NCH_2), 7.59–7.62 (m, 1H, Ar-H), 7.73–7.82 (m, 3H, Ar-4H), 7.98 (s, 1H, Ar-H), 8.36–8.39 (m. 1H, Ar-H) ^{13}C NMR(75 MHz, $CDCl_3$) δ (ppm) 13.84, 45.76, 50.67, 110.26, 126.01, 126.34, 127.40, 129.38, 131.59, 132.70, 133.15, 137.44, 153.57, 154.50, 159.37, 169.84. Anal. Calcd. for $C_{16}H_{13}ClN_6OS$: C, 51.54; H, 3.51; N, 22.54; found C, 51.65; H, 3.59; N, 22.65.

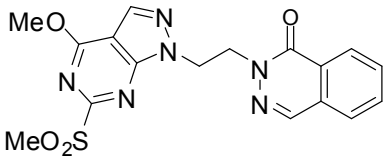
5. Synthesis and characterization of 2-(2-(4-methoxy-6-(methylthio)-1*H*-pyrazolo[3,4-*d*]-pyrimidin-1-yl)ethyl)phthalazin-1(2*H*)-one (5e):



To a 250 ml round bottom flask containing 100 ml of anhydrous methanol added **5b** (1 g, 0.0026 mole) and kept on refluxing with stirring for 20 minutes. Sodium methoxide (0.28 g, 0.0052 mole) was added and the mixture was further refluxed for 5h. Methanol was removed under reduced pressure and ice cold water was added to round bottom flask and the solution was neutralized with dilute acidic acid. The solution was kept for 8-10h so that complete precipitation occurred. The solid precipitate was filtered, washed with water and air dried at 80 °C. This was purified by column chromatography on silica gel using mixture of ethyl acetate-hexane in increasing polarity to give pure **5e.**

5e: Yield 88%; mp 158–160°C; MS (ESI) m/z 369 $[M+H]^+$; ^1H NMR (300 MHz, $CDCl_3$) δ (ppm) 2.25 (s, 3H, SMe), 4.06 (s, 3H, OMe), 4.66–4.70 (m, 2H, NCH_2), 4.84–4.89 (m, 2H, NCH_2), 7.59–7.61 (m, 1H, Ar-H), 7.71–7.81 (m, 2H, Ar-4H), 7.82 (s, 1H, Ar-H), 7.86 (s, 1H, Ar-H), 8.37–8.40 (m. 1H, Ar-H) ^{13}C NMR(75 MHz, $CDCl_3$) δ (ppm) 13.57, 45.32, 50.75, 53.84, 99.69, 125.80, 126.34, 127.47, 129.40, 131.31, 131.64, 132.87, 137.22, 155.88, 159.32, 162.45, 169.16. Anal. Calcd. for $C_{17}H_{16}N_6O_2S$: C, 55.42; H, 4.38; N, 22.81; found C, 55.30; H, 4.79; N, 22.95.

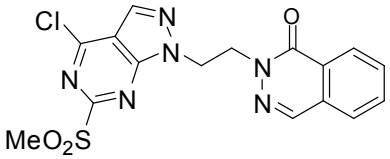
6. Synthesis and characterization of 2-(2-(4-methoxy-6-(methylsulfonyl)-1*H*-pyrazolo[3,4-*d*]pyrimidin-1-yl)ethyl)phthalazin-1(2*H*)-one (5f):



To a round bottom flask containing 1 g of **5e** added 40 ml of acetic acid and 8 ml of water. The round bottom flask was kept in an ice bath and arranged for stirring. To it added 1.5 g of $KMnO_4$ in solid form in small portions over 45 minutes. The reaction mixture was allowed to stir at room temperature for another 3 h. Added H_2O_2 solution drop wise with stirring to the reaction mixture till it becomes colorless. The reaction mixture was transferred in a separating flask and extracted with chloroform (3 x 100 ml). the chloroform layer was washed twice with water, then twice with sodium bicarbonate solution and then again twice with water. Dried it over sodium sulfate and chloroform was removed under reduced pressure to give 0.940 g (87%) of the desired product.

5f: Yield 87%; mp 198–200°C; (Chloroform + Ethyl acetate) MS (ESI) m/z 401 $[M+H]^+$; ^1H NMR (300 MHz, $CDCl_3$) δ (ppm) 3.04 (s, 3H, SO_2Me), 4.23 (s, 3H, OMe), 4.70–4.73 (m, 2H, NCH_2), 4.98–5.02 (m, 2H, NCH_2), 7.63–7.66 (m, 1H, Ar-H), 7.73–7.86 (m, 2H, Ar-H), 7.87 (s, 1H, Ar-H), 8.09 (s, 1H, Ar-H), 8.33–8.36 (m. 1H, Ar-H) ^{13}C NMR(75 MHz, $CDCl_3$) δ (ppm) 38.52, 46.38, 50.72, 55.37, 103.44, 126.36, 127.39, 129.50, 131.80, 132.30, 133.34, 137.88, 154.05, 159.45, 161.89, 165.00. Anal. Calcd. for $C_{17}H_{16}N_6O_4S$: C, 50.99; H, 4.03; N, 20.99; found C, 51.25; H, 4.29; N, 20.95.

7. Synthesis and characterization of 2-(2-(4-chloro-6-(methylsulfonyl)-1*H*-pyrazolo[3,4-*d*]pyrimidin-1-yl)ethyl)phthalazin-1(2*H*)-one (5g):

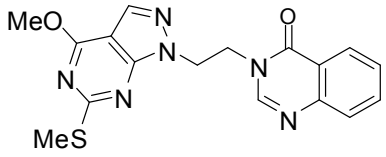


5g was synthesized using the procedure as described for the synthesis of **5f.**

5g: Yield 87%; mp 218-220°C; (Chloroform + Ethyl acetate) MS (ESI) m/z 405 $[M+H]^+$; ^1H NMR (300 MHz, $CDCl_3$) δ (ppm) 3.11 (s, 3H, SO_2Me), 4.72–4.75 (m, 2H, NCH_2), 5.06–5.09 (m, 2H, NCH_2), 7.64–7.66 (m, 1H, Ar-H), 7.73–7.84 (m, 2H, Ar-H), 7.90 (s, 1H, Ar-H), 8.24

(s, 1H, Ar-H), 8.30–8.32 (m. 1H, Ar-H) ^{13}C NMR(75 MHz, $CDCl_3$) δ (ppm) 39.01, 47.01, 50.4, 114.72, 126.10, 126.51, 127.50, 129.40, 131.80, 133.20, 138.10, 152.40, 156.30, 159.30, 161.40. Anal. Calcd. for $C_{16}H_{13Cl}N_6O_3S$: C, 47.47; H, 3.24; N, 20.76; found C, 47.57; H, 3.29; N, 20.95.

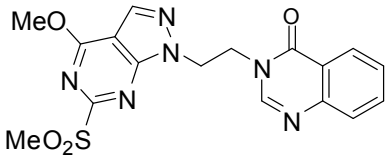
8. Synthesis and characterization of 3-(2-(4-methoxy-6-(methylthio)-1*H*-pyrazolo[3,4-*d*]pyrimidin-1-yl)ethyl)quinazolin-4(3*H*)-one (5h):



5h was synthesized using the procedure as described for the synthesis of **5e.**

5h: Yield 84%; mp 156–158°C; MS (ESI) m/z 369 $[M+H]^+$; ^{1}H NMR (300 MHz, $CDCl_3$) δ (ppm)) 2.24 (s, 3H, SMe), 4.06 (s, 3H, OMe), 4.46–4.48 (m, 2H, NCH_2), 4.80–4.82 (m, 2H, NCH_2), 7.26 (s, 1H, Ar-H), 7.48–7.53 (m, 1H, Ar-H), 7.57–7.60 (m, 1H, Ar-H), 7.71–7.76 (m, 1H, Ar-H), 7.92 (s, 1H, Ar-H), 8.30–8.33 (m. 1H, Ar-H) ^{13}C NMR(75 MHz, $CDCl_3$) δ (ppm) 13.79, 45.20, 46.74, 54.20, 99.85, 121.75, 126.47, 127.23, 127.41, 132.68, 134.29, 145.66, 147.87, 156.27, 161.09, 162.67, 170.35. Anal. Calcd. for $C_{17}H_{16}N_6O_2S$: C, 55.42; H, 4.38; N, 22.81; found C, 55.28; H, 4.76; N, 22.99.

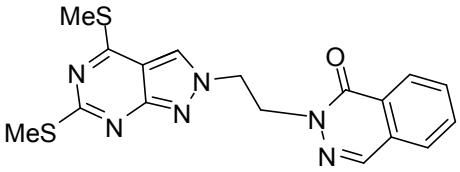
9. Synthesis and characterization of 3-(2-(4-methoxy-6-(methylsulfonyl)-1*H*-pyrazolo[3,4-*d*]pyrimidin-1-yl)ethyl)quinazolin-4(3*H*)-one (5i):



5i was synthesized using the procedure as described for the synthesis of **5f.**

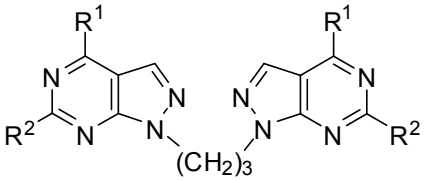
5i: Yield 86%; mp 208- 210°C; (Chloroform + Ethyl acetate) MS (ESI) m/z 401 $[M+H]^+$; ^{1}H NMR (300 MHz, $CDCl_3$) δ (ppm) 3.04 (s, 3H, SO_2Me), 4.24 (s, 3H, OMe), 4.52–4.55 (m, 2H, NCH_2), 4.94–4.97 (m, 2H, NCH_2), 7.35 (s, 1H, Ar-H), 7.49–7.60 (m, 2H, Ar-H), 7.72–7.77 (m, 1H, Ar-H), 8.15 (s, 1H, Ar-H), 8.29–8.31 (m. 1H, Ar-H) ^{13}C NMR(75 MHz, $CDCl_3$) δ (ppm) 38.63, 45.98, 46.83, 55.67, 103.56, 121.59, 126.56, 127.45, 127.71, 133.14, 134.71, 145.79, 147.46, 154.42, 160.94, 162.52, 165.28. Anal. Calcd. for $C_{17}H_{16}N_6O_4S$: C, 50.99; H, 4.03; N, 20.99; found C, 51.05; H, 4.01; N, 21.10.

10. Synthesis and characterization of 2-(2-(3-methyl-4,6-bis(methylthio)-2*H*-pyrazolo[3,4-*d*]pyrimidin-2-yl)ethyl)phthalazin-1(2*H*)-one (6):

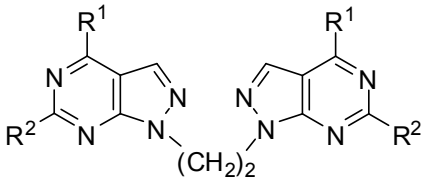


6 was synthesized using the procedure as described for the synthesis of **5a.**

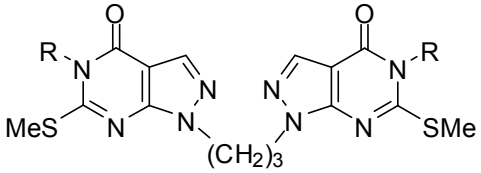
6: Yield 85%; mp 162–164°C; MS (ESI) m/z 382 $[M+H]^+$; ^{1}H NMR (300 MHz, $CDCl_3$) δ (ppm) 2.61 (s, 3H, SMe), 2.63 (s, 3H, SMe), 4.82 (s, 4H, NCH_2), 7.66–7.82 (m, 3H, Ar-H), 7.85 (s, 1H, Ar-H), 8.03 (s, 1H, Ar-H), 8.39–8.42 (m. 1H, Ar-H) ^{13}C NMR(75 MHz, $CDCl_3$) δ (ppm) 11.80, 14.18, 50.95, 51.64, 109.01, 124.18, 126.16, 126.56, 127.47 129.51, 131.84, 133.40, 138.25, 158.80, 159.50, 166.20, 168.49. Anal. Calcd. for $C_{17}H_{16}N_6OS_2$: C, 53.11; H, 4.19; N, 21.86; found C, 53.20; H, 4.29; N, 21.91.



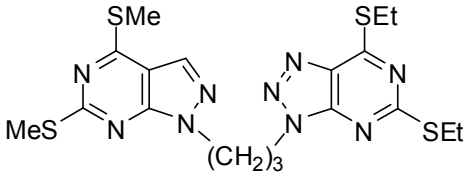
1a: $R^1 = R^2 =$ SMe
1b: R^1 = O-iso-Pr, $R^2 = SO_2Me$
1e: R^1 = Cl, R^2 = SMe
1f: R^1 = OMe, R^2 = SMe
1g: R^1 =S-iso-Pr, R^2 =SMe
1h: R^1 = OEt, R^2 = SMe
1i: R^1 = O-iso-Pr, R^2 = SMe
1j: R^1 = OMe, $R^2 = SO_2Me$
1k: R^1 = OEt, $R^2 = SO_2Me$
1l: R^1 = O-iso-Pr, $R^2 = SO_2Et$
1m: $R^1 = R^2$ = OMe



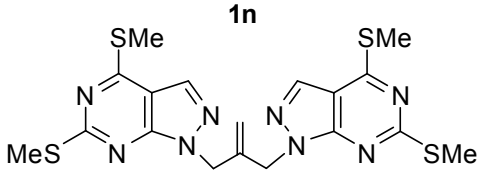
1c: $R^1 = R^2$ = SMe
1d: $R^1 = R^2$ = SEt



2a: R = Me, **2b**: R = Et, **2c**: R = CH_2Ph



1n



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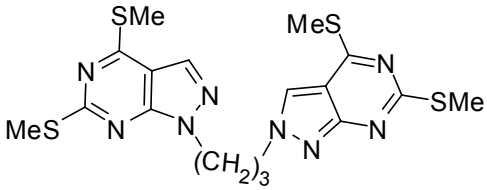


1p

Figure S1: Pyrazolo[3,4-*d*]pyrimidine core based *propylene, ethylene* and *butylidene* linker compound

Table S1. Crystallographic data and structural refinement summary of Compounds **5b**, **5d**, **5f**, **5g** and **5i**

Compound	**5b**	**5d**	**5f**	**5g**	**5i**
Formula	$C_{17}H_{16}N_6OS_2$	$C_{16}H_{13}ClN_6OS$	$C_{17}H_{16}N_6O_4S$	$C_{16}H_{13}ClN_6O_3S$	$C_{17}H_{16}N_6O_4S$
Formula weight	384.48	372.83	400.42	404.83	400.42
T/K	293(2)	293(2)	293(2)	294(2)	293(2)
Crystal System	Monoclinic	Monoclinic	Monoclinic	Monoclinic	Monoclinic
Space group	C2/c	P2(1)/n	P2(1)/n	Cc	C2/c
a/Å	16.708(2)	9.161(1)	9.249(1)	13.6729(8)	18.2274(5)
b/Å	15.732(2)	14.063(1)	17.580(2)	9.0043(6)	15.2903(4)
c/Å	14.436(1)	13.109(1)	11.550(2)	13.8349(8)	13.9319(5)
α/°	90.00	90.00	90.00	90.00	90.00
β/°	107.79(1)	102.12(1)	105.11(1)	90.388(5)	108.746(3)
γ/°	90.00	90.00	90.00	90.00	90.00
V/Å^3	3613.1(7)	1651.2(2)	1813.1(4)	1703.2(2)	3676.9(2)
Z	8	4	4	4	8
ρ_{calc}/g cm^{-1}	1.414	1.500	1.467	1.579	1.447
μ /mm^{-1}	0.314	0.376	0.217	0.380	0.214
2θ max/°	50.00	50.02	50.00	56.29	57.92
Total reflections	5048	4075	4074	9542	7468
Unique reflections	3178	2901	3187	3913	4147
Refls $I > 2\sigma(I)$	1688	1957	2148	3842	2728
Parameters	238	227	255	245	255
Rint	0.0392	0.0251	0.0841	0.0177	0.017
R[F, $I > 2\sigma(I)$]	0.0465	0.0461	0.0486	0.0315	0.0403
wR(F^2, all data)	0.1355	0.1225	0.1354	0.0816	0.1144

Table S2. Important geometrical data obtained from X-ray crystallographic studies

Compound No.	Distance between two N atoms connecting linker (Å)	Intramolecular π–π stacking[a] distance (Å)	Intermolecular π–π stacking[a-d] distance (Å)	Angle between the least-squares planes (°)	Ref. No.
1a	3.28	3.71[a]	3.67[a], 3.59[b], 3.54[c]	13.2(1)	10a
1b	3.09(4)	4.145[a], 3.775[b], 3.605[c]	4.10[a], 3.96[b] 4.30[a], 4.36[b]	21.54(1) 21.3(1)	10e
1e	3.80	No (5.26)	3.56[a], 3.58[b] 3.50[c], 3.87[c]	18.03	10f
1f	3.33(2)	3.8[a]	3.7[a]	13.2(1)	6c
1g	3.26(2)	4.0[a]	not observed	21.96(4)	10b
1h	3.35(2)	3.82[a], 4.05[c]	3.72[b], 3.81[c]	13.13(7)	10c
1i	3.24(3)	3.69[a], 3.84[c]	3.54[a],4.19[c]	14.99(2)	10c
1j	3.15	3.993[a]	3.99[a], 3.66[b]	26.11	10d
1k	3.20	3.969[a]	3.97[a], 3.94[b]	23.49	10d
1l	3.26(3)	4.136[a]	3.96[b], 3.42[c]	21.3(1)	10e
1m	3.41	3.76[a]	3.66[a], 3.76[b] 3.93c	6.72	10f
1n	3.25(4)	3.77[a]	3.80[a], 3.72	15.5(1)	10h
2a	3.35	3.77[a]	3.65[a], 3.61[b]	12.48(5)	10i
2b	3.54	4.23[a]	3.765[a]	10.90	10j
2c	3.33	3.86[a]	3.63[b]	14.51	10k

[a] Distance between centroids of six membered rings.
[b] Distance between centroids of five and six membered rings.
[c] Distance between centroids of nine membered rings.
[d] Distance between centroids of five membered rings

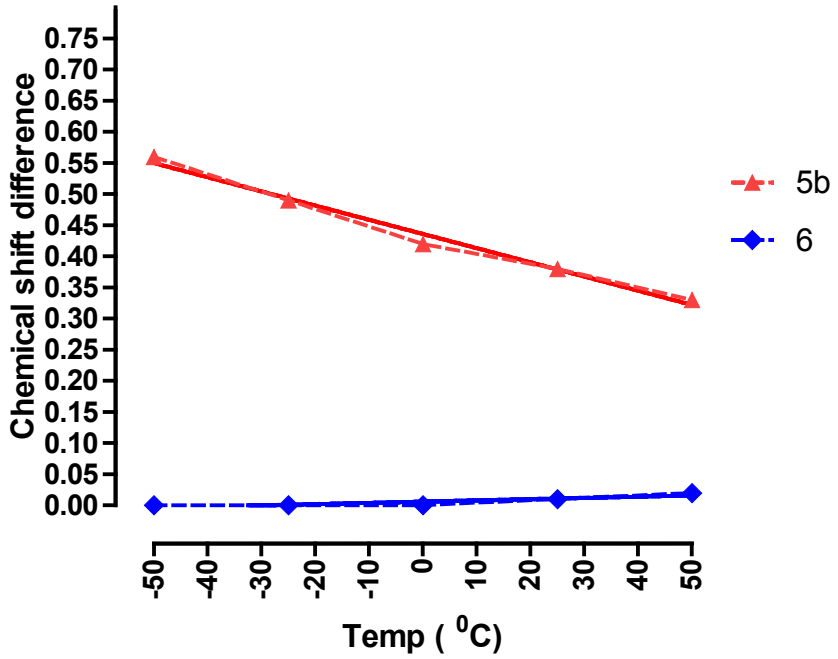


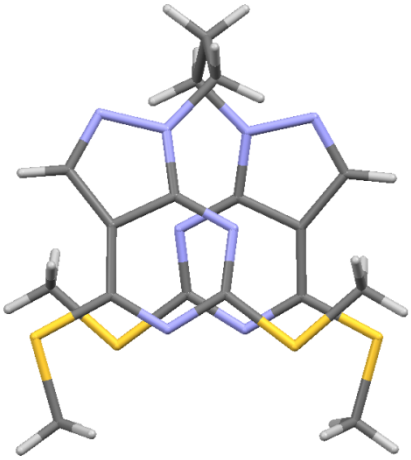
Fig. S2: Variable temperature (-50 to 50 °C) ^{1}H NMR study on **5b** and **6**

Table S3: Variable temperature (-50 to 50 °C) ^{1}H NMR study on 5b and 6. The above graph is plotted against the values shown in red.

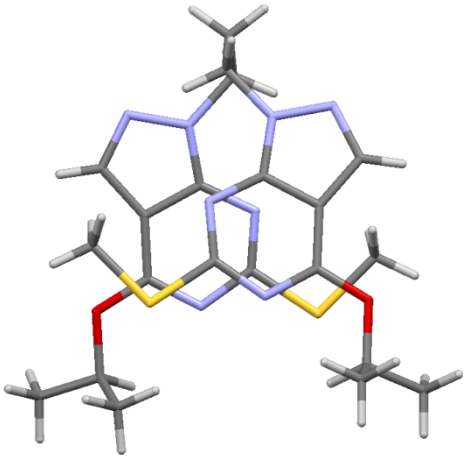
Comp. No.	Temp. (°C)	δ 4-SMe	δ 6-SMe	Δδ4/6-SMe	δH (PP)	δ H-4 (Phtalaz.)
5b	50	2.63	2.30	0.33	7.82	7.86
5b	25	2.64	2.25	0.38	7.81	7.89
5b	0	2.64	2.21	0.43	7.81	7.92
5b	-25	2.64	2.15	0.49	7.80	7.95
5b	-50	2.64	2.08	0.56	7.79	7.99
6	50	2.63	2.61	0.02	7.85	8.02
6	25	2.63	2.62	0.01	7.88	8.04
6	0	2.63	2.63	0	7.89	8.05
6	-25	2.63	2.63	0	7.94	8.06
6	-50	2.64	2.64	0	7.95	8.07

Table S4: Important ^{1}H NMR chemical shifts ($CDCl_3$) of 5b-5g and 6 along with the corresponding monomeric reference compounds (3b, 3d, 3e 4c and 7b in $CDCl_3$ and 3c in DMSO-d_6).

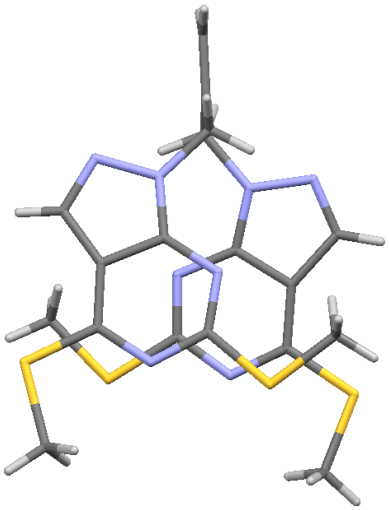
Comp. No.	δ 6-SMe/ SO_2Me	Δδ = δ 6- SCH_3/ SO_2Me (monomer) – δ 6-SCH_3/ SO_2Me (comp.)	δ H-4 (Phtalazinone)/ δ H-2 (Quinazilinone)	Δδ = δH-4′/ δ H-2 (monomer) – δ H-4′ (comp.) δ H-2′ (comp.)
3b	2.68	-	-	-
3c	2.56	-	-	-
3d	2.64	-	-	-
3e	2.63			
3f	3.42			
3g	3.45	-	-	-
4b	-	-	8.10	-
4d			8.15	
7b	2.67			
5a	2.27	0.41	7.26	0.84
5b	2.25	0.43	7.81	0.33
5c	2.26	0.30	7.86	0.28
5d	2.23	0.41	7.79	0.35
5e	2.25	0.38	7.82	0.32
5f	3.04	0.38	7.87	0.27
5g	3.11	0.34	7.90	0.25
5h	2.24	0.39	7.26	0.84
5i	3.04	0.38	7.34	0.76
6	2.61	0.06	8.04	0.10



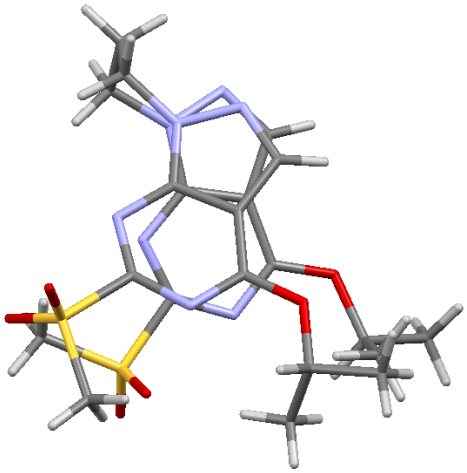
1a



1i



1o



1b

Figure S3: Crystal Structure* of **1a,**[10a] **1i,**[10c] and **1o,**[11] showing that five member pyrazolo moieties are at maximum distance from each other while six member pyrimidine/pyrimidone residues are partially overlapped. In case of **1b**,[10e] however, pyrazolo both moieties are considerably overlapped.

(*) The above crystal structure were generated by using Mercury 2.3.

http://www.ccdc.cam.ac.uk/free_services/mercury/downloads/

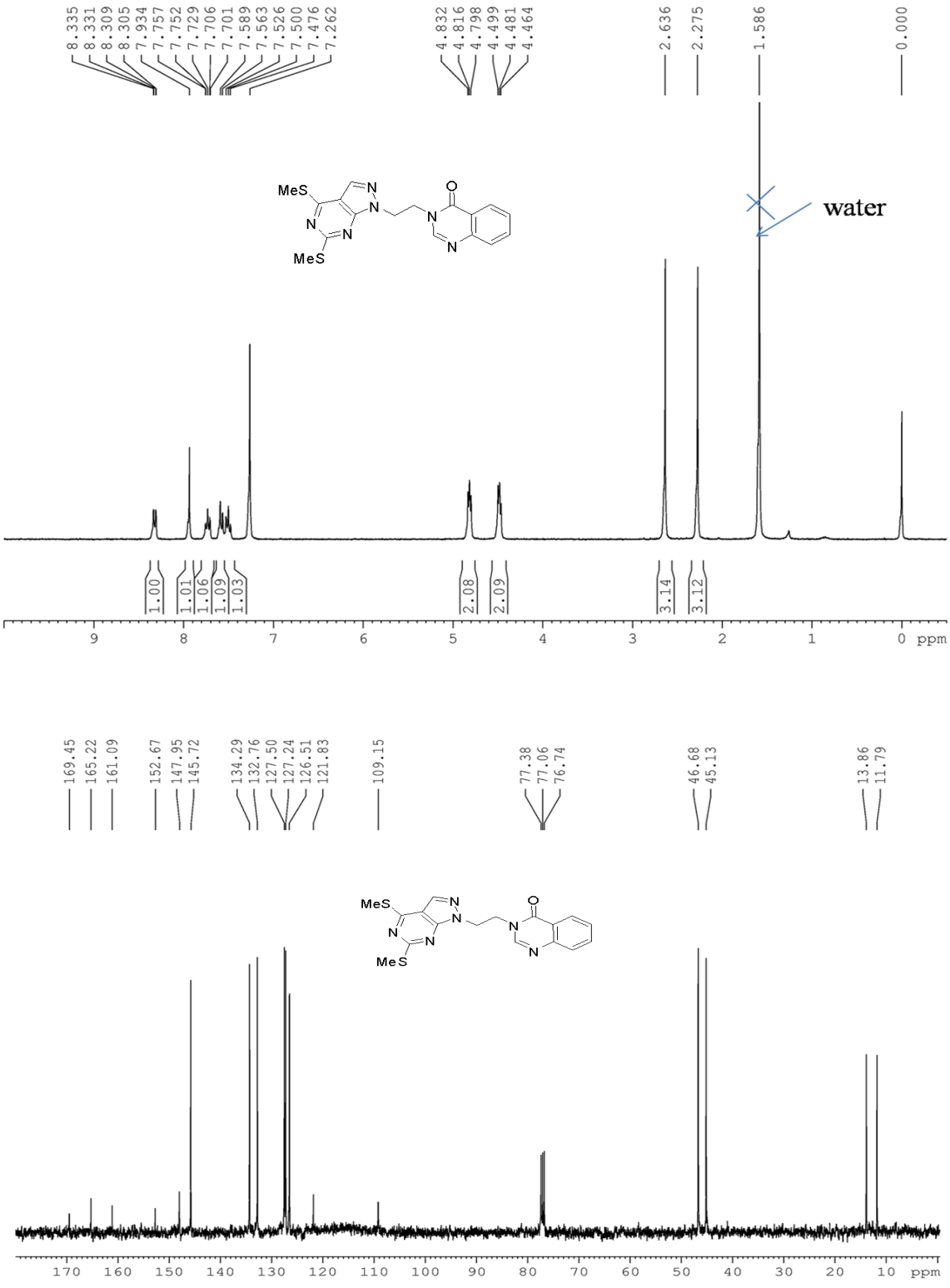


Figure S4: ^{1}H and ^{13}C NMR Spectra of compound **5a in** $CDCl_3$

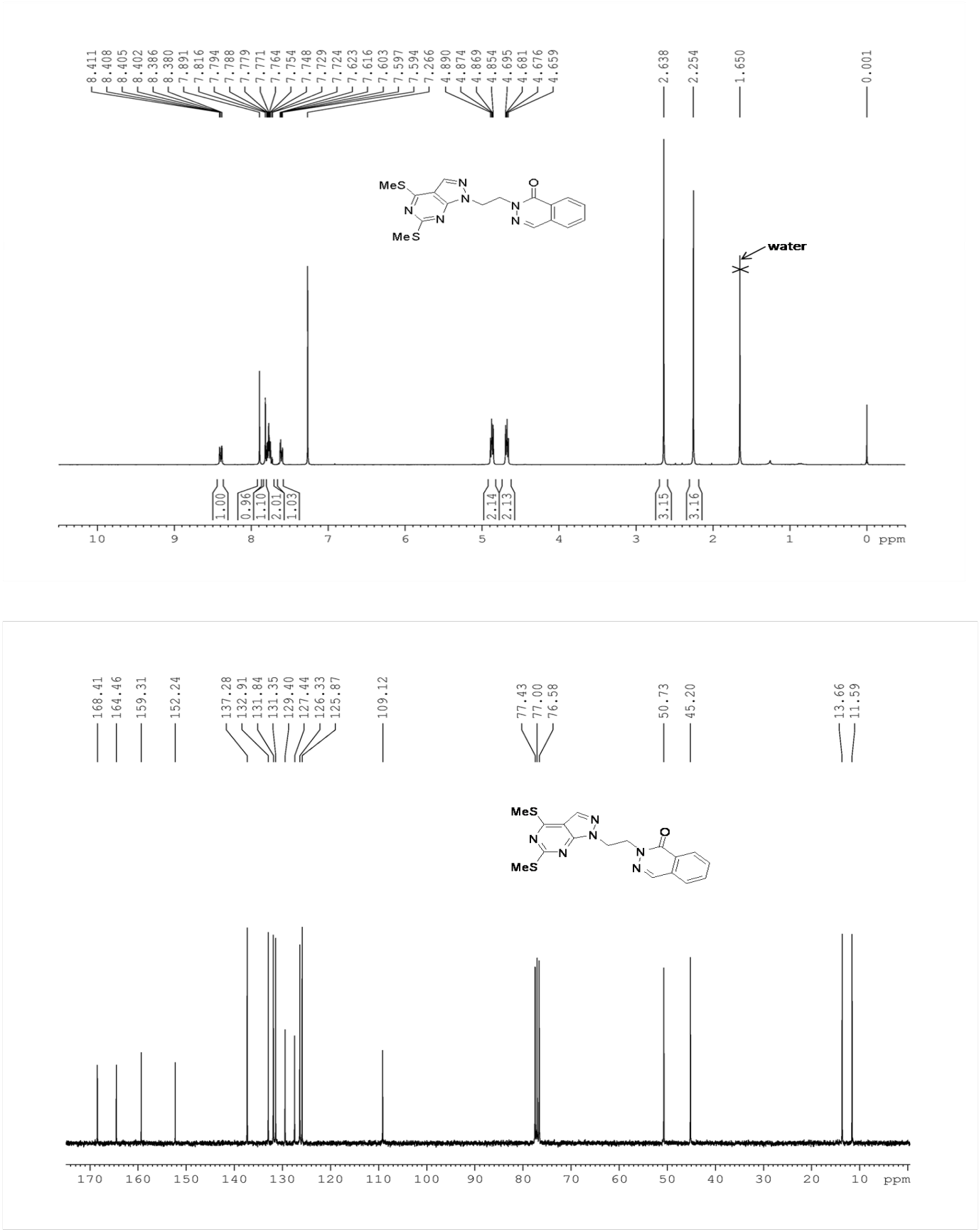


Figure S5: ^{1}H and ^{13}C NMR Spectra of compound **5b in** $CDCl_3$

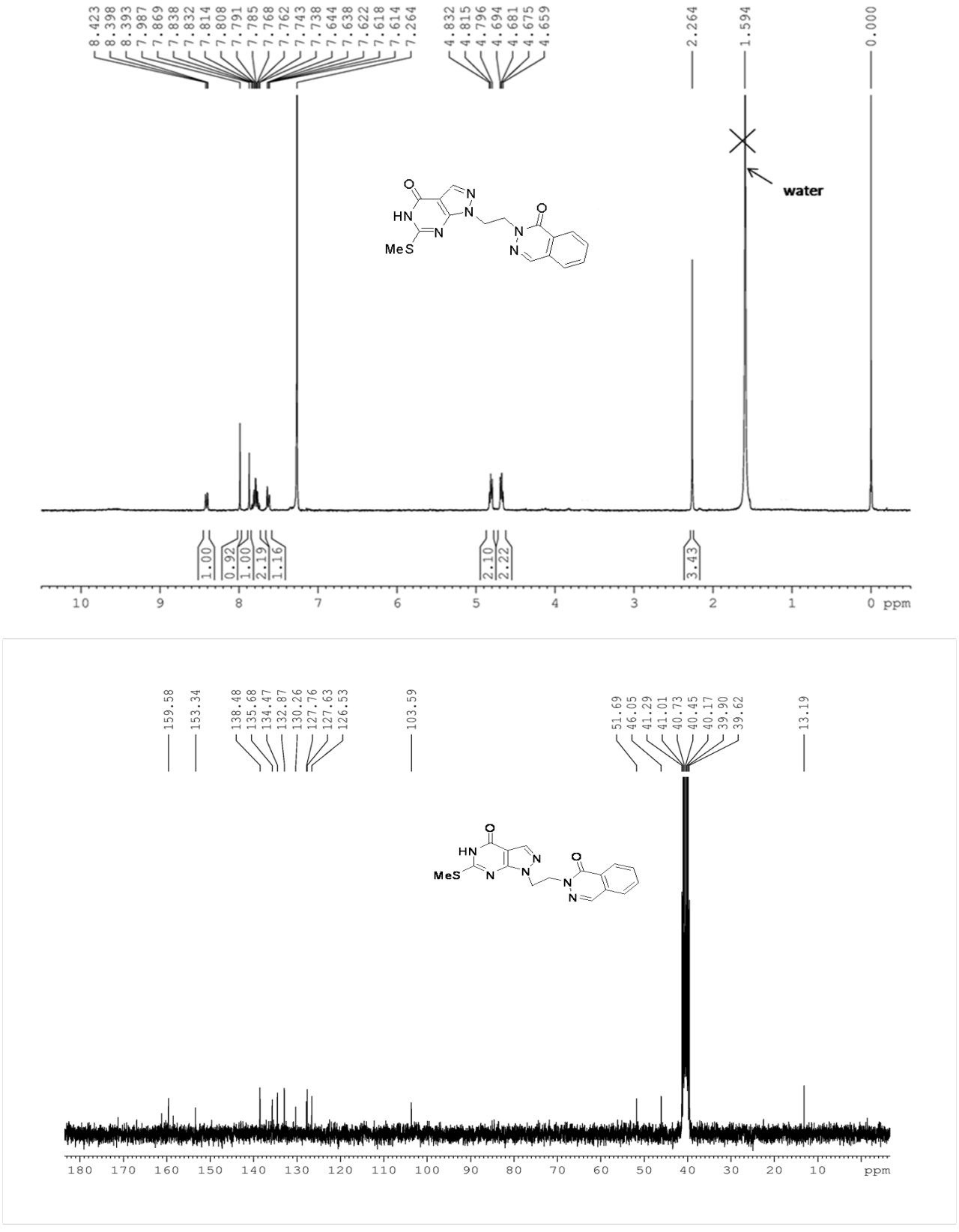


Figure S6: ^{1}H NMR Spectra in $CDCl_3$ and ^{13}C NMR Spectra in DMSO-d_6 of compound **5c**

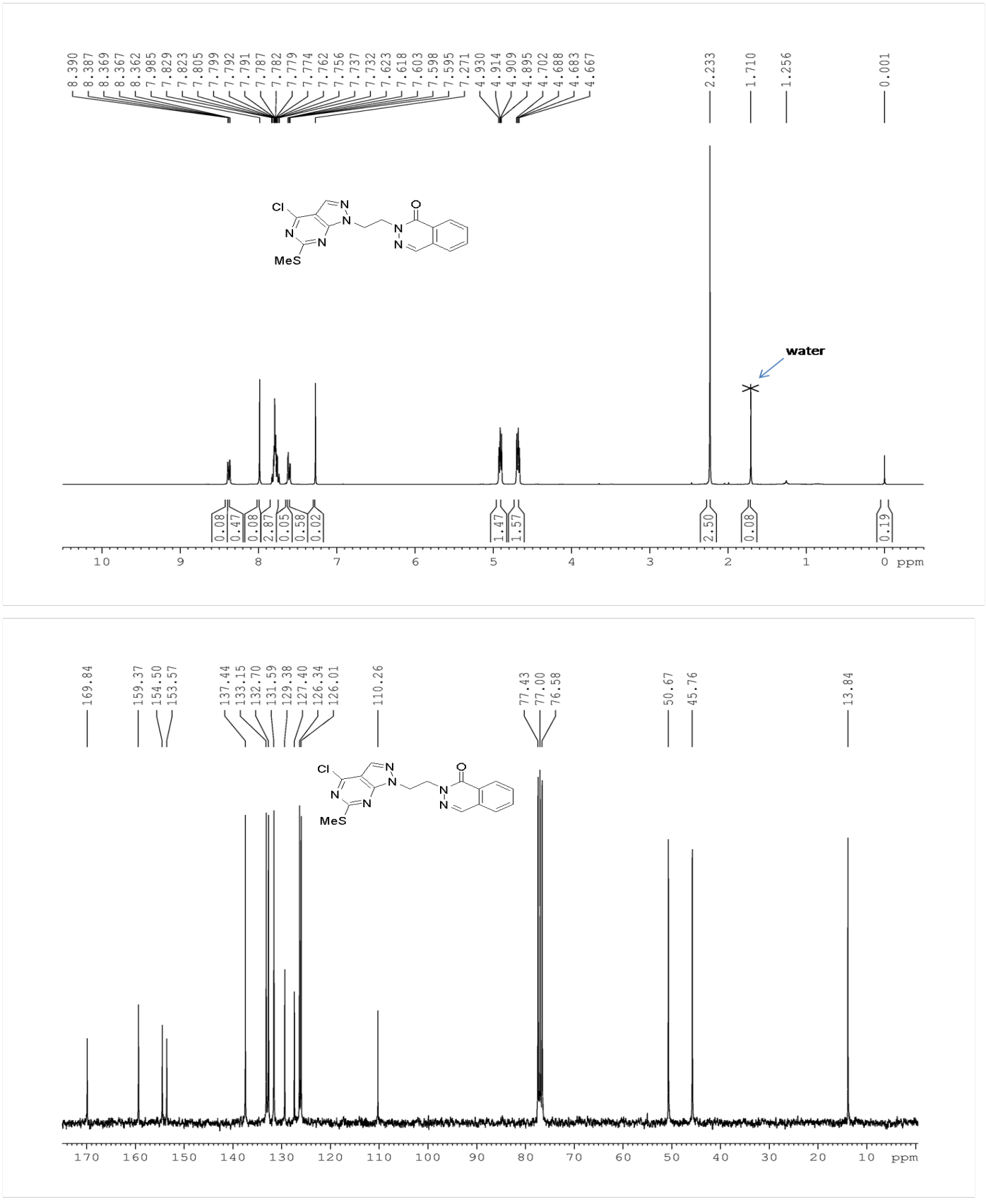


Figure S7: ^{1}H and ^{13}C NMR Spectra of compound **5d in** $CDCl_3$

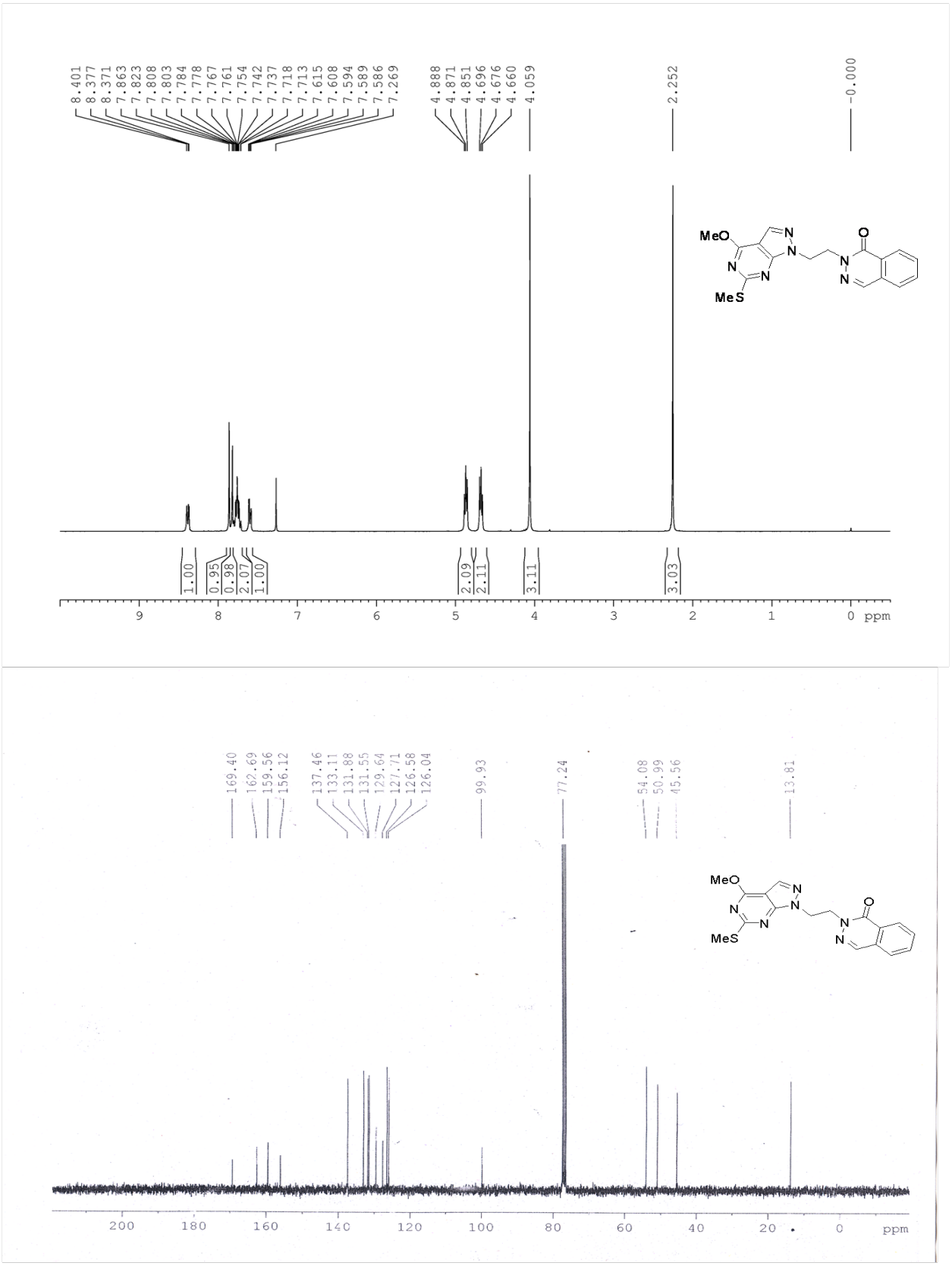


Figure S8: ^{1}H and ^{13}C NMR Spectra of compound **5e in** $CDCl_3$

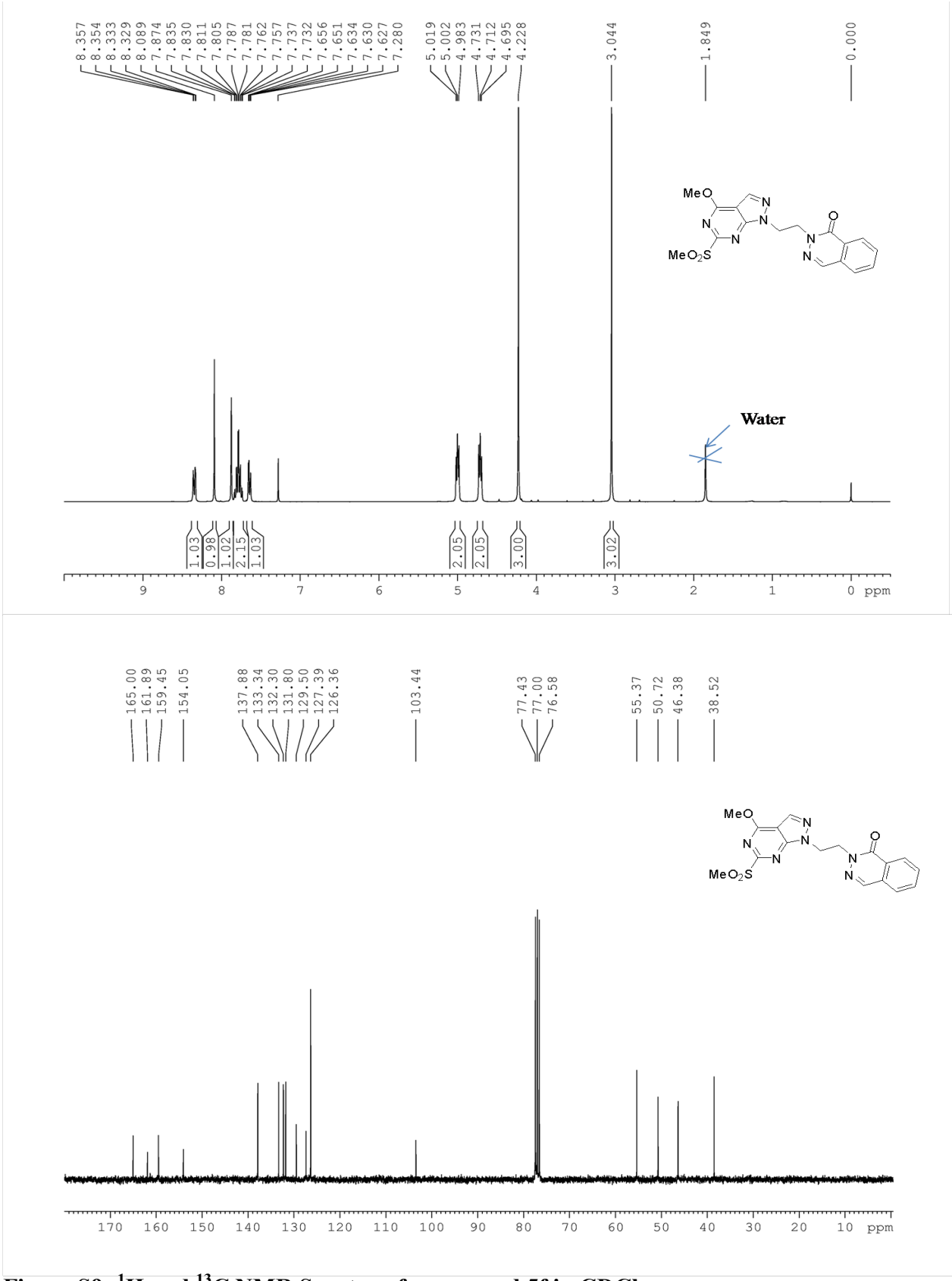


Figure S9: ^{1}H and ^{13}C NMR Spectra of compound 5f in $CDCl_3$

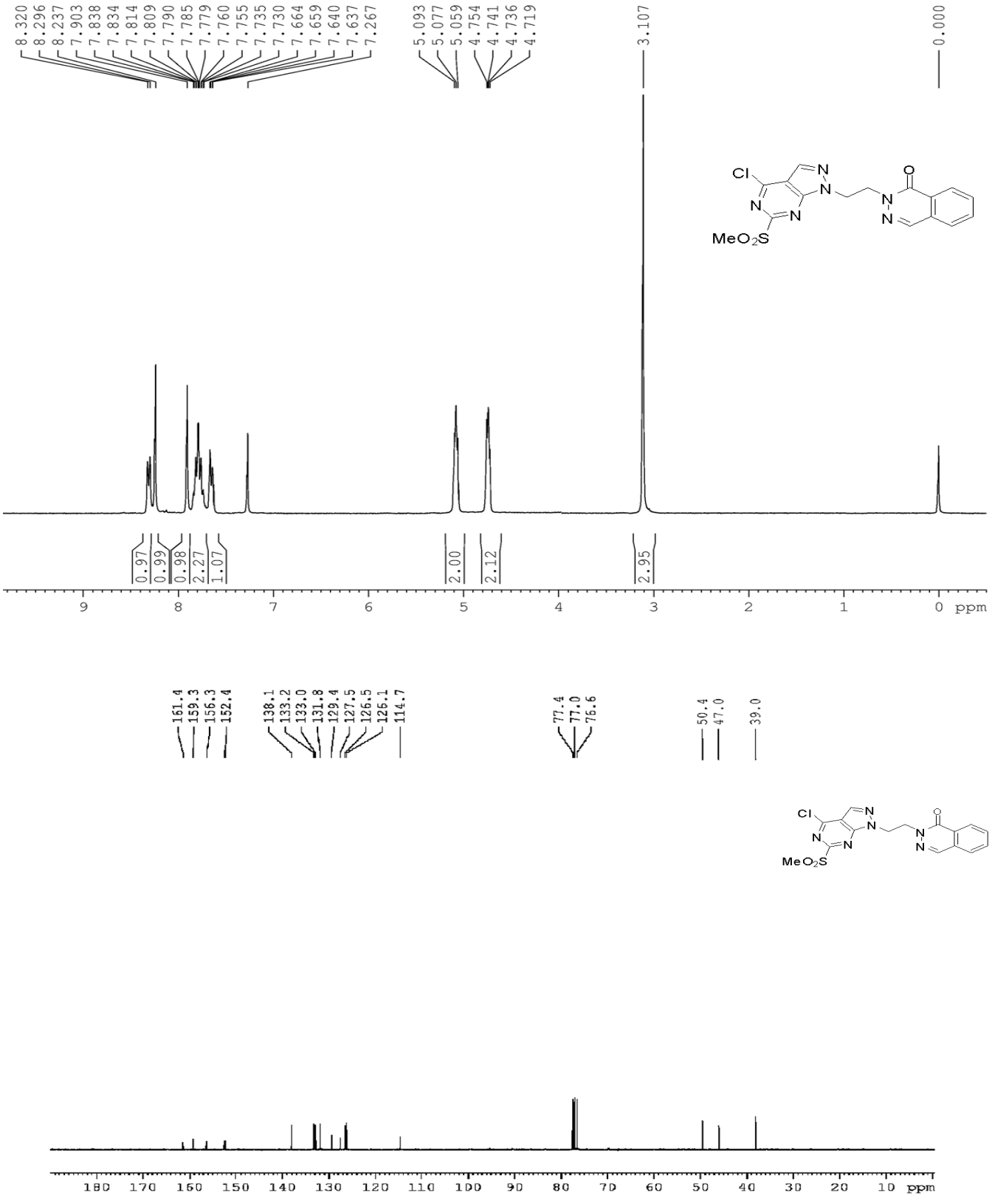


Figure S10: ^{1}H and ^{13}C NMR Spectra of compound **5g** in $CDCl_3$

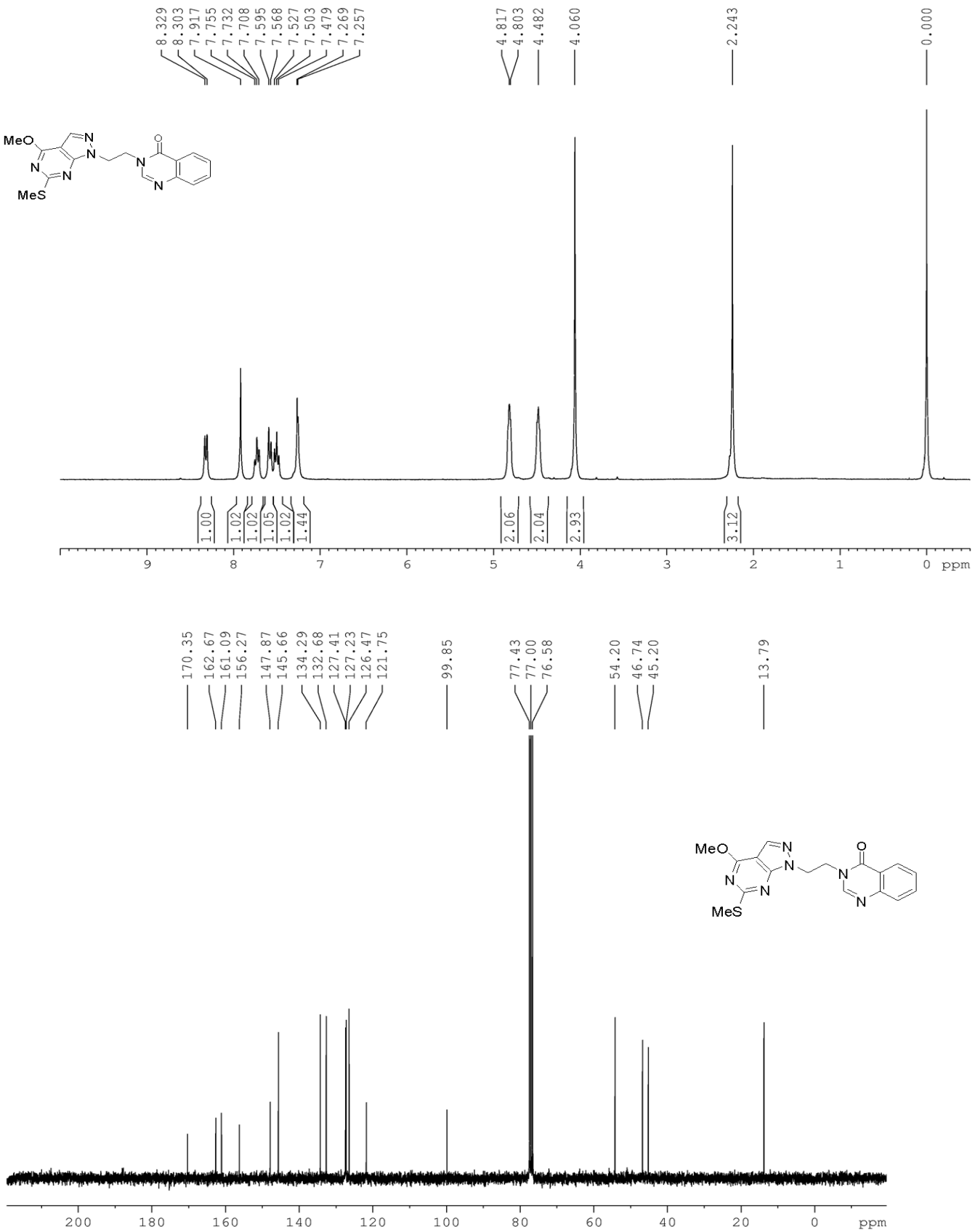


Figure S11: ^{1}H and ^{13}C NMR Spectra of compound **5h** in $CDCl_3$

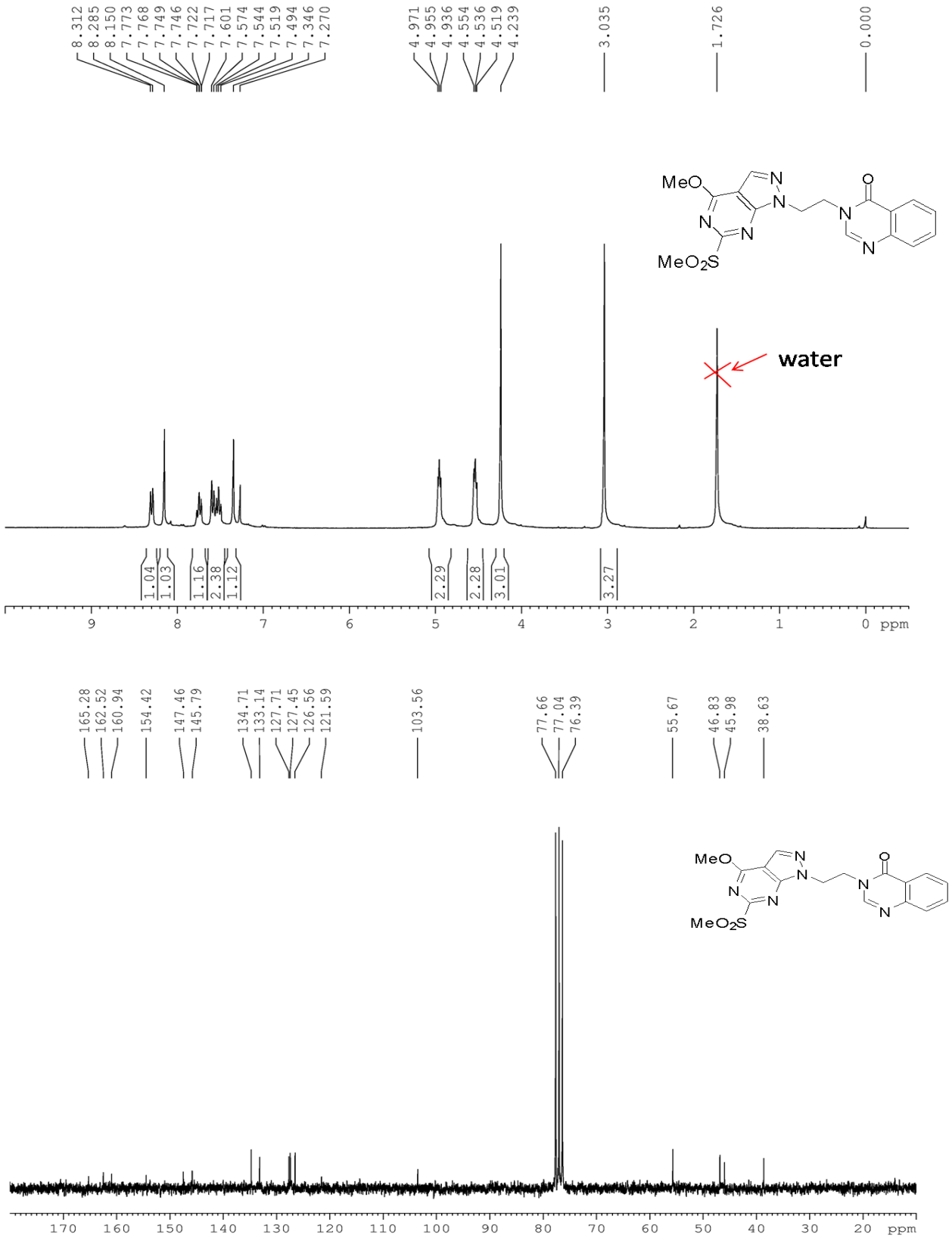


Figure S12: ^{1}H and ^{13}C NMR Spectra of compound **5i** in $CDCl_3$

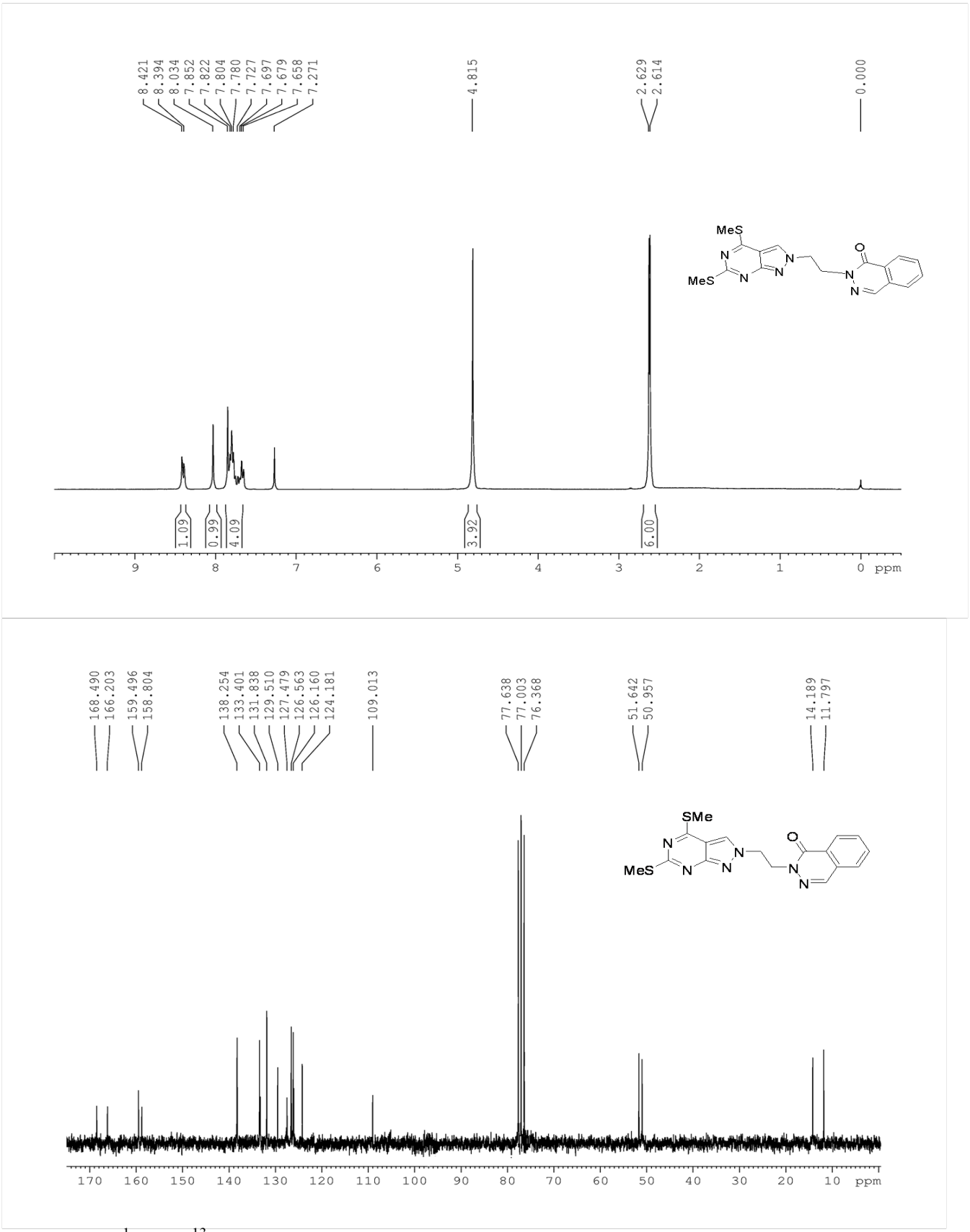


Figure S13: ^{1}H and ^{13}C NMR Spectra of compound **6** in $CDCl_3$

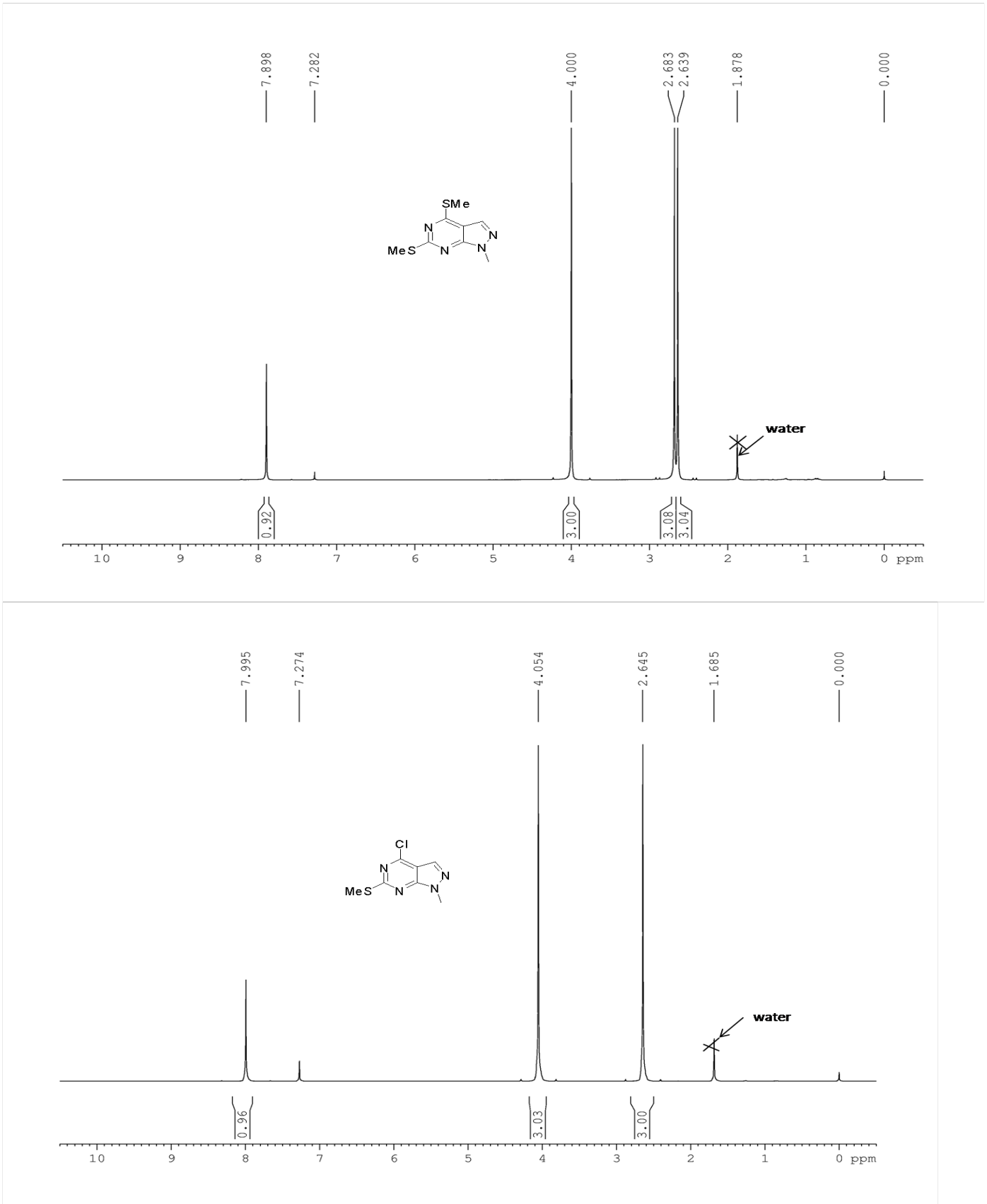
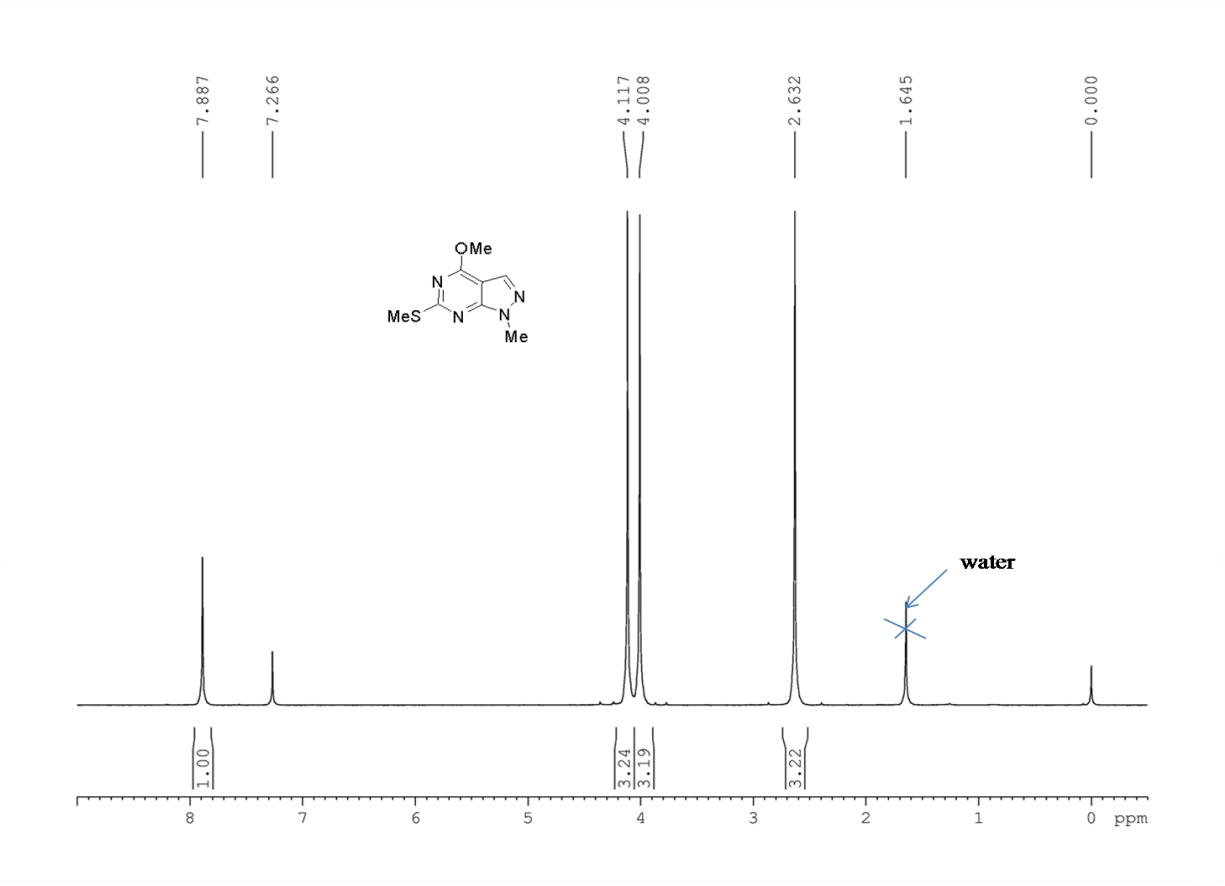


Figure S14: ^{1}H Spectra of compound **3b** and **3d** in $CDCl_3$



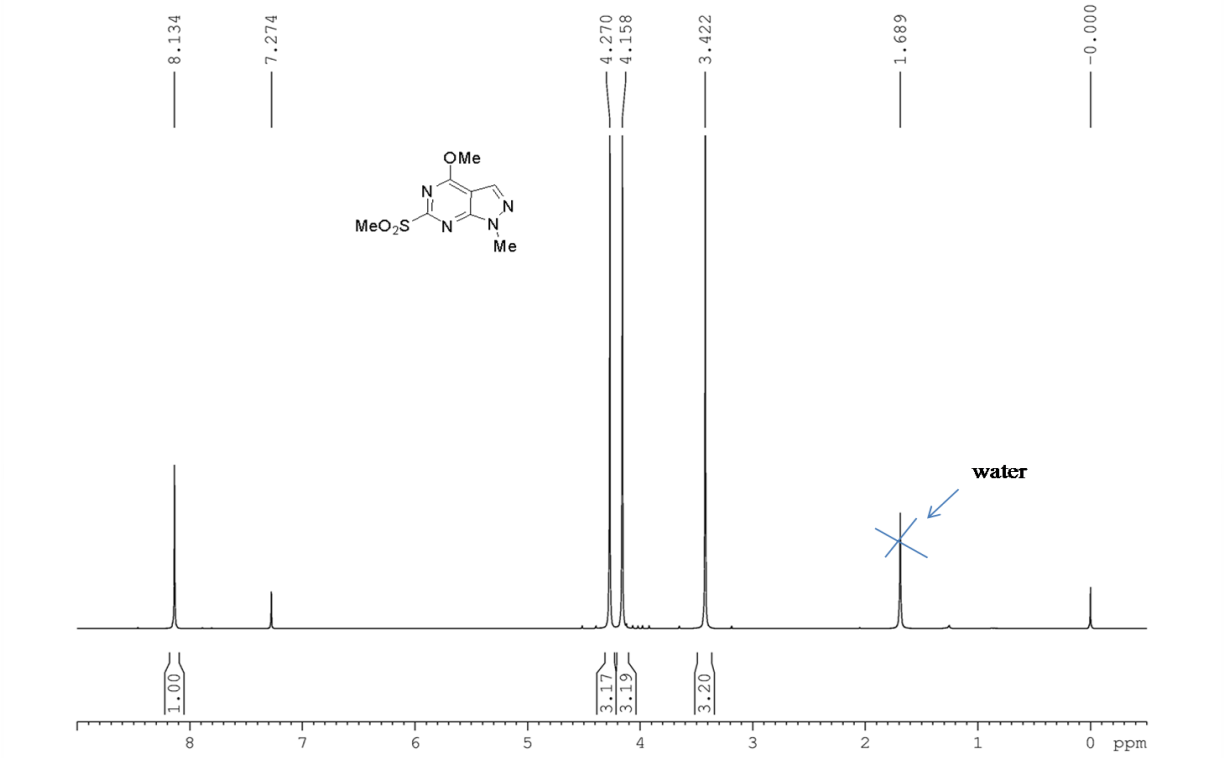
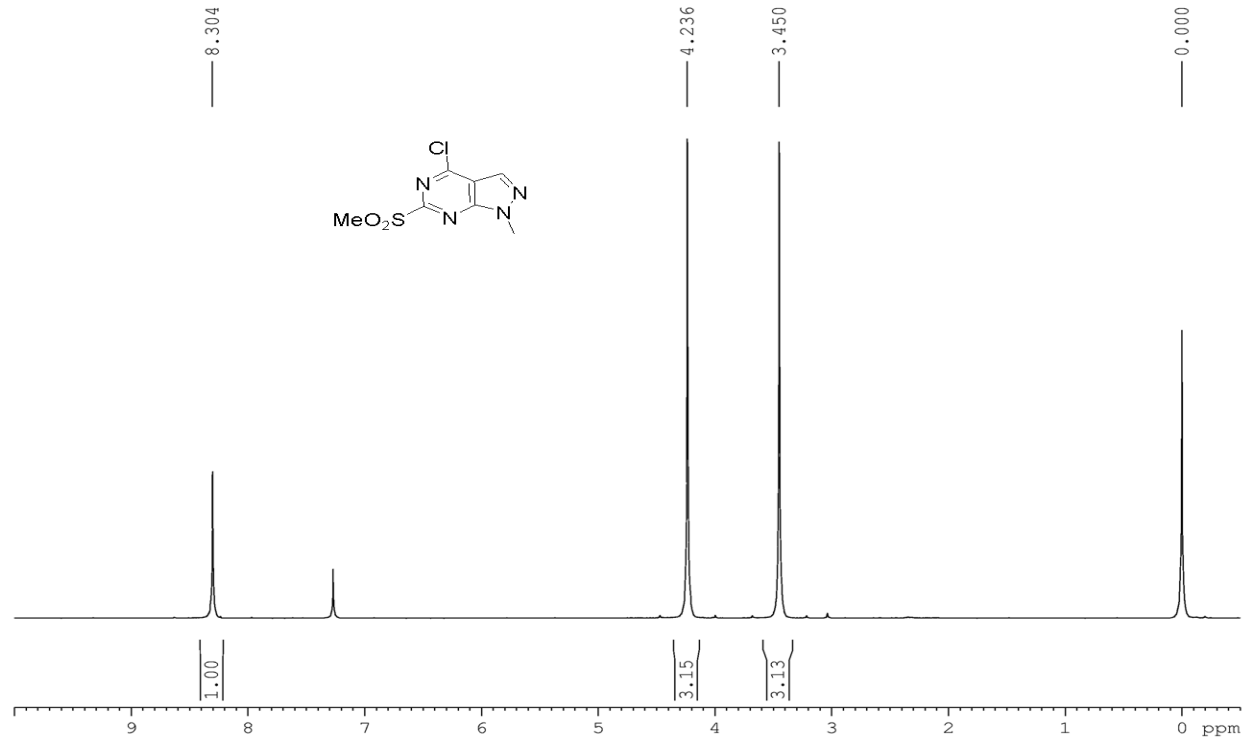


Figure S15: ^{1}H Spectra of compound **3e** and **3f** in $CDCl_3$



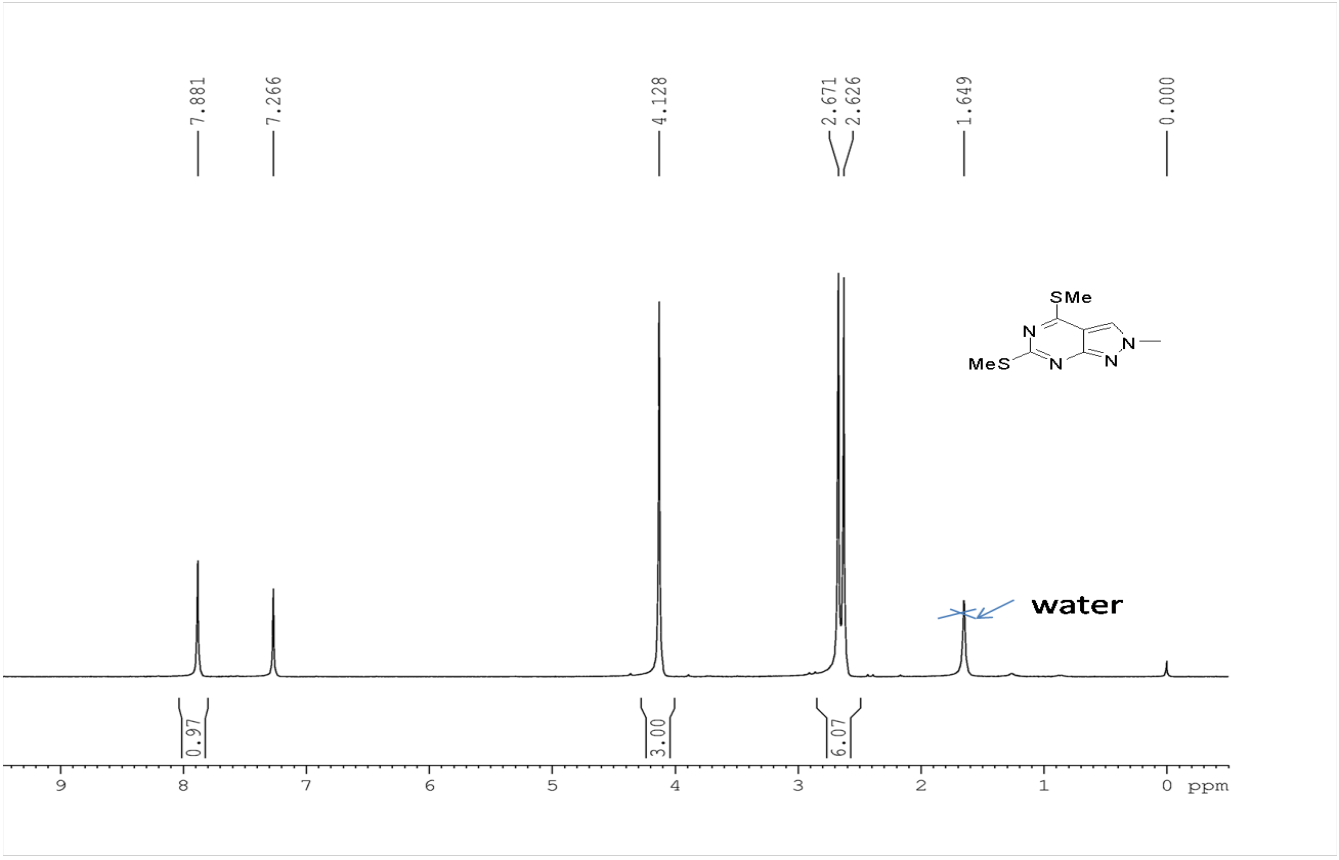


Figure S16: ^{1}H Spectra of compound **3g** and **7b** in $CDCl_3$

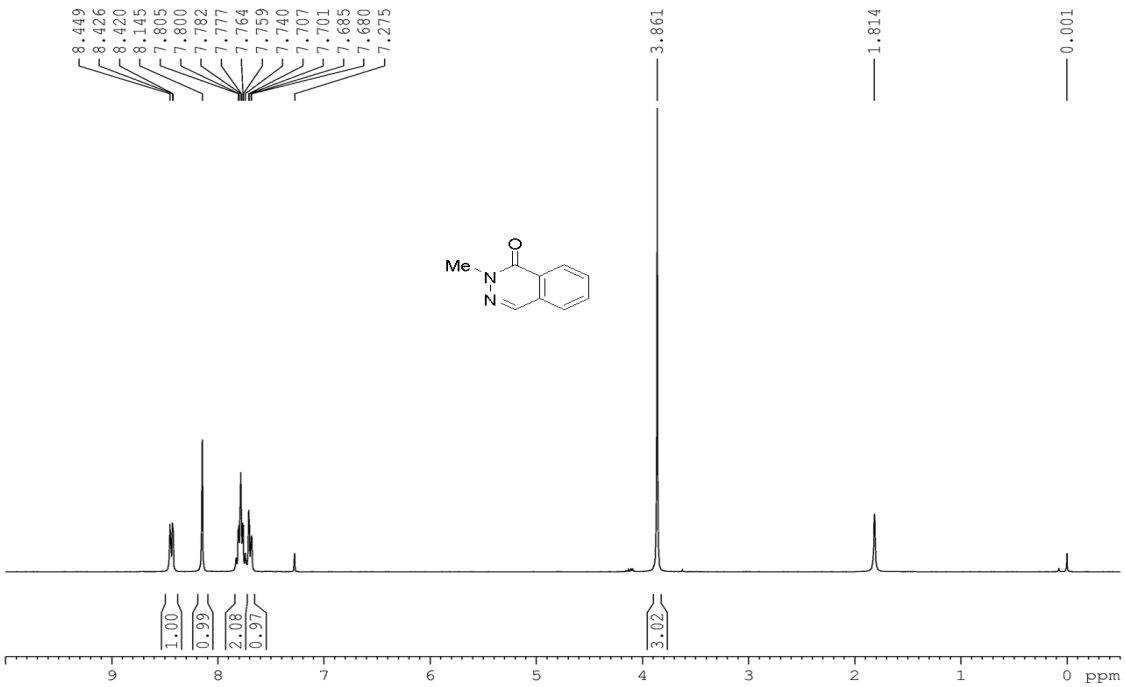


Figure S17: ^{1}H Spectra of compound **4d**in $CDCl_3$

Spectral data of **3-methylquinazolin-4(3*H*)-one*(4b):**

^{1}H NMR (400 MHz, CDCl3) δ 8.33 (dd, *J* = 8.0, 1.0 Hz, 1H), 8.10 (s, 1H), 7.80–7.70 (m, 2H), 7.52 (ddd, *J* = 8.2, 6.9, 1.6 Hz, 1H), 3.62 (s, 3H)

*** Literature data (**From supporting information of *J. Am. Chem. Soc*. **2009**, *131*, 15996).