Supporting Information

A Facile Metal-Free One-Pot Synthesis of 3-Aminoisoquinolines by Intramolecular Transannulation of 1-Sulfonyl-4-(2-aminomethylphenyl)-1,2,3-triazoles

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1. General Information

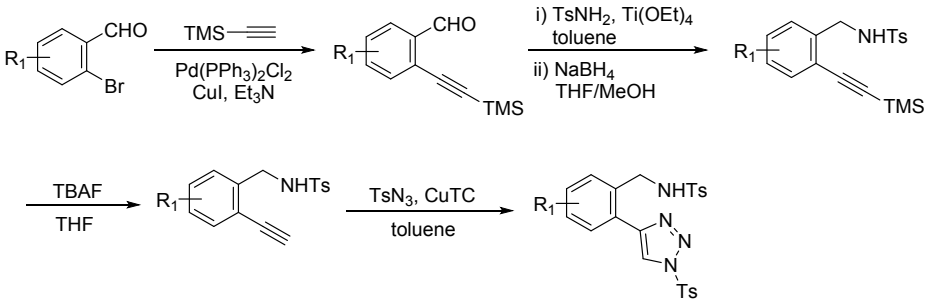
NMR spectra were recorded on Bruker AV III 600 NMR spectrometer and Bruker AV 400 instrument. Solvent signal was used as reference for 1H NMR ($CDCl_3$, 7.26 ppm; DMSO-d_6, 2.50 ppm) and ^{13}C NMR ($CDCl_3$, 77.16 ppm; DMSO-d_6, 39.52 ppm). The following abbreviations were used to explain the multiplicities: s = singlet, d = doublet, t = triplet, q = quartet, td = triple doublet, m = multiplet. Infrared (IR) spectra were recorded on a FTIR-8400S spectrometer. High-resolution mass spectra (HRMS) were recorded on a Waters SYNAPT G2 HDMS.

Reactions were monitored by Thin Layer Chromatography on plates (GF_{254}) supplied by Yantai Chemicals (China). If not specially mentioned, flash column chromatography uses silica gel (200–300 mesh) supplied by Tsingtao Haiyang Chemicals (China). Solvent purification was conducted according to Purification of Laboratory Chemicals (D. D. Peerrin, W. L. Armarego and D. R. Perrins, Pergamon Press, Oxford, 1980).

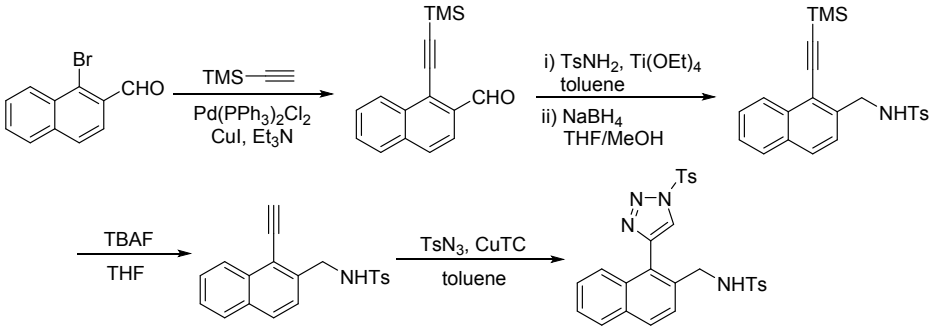
2. Procedure for the Preparation of Triazole Substrates

Procedure A: Triazoles **1a-k**, **1o** and **1p** were prepared referring to the literature procedures[1-3] as described below.

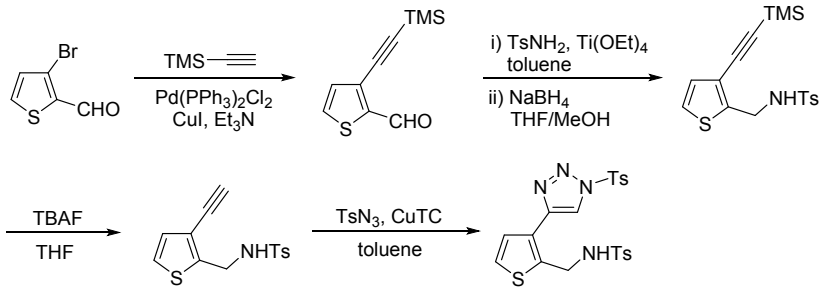
triazoles **a-k:**



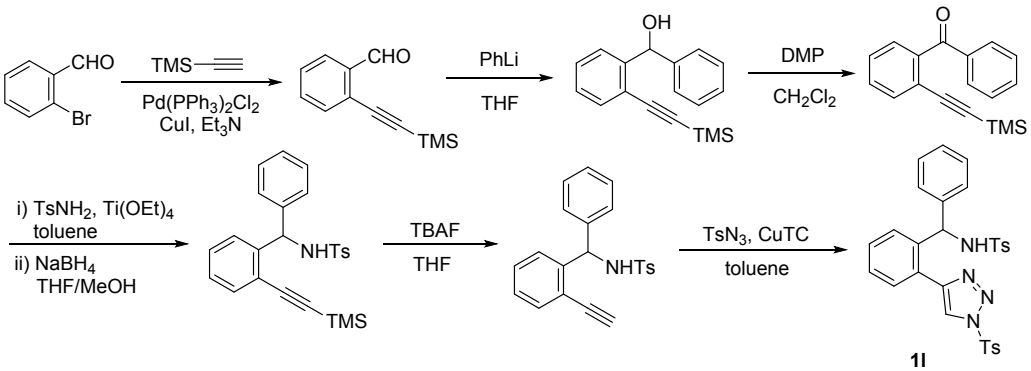
triazole **1o:**



triazole **1p:**



Procedure B: Triazole **1l** was prepared referring to the literature procedures[1-4] as described below.



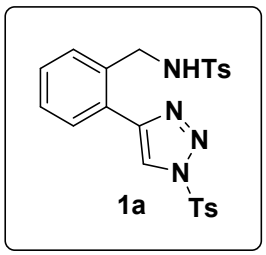
[1]. Ze. F. Xu, X. Yu, D. Yang, C. Y. Li, *Org. Biomol. Chem.*, 2017, **15**, 3161-3164.

[2]. M. Bandini, A. Gualandi, M. Monari, A. Romaniello, D. Savoia, M Tragni, *J. Organomet. Chem.* 2011, **696**, 337-347.

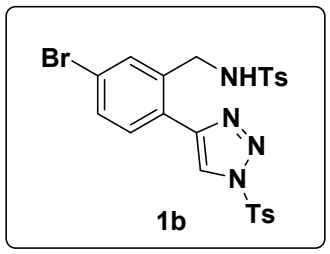
[3]. J. Raushel, V. V. Fokin, *Org. Lett.*, 2010, **12**, 4952-4955.

[4]. E. H. Ryu, H. K. Cho, Y. Zhao, *Org. Lett.*, 2007, **9**, 5147-5150.

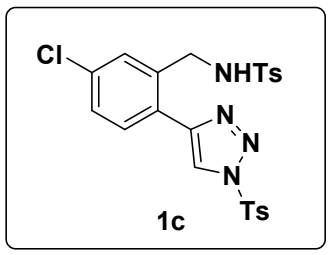
3. Analysis Data of Triazole Substrates



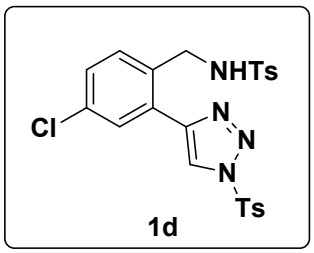
4-methyl-*N*-(2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)benzenesulfonamide (1a): Yield: 81%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.32 (s, 1H), 8.05 (d, J = 8.5 Hz, 2H), 7.65 (d, J = 8.3 Hz, 2H), 7.43 (d, J = 8.2 Hz, 2H), 7.41 (dd, J = 7.7 Hz, 1.3 Hz, 1H), 7.33 (dd, J = 7.2 Hz, 1.6 Hz, 1H), 7.30-7.24 (m, 2H), 7.17 (d, J = 8.0 Hz, 2H), 6.23 (t, J = 6.9 Hz, 1H), 4.10 (d, J = 6.9 Hz, 2H), 2.47 (s, 3H), 2.36 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 147.9, 146.8, 143.1, 137.4, 134.6, 132.6, 131.8, 130.7, 129.6, 129.5, 129.3, 128.9, 128.5, 128.0, 127.0, 121.3, 46.5, 22.0, 21.5; IR ν_{max} (KBr): 3256, 3158, 1593, 1387, 1321, 1194, 1095, 990 cm^{-1}; HRMS m/z calcd for $C_{23}H_{23}N_4O_4S_2$ $[M+H]^+$: 483.1161; found: 483.1161.



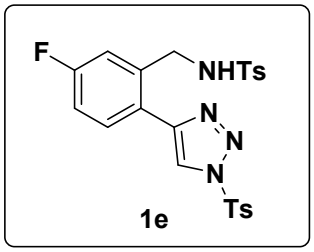
***N*-(5-bromo-2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)-4-methylbenzenesulfonamide (1b)**: Yield: 56%; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.33 (s, 1H), 8.08 (d, J = 8.4 Hz, 2H), 7.64 (d, J = 8.3 Hz, 2H), 7.47 (d, J = 8.2 Hz, 2H), 7.43-7.37 (m, 2H), 7.28 (d, J = 1.1 Hz, 1H), 7.19 (d, J = 8.0 Hz, 2H), 6.27 (t, J = 6.9 Hz, 1H), 4.13 (d, J = 6.9 Hz, 2H), 2.51 (s, 3H), 2.39 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.1, 146.0, 143.3, 137.6, 136.6, 134.7, 132.5, 131.5, 130.8, 130.6, 129.6, 129.1, 127.1, 126.9, 123.5, 121.3, 46.1, 22.1, 21.6; IR ν_{max} (KBr): 2957, 2852, 1729, 1595, 1399, 1159, 1091, 1007 cm^{-1}; HRMS m/z calcd for $C_{23}H_{22}BrN_4O_4S_2$ $[M+H]^+$: 561.0266; found: 561.0266.



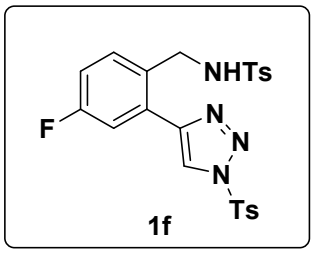
***N*-(5-chloro-2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)-4-methylbenzenesulfonamide (1c):** Yield: 81%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.29 (s, 1H), 8.06 (d, J = 8.3 Hz, 2H), 7.63 (d, J = 8.1 Hz, 2H), 7.45 (d, J = 8.3 Hz, 2H), 7.32 (d, J = 8.9 Hz, 1H), 7.25-7.22 (m, 2H), 7.17 (d, J = 8.1 Hz, 2H), 6.21 (t, J = 6.9 Hz, 1H), 4.11 (d, J = 6.9 Hz, 2H), 2.48 (s, 3H), 2.37 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 148.1, 146.0, 143.3, 137.6, 136.5, 135.3, 132.6, 131.9, 130.8, 130.5, 129.6, 129.1, 128.6, 127.1, 126.5, 121.3, 46.2, 22.1, 21.6; IR ν_{max} (KBr): 3287, 2920, 2849, 1594, 1396, 1333, 1155, 1094, 986 cm^{-1}; HRMS m/z calcd for $C_{23}H_{22}ClN_4O_4S_2$ $[M+H]^+$: 517.0771; found: 517.0777.



***N*-(4-chloro-2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)-4-methylbenzenesulfonamide (1d)**: Yield: 77%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.32 (s, 1H), 8.06 (d, J = 8.4 Hz, 2H), 7.63 (d, J = 8.2 Hz, 2H), 7.45 (d, J = 8.2 Hz, 2H), 7.39 (d, J = 2.1 Hz, 1H), 7.29 (d, J = 8.2 Hz, 1H), 7.23 (dd, J = 8.2 Hz, 2.1 Hz, 1H), 7.18 (d, J = 8.0 Hz, 2H), 6.13 (t, J = 6.9 Hz, 1H), 4.11 (d, J = 6.9 Hz, 2H), 2.48 (s, 3H), 2.38 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 148.1, 145.6, 143.3, 137.6, 134.3, 133.4, 133.4, 132.6, 130.8, 129.6, 129.5, 129.1, 129.0, 127.1, 121.5, 46.0, 22.1, 21.6; IR ν_{max} (KBr): 3315, 3166, 1594, 1394, 1335, 1157, 1092, 997 cm^{-1}; HRMS m/z calcd for $C_{23}H_{22}ClN_4O_4S_2$ $[M+H]^+$: 517.0771; found: 517.0776.

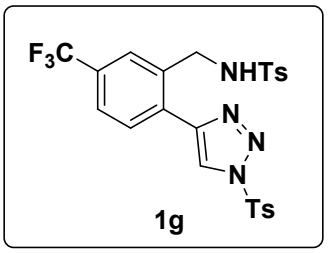


***N*-(5-fluoro-2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)-4-methylbenzenesulfonamide (1e)**: Yield: 72%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.26 (s, 1H), 8.05 (d, J = 8.5 Hz, 2H), 7.65 (d, J = 8.3 Hz, 2H), 7.44 (d, J = 8.2 Hz, 2H), 7.37 (dd, J = 8.6 Hz, 5.5 Hz, 1H), 7.19 (d, J = 8.0 Hz, 2H), 7.04 (dd, J = 9.1 Hz, 2.6 Hz, 1H), 6.98 (td, J = 8.2 Hz, 2.7 Hz, 1H), 6.17 (t, J = 6.9 Hz, 1H), 4.10 (d, J = 6.9 Hz, 2H), 2.48 (s, 3H), 2.38 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 162.9 (d, J = 251.0 Hz), 148.0, 146.1, 143.3, 137.6, 137.5 (d, J = 7.6 Hz), 132.7, 131.2 (d, J = 8.6 Hz), 130.8, 129.7, 129.1, 127.1, 124.2 (d, J = 3.2 Hz), 121.1, 118.7 (d, J = 22.0 Hz), 115.6 (d, J = 21.3 Hz), 46.2, 22.1, 21.6; IR ν_{max} (KBr): 3355, 3148, 2920, 1596, 1487, 1398, 1332, 1156, 1094, 989 cm^{-1}; HRMS m/z calcd for $C_{23}H_{22}FN_4O_4S_2$ $[M+H]^+$: 501.1066; found: 501.10670.

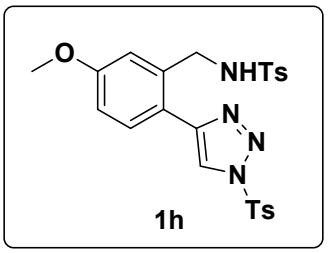


***N*-(4-fluoro-2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)-4-methylbenzenesulfonamide (1f)**: Yield: 69%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.32 (s, 1H), 8.06 (d, J = 8.3 Hz, 2H), 7.65 (d, J = 8.1 Hz, 2H), 7.45 (d, J = 8.3 Hz, 2H), 7.33 (dd, J = 8.4 Hz, 5.7 Hz, 1H), 7.20 (d, J = 8.0 Hz, 2H), 7.13 (dd, J = 9.1 Hz, 2.6 Hz, 1H), 6.97 (td, J = 8.2 Hz, 2.6 Hz, 1H), 6.08 (t, J = 6.9 Hz, 1H), 4.11 (d, J = 6.9 Hz, 2H), 2.48 (s, 3H), 2.38 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 162.3 (d, J = 248.4 Hz), 148.1, 145.9 (d, J = 2.0 Hz), 143.3, 137.6, 134.0 (d, J = 8.3 Hz), 132.6, 130.9, 130.8, 130.0 (d, J = 8.4 Hz), 129.7, 129.1, 127.1, 121.6, 116.4 (d, J = 20.9 Hz), 115.9 (d, J = 23.1 Hz), 45.9, 22.1, 21.6; IR ν_{max} (KBr): 3249, 3134, 1592, 1500, 1394, 1194, 1159, 1001, 811 cm^{-1}; HRMS m/z calcd for $C_{23}H_{22}FN_4O_4S_2$ $[M+H]^+$: 501.1066;

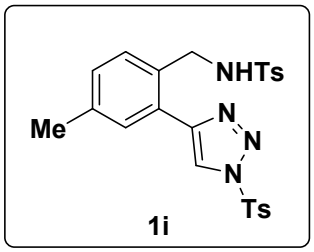
found: 501.1068.



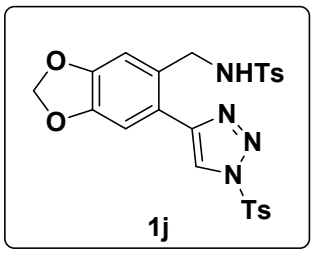
4-methyl-*N*-(2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)-5-(trifluoromethyl)benzyl)benzenesulfonamide (1g): Yield:53%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.39 (s, 1H), 8.08 (d, J = 8.4 Hz, 2H), 7.61 (d, J = 8.2 Hz, 2H), 7.55-7.50 (m, 2H), 7.49 (s, 1H), 7.46 (d, J = 8.2 Hz, 2H), 7.15 (d, J = 8.1 Hz, 2H), 6.23 (t, J = 6.9 Hz, 1H), 4.23 (d, J = 6.9 Hz, 2H), 2.49 (s, 3H), 2.35 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 148.2, 145.6, 143.4, 137.6, 135.6, 132.5, 131.6, 131.3 (q, J = 32.9 Hz), 130.9, 129.7, 129.6, 129.2, 128.7 (q, J = 3.4 Hz), 127.0, 125.3 (q, J = 3.4 Hz), 123.5 (q, J = 272.6 Hz), 122.0, 46.3, 22.1, 21.5; IR ν_{max} (KBr): 3281, 2924, 1595, 1395, 1325, 1170, 1155, 996 cm^{-1}; HRMS m/z calcd for $C_{24}H_{22}F_3N_4O_4S_2$ $[M+H]^+$: 551.1035; found: 551.1039.



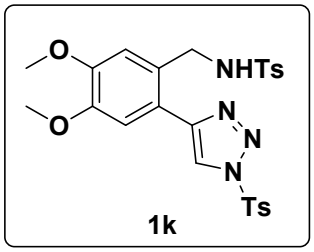
***N*-(5-methoxy-2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)-4-methylbenzenesulfonamide (1h)**: Yield: 93%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.20 (s, 1H), 8.04 (d, J = 8.4 Hz, 2H), 7.65 (d, J = 8.2 Hz, 2H), 7.43 (d, J = 8.3 Hz, 2H), 7.30 (d, J = 8.5 Hz, 1H), 7.17 (d, J = 8.1 Hz, 2H), 6.82 (d, J = 2.6 Hz, 1H), 6.80 (dd, J = 8.5 Hz, 2.6 Hz, 1H), 6.26 (t, J = 6.8 Hz, 1H), 4.08 (d, J = 6.8 Hz, 2H), 3.77 (s, 3H), 2.47 (s, 3H), 2.36 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 160.3, 147.8, 146.9, 143.1, 137.7, 136.3, 132.8, 130.7, 130.7, 129.6, 129.0, 127.1, 120.4, 120.4, 116.6, 114.4, 55.5, 46.8, 22.0, 21.6; IR ν_{max} (KBr): 3274, 2921, 1615, 1495, 1397, 1196, 1159, 977 cm^{-1}; HRMS m/z calcd for $C_{24}H_{25}N_4O_5S_2$ $[M+H]^+$: 513.1266; found: 513.1271.



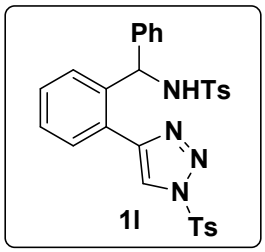
4-methyl-*N*-(4-methyl-2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)benzenesulfonamide (1i): Yield: 98%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.29 (s, 1H), 8.05 (d, J = 8.4 Hz, 2H), 7.66 (d, J = 8.2 Hz, 2H), 7.43 (d, J = 8.2 Hz, 2H), 7.24-7.20 (m, 2H), 7.18 (d, J = 8.0 Hz, 2H), 7.08 (d, J = 7.7 Hz, 1H), 6.12 (t, J = 6.7 Hz, 1H), 4.06 (d, J = 6.7 Hz, 2H), 2.48 (s, 3H), 2.38 (s, 3H), 2.32 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 147.9, 147.0, 143.0, 138.5, 137.6, 132.8, 131.9, 131.8, 130.7, 130.4, 129.9, 129.6, 129.0, 127.9, 127.1, 121.1, 46.3, 22.0, 21.6, 21.1; IR ν_{max} (KBr): 3146, 2923, 1596, 1328, 1161, 1093, 1009, 814 cm^{-1}; HRMS m/z calcd for $C_{24}H_{25}N_4O_4S_2$ $[M+H]^+$: 497.1317; found: 497.1322.



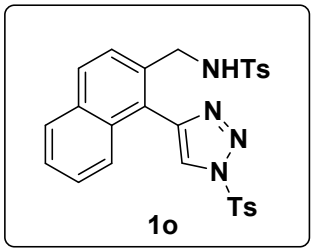
4-methyl-*N*-((6-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzo[d][1,3]dioxol-5-yl)methyl)benzenesulfonamide (1j): Yield: 93%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.19 (s, 1H), 8.05 (d, J = 8.4 Hz, 2H), 7.68 (d, J = 8.2 Hz, 2H), 7.44 (d, J = 8.3 Hz, 2H), 7.21 (d, J = 8.1 Hz, 2H), 6.82 (s, 1H), 6.79 (s, 1H), 6.08 (t, J = 6.8 Hz, 1H), 5.97 (s, 2H), 3.98 (d, J = 6.8 Hz, 2H), 2.48 (s, 3H), 2.39 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 148.6, 147.9, 147.8, 146.8 143.1, 137.7, 132.8, 130.8, 129.6, 129.5, 129.1, 127.2, 121.7, 120.7, 111.9, 109.0, 101.9, 46.4, 22.1, 21.6; IR ν_{max} (KBr): 3268, 3171, 1595, 1506, 1391, 1158, 1031, 985 cm^{-1}; HRMS m/z calcd for $C_{24}H_{23}N_4O_6S_2$ $[M+H]^+$: 527.1059; found: 527.1055.



***N*-(4,5-dimethoxy-2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)benzyl)-4-methylbenzenesulfonamide (1k)**: Yield: 85%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.25 (s, 1H), 8.06 (d, J = 8.4 Hz, 2H), 7.67 (d, J = 8.2 Hz, 2H), 7.43 (d, J = 8.2 Hz, 2H), 7.19 (d, J = 8.0 Hz, 2H), 6.86 (s, 1H), 6.77 (s, 1H), 6.08 (t, J = 6.8 Hz, 1H), 4.04 (d, J = 6.8 Hz, 2H), 3.86 (s, 3H), 3.83 (s, 3H), 2.48 (s, 3H), 2.37 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 149.6, 148.8, 147.9, 146.7, 143.2, 137.6, 132.8, 130.7, 129.6, 129.0, 127.7, 127.1, 120.6, 120.5, 114.4, 112.0, 56.3, 56.1, 46.4, 22.1, 21.6; IR ν_{max} (KBr): 3341, 3156, 1593, 1501, 1461, 1332, 1156, 2083, 973 cm^{-1}; HRMS m/z calcd for $C_{25}H_{27}N_4O_6S_2$ $[M+H]^+$: 543.1372; found: 543.1378.

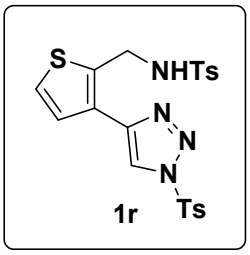


4-methyl-*N*-(phenyl(2-(1-tosyl-1*H*-1,2,3-triazol-4-yl)phenyl)methyl)benzenesulfonamide (1l): Yield: 82%; ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.92 (d, J = 8.5 Hz, 2H), 7.72 (s, 1H), 7.52 (d, J = 8.2 Hz, 2H), 7.42 (d, J = 8.1 Hz, 2H), 7.30-7.27 (m, 1H), 7.26-7.21 (m, 3H), 7.05 (d, J = 8.0 Hz, 2H), 6.93-6.82 (m, 5H), 6.71 (d, J = 8.8 Hz, 1H), 5.90 (d, J = 9.0 Hz, 1H), 2.49 (s, 3H), 2.33 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 147.6, 146.7, 143.0, 140.1, 134.0, 138.0, 132.8, 131.0, 130.7, 130.6, 129.5, 129.3, 128.9, 128.0, 127.8, 127.6, 127.0, 126.9, 126.4, 121.3, 59.8, 22.0, 21.6; IR ν_{max} (KBr): 3274, 3134, 1593, 1449, 1396, 1318, 1195, 1165, 1095, 983 cm^{-1}; HRMS m/z calcd for $C_{29}H_{27}N_4O_4S_2$ $[M+H]^+$: 559.1474; found: 559.1476.



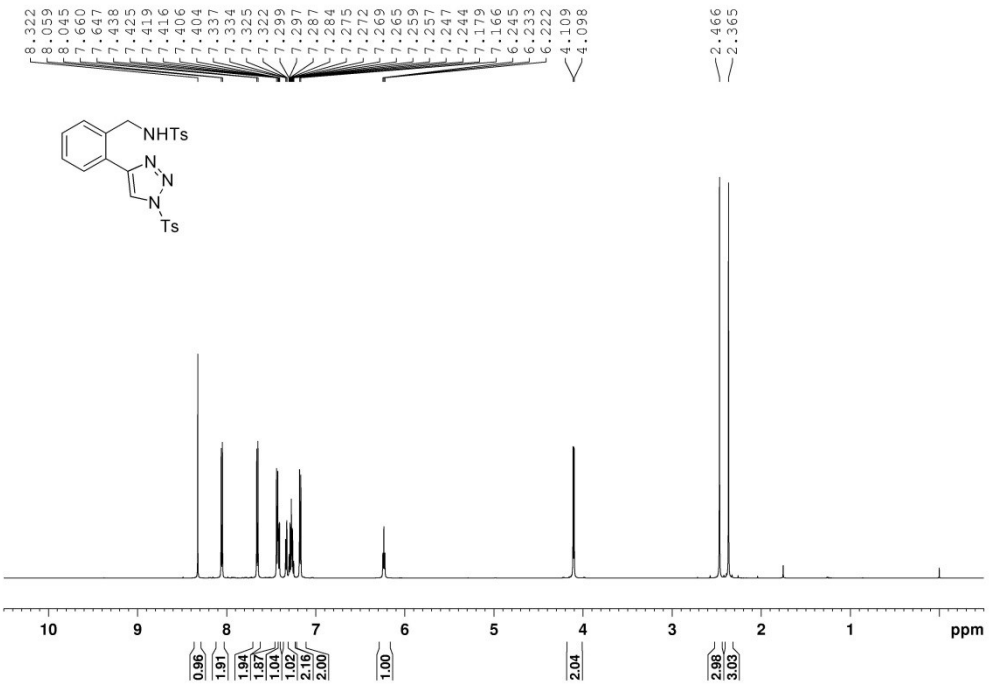
4-methyl-*N*-((1-(1-tosyl-1*H*-1,2,3-triazol-4-yl)naphthalen-2-yl)methyl)benzenesulfonamide (1o): Yield: 90%; ^{1}H NMR (400

MHz, $CDCl_3$) δ 8.29 (s, 1H), 8.11 (d, J = 8.4 Hz, 2H), 7.86-7.79 (m, 2H), 7.63 (d, J = 8.3 Hz, 2H), 7.52-7.40 (m, 6H), 7.16 (d, J = 8.1 Hz, 2H), 5.62 (t, J = 6.6 Hz, 1H), 3.90 (d, J = 6.6 Hz, 2H), 2.50 (s, 3H), 2.36 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 147.9, 143.4, 142.9, 137.0, 134.4, 133.1, 132.8, 132.2, 130.8, 130.3, 129.7, 129.1, 128.5, 127.8, 127.3, 127.1, 126.5, 125.5, 124.9, 123.8, 46.4, 22.1, 21.6; IR ν_{max} (KBr): 3137, 1594, 1399, 1319, 1198, 1153, 1091, 1025, 995 cm^{-1}; HRMS m/z calcd for $C_{27}H_{25}N_4O_4S_2$ $[M+H]^+$: 533.1317; found: 533.1321.

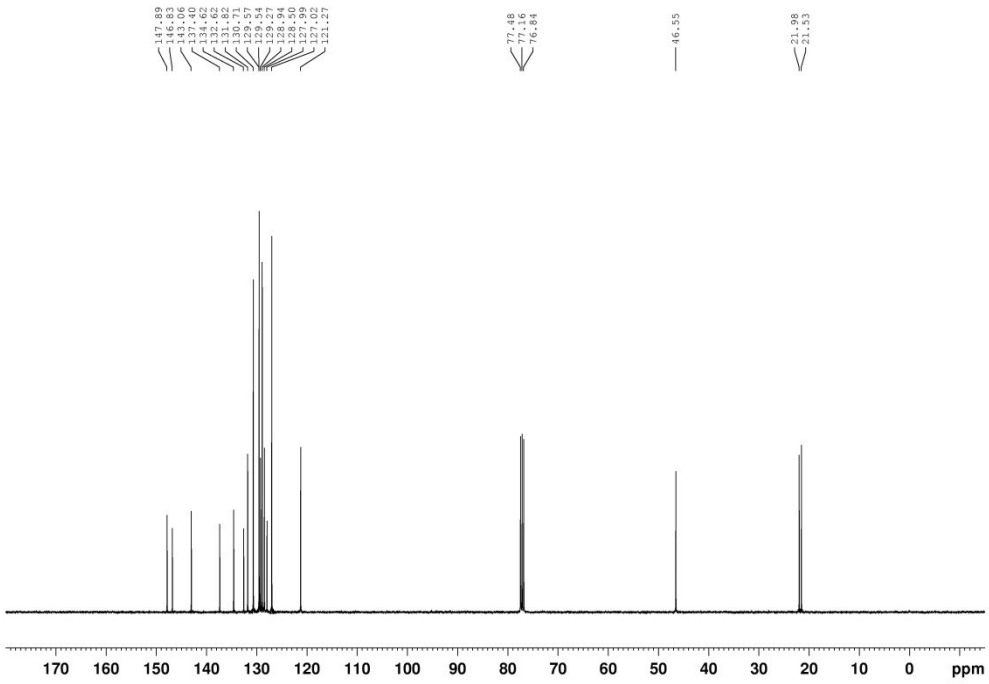


4-methyl-*N*-((3-(1-tosyl-1*H*-1,2,3-triazol-4-yl)thiophen-2-yl)methyl)benzenesulfonamide (1r): Yield: 84%; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.20 (s, 1H), 8.04 (d, J = 8.4 Hz, 2H), 7.66 (d, J = 8.3 Hz, 2H), 7.44 (d, J = 8.2 Hz, 2H), 7.20-7.15 (m, 3H), 7.07 (d, J = 5.3 Hz, 1H), 6.19 (t, J = 6.8 Hz, 1H), 4.41 (d, J = 6.8 Hz, 2H), 2.48 (s, 3H), 2.38 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 147.9, 143.3, 143.2, 137.6, 136.6, 132.9, 130.8, 129.6, 129.0, 127.1, 127.1, 127.0, 125.3, 119.8, 40.7, 22.1, 21.6; IR ν_{max} (KBr): 3231, 1928, 1595, 1431, 1392, 1194, 1091, 987 cm^{-1}; HRMS m/z calcd for $C_{21}H_{21}N_4O_4S_3$ $[M+H]^+$: 489.0725; found: 489.0728.

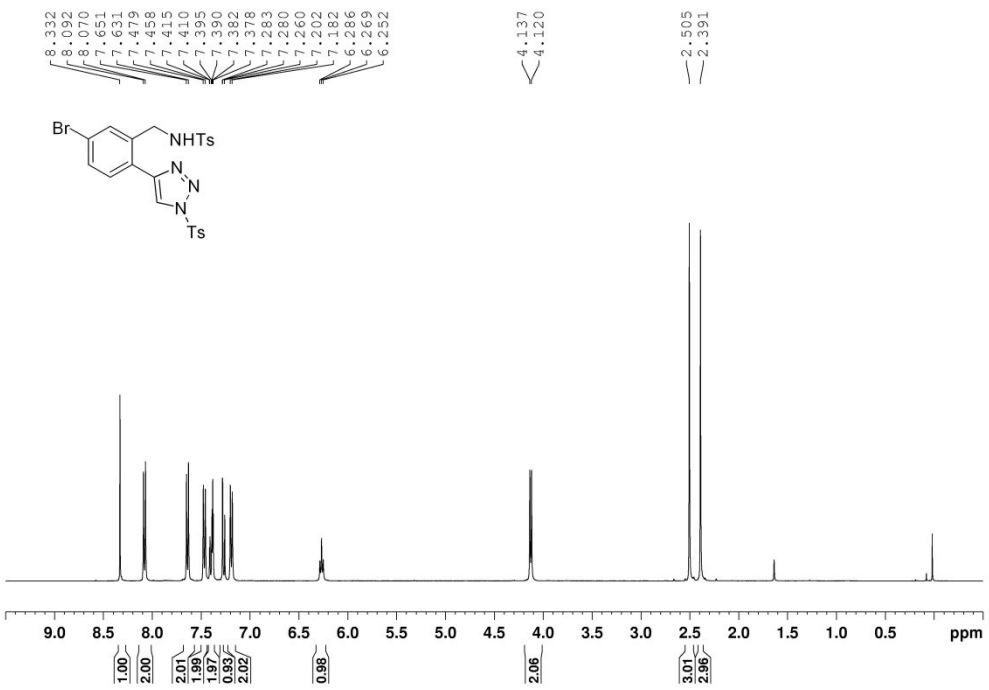
4. NMR spectrum



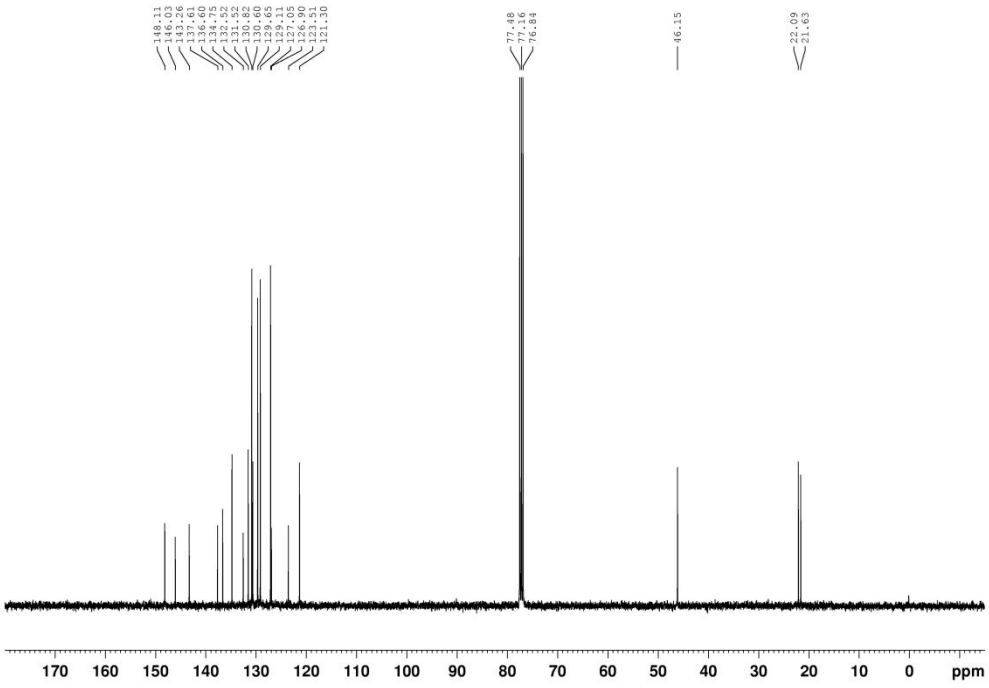
^{1}H NMR Spectrum for **1a** ($CDCl_3$, 600 MHz)



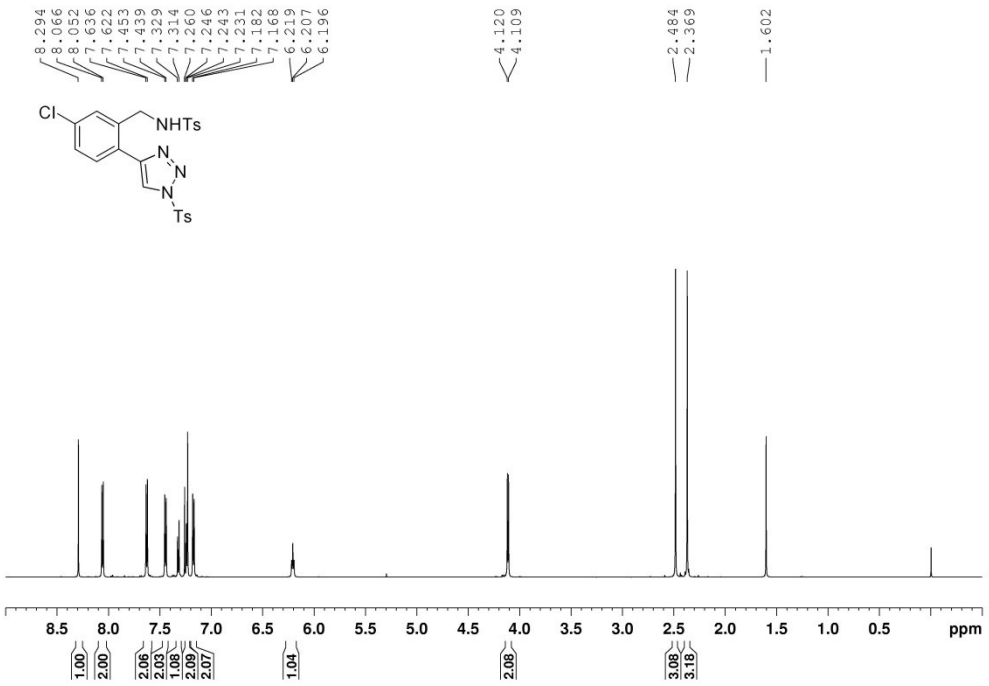
^{13}C NMR Spectrum for **1a** ($CDCl_3$, 100 MHz)



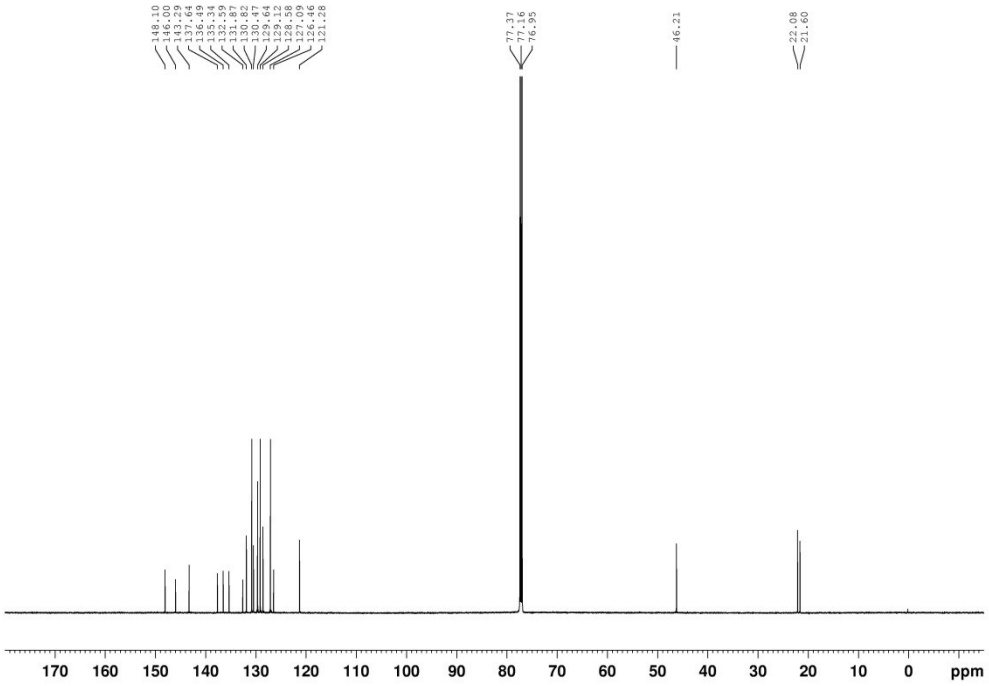
^{1}H NMR Spectrum for **1b** ($CDCl_3$, 400 MHz)



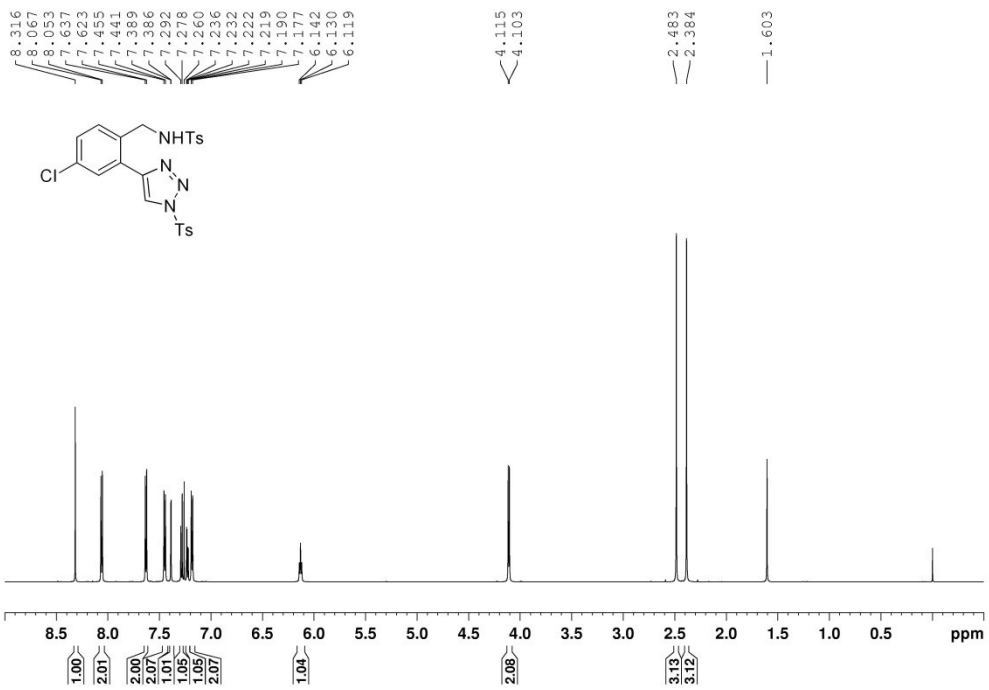
^{13}C NMR Spectrum for **1b** ($CDCl_3$, 100 MHz)



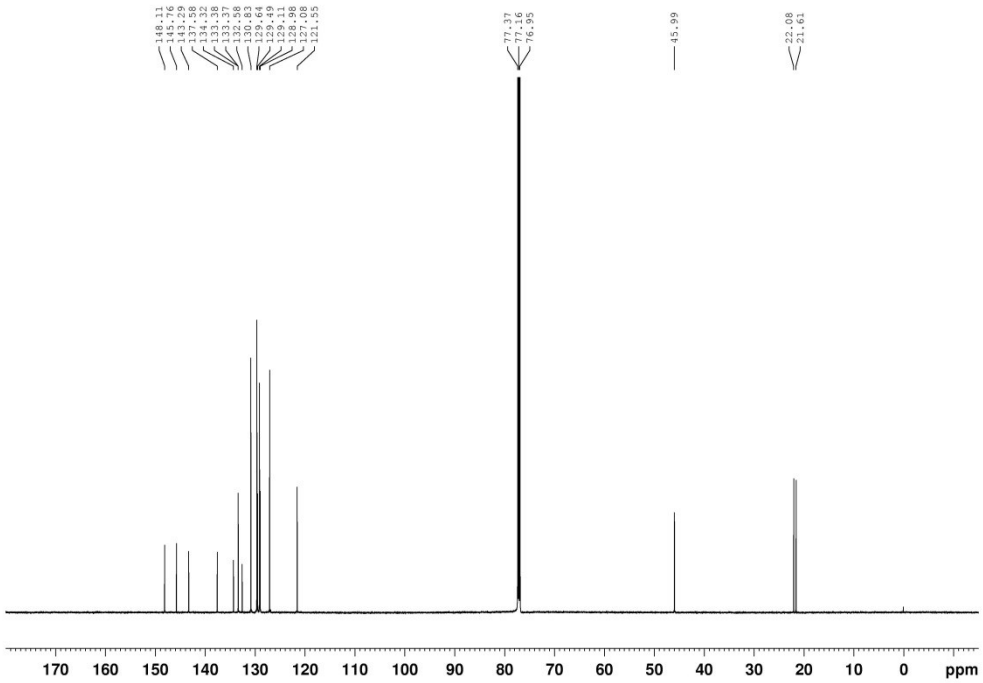
^{1}H NMR Spectrum for **1c** ($CDCl_3$, 600 MHz)



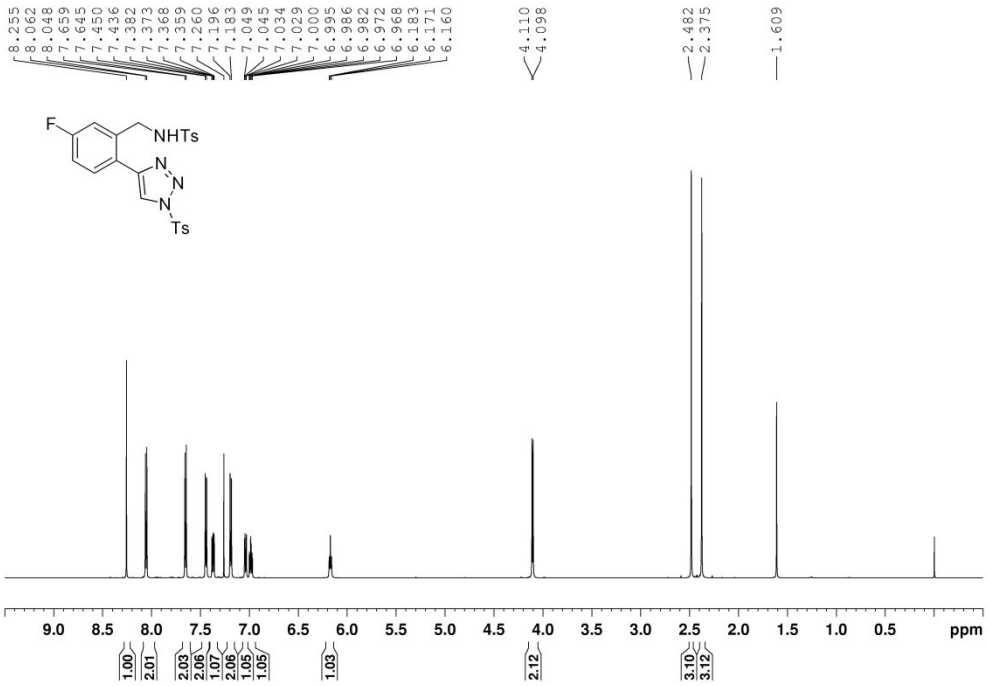
^{13}C NMR Spectrum for **1c** ($CDCl_3$, 150 MHz)



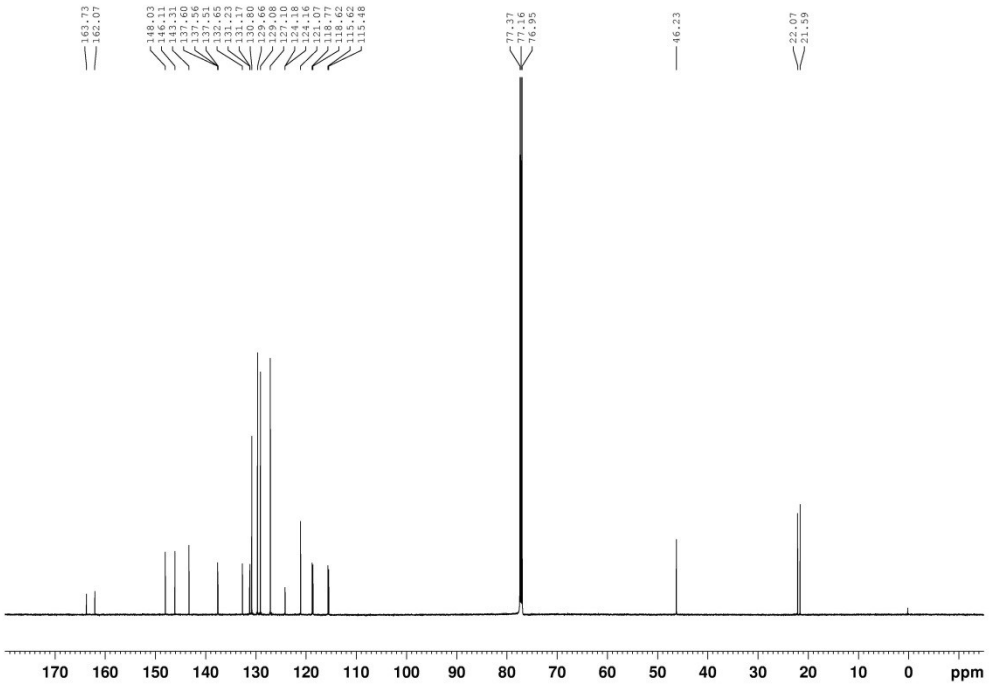
^{1}H NMR Spectrum for **1d** ($CDCl_3$, 600 MHz)



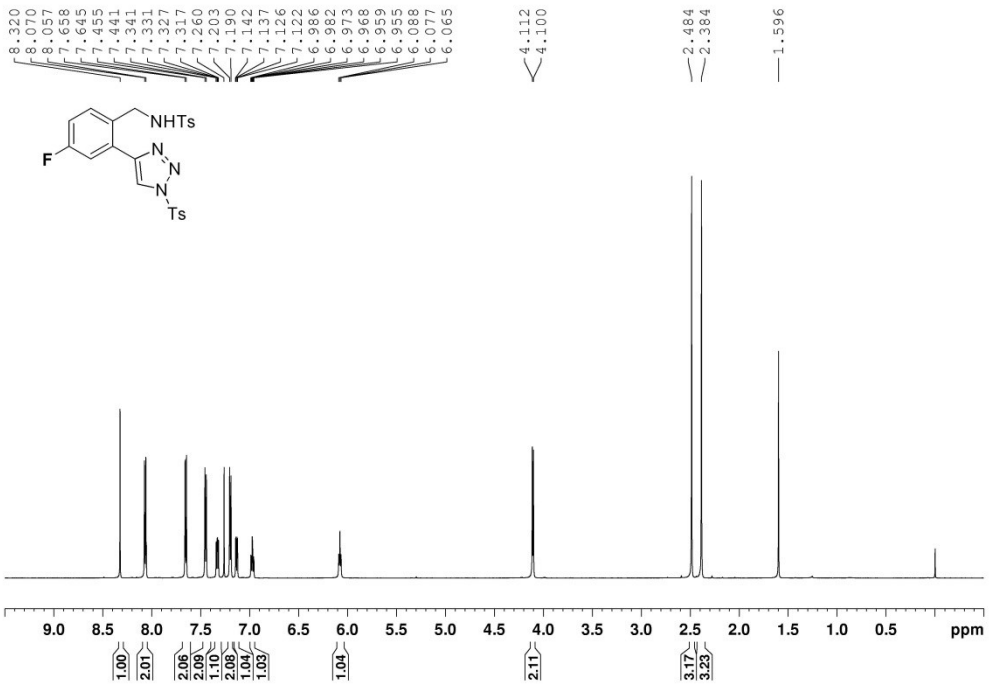
^{13}C NMR Spectrum for **1d** ($CDCl_3$, 150 MHz)



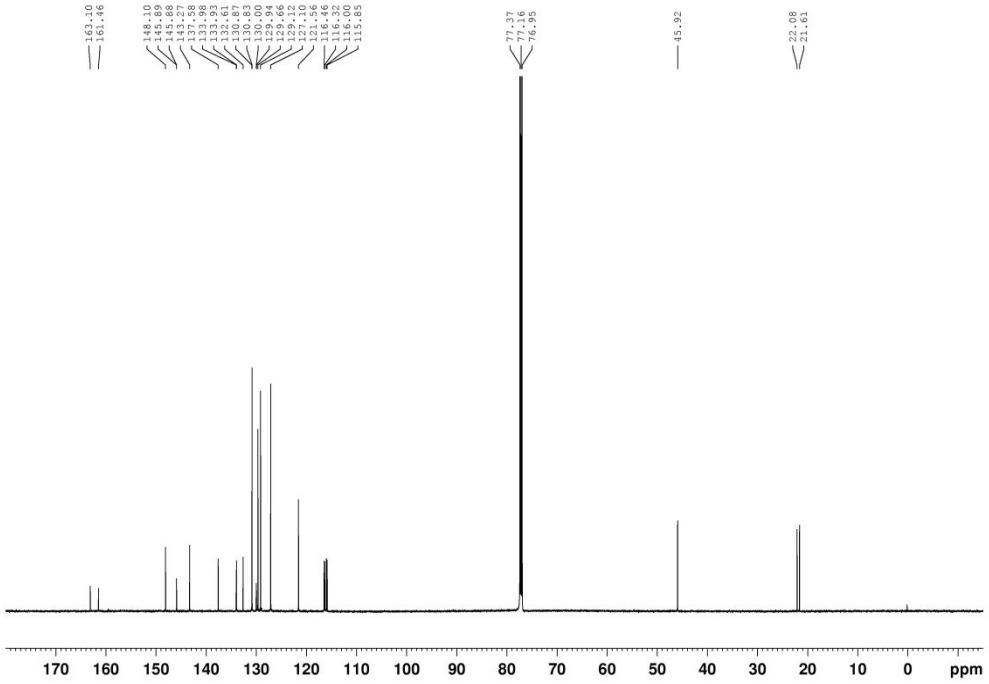
^{1}H NMR Spectrum for **1e** ($CDCl_3$, 600 MHz)



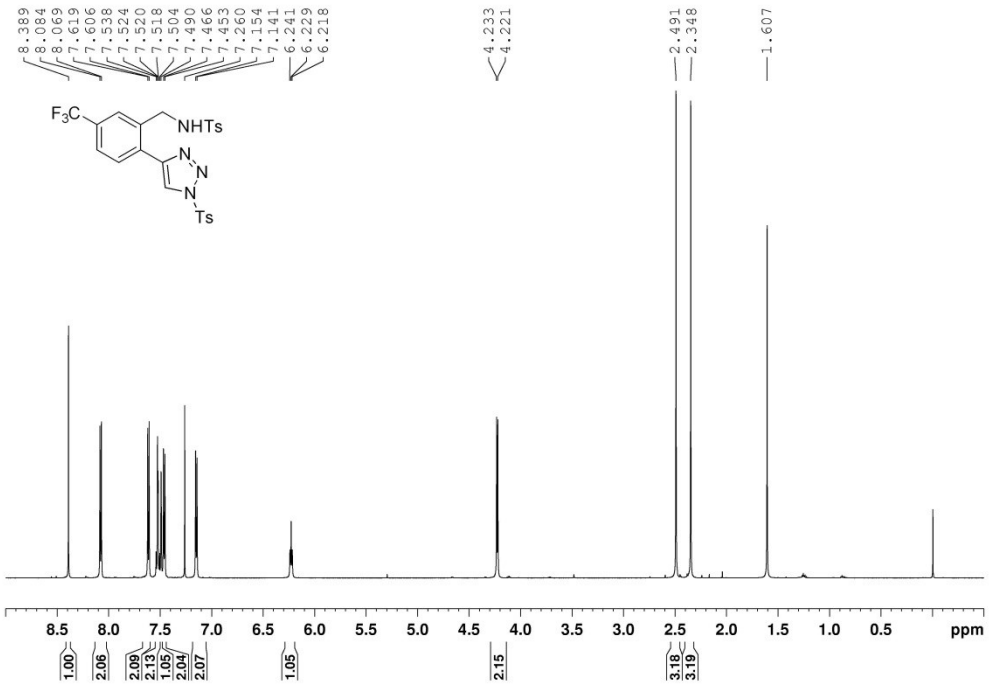
^{13}C NMR Spectrum for **1e** ($CDCl_3$, 150 MHz)



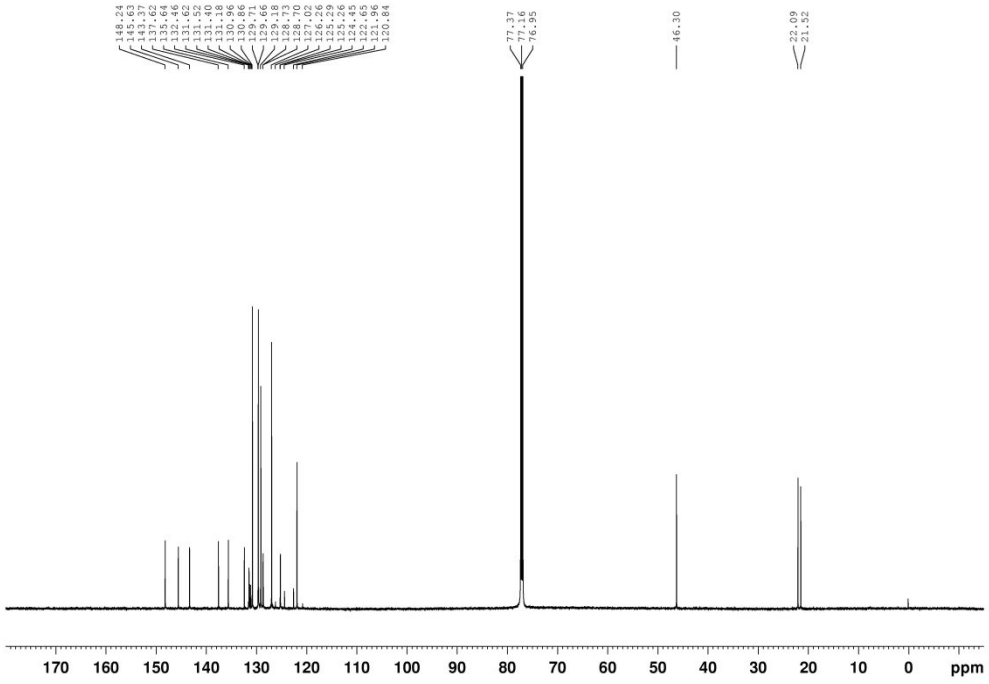
^{1}H NMR Spectrum for **1f** ($CDCl_3$, 600 MHz)



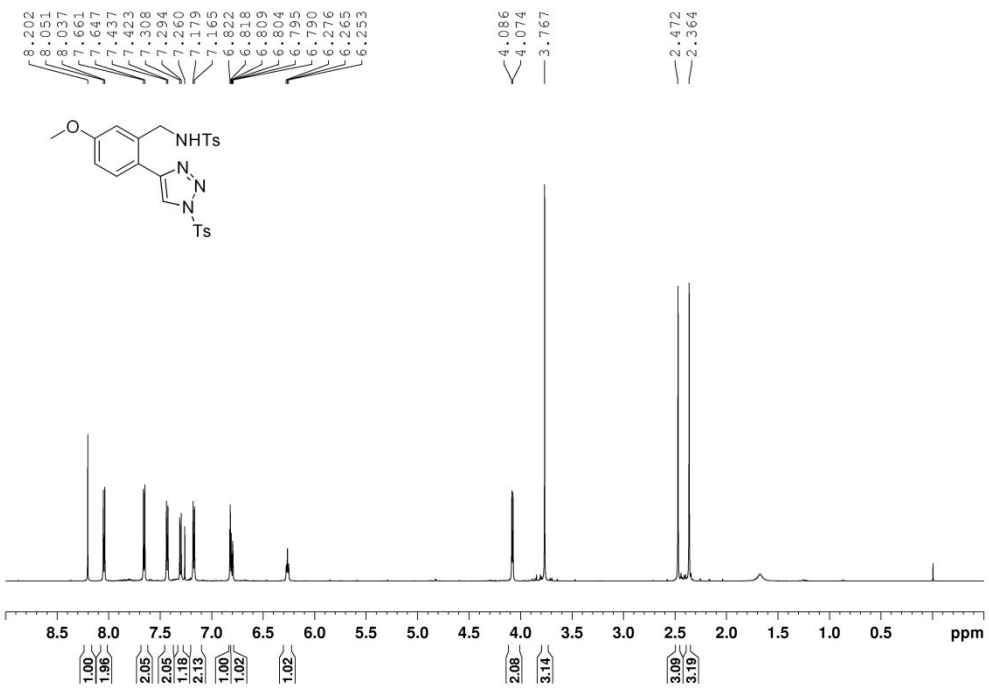
^{13}C NMR Spectrum for **1f** ($CDCl_3$, 150 MHz)



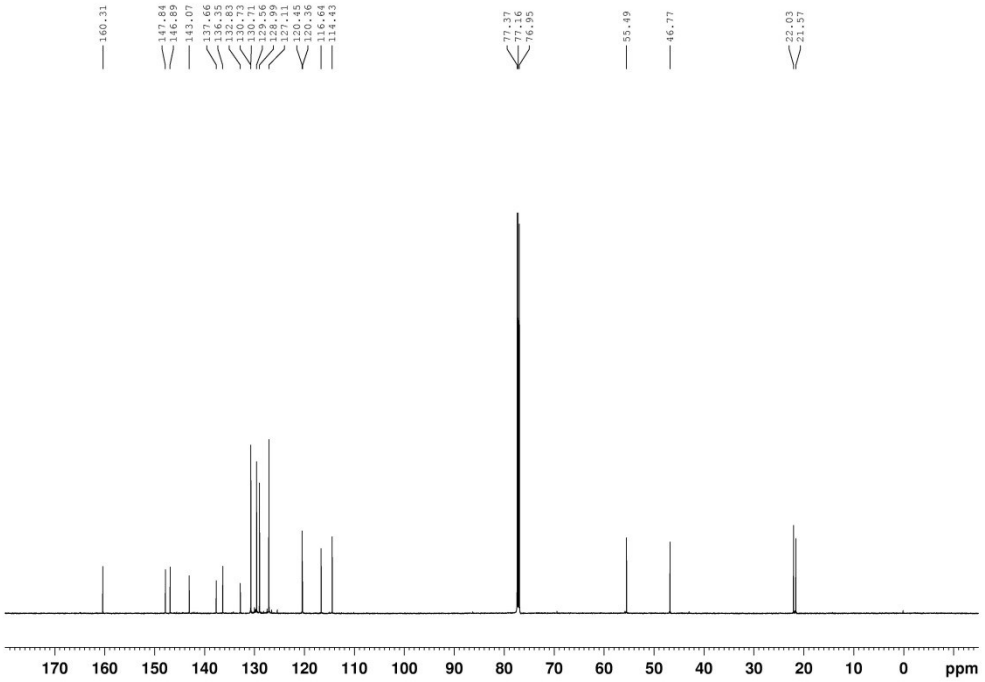
^{1}H NMR Spectrum for **1g** ($CDCl_3$, 600 MHz)



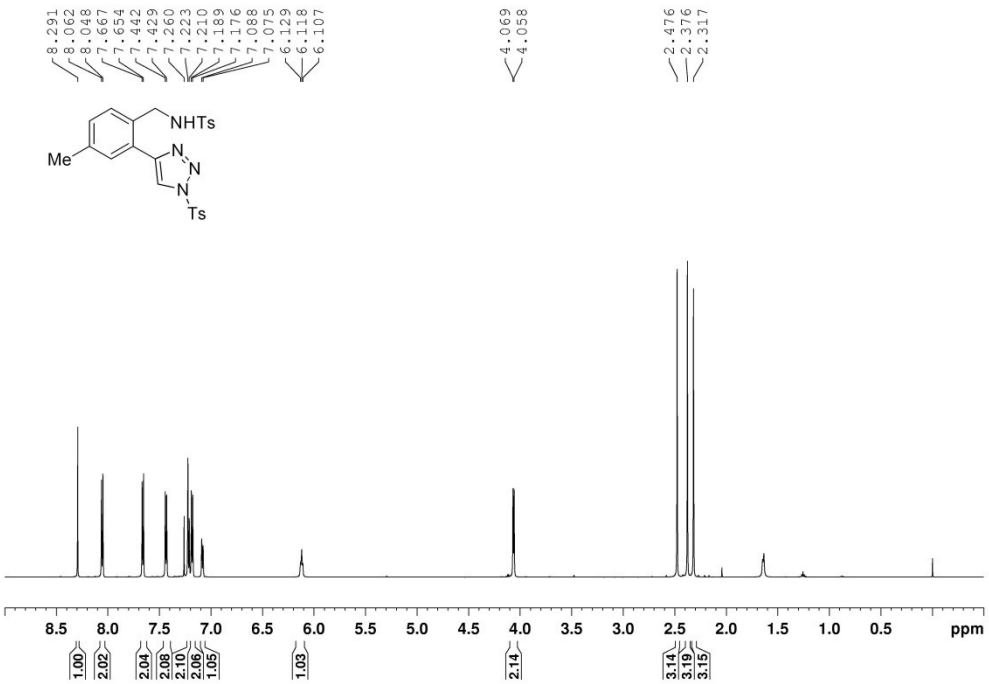
^{13}C NMR Spectrum for **1g** ($CDCl_3$, 150 MHz)



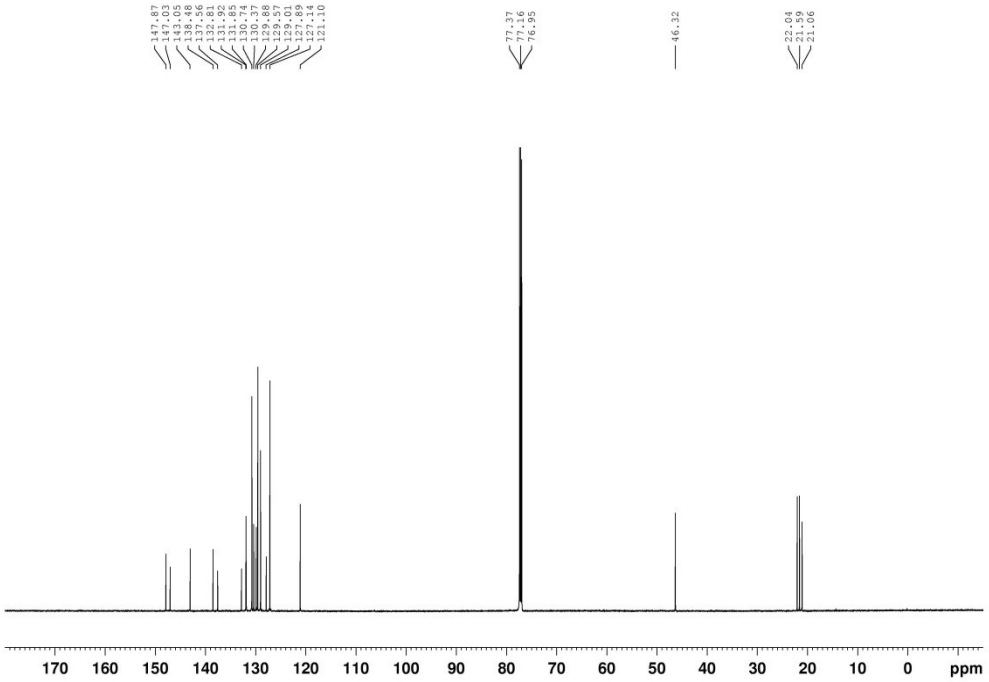
^{1}H NMR Spectrum for **1h** ($CDCl_3$, 600 MHz)



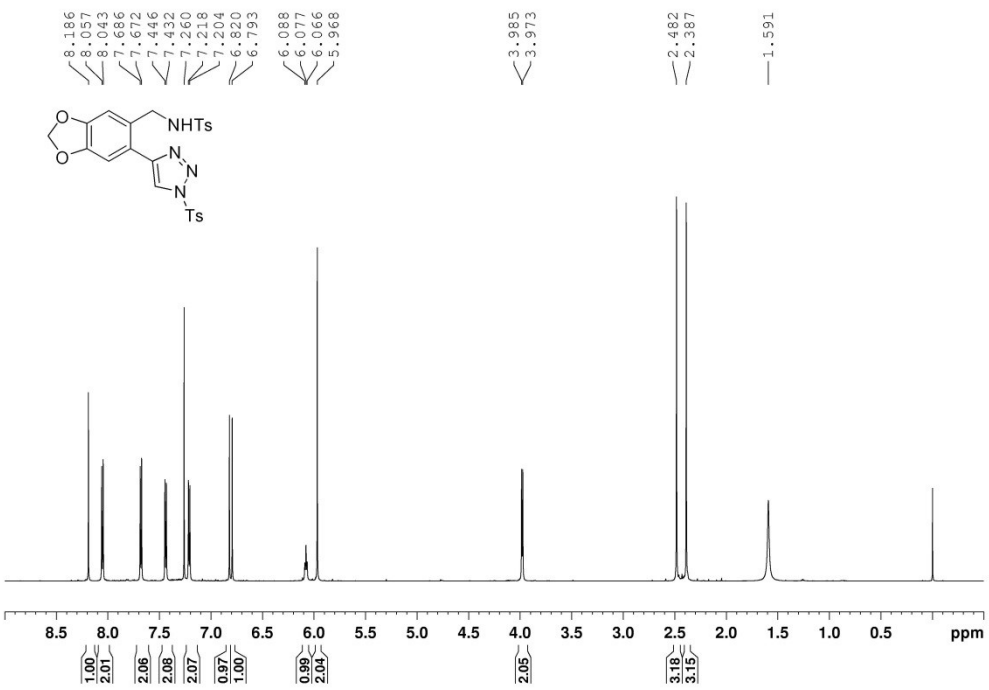
^{13}C NMR Spectrum for **1h** ($CDCl_3$, 150 MHz)



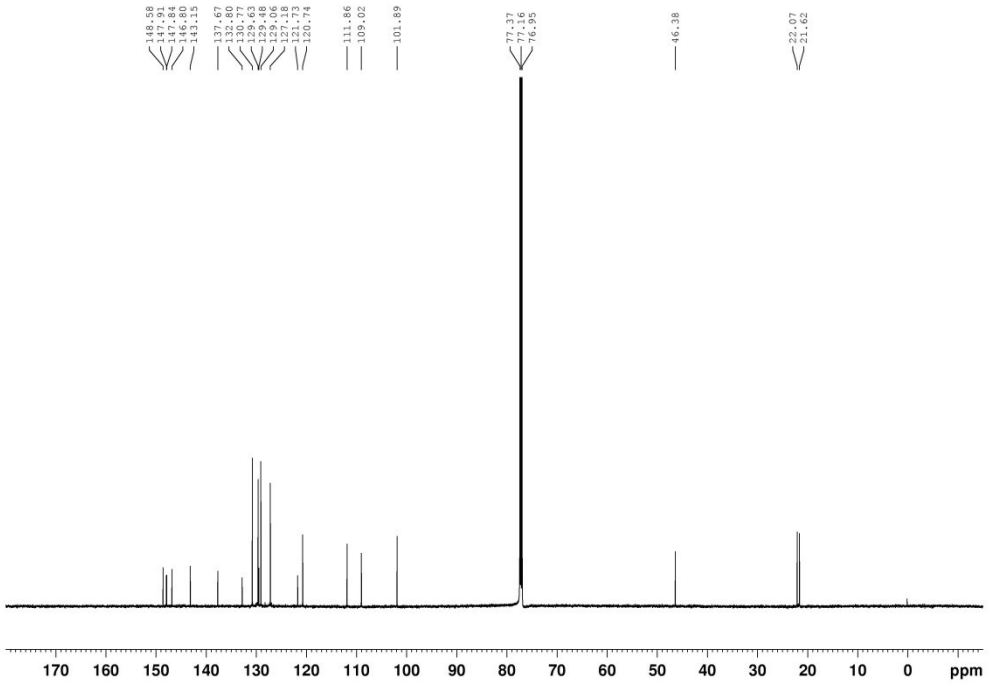
^{1}H NMR Spectrum for **1i** ($CDCl_3$, 600 MHz)



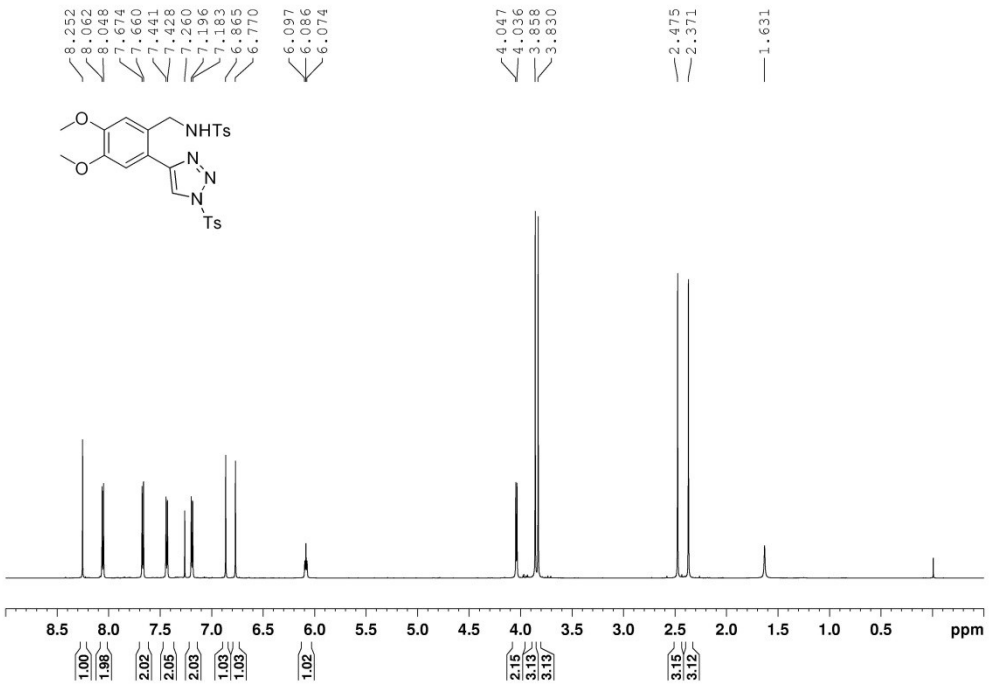
^{13}C NMR Spectrum for **1i** ($CDCl_3$, 150 MHz)



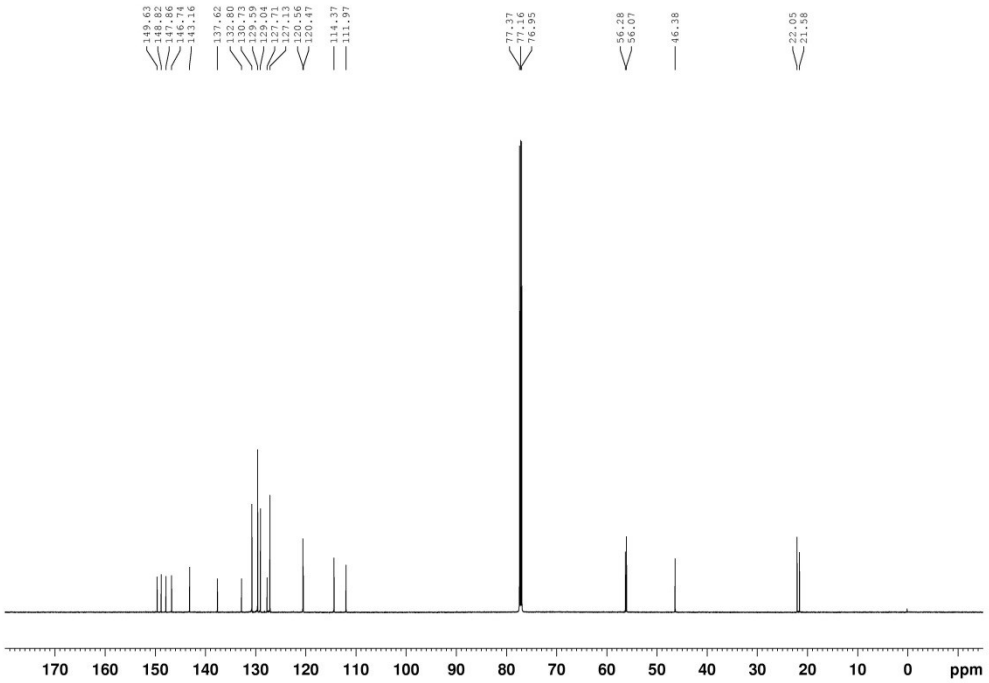
^{1}H NMR Spectrum for **1j** ($CDCl_3$, 600 MHz)



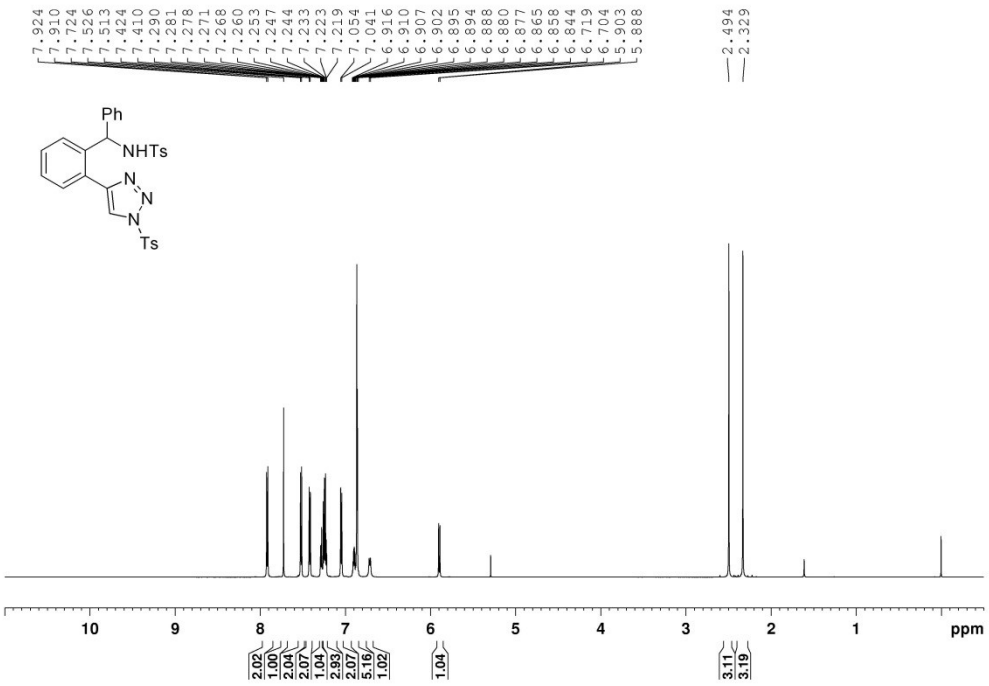
^{13}C NMR Spectrum for **1j** ($CDCl_3$, 150 MHz)



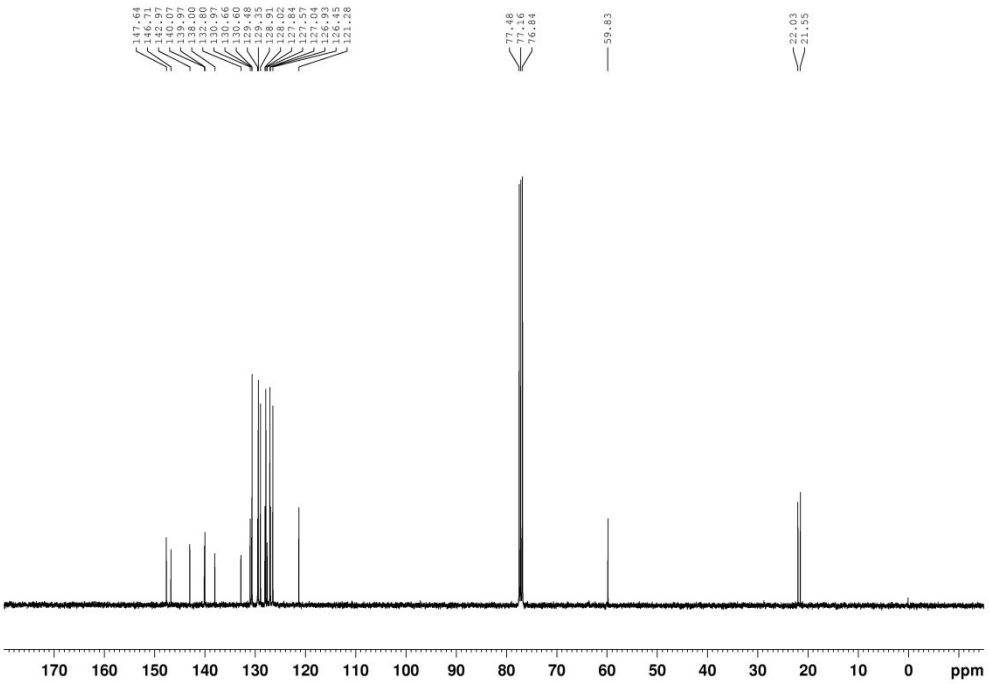
^{1}H NMR Spectrum for **1k** ($CDCl_3$, 600 MHz)



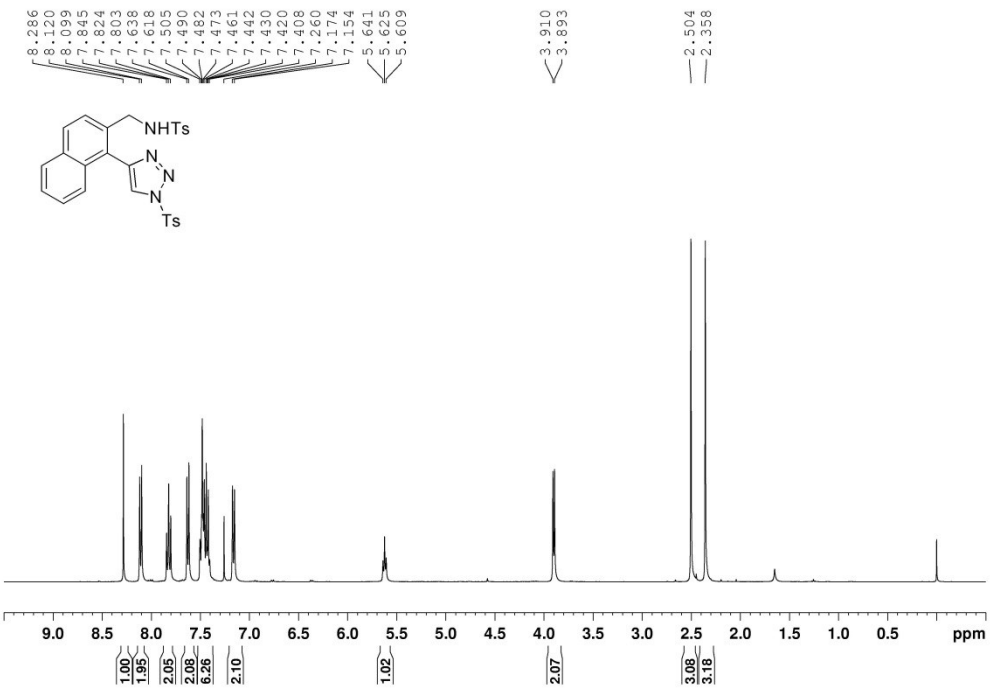
^{13}C NMR Spectrum for **1k** ($CDCl_3$, 150 MHz)



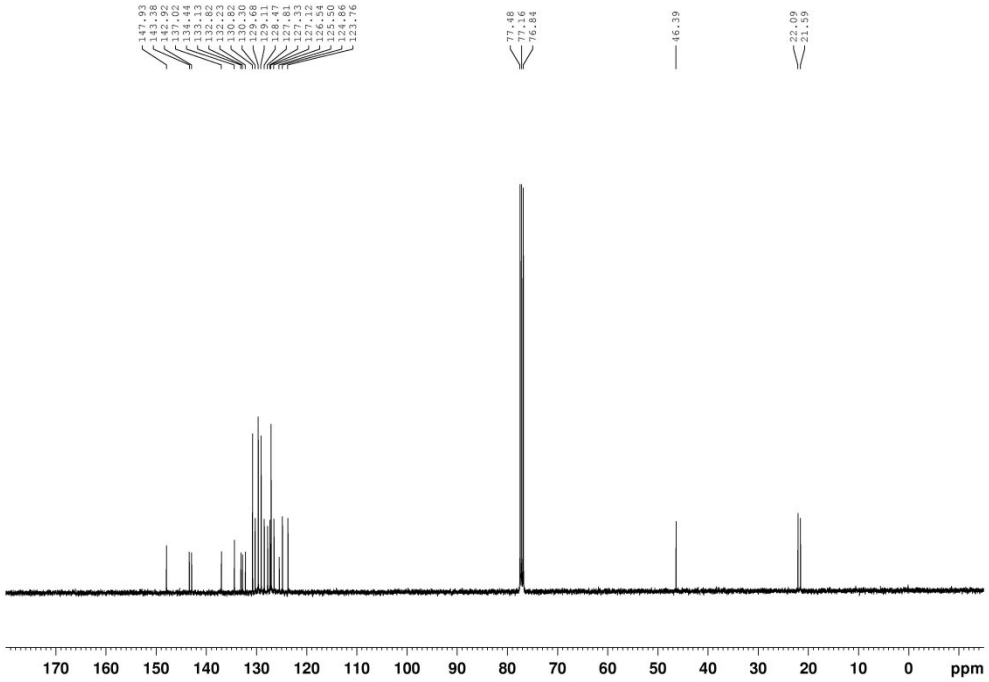
^{1}H NMR Spectrum for **1l** ($CDCl_3$, 600 MHz)



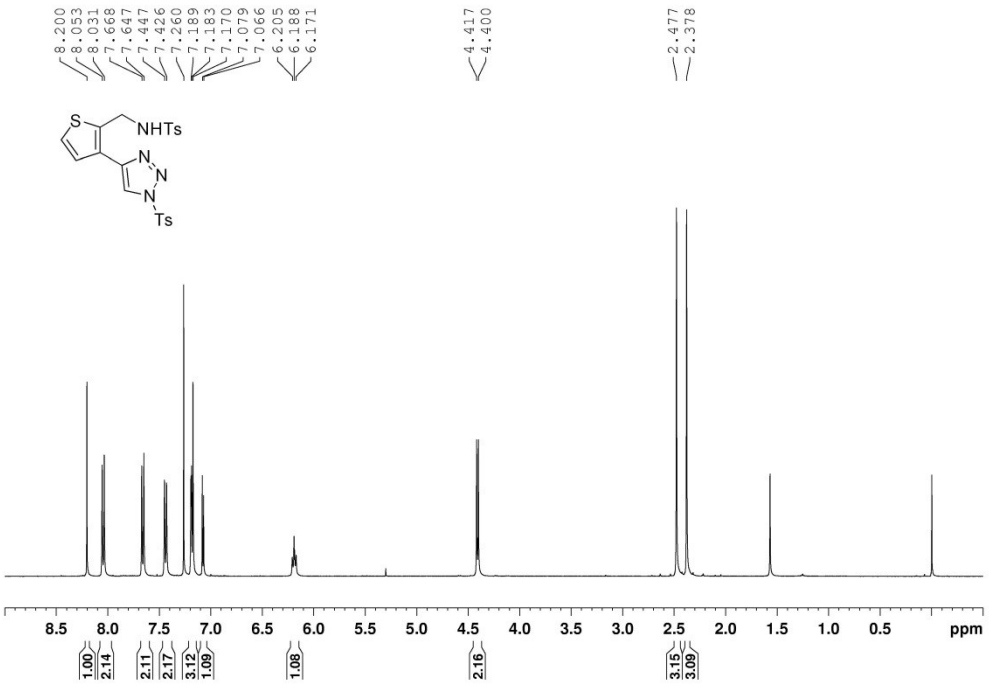
^{13}C NMR Spectrum for **1l** ($CDCl_3$, 100 MHz)



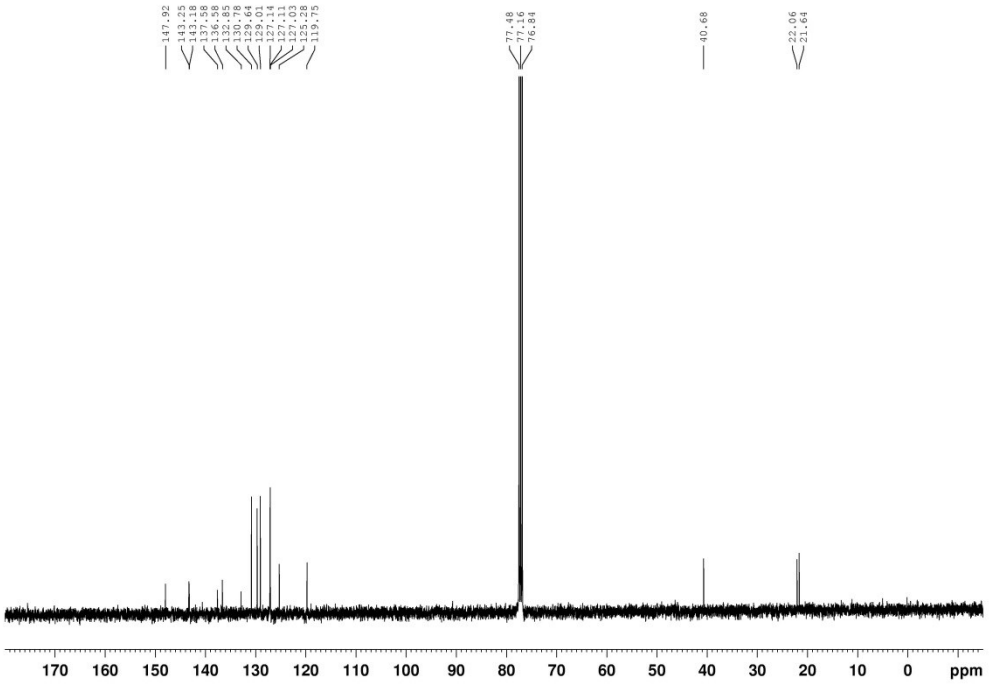
^{1}H NMR Spectrum for **1o** ($CDCl_3$, 400 MHz)



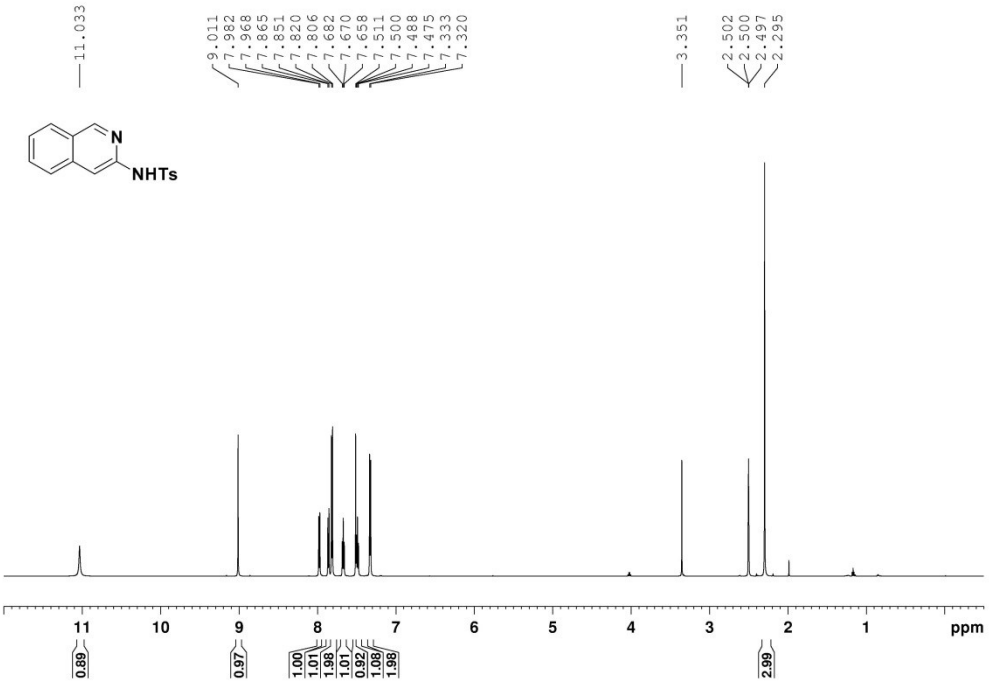
^{13}C NMR Spectrum for **1o** ($CDCl_3$, 100 MHz)



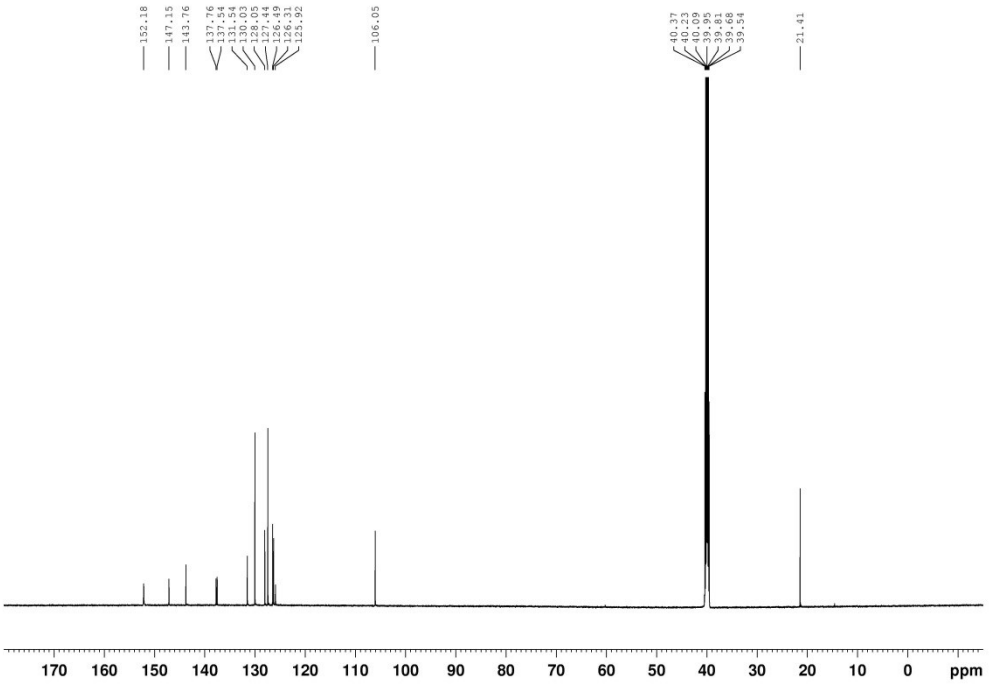
^{1}H NMR Spectrum for **1p** ($CDCl_3$, 400 MHz)



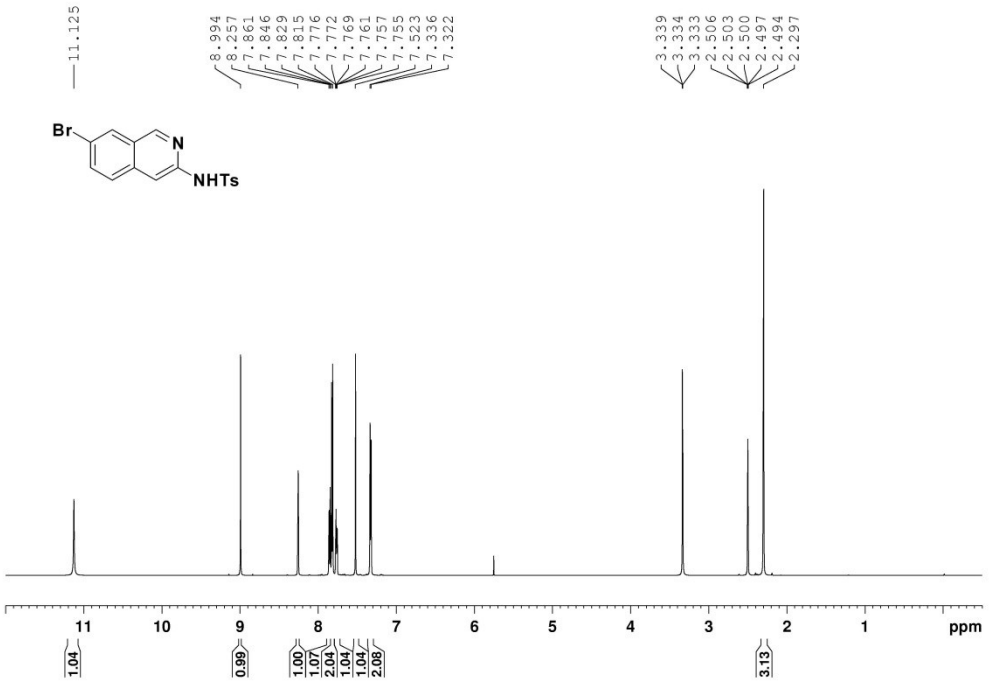
^{13}C NMR Spectrum for **1p** ($CDCl_3$, 100 MHz)



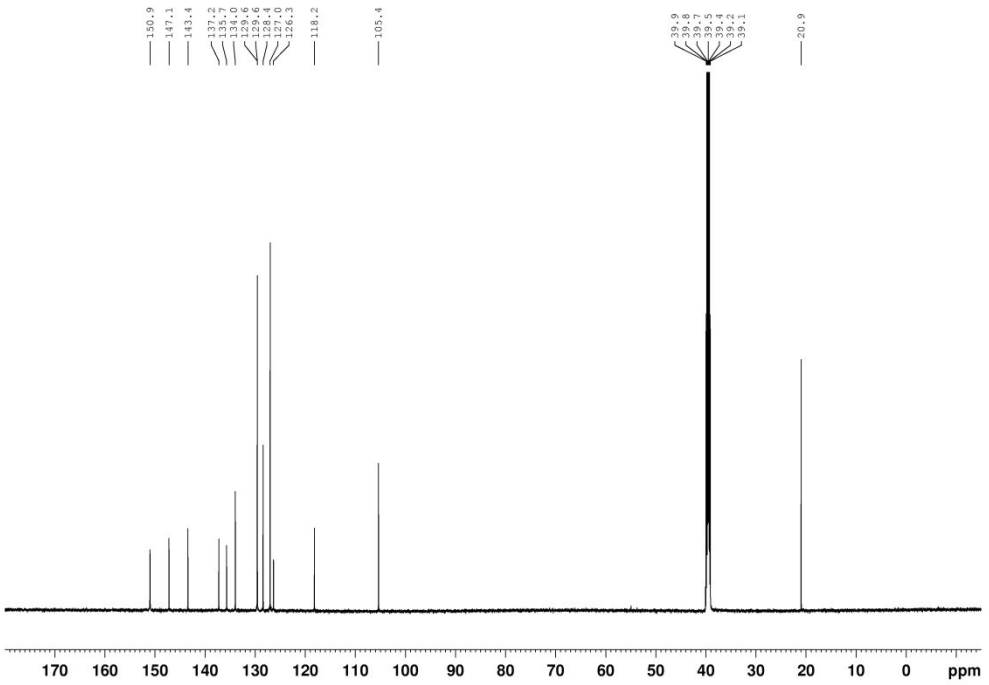
^{1}H NMR Spectrum for **3a** (DMSO-d_6, 600 MHz)



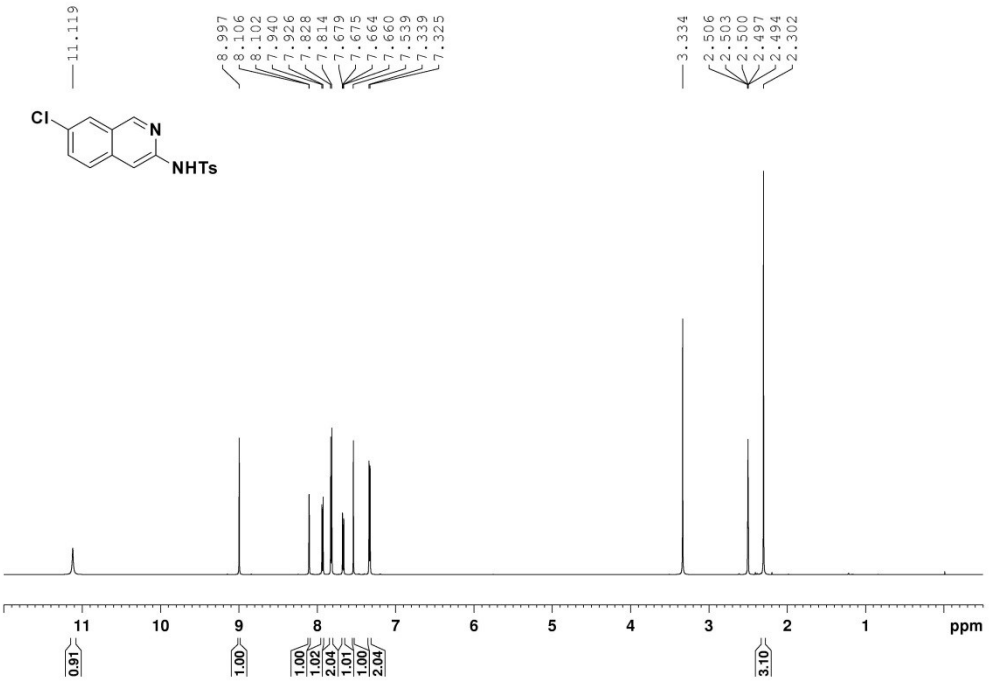
^{13}C NMR Spectrum for **3a** (DMSO-d_6, 150 MHz)



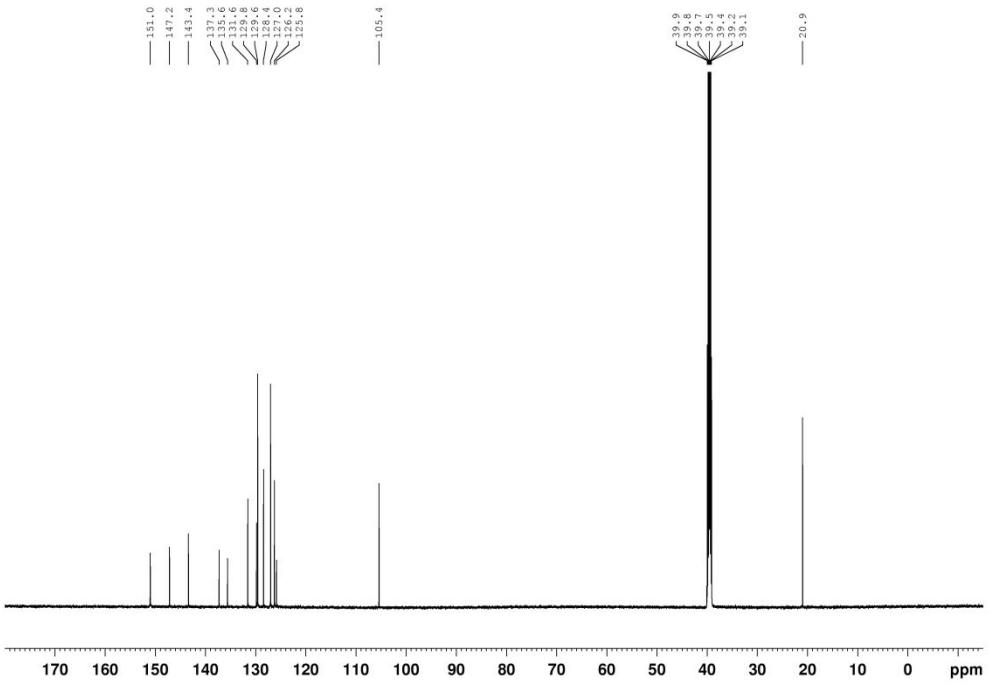
^{1}H NMR Spectrum for **3b** (DMSO-d_6, 600 MHz)



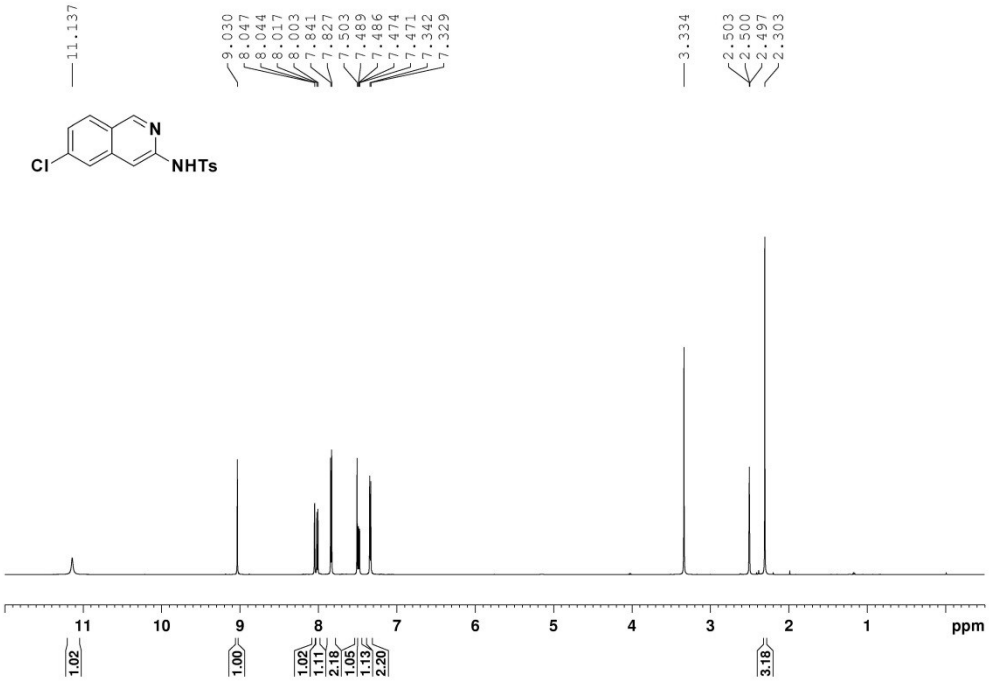
^{13}C NMR Spectrum for **3b** (DMSO-d_6, 150 MHz)



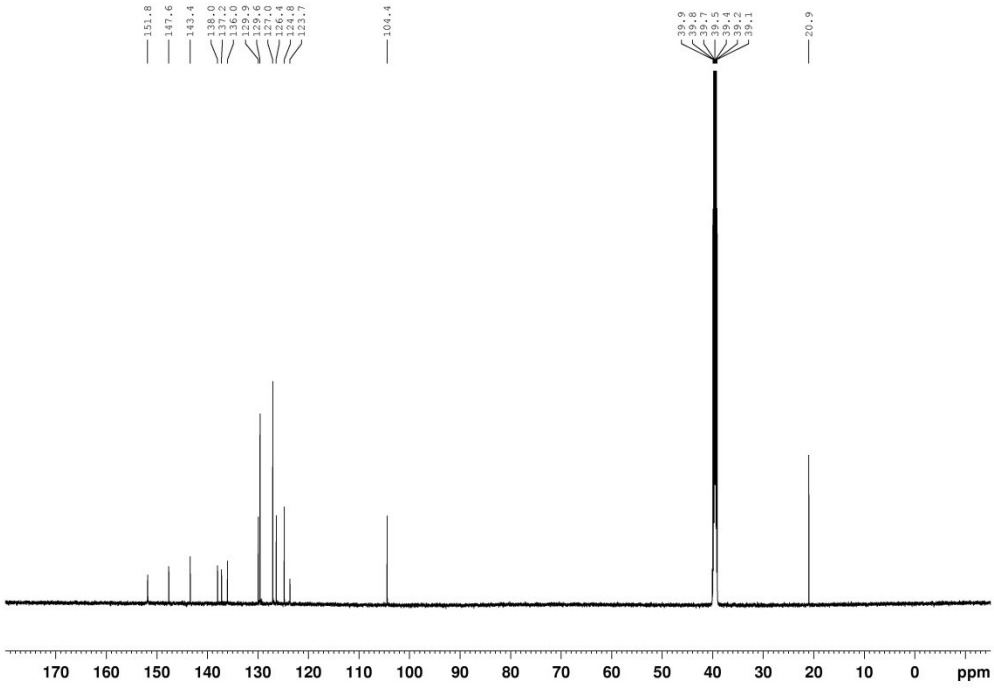
^{1}H NMR Spectrum for **3c** (DMSO-d_6, 600 MHz)



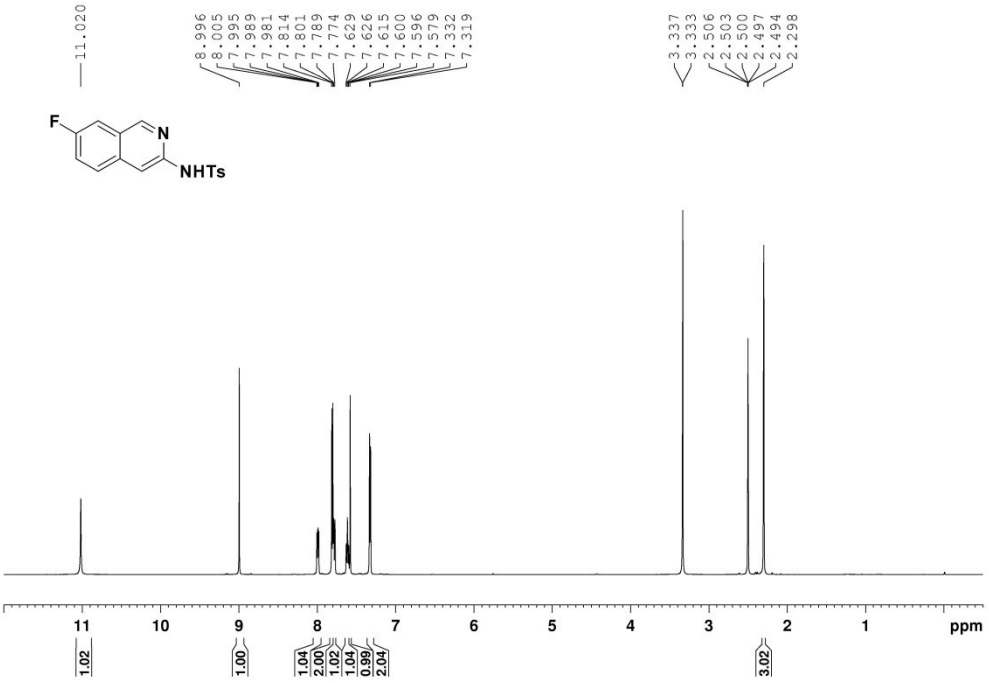
^{13}C NMR Spectrum for **3c** (DMSO-d_6, 150 MHz)



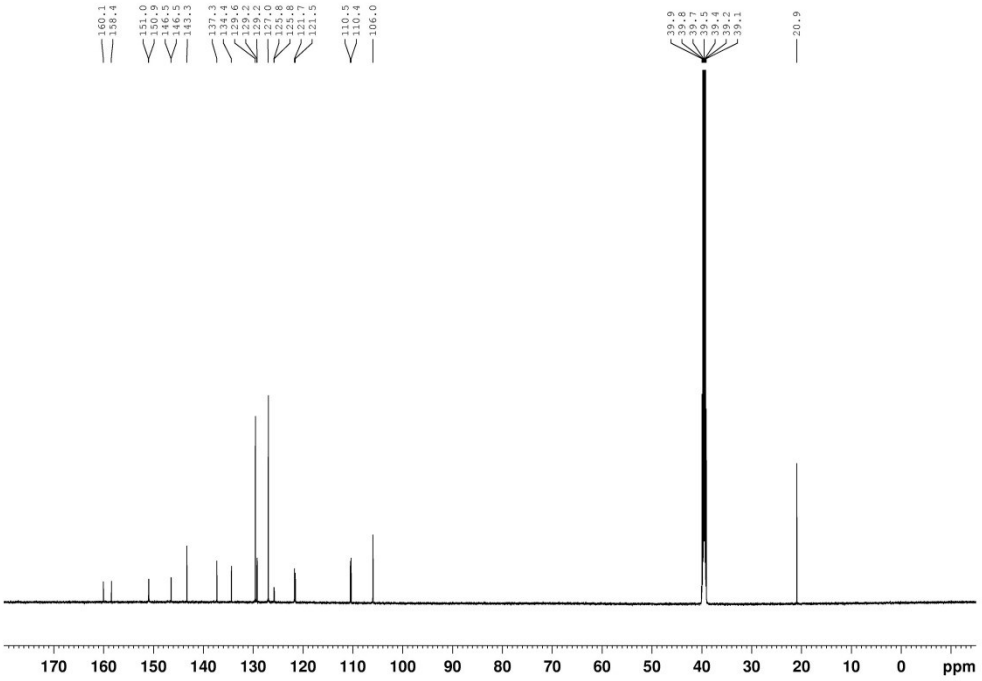
^{1}H NMR Spectrum for **3d** (DMSO-d_6, 600 MHz)



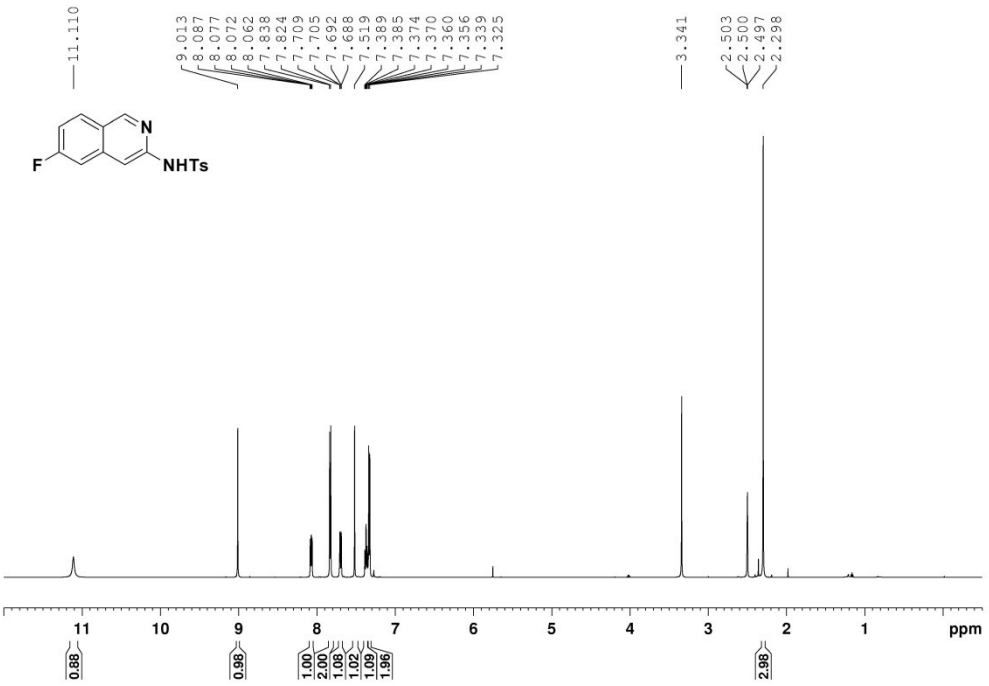
^{13}C NMR Spectrum for **3d** (DMSO-d_6, 150 MHz)



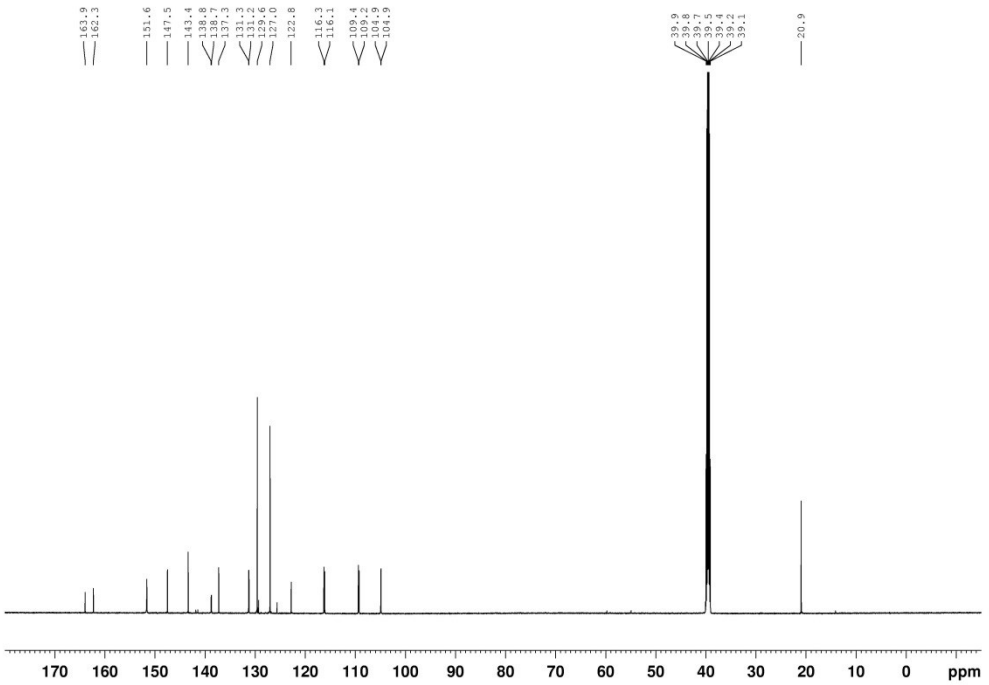
^{1}H NMR Spectrum for **3e** (DMSO-d_6, 600 MHz)



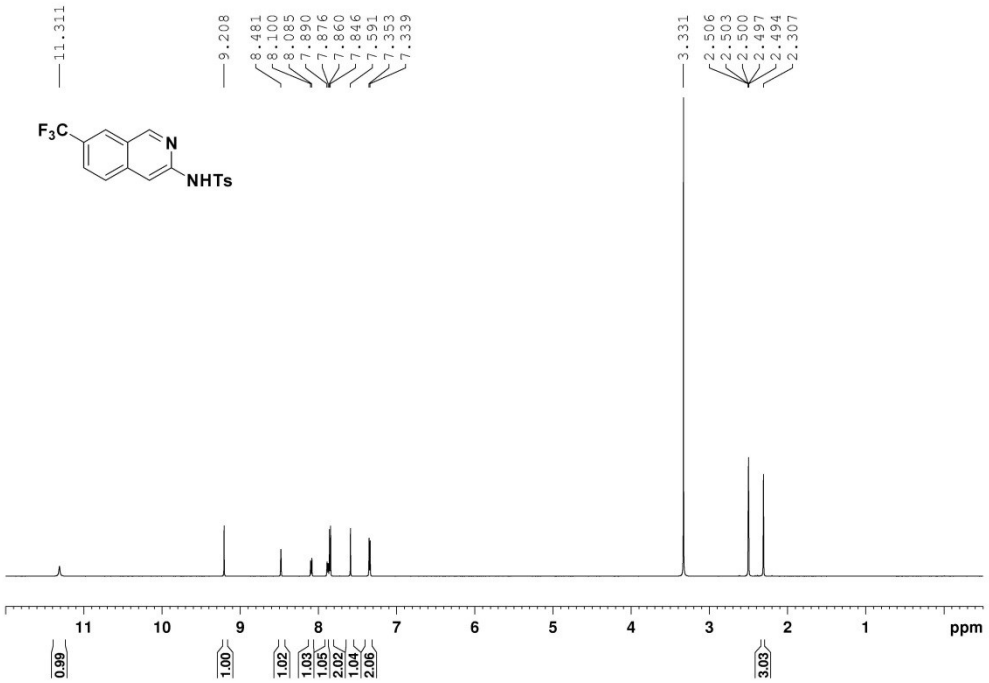
^{13}C NMR Spectrum for **3e** (DMSO-d_6, 150 MHz)



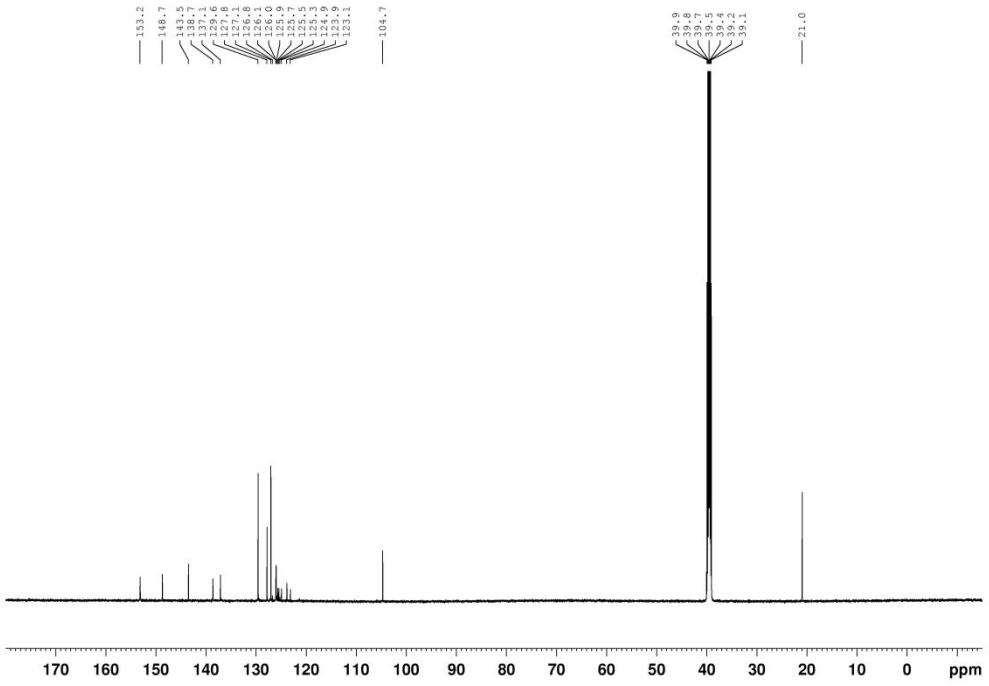
^{1}H NMR Spectrum for **3f** (DMSO-d_6, 600 MHz)



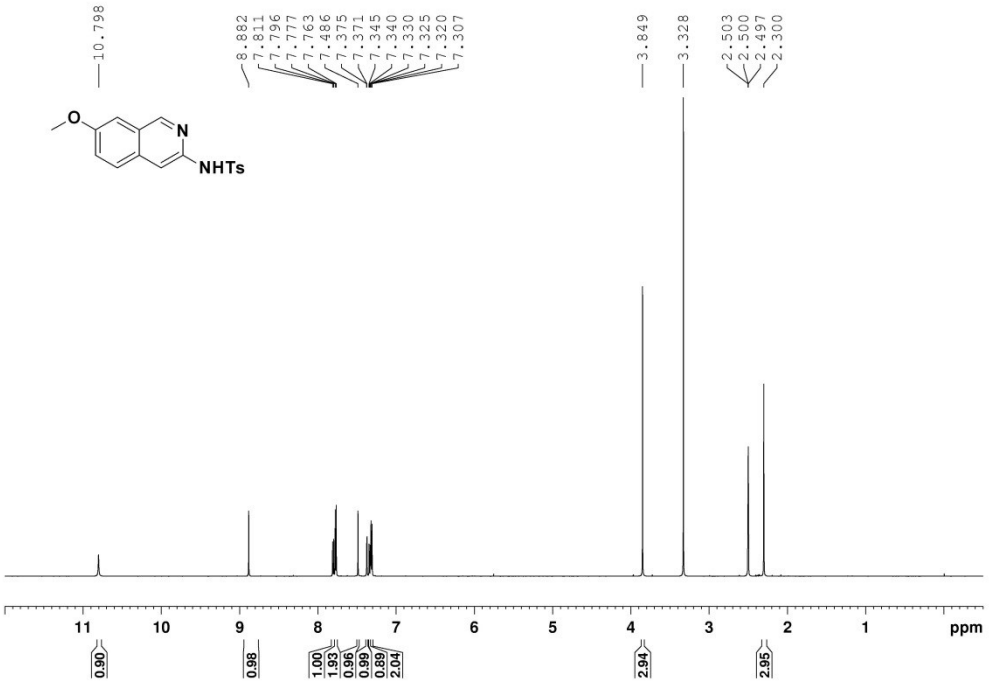
^{13}C NMR Spectrum for **3f** (DMSO-d_6, 150 MHz)



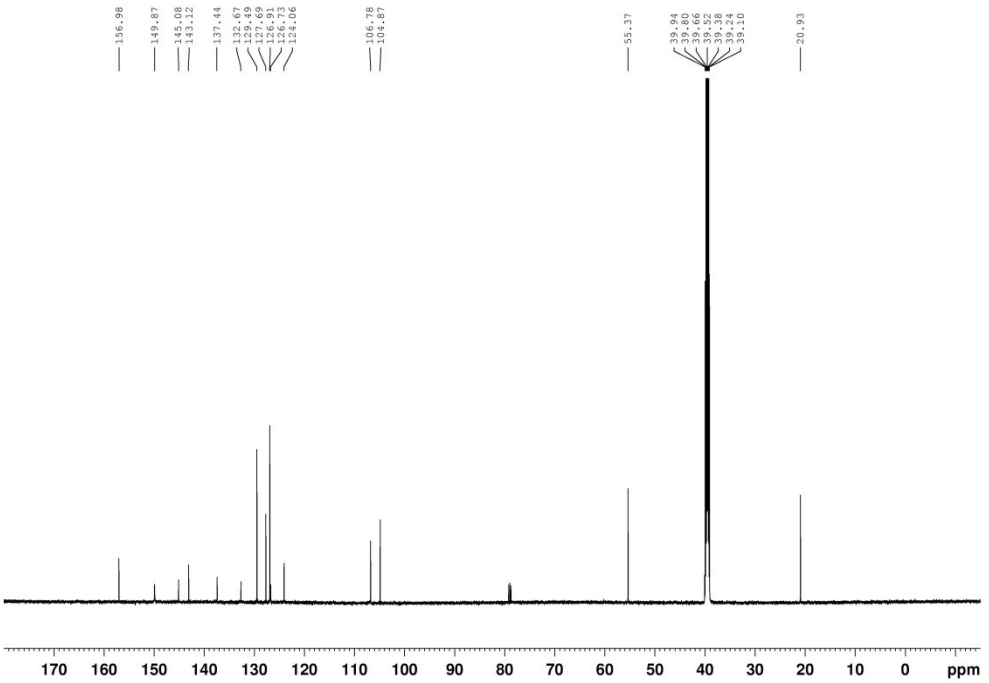
^{1}H NMR Spectrum for **3g** (DMSO-d_6, 600 MHz)



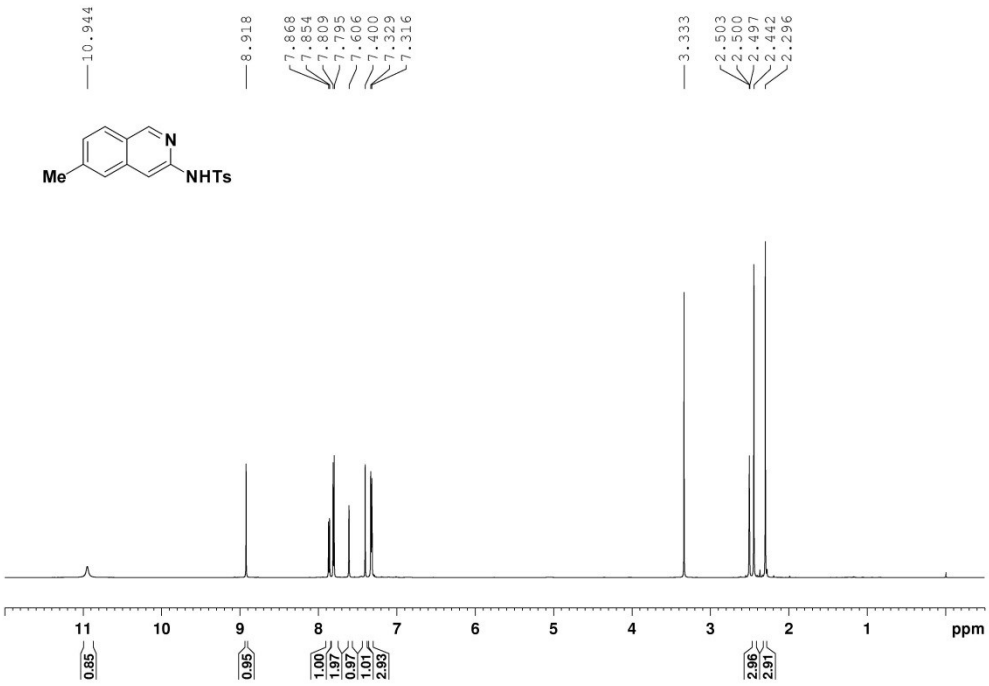
^{13}C NMR Spectrum for **3g** (DMSO-d_6, 150 MHz)



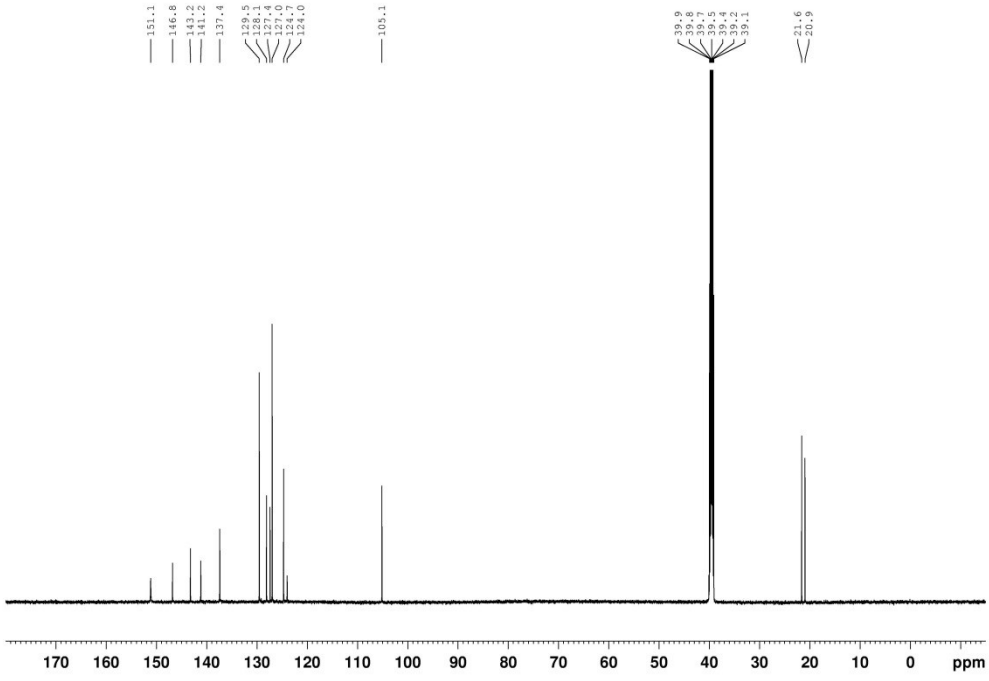
^{1}H NMR Spectrum for **3h** (DMSO-d_6, 600 MHz)



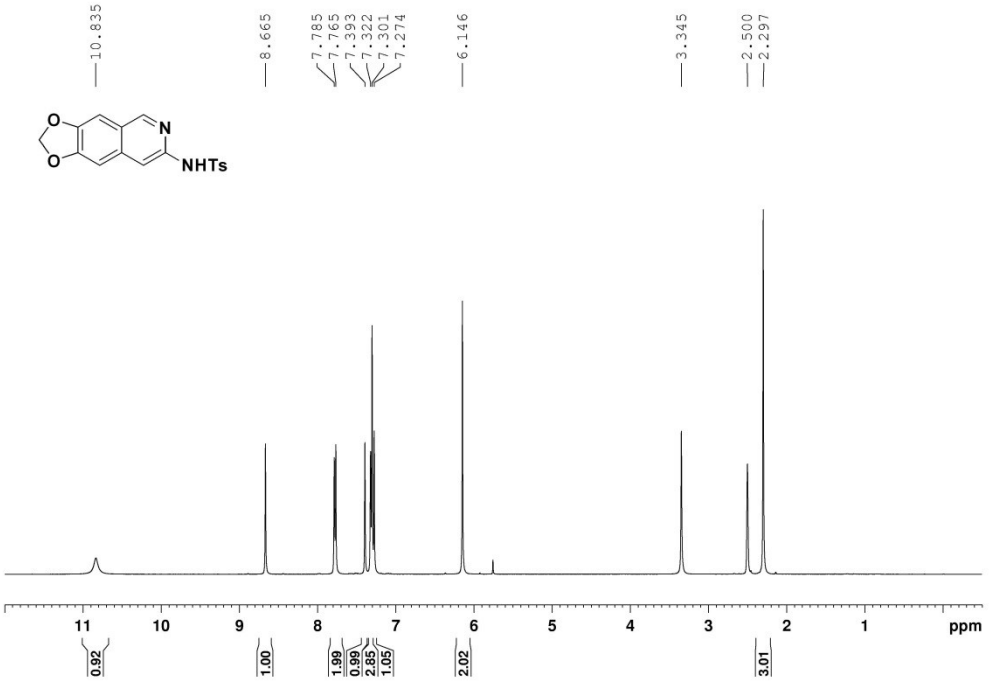
^{13}C NMR Spectrum for **3h** (DMSO-d_6, 150 MHz)



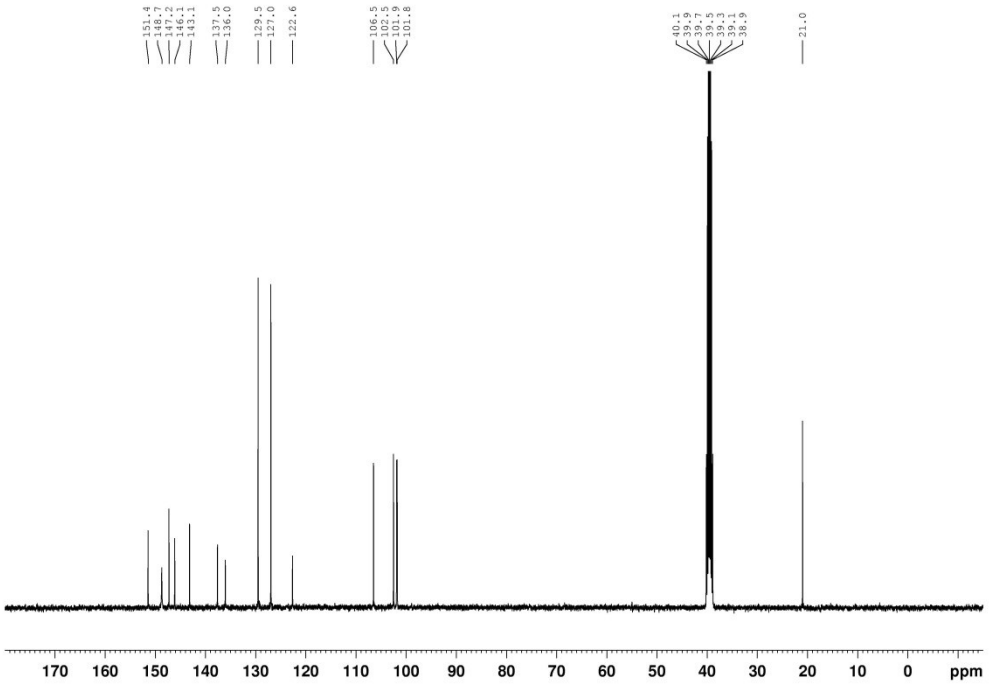
^{1}H NMR Spectrum for **3i** (DMSO-d_6, 600 MHz)



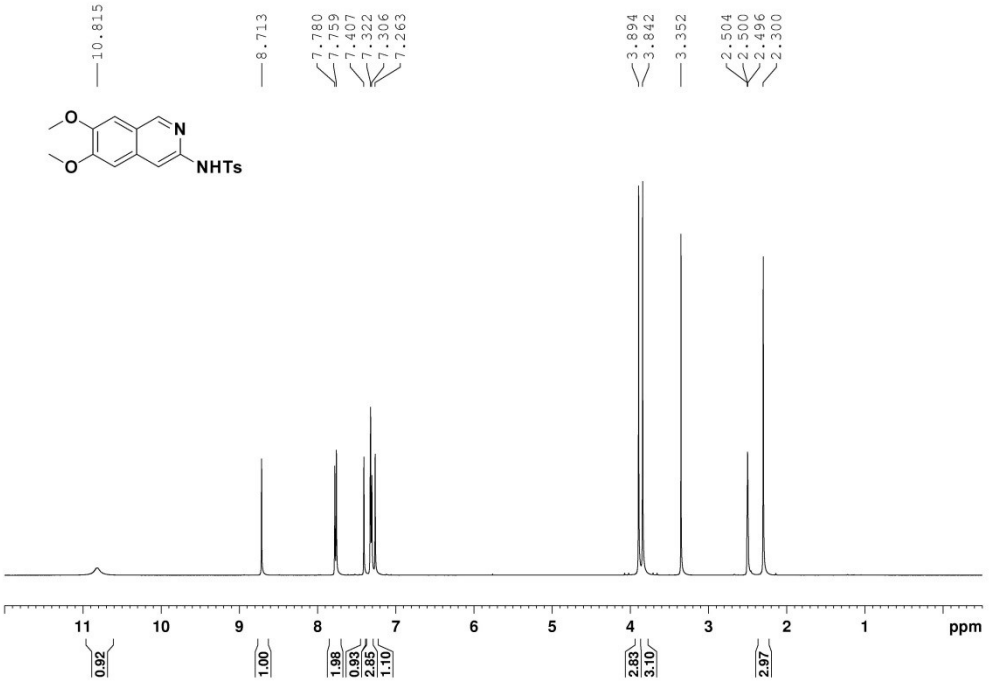
^{13}C NMR Spectrum for **3i** (DMSO-d_6, 150 MHz)



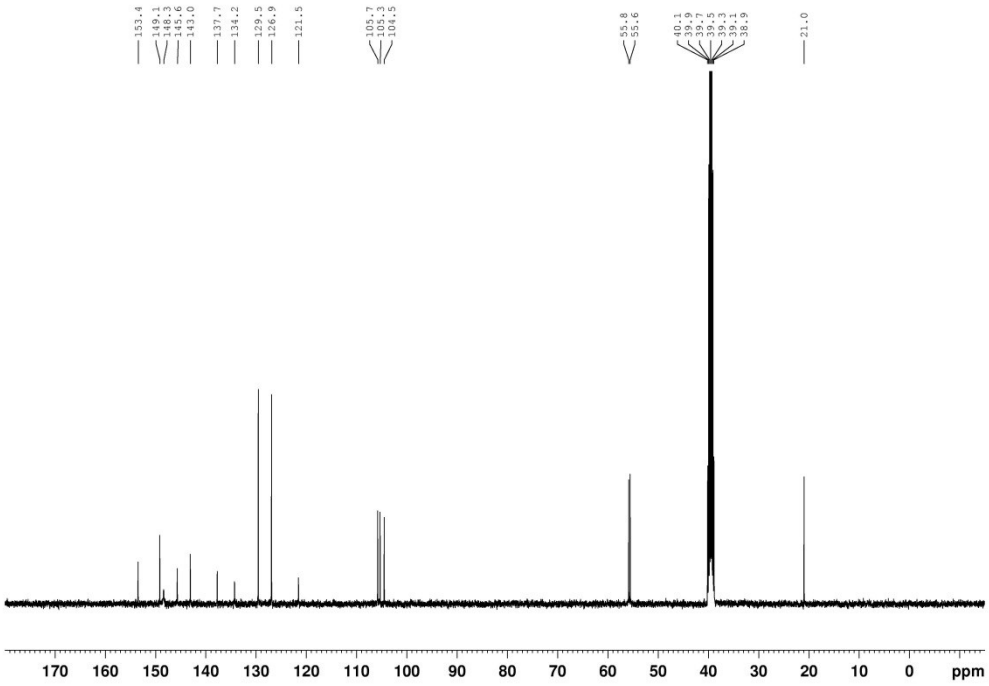
^{1}H NMR Spectrum for **3j** (DMSO-d_6, 400 MHz)



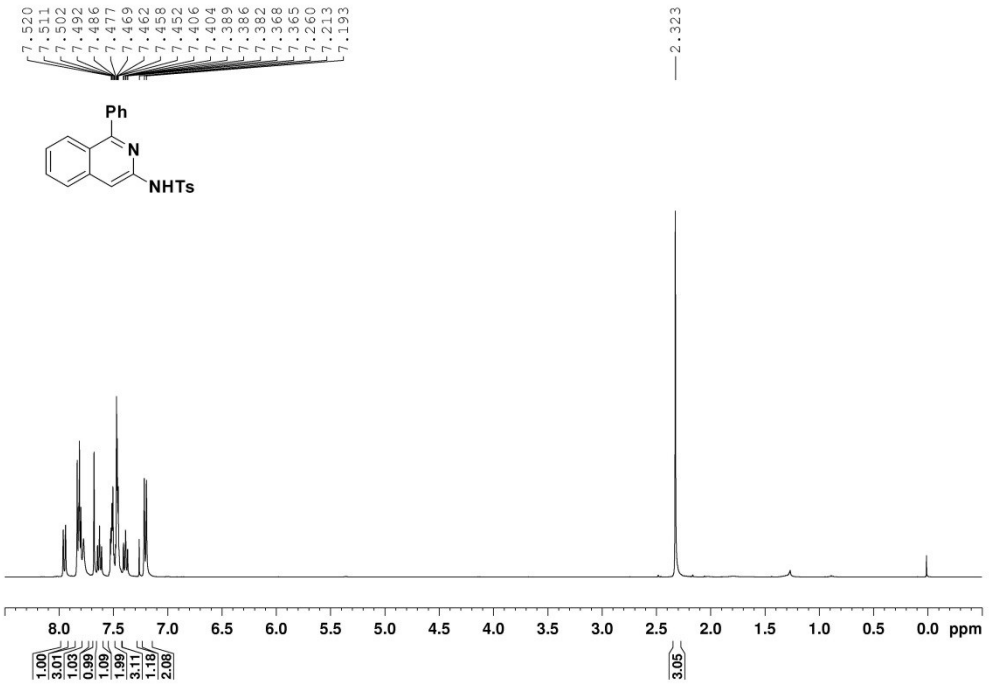
^{13}C NMR Spectrum for **3j** (DMSO-d_6, 100 MHz)



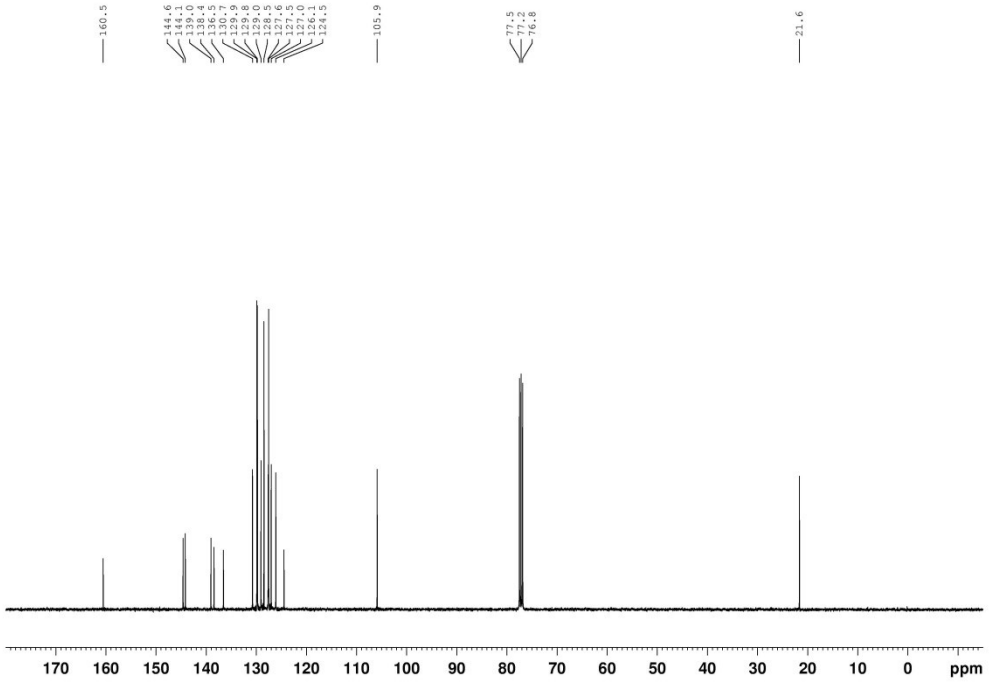
^{1}H NMR Spectrum for **3k** (DMSO-d_6, 400 MHz)



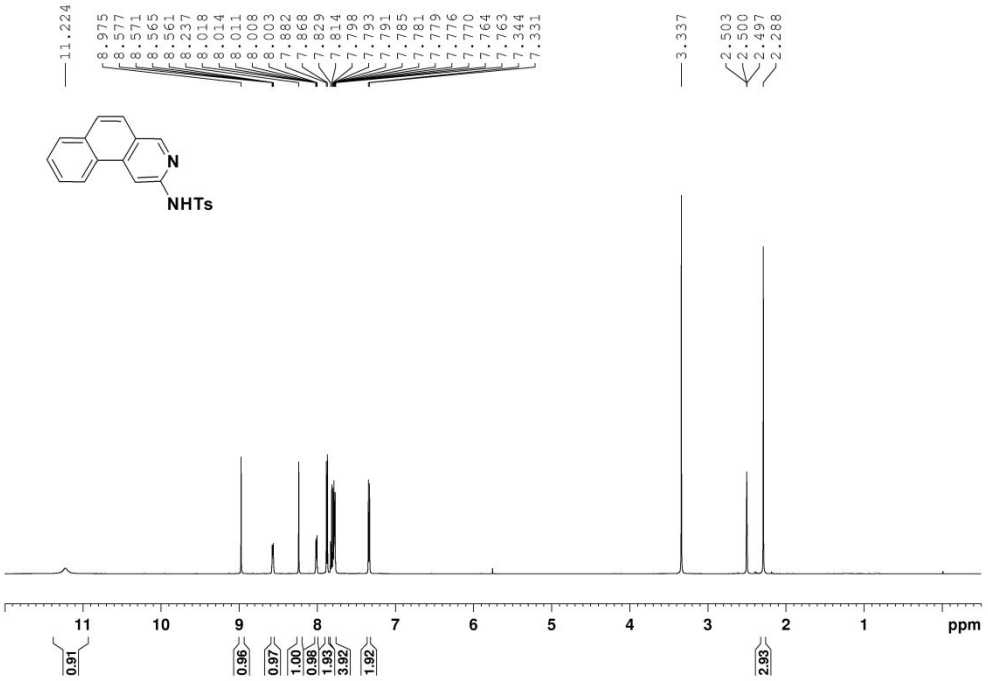
^{13}C NMR Spectrum for **3k** (DMSO-d_6, 100 MHz)



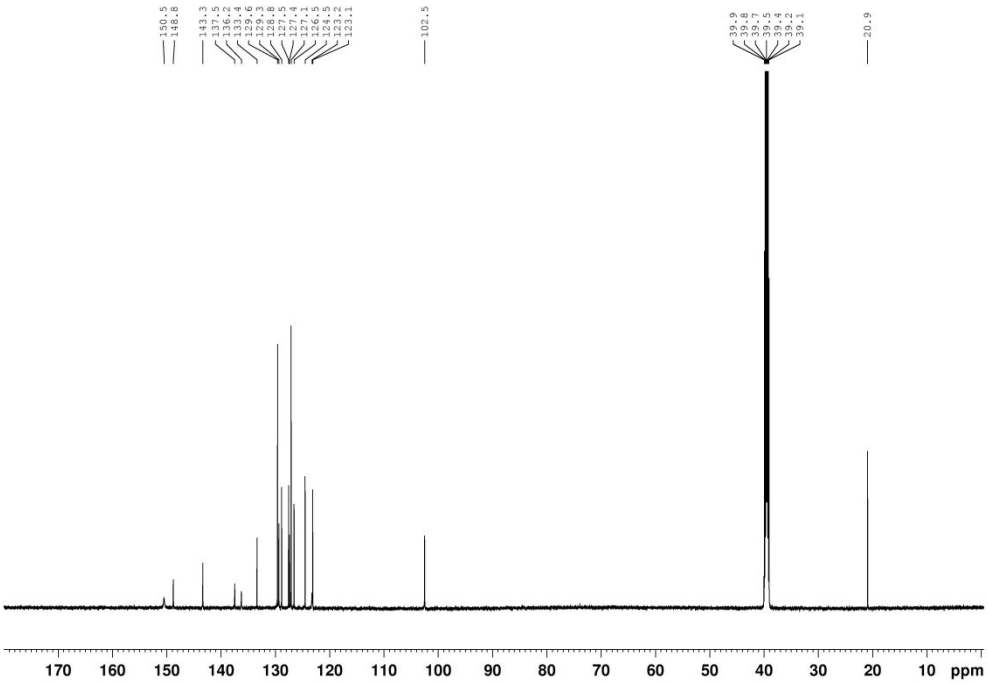
^{1}H NMR Spectrum for **3l** ($CDCl_3$, 400 MHz)



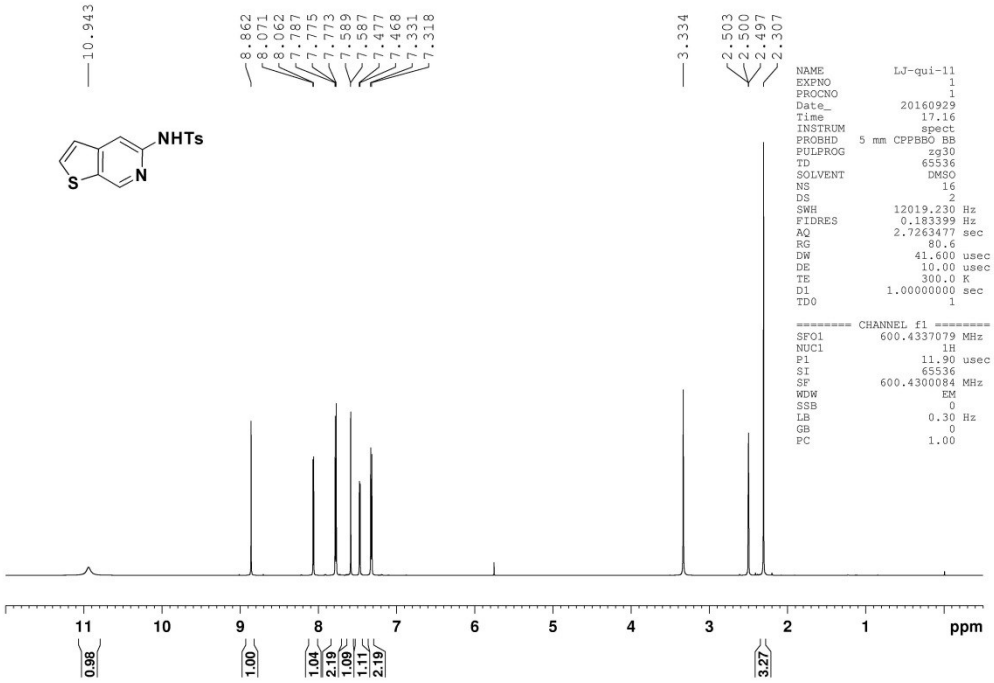
^{13}C NMR Spectrum for **3l** ($CDCl_3$, 100 MHz)



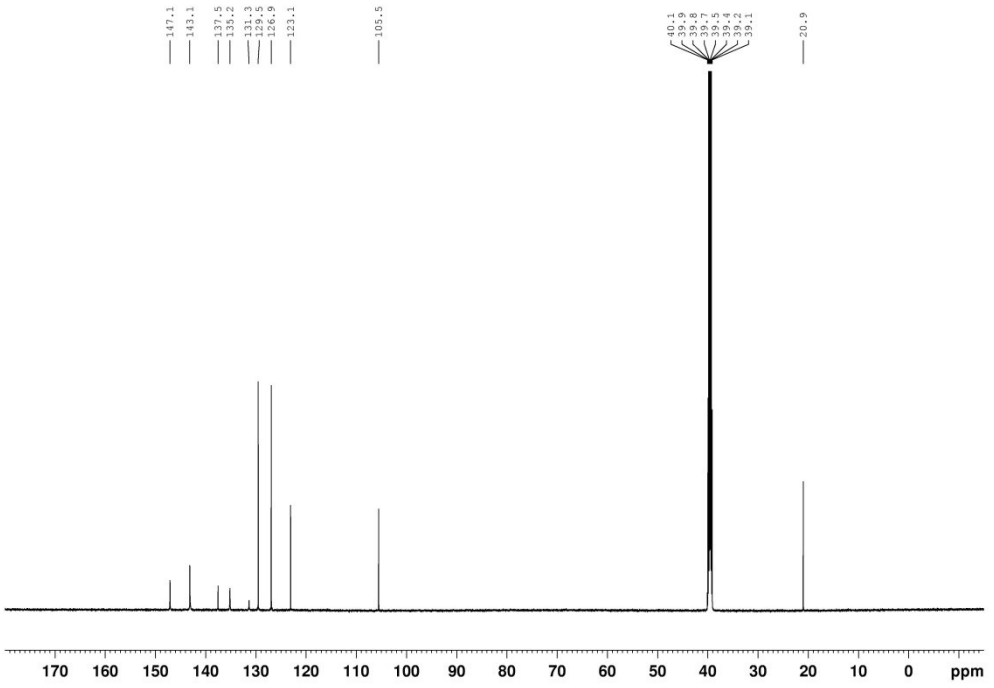
^{1}H NMR Spectrum for **3o** (DMSO-d_6, 600 MHz)



^{13}C NMR Spectrum for **3o** (DMSO-d_6, 150 MHz)



^{1}H NMR Spectrum for **3p** (DMSO-d_6, 600 MHz)



^{13}C NMR Spectrum for **3p** (DMSO-d_6, 150 MHz)