

Synthesis of 2-styryl-quinazoline and 3-styryl-quinoxaline based sulfonate esters *via* sp³ C-H activation and their biological evaluation for α -glucosidase inhibition

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General: Starting materials are bought from the SD-Fine, Sigma-Aldrich and Spectrochem and used without further purification. ¹H and ¹³C-NMR spectra were recorded on Bruker 400 MHz spectrometer using CDCl₃ or DMSO-d₆ solvents and reported in δ ppm. The mass spectra are recorded on agilent 6530Q-TOF LC/HRMS. Melting points were recorded using Stuart melting point apparatus.

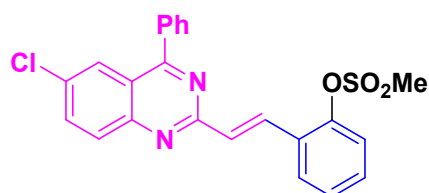
1. Experimental procedures.

Representative procedure for the synthesis of 2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl methanesulfonate (3a): To a solution of 6-chloro-2-methyl-4-phenylquinazoline (**1a**) (25 mg, 0.1 mmol) in EtOH (3 mL) were added sulfonate aldehyde (**2a**) (20 mg, 0.1 mmol), NEt₃ (0.0139 mL, 10 mol%). The mixture was heated at 80 °C for 6 h till the completion of the reaction (TLC monitoring), cooled to room temperature. The solvent was removed under reduced pressure to give the crude product which was purified by silica gel column chromatography. Elution of the column with EtOAc + hexanes (30/70 v/v) afford pure product **3a** as white solid (36 mg, 85%).

Representative procedure for the synthesis of (E)-2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl methanesulfonate (5a): To a solution of 3-methylquinoxalin-2-ol (**4**) (16 mg, 0.1 mmol), in EtOH (3 mL), sulfonate aldehyde (**2a**) (20 mg, 0.1 mmol), NEt₃ (0.014 mL, 10 mol%) were added and the mixture was heated at 80 °C for 5 h. After the completion of reaction (monitored by TLC), the mixture was cooled to room temperature. Evaporation of the solvent gave the crude product which was purified by silica gel column chromatography. Elution of the column using EtOAc: hexanes (30:70 v/v) gave desired product **5a** as yellow solid (28 mg, 84%).

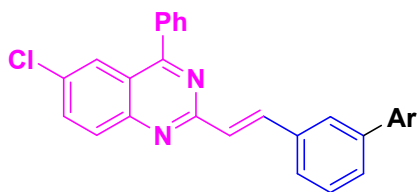
2. Characterization of new compounds

2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl methanesulfonate (3a): White solid, mp 173–174 °C, 85% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.25 (d, *J* = 8.8 Hz, 2H), 8.11 (d, *J* = 8.8 Hz, 1H), 7.75–7.69 (m, 3H), 7.57 (*J* = 2.4 Hz, 1H), 7.54–7.52 (m, 3H), 7.50 (d, *J* = 1.8 Hz, 1H) 7.43 (d, *J* = 15.6 Hz, 1H), 7.37–7.35 (m, 2H), 3.60 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 160.13, 155.23, 152.96, 147.34, 137.61, 132.85, 131.92, 130.42, 130.26, 129.44, 128.98, 128.21, 127.94, 127.60, 125.62, 123.73, 123.06, 122.20, 115.70, 115.42, 26.80; HRMS (ESI, *m/z*): calcd. For C₂₃H₁₇ClN₂O₃SH⁺ 437.0732, found 437.0728; IR (KBr thin film, cm⁻¹): ν_{max} 3085, 2958, 1650, 1421, 1370, 1205, 971, 880.



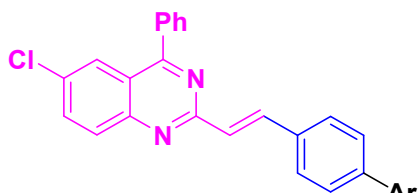
3a (85%); 6h

3-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl benzenesulfonate (3b): White solid, mp 180–181 °C, 84% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.14 – 7.99 (m, 3H), 7.89 (d, *J* = 7.3 Hz, 2H), 7.82 (s, 3H), 7.65 (s, 4H), 7.57 (d, *J* = 5.0 Hz, 3H), 7.32 (t, *J* = 17.0 Hz, 3H), 6.99 (d, *J* = 7.4 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 160.81, 156.29, 156.15, 153.74, 149.75, 139.33, 135.84, 134.80, 133.82, 133.22, 132.95, 132.90, 131.47, 131.35, 130.56, 129.91, 129.31, 126.17, 124.78, 124.54, 124.17, 122.97, 116.76, 116.51; HRMS (ESI, *m/z*): calcd. For C₂₈H₁₉ClN₂O₃SH⁺ 499.0889, found 499.0893; IR (KBr thin film, cm⁻¹): ν_{max} 3392, 2963, 1667, 1434, 1368, 1258, 1036, 829.



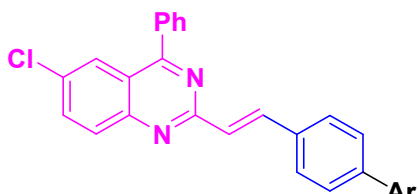
Ar = OSO₂Ph; **3b** (84%); **5h**

4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl benzenesulfonate (3c): White solid, mp 215–216 °C, 83% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.13 (d, *J* = 15.9 Hz, 1H), 8.04 – 7.98 (m, 2H), 7.87 (d, *J* = 7.6 Hz, 2H), 7.81 (d, *J* = 6.8 Hz, 3H), 7.69 (t, *J* = 7.4 Hz, 1H), 7.62 (s, 3H), 7.56 (dd, *J* = 16.5, 8.3 Hz, 4H), 7.36 (d, *J* = 15.9 Hz, 1H), 7.03 (d, *J* = 8.4 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃+DMSO-*d*₆) δ 166.27, 159.37, 149.16, 135.76, 133.85, 132.72, 131.98, 131.20, 130.25, 129.83, 129.54, 129.46, 129.06, 128.67, 127.98, 125.97, 125.32, 125.00, 124.77, 123.67, 122.46, 120.95; HRMS (ESI, *m/z*): calcd. For C₂₈H₁₉ClN₂O₃SH⁺ 499.0889, found 499.0888; IR (KBr thin film, cm⁻¹): ν_{max} 3420, 2905, 1661, 1416, 1346, 1246, 1025, 827.



Ar = OSO₂Ph; **3c** (83%); **5.5h**

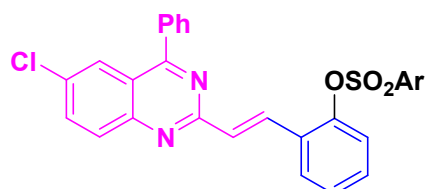
4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl methanesulfonate (3d): White solid, mp 230–231 °C, 82% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.11 (d, *J* = 15.9 Hz, 1H), 7.93 (dd, *J* = 13.3, 5.5 Hz, 2H), 7.78 – 7.70 (m, 3H), 7.57 (s, 2H), 7.55 (d, *J* = 3.7 Hz, 3H), 7.21 (d, *J* = 9.9 Hz, 1H), 6.87 (d, *J* = 8.6 Hz, 2H), 3.79 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-*d*₆) δ 167.44, 160.35, 150.21, 149.91, 137.21, 136.79, 135.30, 135.06, 132.33, 130.93, 130.58, 130.14, 129.67, 129.13, 129.07, 125.90, 123.05, 122.07, 37.89; HRMS (ESI, *m/z*): calcd. For C₃₀H₂₃ClN₂O₄SH⁺ 437.0732, found 437.0727; IR (KBr thin film, cm⁻¹): ν_{max} 3396, 2999, 2894, 1651, 1558, 1352, 1149, 896, 780.



Ar = OSO₂Me; **3d** (82%); **6h**

2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl-4-methylbenzenesulfonate (3e): Pale green powder, mp 199–200 °C, 80% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-*d*₆) δ 8.05–7.91 (m, 4H), 7.84 (s, 3H), 7.70 (s, 3H), 7.64 (d, *J* = 8.0 Hz, 2H), 7.44–7.39 (m, 2H), 7.29 (d,

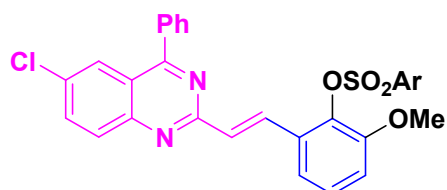
$J = 7.2$ Hz, 1H), 7.17 (d, $J = 15.6$ Hz, 1H), 7.01 (d, $J = 7.6$ Hz, 2H), 2.13 (s, 3H); ^{13}C NMR (100 MHz, $\text{CDCl}_3 + \text{DMSO-d}_6$) δ 167.32, 155.52, 147.32, 145.85, 143.87, 136.87, 134.96, 132.60, 131.90, 131.11, 130.84, 130.59, 130.44, 130.10, 130.02, 129.08, 128.40, 127.99, 127.49, 125.88, 123.83, 121.99, 118.12, 116.79, 21.50; HRMS (ESI, m/z): calcd. For $\text{C}_{29}\text{H}_{21}\text{ClN}_2\text{O}_3\text{SH}^+$ 513.1045, found 513.1040; IR (KBr thin film, cm^{-1}): ν_{max} 3395, 2950, 1636, 1562, 1348, 1154, 975, 856, 765.



Ar = 4-Me-C₆H₄ ; 3e (80%); 5h

2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-6-methoxyphenyl-4-methylbenzenesulfonate

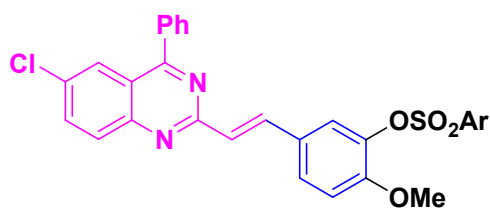
(3f): Yellow powder, mp 173–174 °C, 82% yield. ^1H NMR (400 MHz, DMSO-d_6) δ 8.06–8.03 (m, 2H), 8.01 (d, $J = 4.6$ Hz, 2H), 7.89–7.86 (m, 2H), 7.73–7.70 (m 5H), 7.57 (d, $J = 7.6$ Hz, 1H), 7.37–7.33 (m, 2H), 7.31 (s, 1H) 7.21 (d, $J = 8.2$ Hz, 2H), 7.17 (d, $J = 7.8$ Hz, 1H), 3.64 (s, 3H), 2.08 (s, 3H); ^{13}C NMR (100 MHz, DMSO-d_6) δ 167.25, 160.11, 153.02, 150.13, 145.68, 137.00, 136.69, 135.32, 133.40, 132.38, 131.87, 131.37, 131.16, 130.93, 130.70, 130.38, 130.25, 129.31, 128.56, 128.47, 125.99, 121.97, 118.87, 114.30, 56.33, 21.36; HRMS (ESI, m/z): calcd. For $\text{C}_{30}\text{H}_{23}\text{ClN}_2\text{O}_4\text{SH}^+$ 543.1151, found 543.1142; IR (KBr thin film, cm^{-1}): ν_{max} 3396, 2980, 1650, 1534, 1328, 1150, 1070, 862.



Ar = 4-Me-C₆H₄ ; 3f (82%); 6h

5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl 4-methylbenzenesulfonate

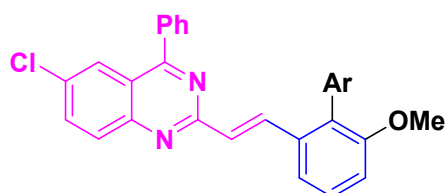
(3g): White powder, mp 210–211 °C, 81% yield. ^1H NMR (400 MHz, CDCl_3) δ 8.13 (d, $J = 15.8$ Hz, 1H), 8.06 – 8.00 (m, 2H), 7.85 – 7.79 (m, 3H), 7.78 (d, $J = 8.3$ Hz, 2H), 7.66 – 7.60 (m, 3H), 7.38 (d, $J = 15.9$ Hz, 1H), 7.31 (d, $J = 8.1$ Hz, 2H), 7.18 (s, 2H), 7.15 (s, 1H), 3.62 (s, 3H), 2.45 (s, 3H); ^{13}C NMR (100 MHz, $\text{CDCl}_3 + \text{DMSO-d}_6$) δ 155.46, 153.29, 147.03, 145.47, 138.14, 137.46, 135.48, 133.16, 132.21, 132.15, 131.37, 130.17, 129.82, 129.77, 129.57, 129.20, 129.16, 129.11, 128.63, 126.48, 125.41, 119.68, 113.91, 57.10, 17.53; HRMS (ESI, m/z): calcd. For $\text{C}_{30}\text{H}_{23}\text{ClN}_2\text{O}_4\text{SH}^+$ 543.1151, found 543.1146; IR (KBr thin film, cm^{-1}): ν_{max} 3396, 2980, 1650, 1534, 1328, 1150, 1070, 862.



Ar = 4-Me-C₆H₄; **3g** (81%); **5.5h**

2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-6-methoxyphenyl benzenesulfonate (3h):

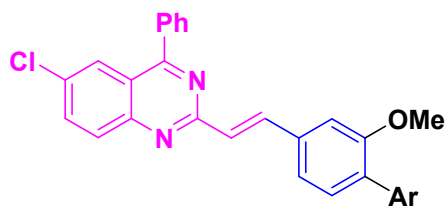
Yellow powder, mp 225–226 °C, 82% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-d₆) δ 8.14 (s, 1H), 8.10 (s, 1H), 8.06–8.03 (m, 1H), 7.98–7.94 (m, 3H), 7.84–7.82 (m, 2H), 7.67–7.62 (m, 2H), 7.55 (s, 1H), 7.51 (s, 1H), 7.39–7.31 (m, 3H), 3.97 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 168.04, 154.67, 152.53, 146.29, 144.73, 137.39, 136.67, 135.21, 134.15, 133.50, 132.44, 131.40, 129.46, 129.39, 129.04, 128.41, 128.35, 127.90, 127.85, 126.50, 125.70, 124.68, 118.92, 113.06, 56.33; HRMS (ESI, m/z): calcd. For C₂₉H₂₁ClN₂O₄SH⁺ 529.0994, found 529.0915; IR (KBr thin film, cm⁻¹): ν_{max} 3400, 2969, 1650, 1486, 1362, 1147, 1024, 874.



Ar = OSO₂Ph; **3h** (82%); **6h**

5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl benzenesulfonate (3i):

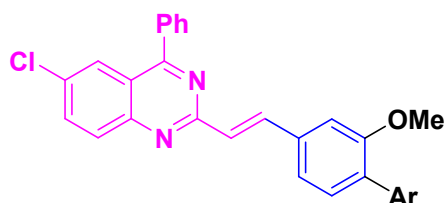
Pale yellow powder, mp 205–206 °C, 80% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.13 (d, *J* = 16.1 Hz, 1H), 8.05 (s, 1H), 8.01 (d, *J* = 7.8 Hz, 1H), 7.92 (d, *J* = 4.9 Hz, 2H), 7.82 (s, 3H), 7.64 (s, 4H), 7.54 (s, 2H), 7.37 (d, *J* = 15.8 Hz, 1H), 7.21 (t, *J* = 26.1 Hz, 3H), 3.59 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 170.37, 152.18, 149.60, 148.61, 148.55, 144.75, 136.94, 136.25, 135.37, 133.88, 133.30, 132.52, 131.14, 131.01, 130.86, 130.63, 130.53, 130.14, 130.11, 129.62, 128.72, 127.39, 127.29, 126.15, 54.57; HRMS (ESI, m/z): calcd. For C₂₉H₂₁ClN₂O₄SH⁺ 529.0994, found 529.2456; IR (KBr thin film, cm⁻¹): ν_{max} 3080, 2985, 1660, 1490, 1370, 1130, 1010, 835.



Ar = OSO₂Ph; **3i** (80%); **6h**

5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl methanesulfonate (3j):

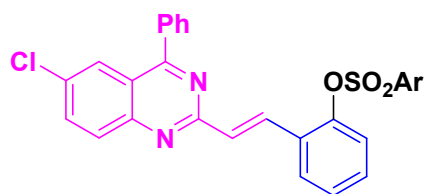
White solid, mp 264–265 °C, 81% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-d₆) δ 8.27 (d, *J* = 15.6 Hz, 1H), 8.01 (d, *J* = 7.4 Hz, 1H), 7.69 (d, *J* = 15.5 Hz, 1H), 7.58 (d, *J* = 7.2 Hz, 3H), 7.51 (d, *J* = 8.3 Hz, 3H), 7.33 (t, *J* = 8.0 Hz, 1H), 7.28 (s, 1H), 7.19 (s, 1H), 7.10 (d, *J* = 7.8 Hz, 1H), 3.94 (s, 3H), 3.48 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 168.24, 161.17, 152.86, 150.95, 139.56, 138.46, 137.53, 137.16, 135.87, 133.04, 131.68, 131.36, 130.91, 130.01, 129.85, 126.67, 125.36, 122.82, 121.64, 113.40, 57.31, 39.54; HRMS (ESI, m/z): calcd. For C₂₄H₁₉ClN₂O₄SH⁺ 467.0838, found 467.0841; IR (KBr thin film, cm⁻¹): ν_{max} 3394, 1662, 1508, 1325, 1153, 970, 873.



Ar = OSO₂Me; **3j** (81%); **6h**

2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl-4-nitrobenzene sulfonate (3k):

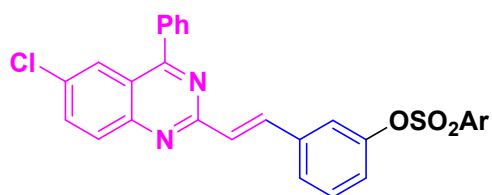
Yellow crystalline solid, mp 236–237 °C, 84% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-d₆) δ 8.02 (d, *J* = 16.0 Hz, 1H), 7.97–7.94 (m, 2H), 7.80–7.74 (m, 4H), 7.63–7.45 (m, 7H), 7.25–7.22 (m, 2H), 7.19 (s, 1H), 6.90 (d, *J* = 8.0 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 167.66, 160.31, 153.03, 151.67, 150.12, 149.45, 139.91, 139.61, 137.09, 136.71, 135.68, 135.35, 132.11, 131.06, 130.56, 130.27, 130.03, 129.51, 129.24, 126.01, 125.62, 125.54, 123.45, 123.03; HRMS (ESI, m/z): calcd. For C₂₈H₁₈ClN₃O₅SH⁺ 544.0728, found 544.0744; IR (KBr thin film, cm⁻¹): ν_{max} 3400, 3105, 1651, 1538, 1347, 1191, 1088, 900, 779.



Ar = 4-NO₂-C₆H₄; **3k** (84%); **5h**

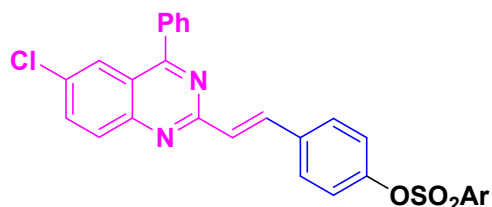
3-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl 4-nitrobenzenesulfonate (3l):

Pale yellow solid, mp 201–203 °C, 85% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.22 (d, *J* = 15.9 Hz, 1H), 8.06–7.99 (m, 2H), 7.82 (s, 4H), 7.68 (d, *J* = 6.7 Hz, 2H), 7.63 (s, 4H), 7.46 (s, 2H), 7.38 (dd, *J* = 18.4, 6.8 Hz, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 168.50, 154.58, 152.70, 149.83, 142.20, 138.93, 136.70, 134.88, 134.68, 133.14, 131.72, 130.67, 130.43, 130.38, 129.98, 128.93, 128.15, 127.61, 126.25, 125.75, 125.45, 121.31, 119.89, 118.11; HRMS (ESI, m/z): calcd. For C₂₈H₁₈ClN₃O₅SNH₄⁺ 561.0994, found 561.0738.



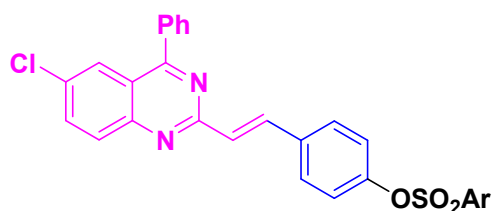
Ar = 4-NO₂-C₆H₄ ; **3l** (85%); 5.5h

4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl 4-nitrobenzenesulfonate (3m): Pale yellow solid, mp 218–219 °C, 81% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.04–7.95 (m, 3H), 7.80–7.73 (m, 5H), 7.61–7.55 (m, 4H), 7.48–7.45 (m, 3H), 7.24–7.18 (m, 2H), 6.90 (d, *J* = 8.0 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃+DMSO-*d*₆) δ 154.03, 151.78, 149.38, 148.75, 137.42, 134.47, 134.06, 133.66, 131.61, 131.02, 129.50, 129.09, 128.80, 128.25, 127.66, 127.44, 125.73, 122.96, 122.59, 121.59, 119.92, 114.54; HRMS (ESI, *m/z*): calcd. For C₂₈H₁₈ClN₃O₅SH⁺ 544.0728, found 544.0746; IR (KBr thin film, cm⁻¹): ν_{max} 3395, 3098, 1650, 1557, 1536, 1364, 1202, 1090, 839.



Ar = 4-NO₂-C₆H₄ ; **3m** (81%); 6h

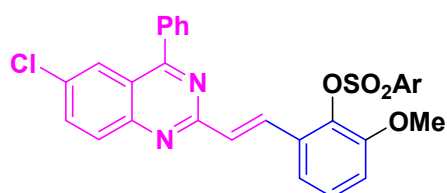
4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl-4-nitro-3-(trifluoromethyl) benzene sulfonate (3n): Light brown solid, mp 175–176 °C, 80% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-*d*₆) δ 8.57 (s, 2H), 8.30 – 8.17 (m, 7H), 8.09 (d, *J* = 9.3 Hz, 2H), 8.00 (s, 5H), 7.87 (s, 4H), 7.73 (d, *J* = 8.0 Hz, 2H), 7.69 (s, 7H), 7.63 (d, *J* = 16.0 Hz, 2H); ¹³C NMR (100 MHz, DMSO-*d*₆) δ 155.33, 153.06, 150.08, 149.44, 141.49, 141.30, 141.10, 132.10, 131.66, 129.64, 129.61, 129.26, 129.16, 128.92, 128.35, 127.52, 127.34, 125.29, 125.10, 123.84, 123.80, 123.62, 123.40, 117.87, 117.83; HRMS (ESI, *m/z*): calcd. For C₂₉H₁₇ClF₃N₃O₅S 611.0530, found 610.1852; IR (KBr thin film, cm⁻¹): ν_{max} 3390, 2901, 1650, 1532, 1345, 1115, 1031, 865.



Ar = 4-NO₂, 3-CF₃-C₆H₃ ; **3n** (80%); 5h

2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-6-methoxyphenyl-4-nitrobenzenesulfonate (3o):

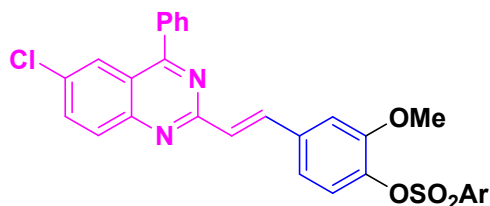
Yellow solid, mp 184–185 °C, 82% yield. ¹H NMR (400 MHz, DMSO-d₆) δ 8.37 (d, *J* = 7.6 Hz, 2H), δ 8.37 (d, *J* = 7.8 Hz, 2H), 8.07 – 8.00 (m, 3H), 7.94–7.89 (m, 2H), 7.81 – 7.75 (m, 3H), 7.58 (s, 3H), 7.35 (d, *J* = 16.0 Hz, 1H), 7.25– 7.13 (m, 3H), 3.54 (s, 3H); ¹³C NMR (100 MHz, DMSO-d₆) δ 167.34, 159.81, 152.71, 150.81, 150.05, 141.78, 136.88, 136.56, 135.36, 132.53, 131.33, 131.12, 130.95, 130.70, 130.32, 130.24, 129.30, 129.24, 129.01, 125.93, 125.03, 121.93, 119.19, 114.44, 56.39; HRMS (ESI, m/z): calcd. For C₂₉H₂₀ClN₃O₆SH⁺ 574.0834, found 574.0863; IR (KBr thin film, cm⁻¹): ν_{max} 3396, 2989, 1649, 1566, 1346, 1279, 1148, 1066, 833.



Ar = 4-NO₂-C₆H₄ ; 3o (82%); 6h

5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl-4-nitrobenzenesulfonate (3p):

Yellow solid, mp 190–191 °C, 80% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.39 (d, *J* = 8.0 Hz, 2H), 8.13 (d, *J* = 8.8 Hz, 3H), 8.05 – 8.00 (m, 2H), 7.83 (s, 3H), 7.64 (s, 3H), 7.39 (d, *J* = 16.0 Hz, 1H), 7.28 (s, 1H), 7.17 (s, 1H), 3.61 (s, 3H); ¹³C NMR (100 MHz, DMSO-d₆) δ 167.70, 160.39, 151.76, 151.42, 150.14, 140.90, 138.13, 137.62, 136.97, 136.72, 135.38, 132.30, 131.04, 130.77, 130.46, 130.27, 129.65, 129.23, 126.03, 125.11, 124.45, 122.12, 121.06, 112.87, 56.24; HRMS (ESI, m/z): calcd. For C₂₉H₂₀ClN₃O₆SH⁺ 574.0834, found 574.0864; IR (KBr thin film, cm⁻¹): ν_{max} 3401, 2960, 1630, 1508, 1348, 1154, 1074, 846.

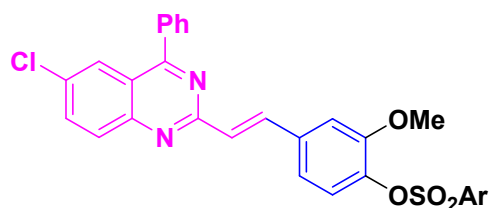


Ar = 4-NO₂-C₆H₄ ; 3p (80%); 6h

5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl-4-nitro-3-

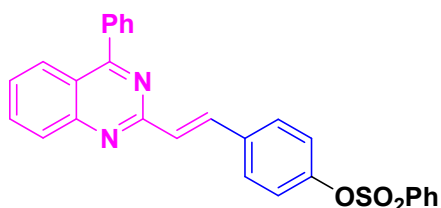
(trifluoromethyl) benzenesulfonate (3q): Light brown solid, mp 185–186 °C, 83% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.37 (d, *J* = 8.4 Hz, 2H), 8.06 (d, *J* = 8.4 Hz, 2H), 8.01 (d, *J* = 16.0 Hz, 1H), 7.93 (dd, *J* = 8.4, 3.6 Hz, 2H), 7.81–7.74 (m, 3H), 7.57 (s, 3H), 7.37–7.12 (m, 3H), 3.53 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 166.24, 162.85, 159.61, 152.41,

149.11, 148.83, 137.93, 135.70, 135.53, 133.88, 133.68, 130.86, 130.72, 130.57, 130.43, 129.67, 129.43, 129.41, 129.38, 128.98, 128.95, 127.93, 127.89, 126.26, 124.75, 124.45, 104.35, 55.22; HRMS (ESI, m/z): calcd. For C₃₀H₁₉ClF₃N₃O₆S 641.2635, found 641.2272.



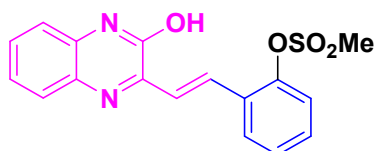
Ar = 4-NO₂, 3-CF₃-C₆H₃; **3q** (83%); **5h**

(E)-4-(2-(4-Phenylquinazolin-2-yl)vinyl)phenyl benzenesulfonate (3r): pale yellow solid, mp 196–197 °C, 80% yield. ¹H NMR (400 MHz, CDCl₃) δ 8.12 (d, *J* = 16.0 Hz, 1H), 8.02–7.97 (dd, *J* = 16.9, 5.2 Hz, 2H), 7.86–7.78 (m, 5H), 7.69–7.51 (m, 8H), 7.35 (d, *J* = 16.0 Hz, 1H), 7.02 (d, *J* = 8.4 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃) δ 167.52, 160.41, 150.22, 149.81, 137.17, 136.83, 135.39, 135.32, 134.71, 134.33, 132.75, 130.37, 130.32, 129.88, 129.21, 128.89, 128.84, 128.53, 125.97, 122.77, 122.16. IR (KBr thin film, cm⁻¹): ν_{max} 2982, 1615, 1512, 1375, 1185, 1068.



3r (80%); **6h**

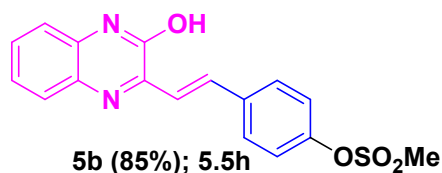
(E)-2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl methanesulfonate (5a): Yellow solid, mp 230–231 °C, 84% yield. ¹H NMR (400 MHz, DMSO-d₆+CDCl₃) δ 12.39 (s, 1H), 8.05 (d, *J* = 16.2 Hz, 1H), 7.70 (d, *J* = 7.4 Hz, 3H), 7.57 (d, *J* = 16.2 Hz, 1H), 7.37 (d, *J* = 7.3 Hz, 1H), 7.31 (d, *J* = 8.1 Hz, 2H), 7.28 – 7.16 (m, 2H), 3.24 (s, 3H); ¹³C NMR (100MHz, CDCl₃+ DMSO-d₆) δ 168.98, 144.03, 142.60, 141.66, 139.56, 137.24, 135.89, 134.53, 133.16, 131.49, 128.53, 127.15, 125.68, 123.99, 122.33, 115.91, 38.53; HRMS (ESI, m/z): calcd. For C₁₇H₁₄N₂O₄SNa⁺ 365.0566, found 365.0756; IR (KBr thin film, cm⁻¹): ν_{max} 3400, 2910, 283, 1640, 1574, 1366, 1151, 1067, 861.



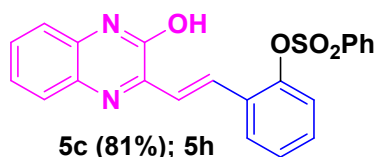
5a (84%); **5h**

4-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl methanesulfonate (5b): Pale red solid, mp 237–238 °C, 85% yield. ¹H NMR (400 MHz, CDCl₃+ DMSO-d₆) δ 12.23 (s, 1H), 8.01 (d, *J* =

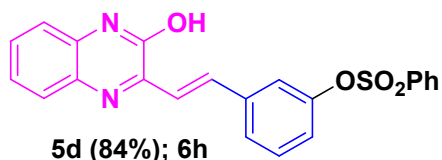
16.0 Hz, 1H), 7.69 (d, $J = 7.6$ Hz, 1H), 7.54 (d, $J = 8.6$ Hz, 1H), 7.47 (d, $J = 16.0$ Hz, 2H), 7.31 (d, $J = 7.0$ Hz, 1H), 7.24 – 7.17 (m, 2H), 6.86 (d, $J = 8.6$ Hz, 2H), 3.77 (s, 3H); ^{13}C NMR (100 MHz, $\text{CDCl}_3 + \text{DMSO-d}_6$) δ 168.34, 148.65, 144.32, 138.86, 135.75, 134.21, 133.43, 131.71, 130.18, 128.72, 126.99, 126.00, 123.89, 113.10, 36.28; HRMS (ESI, m/z): calcd. For $\text{C}_{17}\text{H}_{14}\text{N}_2\text{O}_4\text{SNa}^+$ 365.0566, found 365.0756; IR (KBr thin film, cm^{-1}): ν_{max} 3400, 3017, 2966, 1651, 1525, 1415, 1336, 1148, 992, 839.



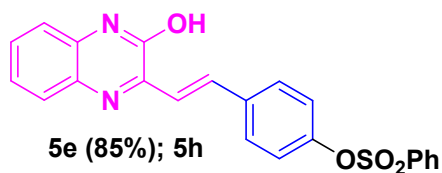
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (5c): Light green solid, mp 235–236 °C, 81% yield. ^1H NMR (400 MHz, DMSO-d_6) δ 12.54 (s, 1H), 7.94 (d, $J = 16.2$ Hz, 1H), 7.90 – 7.86 (m, 3H), 7.83 (dd, $J = 8.0, 1.2$ Hz, 1H), 7.69–7.65 (m, 1H), 7.56 – 7.52 (m, 3H), 7.50 – 7.42 (m, 2H), 7.39 – 7.33 (m, 3H), 7.29 – 7.27 (m, 1H); ^{13}C NMR (100 MHz, $\text{CDCl}_3 + \text{DMSO-d}_6$) δ 169.35, 158.32, 145.23, 138.19, 136.71, 136.30, 135.32, 134.44, 133.38, 132.39, 132.13, 129.50, 127.65, 127.30, 125.17, 124.22, 123.38, 121.11, 119.92, 118.67; HRMS (ESI, m/z): calcd. For $\text{C}_{22}\text{H}_{16}\text{N}_2\text{O}_4\text{SH}^+$ 405.0904, found 405.0913; IR (KBr thin film, cm^{-1}): ν_{max} 3403, 2926, 2886, 1625, 1558, 1372, 1192, 1081, 880, 771.



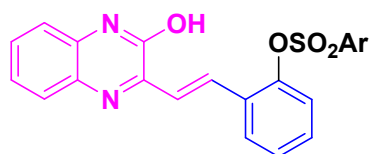
3-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (5d): Pale yellow solid, mp 221–222 °C, 84% yield. ^1H NMR (400 MHz, $\text{CDCl}_3 + \text{DMSO-d}_6$) δ 12.31 (s, 1H), 9.58 (s, 1H), 8.04 – 7.88 (m, 2H), 7.71 (d, $J = 6.9$ Hz, 2H), 7.48 (d, $J = 5.3$ Hz, 3H), 7.42 (s, 1H), 7.37 (s, 1H), 7.33 – 7.16 (m, 3H), 6.81 (d, $J = 4.6$ Hz, 2H); ^{13}C NMR (100 MHz, $\text{CDCl}_3 + \text{DMSO-d}_6$) δ 156.18, 153.72, 148.52, 135.85, 135.79, 133.79, 133.09, 131.38, 131.25, 131.13, 130.60, 130.56, 129.89, 129.61, 128.97, 128.19, 125.27, 124.75, 124.69, 116.71; HRMS (ESI, m/z): calcd. For $\text{C}_{22}\text{H}_{16}\text{N}_2\text{O}_4\text{SH}^+$ 405.0904, found 405.0920; IR (KBr thin film, cm^{-1}): ν_{max} 3400, 2980, 1644, 1536, 1355, 1185, 958, 810, 762.



4-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (5e): Yellow solid, mp 202–203 °C, 85% yield. ¹H NMR (400 MHz, CDCl₃) δ 11.99 (s, 1H), 8.04 (d, *J* = 16.4 Hz, 1H), 7.80 (d, *J* = 7.6 Hz, 3H), 7.64–7.60 (m, 1H), 7.59–7.52 (m, 2H), 7.51–7.40 (m, 3H), 7.30–7.27 (m, 2H), 7.19 (s, 1H), 6.96 (d, *J* = 8.4 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃+DMSO-*d*₆) δ 168.64, 150.50, 143.64, 139.53, 137.22, 135.86, 134.52, 133.16, 132.15, 130.13, 129.05, 127.06, 125.71, 124.68, 124.00, 122.62, 121.00, 117.96; HRMS (ESI, *m/z*): calcd. For C₂₂H₁₆N₂O₄SH⁺ 405.0904, found 405.0921.

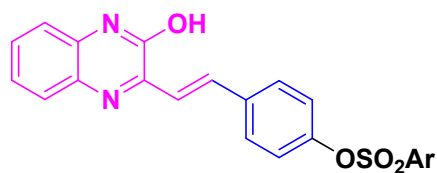


2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl 4-methylbenzenesulfonate (5f): Pale yellow powder, mp 224–225 °C, 81% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-*d*₆) δ 12.30 (s, 1H), 7.85 (d, *J* = 16.0 Hz, 1H), 7.76 (d, *J* = 8.0 Hz, 1H), 7.69–7.62 (m, 4H), 7.45–7.42 (m, 1H), 7.37–7.28 (m, 5H), 7.11 (d, *J* = 8.0 Hz, 2H), 2.16 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-*d*₆) δ 160.64, 154.42, 144.41, 141.13, 139.69, 138.66, 137.16, 135.98, 134.75, 134.05, 133.50, 132.96, 131.97, 130.41, 129.39, 127.81, 127.50, 126.56, 126.01, 119.71, 21.54; HRMS (ESI, *m/z*): calcd. For C₂₃H₁₈N₂O₄SH⁺ 419.1060, found 419.1082; IR (KBr thin film, cm⁻¹): ν_{max} 3395, 2986, 2877, 1665, 1527, 1353, 1374, 1196, 1083, 880.



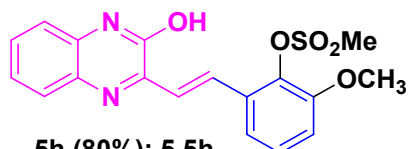
4-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl-4-methylbenzenesulfonate (5g): Yellow solid, mp 229–230 °C, 84% yield. ¹H NMR (400 MHz, DMSO-*d*₆+CDCl₃) δ 12.32 (s, 1H), 7.99 (d, *J* = 16.1 Hz, 1H), 7.69 (d, *J* = 6.2 Hz, 1H), 7.63 (d, *J* = 5.2 Hz, 2H), 7.53 (d, *J* = 9.2 Hz, 3H), 7.34 (d, *J* = 12.2 Hz, 3H), 7.29–7.15 (m, 3H), 6.93 (d, *J* = 5.3 Hz, 2H), 2.40 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-*d*₆) δ 155.29, 153.08, 149.77, 145.92, 135.77, 135.65, 132.85, 132.09, 132.00, 130.31, 129.99, 129.15, 128.75, 128.53, 123.67, 123.44, 122.89, 115.67, 21.72;

HRMS (ESI, m/z): calcd. For $C_{23}H_{18}N_2O_4SH^+$ 418.0987, found 419.1079; IR (KBr thin film, cm^{-1}): ν_{max} 3396, 2932, 2893, 1666, 1590, 1430, 1372, 1176, 1091, 828.



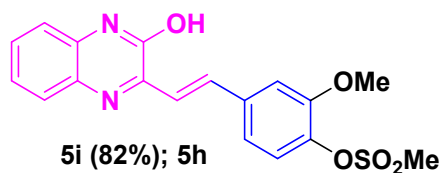
Ar = 4-Me-C₆H₄; **5g** (84%); **6h**

2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-6-methoxyphenyl methanesulfonate (5h); White solid, mp 243–244 °C, 80% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-d₆) δ 12.50 (s, 1H), 8.35 (d, J = 16.0 Hz, 1H), 7.76 (d, J = 8.0 Hz, 1H), 7.64 (d, J = 16.4 Hz, 1H), 7.512–7.455 (m, 2H), 7.39–7.26 (m, 3H), 7.17 (d, J = 8.0 Hz, 1H), 3.91 (s, 3H), 3.49 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 168.44, 162.05, 151.23, 150.19, 139.89, 137.99, 135.60, 133.25, 131.22, 130.89, 130.24, 129.81, 126.70, 123.00, 112.10, 110.3, 56.87, 30.73; HRMS (ESI, m/z): calcd. For $C_{18}H_{16}N_2O_5SH^+$ 373.0853, found 373.0870; IR (KBr thin film, cm^{-1}): ν_{max} 3400, 2910, 283, 1640, 1574, 1366, 1151, 1067, 861.



5h (80%); **5.5h**

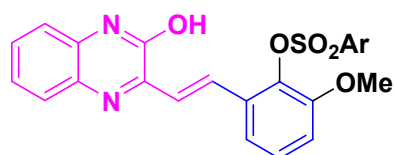
5-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-2-methoxyphenyl methane sulfonate (5i); Yellow crystalline solid, mp 207–208 °C, 82% yield. ¹H NMR (400 MHz, CDCl₃+ DMSO-d₆) δ 12.27 (s, 1H), 8.04 (d, J = 16.0 Hz, 1H), 7.74 (d, J = 8.0 Hz, 1H), 7.64 (d, J = 8.0 Hz, 2H), 7.56–7.44 (m, 1H), 7.37–7.33 (m, 1H), 7.24–7.23 (m, 1H), 7.10–7.06 (m, 2H), 3.52 (s, 3H), 2.38 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+ DMSO-d₆) δ 161.41, 158.70, 157.57, 151.10, 144.39, 142.42, 138.52, 137.48, 135.56, 135.20, 134.34, 129.45, 128.90, 126.35, 121.35, 116.76, 61.32, 27.41; HRMS (ESI, m/z): calcd. For $C_{18}H_{16}N_2O_5SNa^+$ 395.0672, found 395.0689; IR (KBr thin film, cm^{-1}): ν_{max} 3401, 2935, 2884, 1655, 1587, 1415, 1347, 1154, 1090, 843.



5i (82%); **5h**

2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-6-methoxyphenyl benzenesulfonate (5j); Pale green solid, mp 223–224 °C, 80% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-d₆) δ 8.13–8.03 (m, 2H), 8.01–7.82 (m, 2H), 7.84–7.82 (m, 2H), 7.67–7.62 (m, 4H), 7.56 (s, 1H), 7.52 (s, 1H), 7.39–7.31 (m, 2H), 3.97 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+ DMSO-d₆) δ 159.95, 157.57, 142.05,

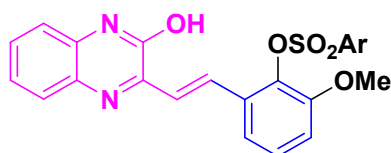
141.40, 138.97, 137.49, 136.89, 136.71, 134.96, 134.82, 134.06, 133.71, 133.09, 132.85, 129.08, 128.42, 123.05, 120.43, 118.21, 60.70; HRMS (ESI, m/z): calcd. For $C_{23}H_{18}N_2O_5SH^+$ 435.1009, found 435.1017; IR (KBr thin film, cm^{-1}): ν_{max} 3398, 1666, 1576, 1449, 1376, 1205, 1084, 766.



Ar = Ph; **5j** (80%); **5h**

2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-6-methoxyphenyl 4-methylbenzenesulfonate (5k):

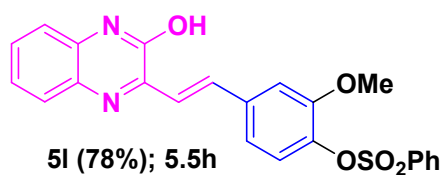
Light brown solid, mp 222–223 °C, 75% yield. 1H NMR (400 MHz, $CDCl_3+DMSO-d_6$) δ 12.39 (s, 1H), 7.84 (d, $J = 16.2$ Hz, 1H), 7.72 (t, $J = 8.8$ Hz, 3H), 7.46 (dd, $J = 15.3, 9.7$ Hz, 2H), 7.36 (d, $J = 8.3$ Hz, 1H), 7.34 – 7.26 (m, 3H), 7.22 (d, $J = 8.1$ Hz, 2H), 7.03 (d, $J = 7.6$ Hz, 1H), 3.72 (s, 3H), 2.12 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3+DMSO-d_6$) δ 159.88, 157.83, 157.51, 149.94, 142.16, 138.41, 137.46, 136.85, 136.54, 135.02, 134.81, 134.57, 133.66, 133.12, 132.76, 128.74, 128.43, 123.05, 120.40, 118.29, 60.84, 26.06; HRMS (ESI, m/z): calcd. For $C_{24}H_{20}N_2O_5SH^+$ 449.1166, found 449.1187; IR (KBr thin film, cm^{-1}): ν_{max} 3389, 2835, 1650, 1573, 1354, 1083, 811.



Ar = 4-Me- C_6H_4 ; **5k** (75%); **6h**

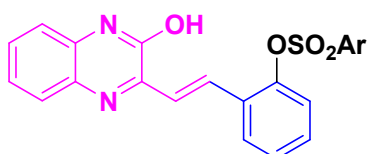
5-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-2-methoxyphenyl benzenesulfonate (5l):

Yellow solid, mp 197–198 °C, 78 % yield. 1H NMR (400 MHz, $DMSO-d_6+CDCl_3$) δ 12.27 (s, 1H), 7.91 – 7.78 (m, 3H), 7.69 – 7.63 (m, 1H), 7.49 (d, $J = 16.1$ Hz, 1H), 7.40 (s, 4H), 7.31 (d, $J = 6.7$ Hz, 1H), 7.27 – 7.17 (m, 3H), 6.90 (d, $J = 7.2$ Hz, 1H), 3.59 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3+DMSO-d_6$) δ 157.95, 155.57, 140.05, 139.40, 136.97, 135.49, 134.89, 134.71, 132.96, 132.82, 132.06, 131.71, 131.09, 130.85, 127.08, 126.42, 121.05, 118.43, 116.21, 58.70; HRMS (ESI, m/z): calcd. For $C_{23}H_{18}N_2O_5SH^+$ 435.1009, found 435.1026; IR (KBr thin film, cm^{-1}): ν_{max} 3410, 2928, 2845, 1659, 1504, 1355, 1114, 1030, 839.



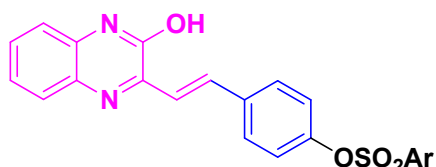
5l (78%); **5.5h**

2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl-4-nitrobenzenesulfonate (5m): Pale yellow solid, mp 238–239 °C, 85% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-d₆) δ 12.53 (s, 1H), 8.22 (d, *J* = 8.4 Hz, 2H), 8.08 (d, *J* = 8.4 Hz, 2H), 7.86–7.78 (m, 2H), 7.66 (d, *J* = 16.4 Hz, 1H), 7.59–7.43 (m, 3H), 7.42–7.23 (m, 4H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 157.74, 155.10, 153.82, 149.96, 142.83, 135.43, 134.88, 133.47, 133.34, 133.17, 132.88, 131.89, 131.66, 131.28, 130.65, 130.42, 127.63, 126.82, 126.57, 118.50; HRMS (ESI, *m/z*): calcd. For Calculated Formula: C₂₂H₁₅N₃O₆SH⁺ 450.0754, found 450.0769; IR (KBr thin film, cm⁻¹): ν_{max} 3395, 2950, 2840, 1160, 1531, 1356, 1189, 1074, 821.



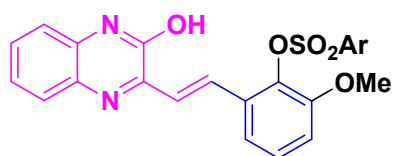
Ar = 4-NO₂-C₆H₄; 5m (85%); 5h

4-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl-4-nitrobenzenesulfonate (5n): Yellow solid, mp 233–234 °C, 84% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-d₆) δ 8.45–8.41 (m, 2H), 8.13–8.09 (m, 2H), 8.04–7.98 (m, 1H), 7.72 (dd, *J* = 7.6, 1.0 Hz, 1H), 7.64 (d, *J* = 8.4 Hz, 2H), 7.56 (d, *J* = 16.4 Hz, 1H), 7.43–7.38 (m, 1H), 7.29–7.22 (m, 2H), 7.05 (d, *J* = 8.4 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 160.08, 157.71, 155.98, 154.05, 145.09, 140.91, 140.28, 137.60, 136.80, 135.06, 134.75, 134.05, 133.50, 129.70, 128.49, 128.41, 127.50, 120.41; HRMS (ESI, *m/z*): calcd. For C₂₂H₁₅N₃O₆SH⁺ 450.0754, found 450.0756; IR (KBr thin film, cm⁻¹): ν_{max} 3396, 2886, 1664, 1532, 1405, 1360, 1149, 977, 855.



Ar = 4-NO₂-C₆H₄; 5n (84%); 5h

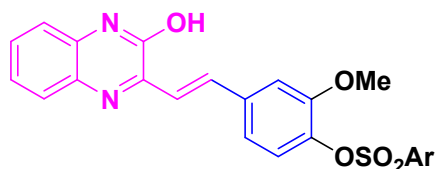
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-6-methoxyphenyl 4-nitrobenzenesulfonate (5o): Yellow solid, mp 229–230 °C, 82% yield. ¹H NMR (400 MHz, DMSO-d₆+CDCl₃) δ 12.49 (s, 1H), 8.33 (d, *J* = 7.8 Hz, 2H), 8.20 (t, *J* = 14.6 Hz, 2H), 7.77 (d, *J* = 16.0 Hz, 1H), 7.67 (d, *J* = 7.2 Hz, 1H), 7.51–7.28 (m, 6H), 7.18 (d, *J* = 8.0 Hz, 1H), 3.72 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 159.72, 157.56, 157.29, 155.62, 146.63, 141.89, 137.28, 136.97, 136.21, 135.27, 134.97, 134.36, 133.61, 133.56, 129.69, 129.63, 128.64, 123.39, 120.50, 118.89, 61.07; HRMS (ESI, *m/z*): calcd. For C₂₃H₁₇N₃O₇SH⁺ 480.0860, found 480.0880; IR (KBr thin film, cm⁻¹): ν_{max} 3390, 3102, 2892, 1666, 1573, 1347, 1140, 1063, 887, 754.



Ar = 4-NO₂-C₆H₄; **5o** (82%); **6h**

5-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-2-methoxyphenyl-4-nitrobenzenesulfonat (5p):

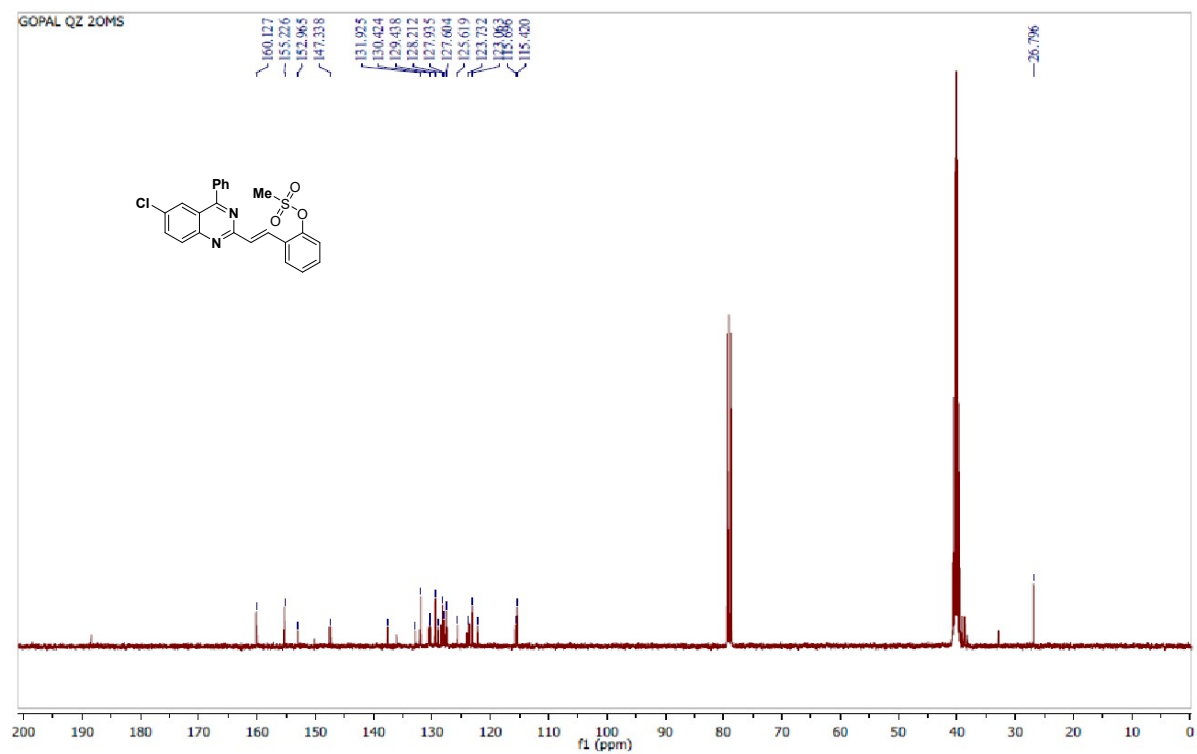
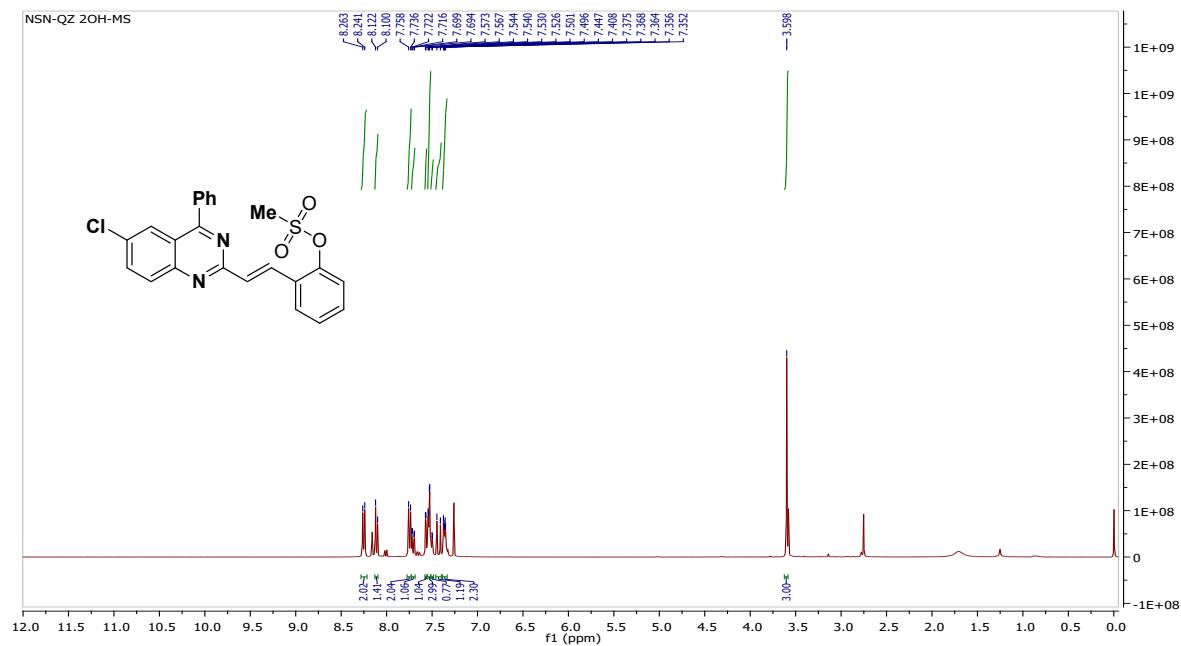
White solid, mp 218–219 °C, 78% yield. ¹H NMR (400 MHz, CDCl₃+DMSO-d₆) δ 12.33 (s, 1H), 8.35 (d, *J* = 8.8 Hz, 2H), 8.05 (d, *J* = 8.8 Hz, 2H), 8.00 (d, *J* = 16.2 Hz, 1H), 7.73 (s, 1H), 7.69 (d, *J* = 7.9 Hz, 1H), 7.53 (d, *J* = 16.2 Hz, 1H), 7.39 – 7.32 (m, 1H), 7.28 – 7.18 (m, 2H), 7.17 – 7.13 (m, 2H), 3.53 (s, 3H); ¹³C NMR (100 MHz, CDCl₃+DMSO-d₆) δ 155.86, 153.71, 153.57, 153.44, 151.79, 142.73, 138.02, 133.41, 133.12, 132.32, 131.48, 131.13, 130.50, 129.77, 125.89, 125.79, 124.84, 119.56, 116.66, 115.12, 57.25; HRMS (ESI, *m/z*): calcd. For C₂₃H₁₇N₃O₇SH⁺ 480.0860, found 480.0866; IR (KBr thin film, cm⁻¹): ν_{max} 3405, 2976, 2844, 1661, 1532, 1347, 1115, 851.

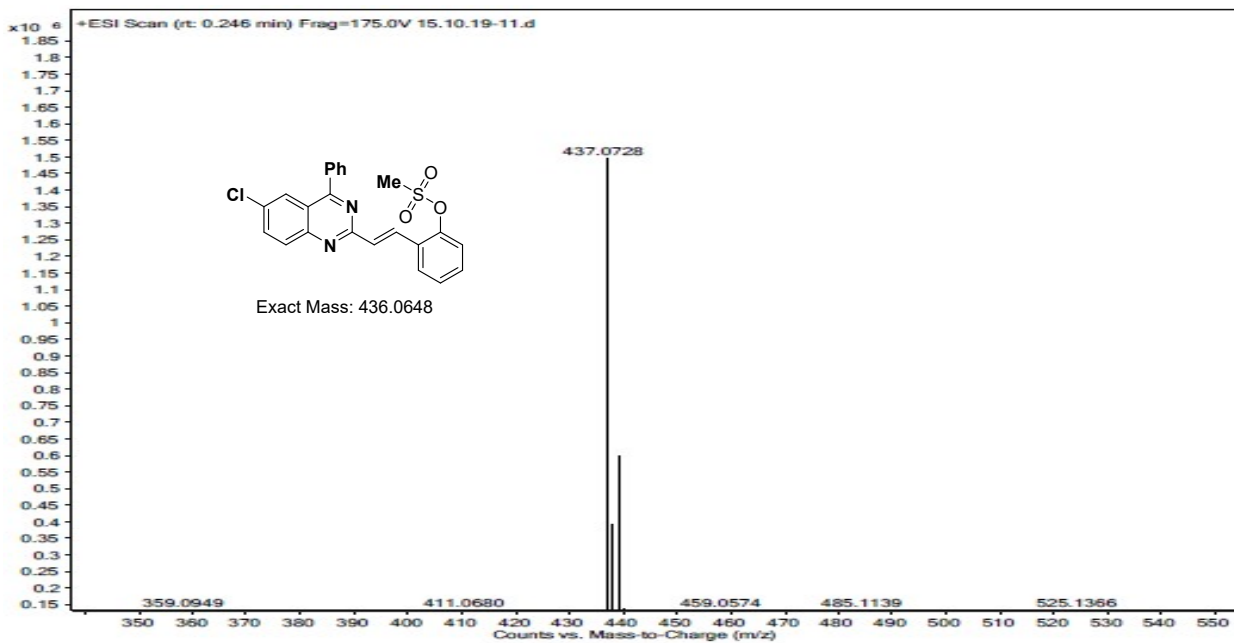


Ar = 4-NO₂-C₆H₄; **5p** (78%); **5.5h**

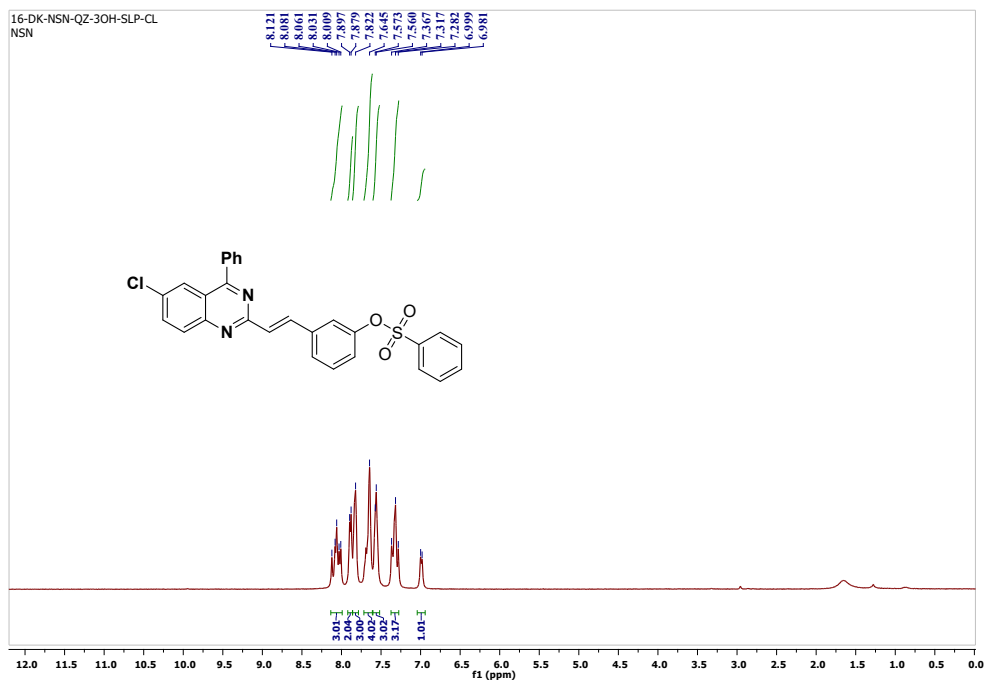
3. ¹H & ¹³C-NMR and Mass spectra of products (3a -3r and 5a – 5p).

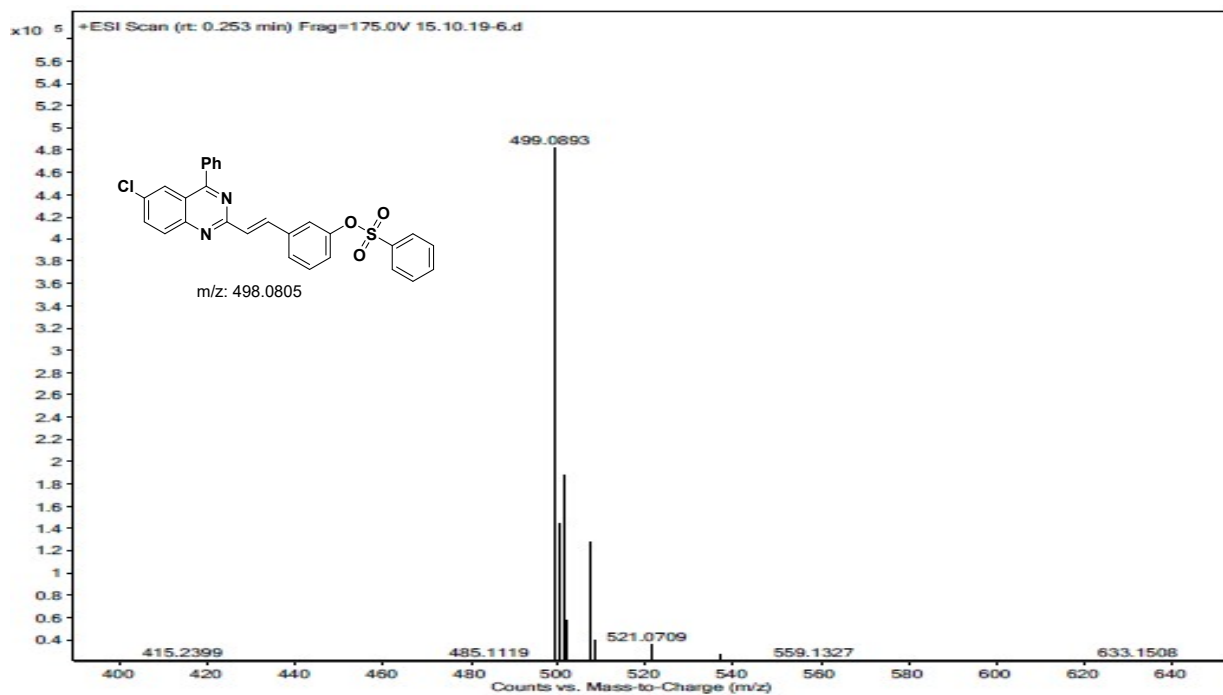
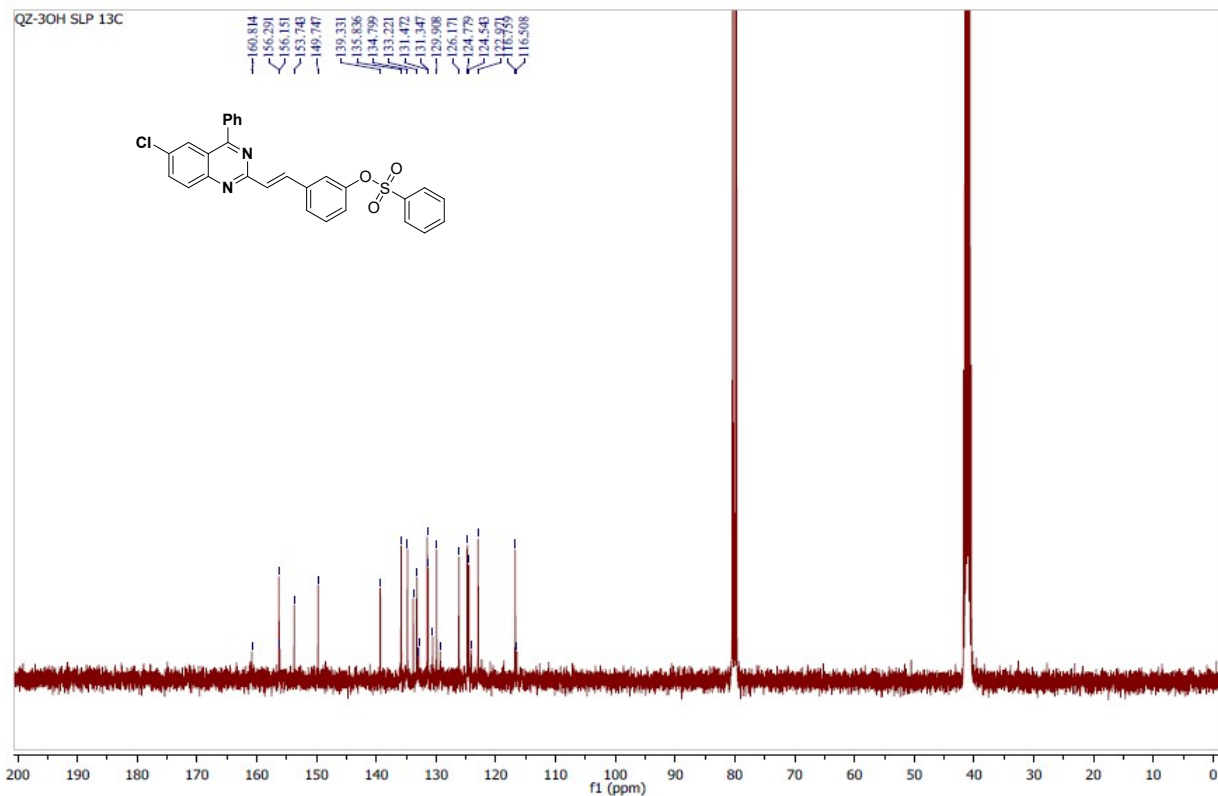
2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl methanesulfonate (3a):



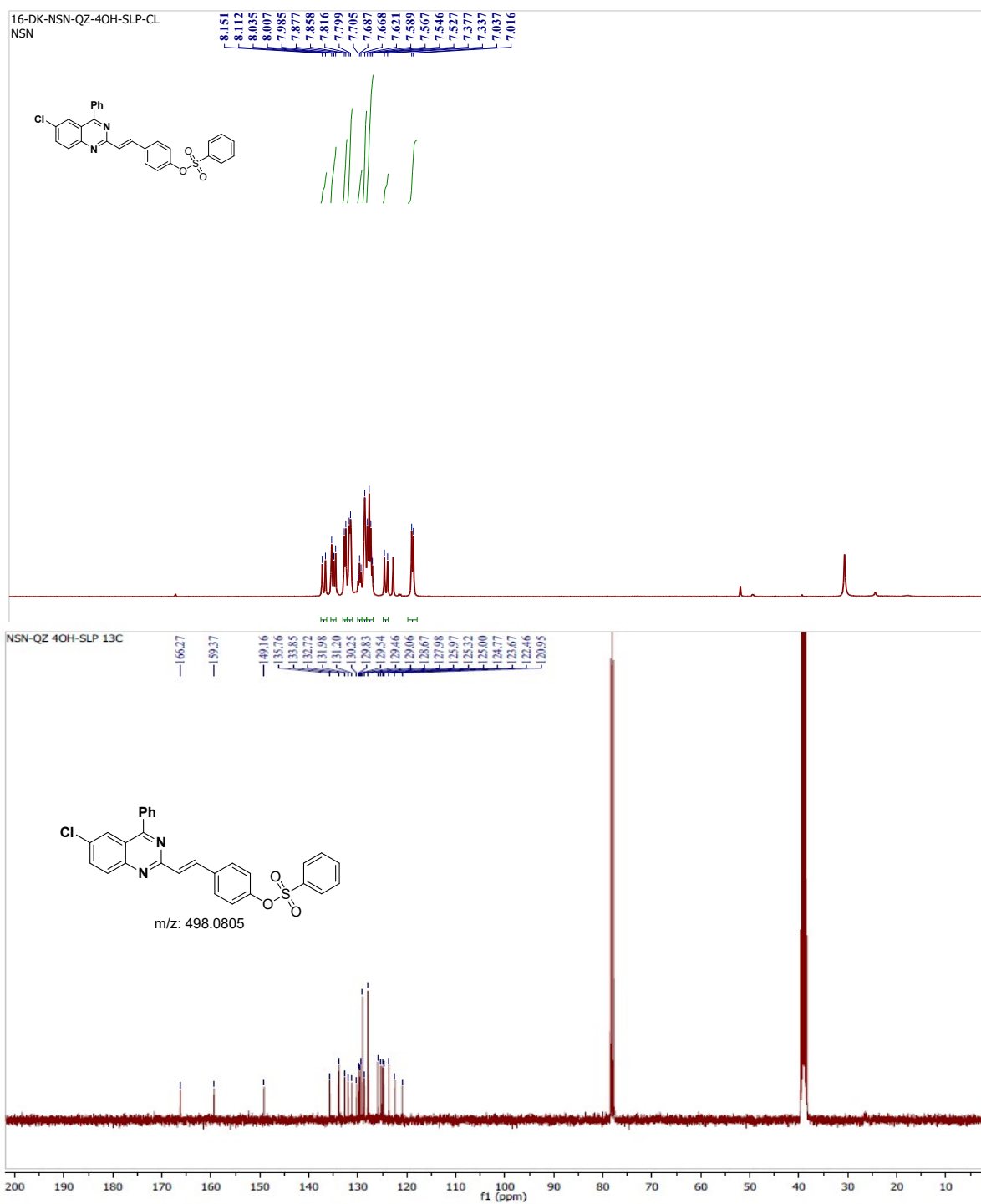


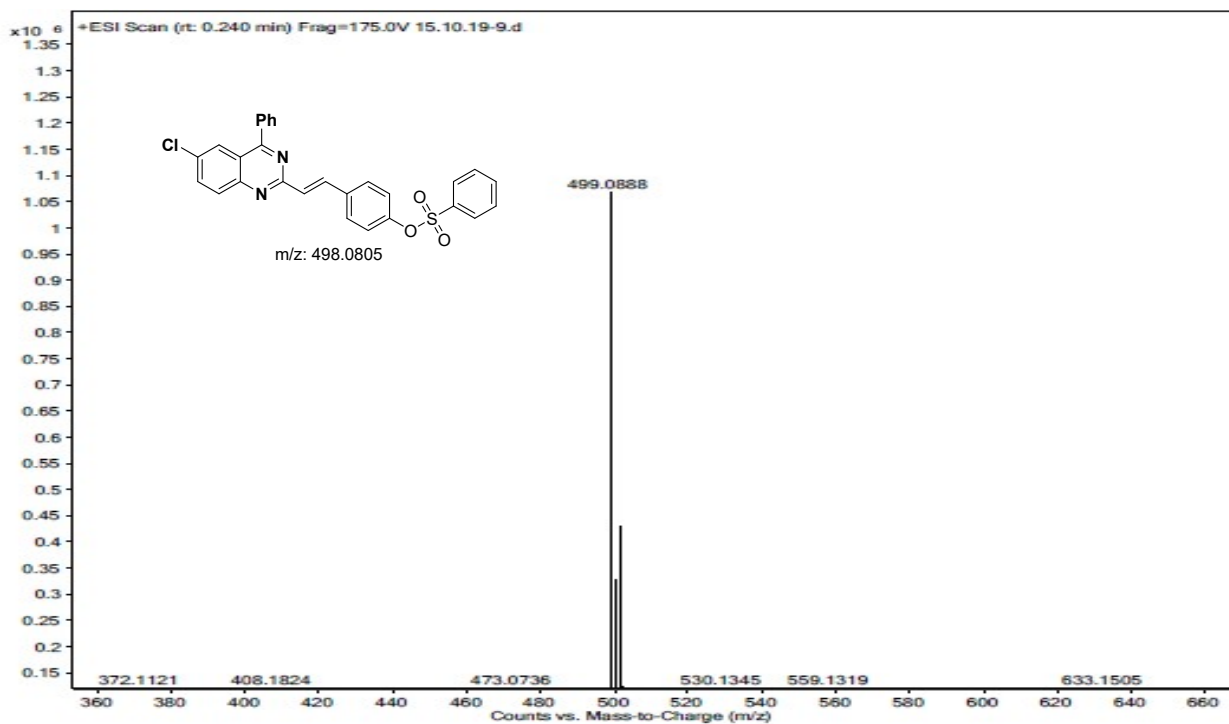
5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl 4-methylbenzene sulfonate (3b):



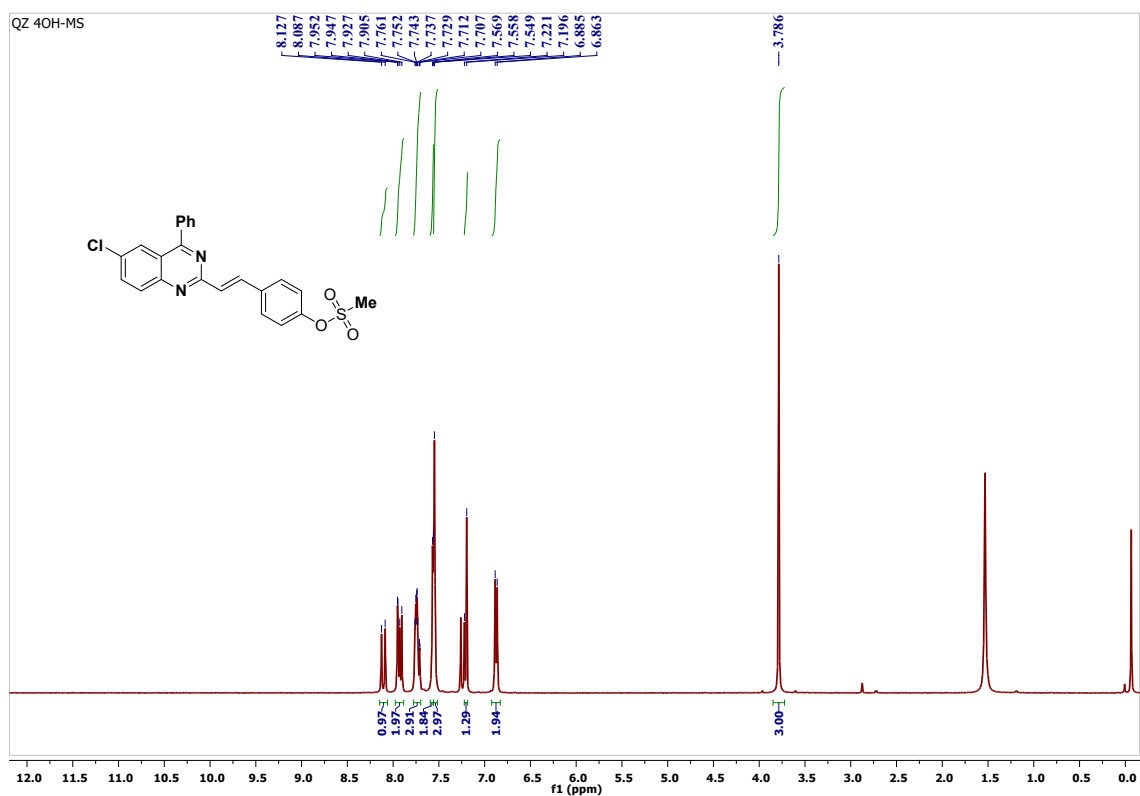


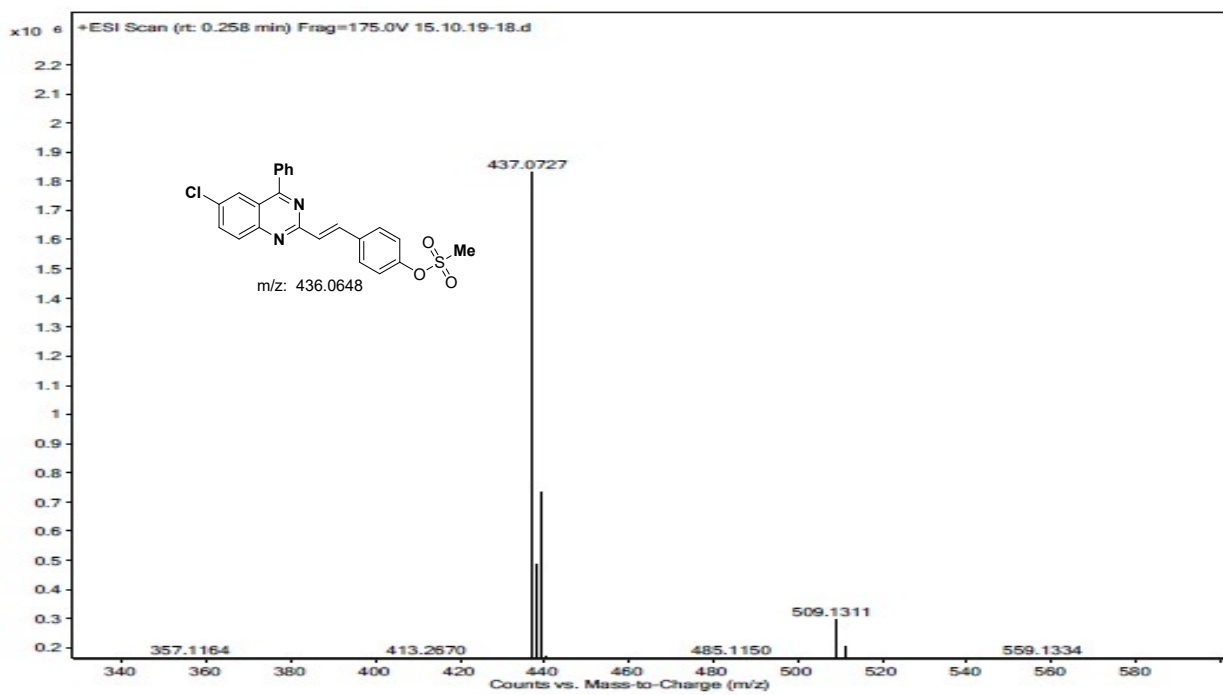
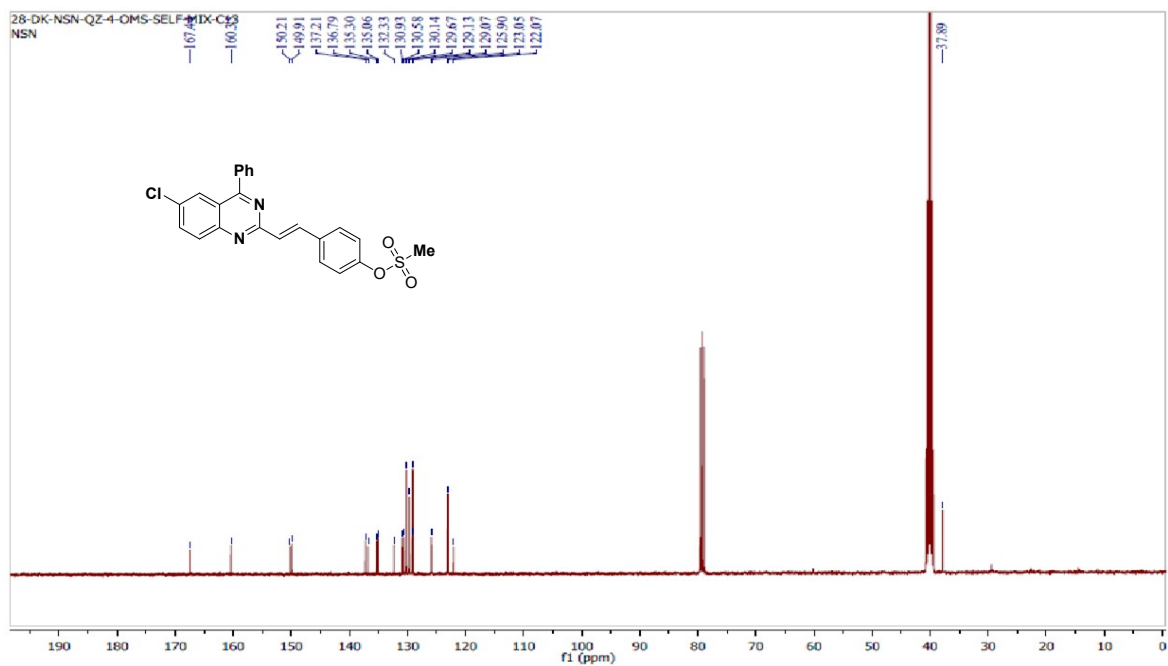
4-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (3c):



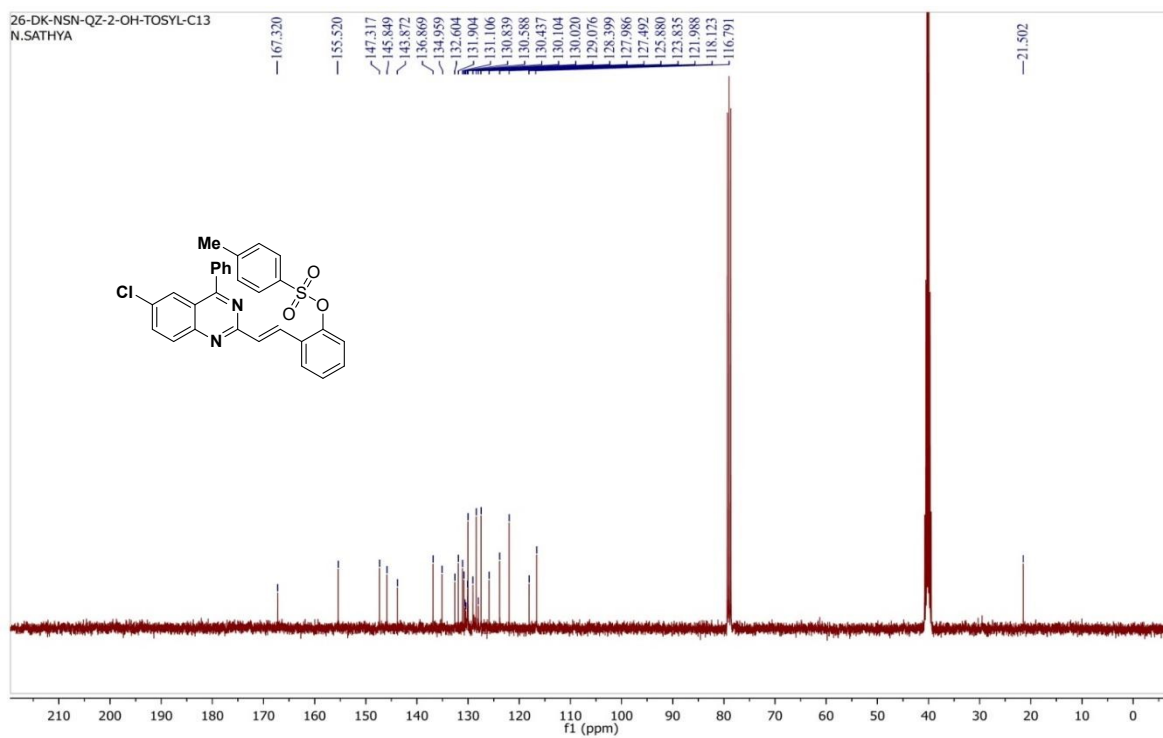
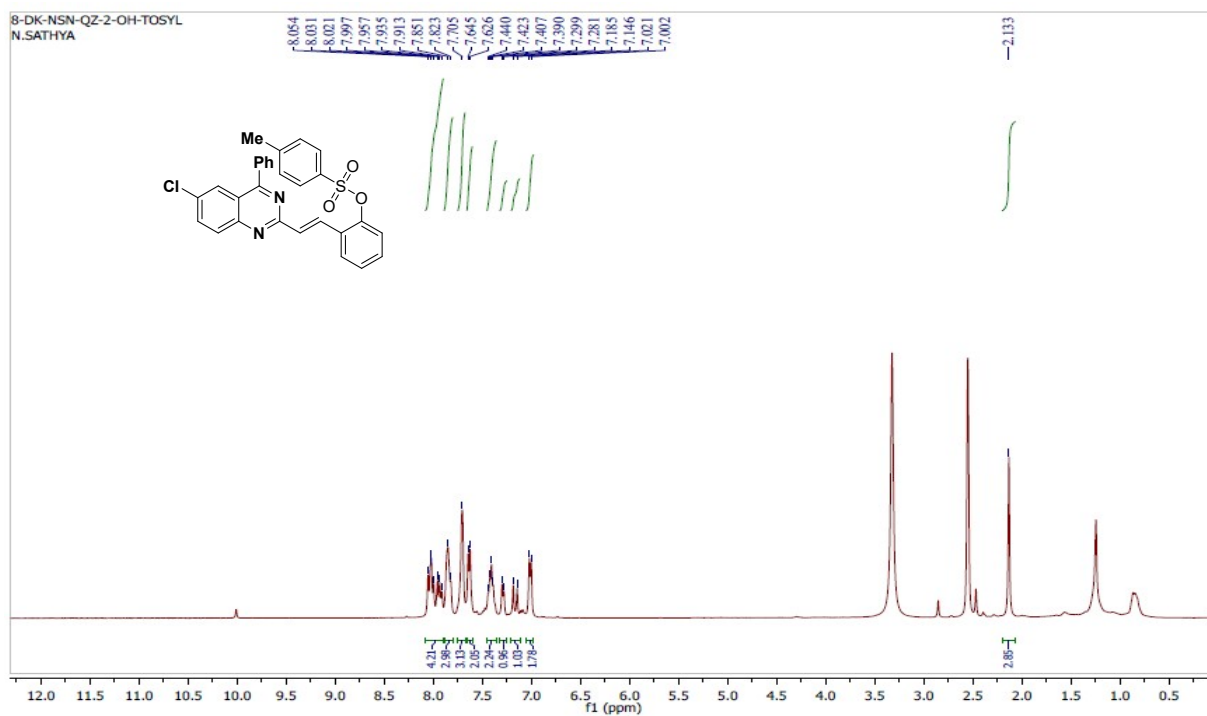


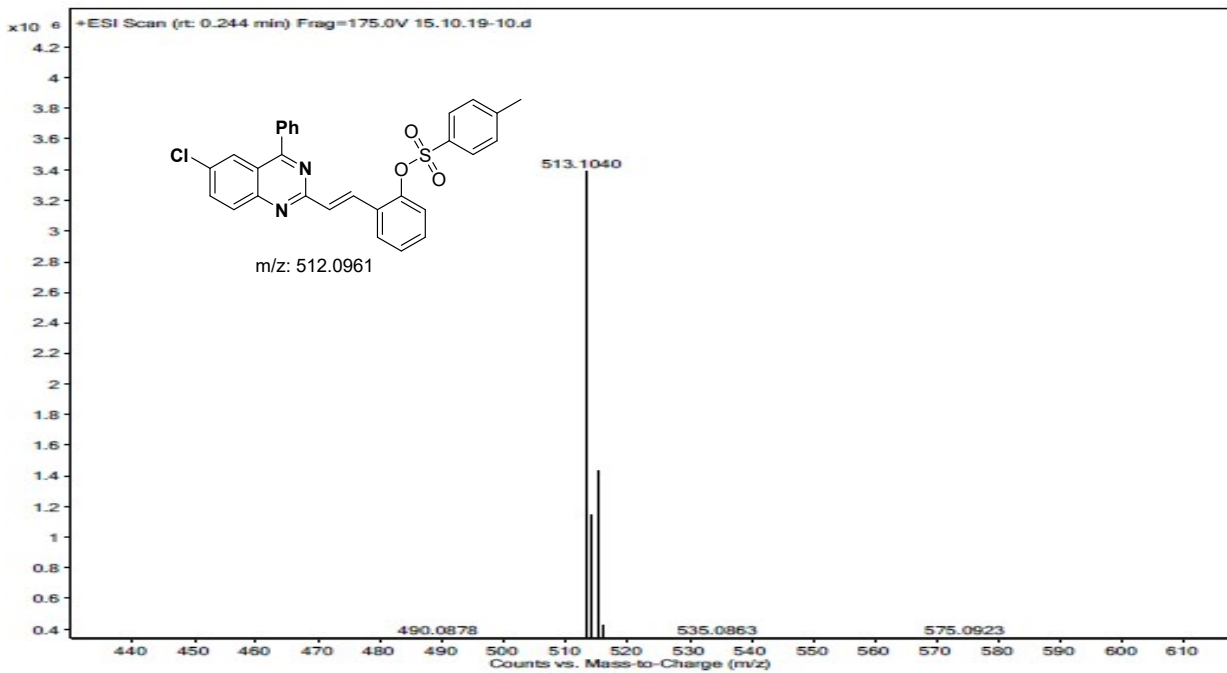
4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl methanesulfonate (3d):



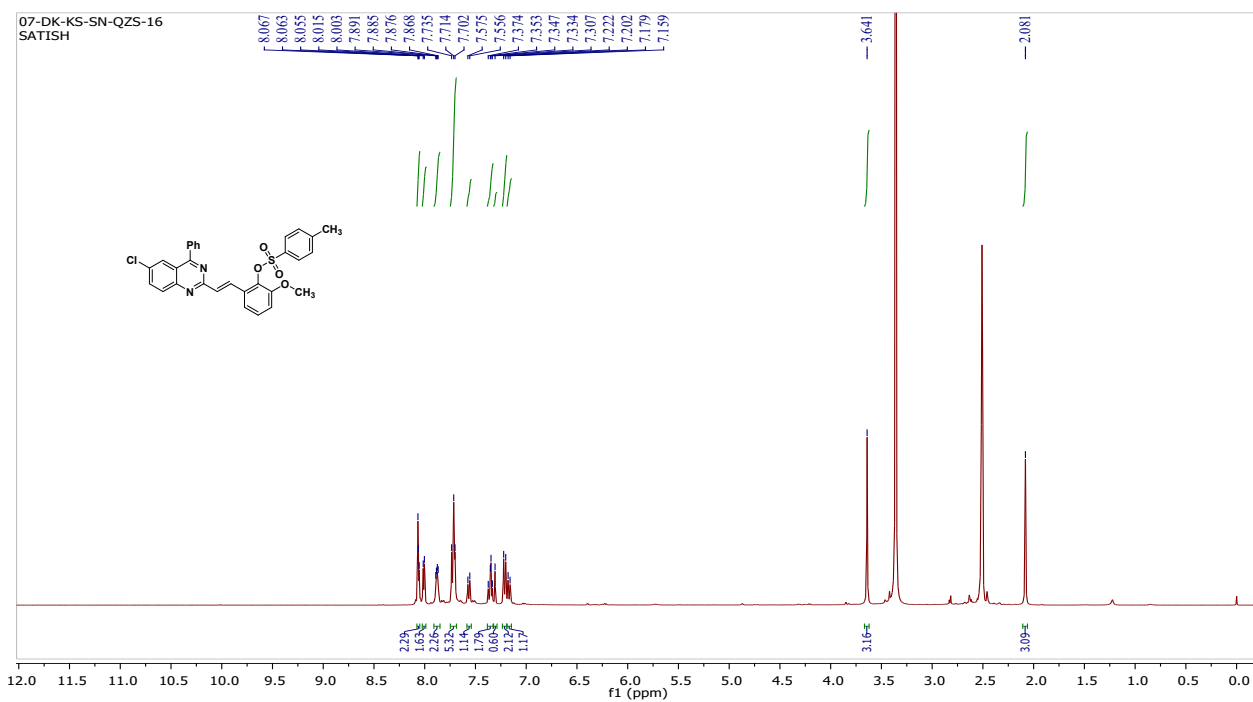


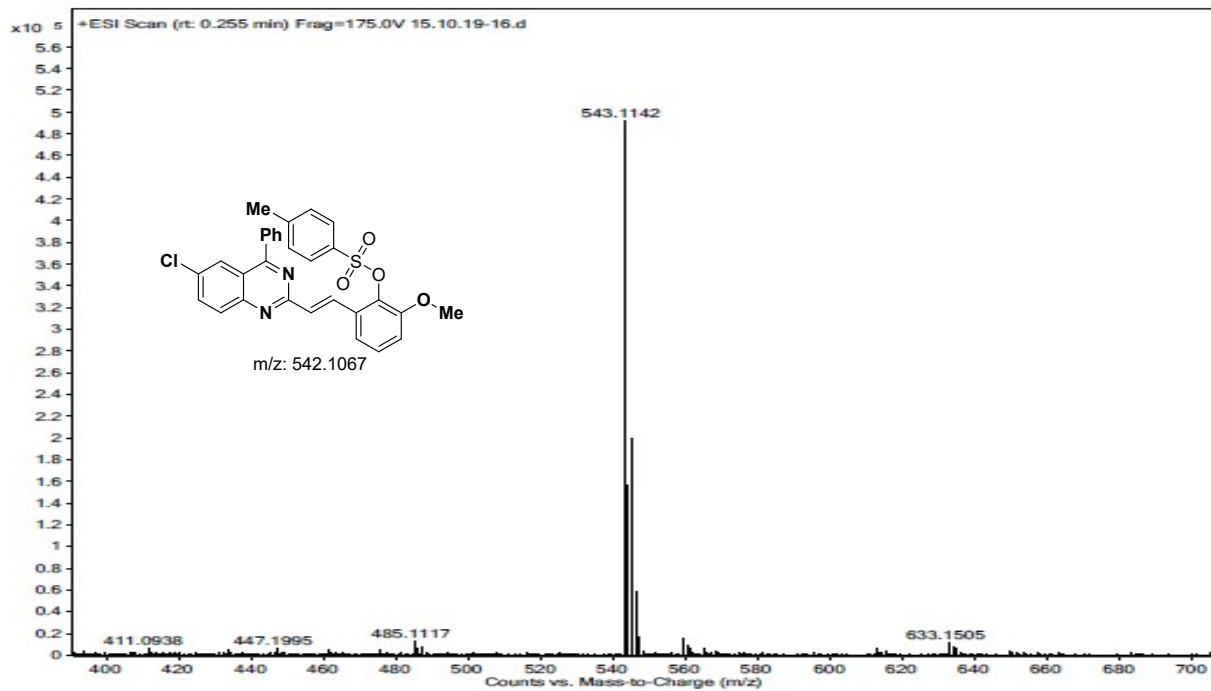
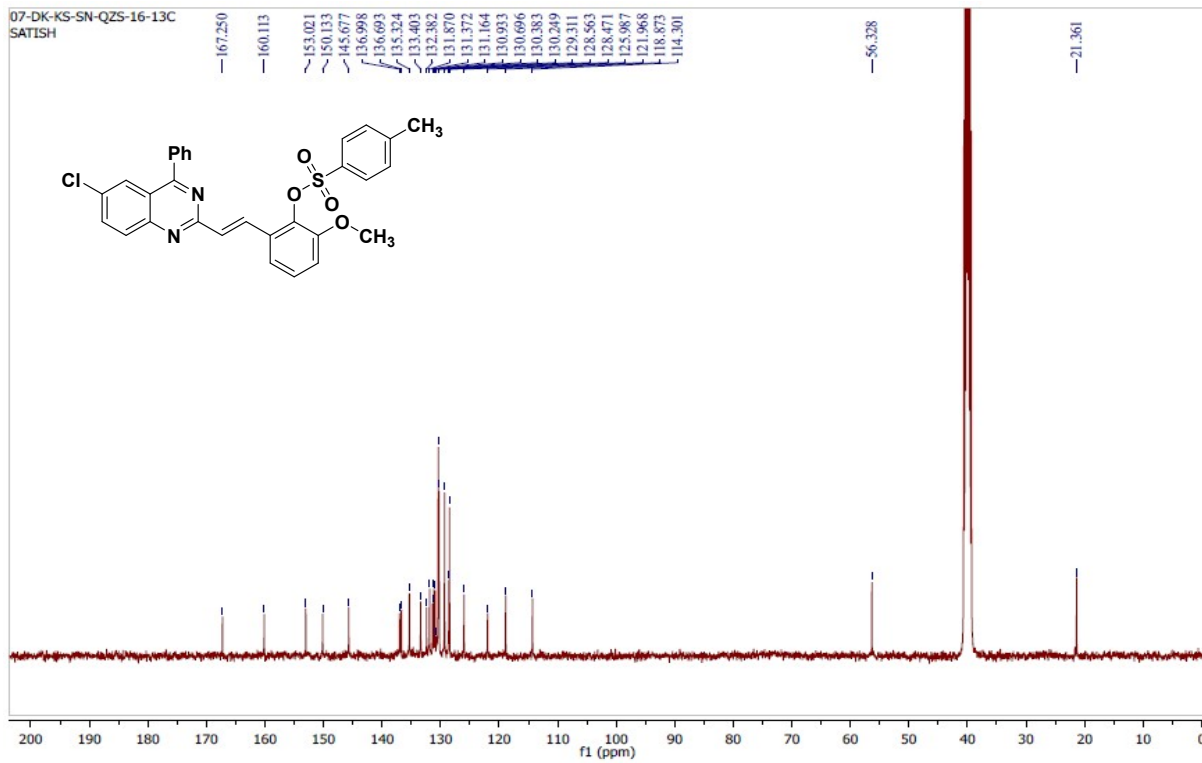
2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl-4-methylbenzenesulfonate (3e):



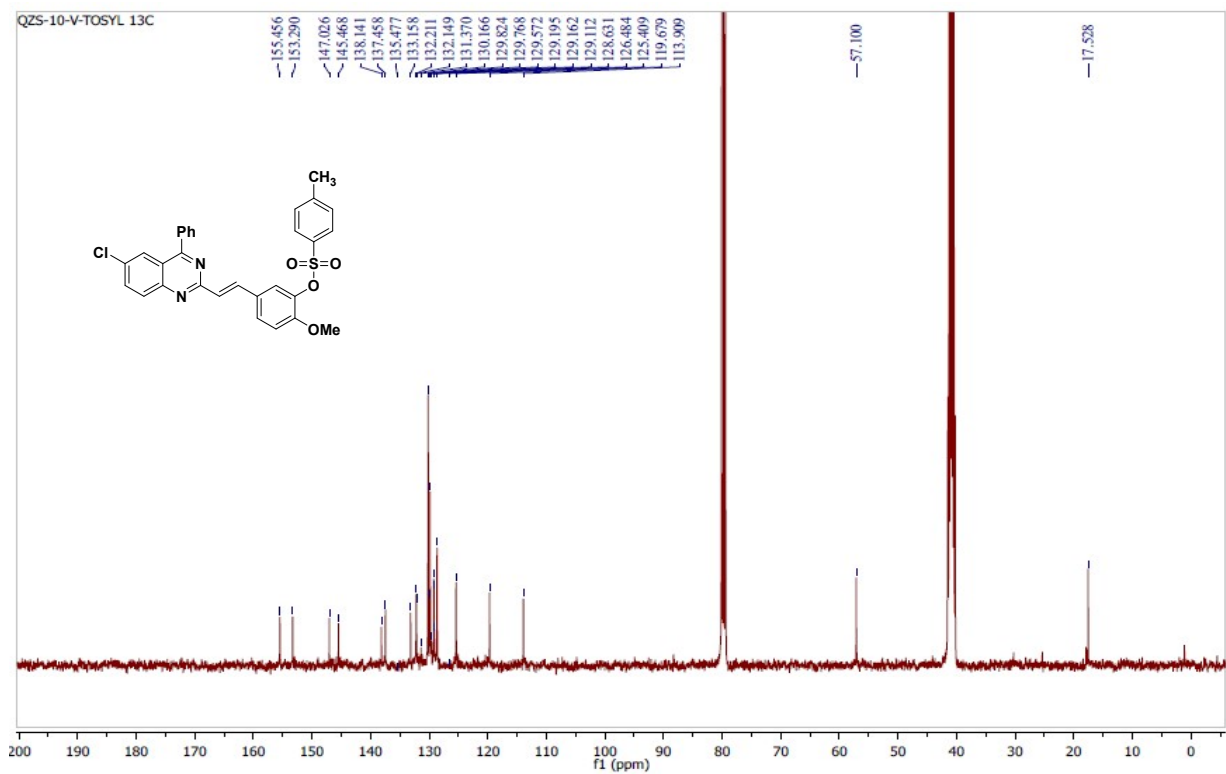
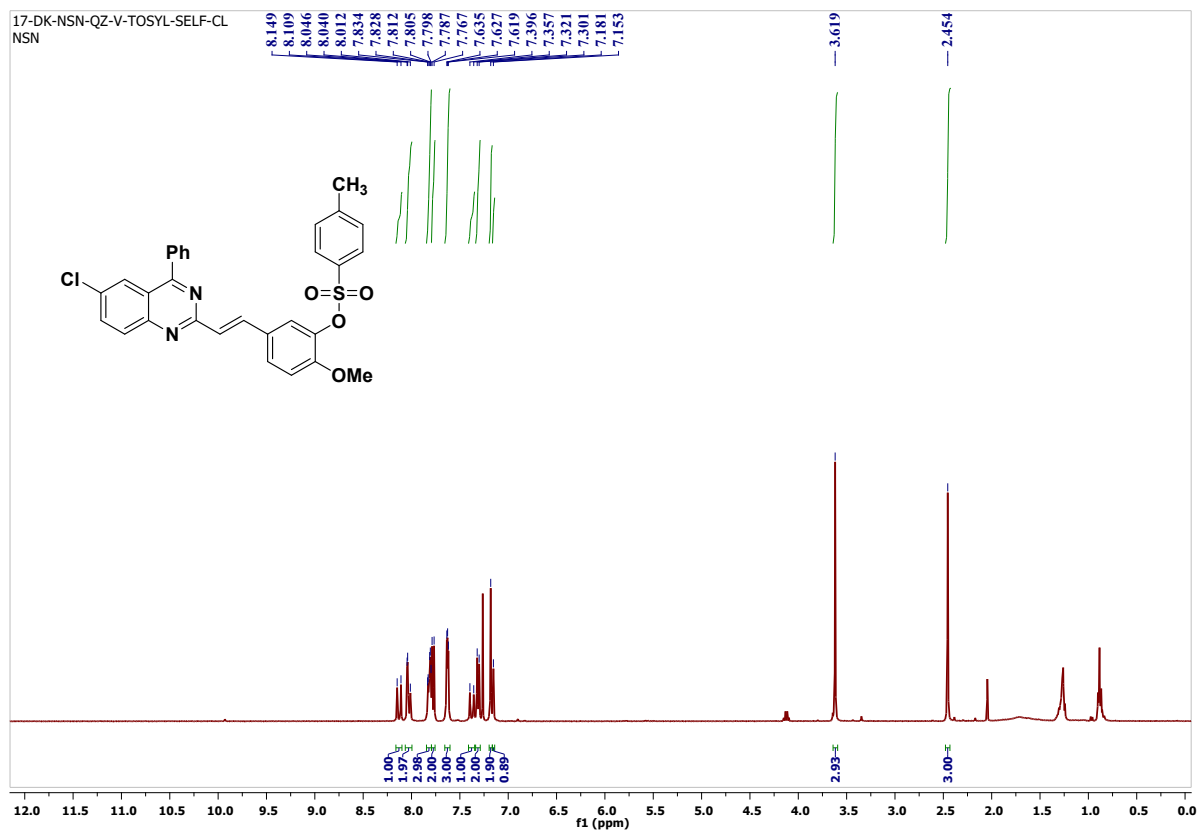


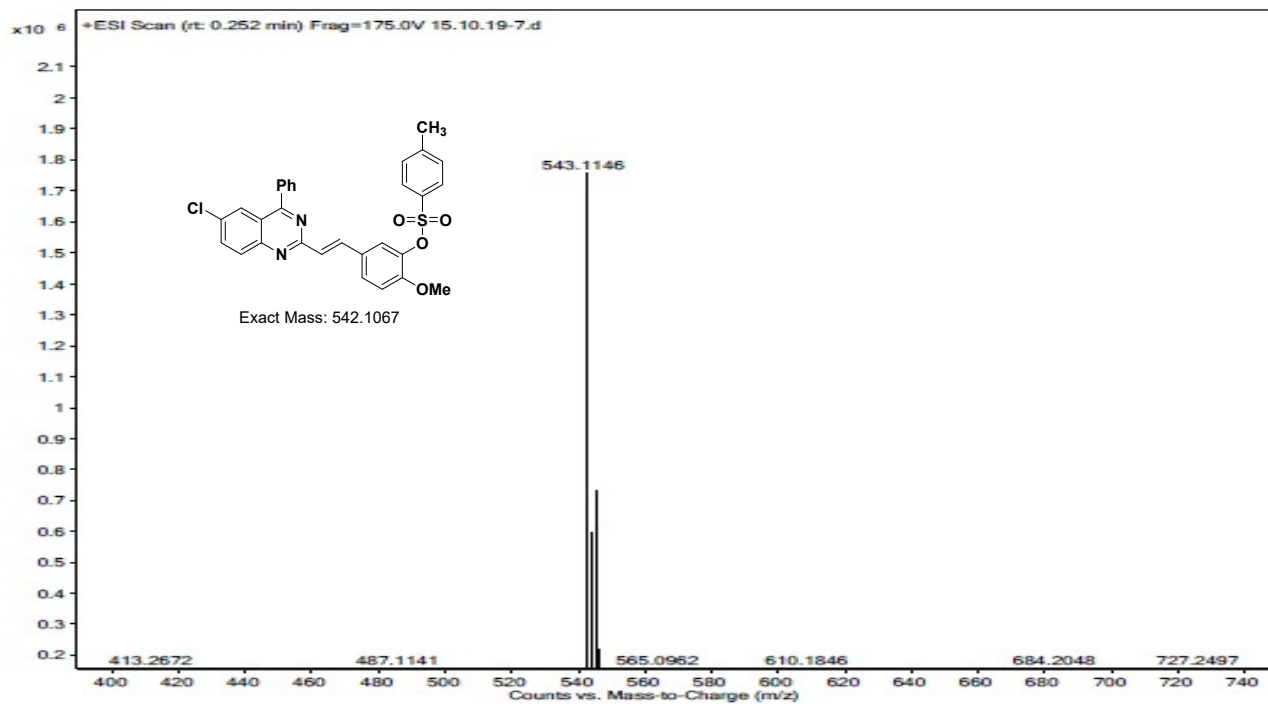
5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl-4-methylbenzenesulfonate (3f):



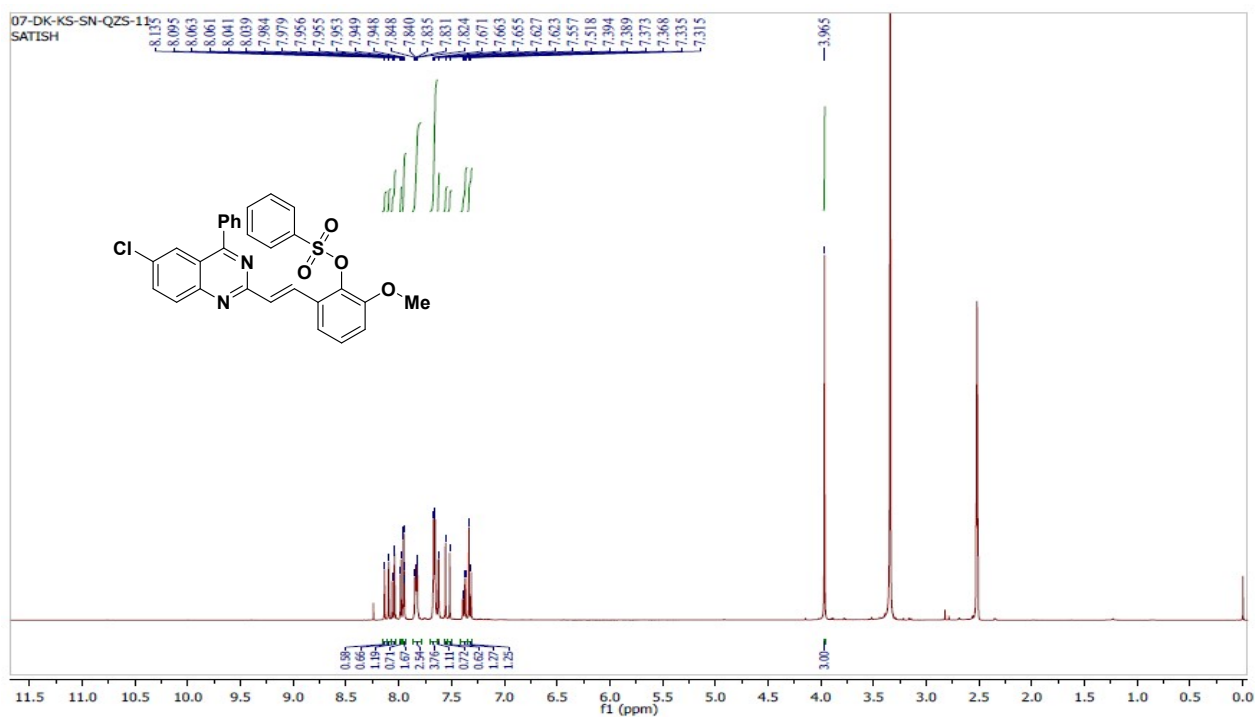


5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl-4-methylbenzenesulfonate (3g):

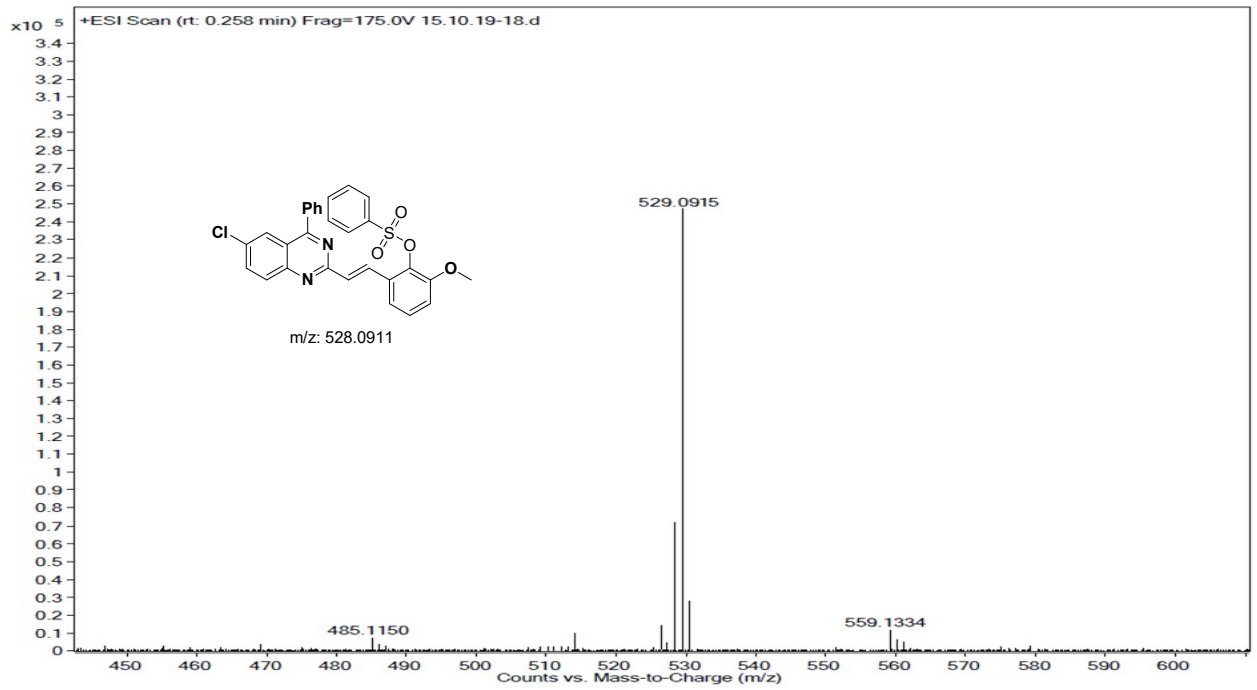
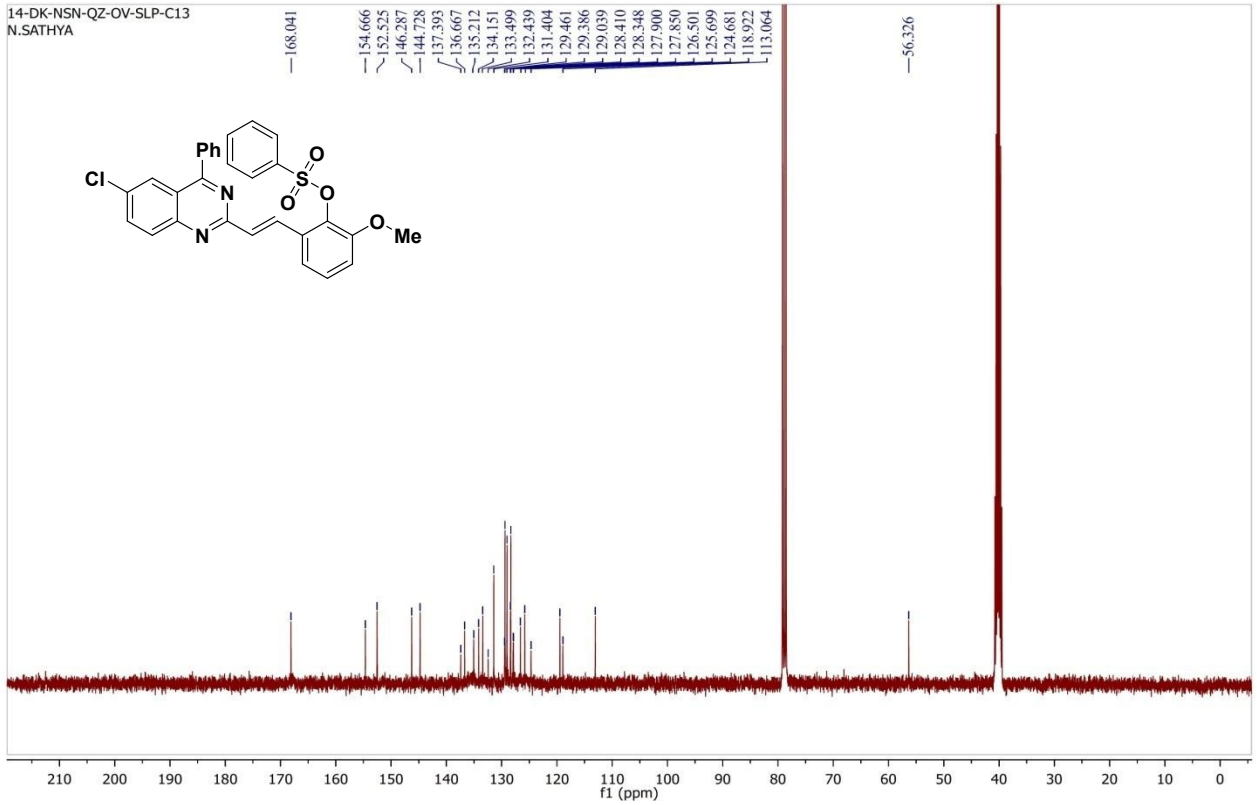




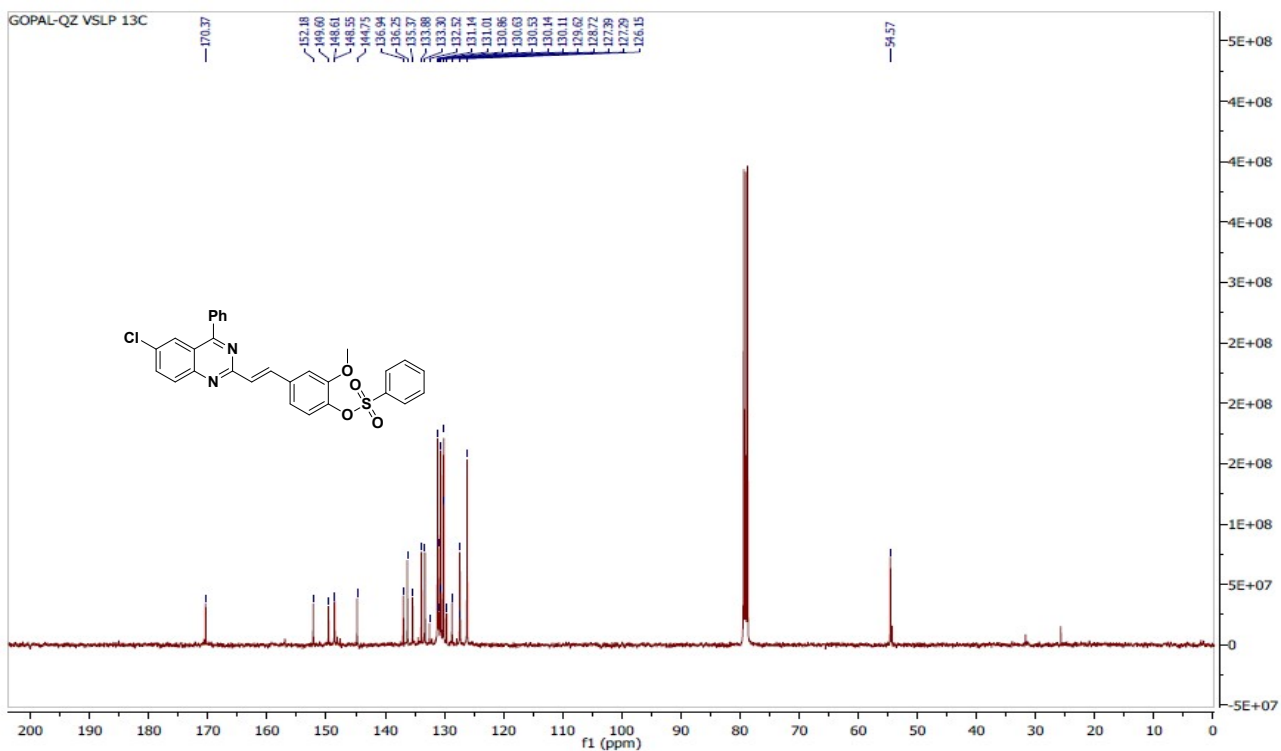
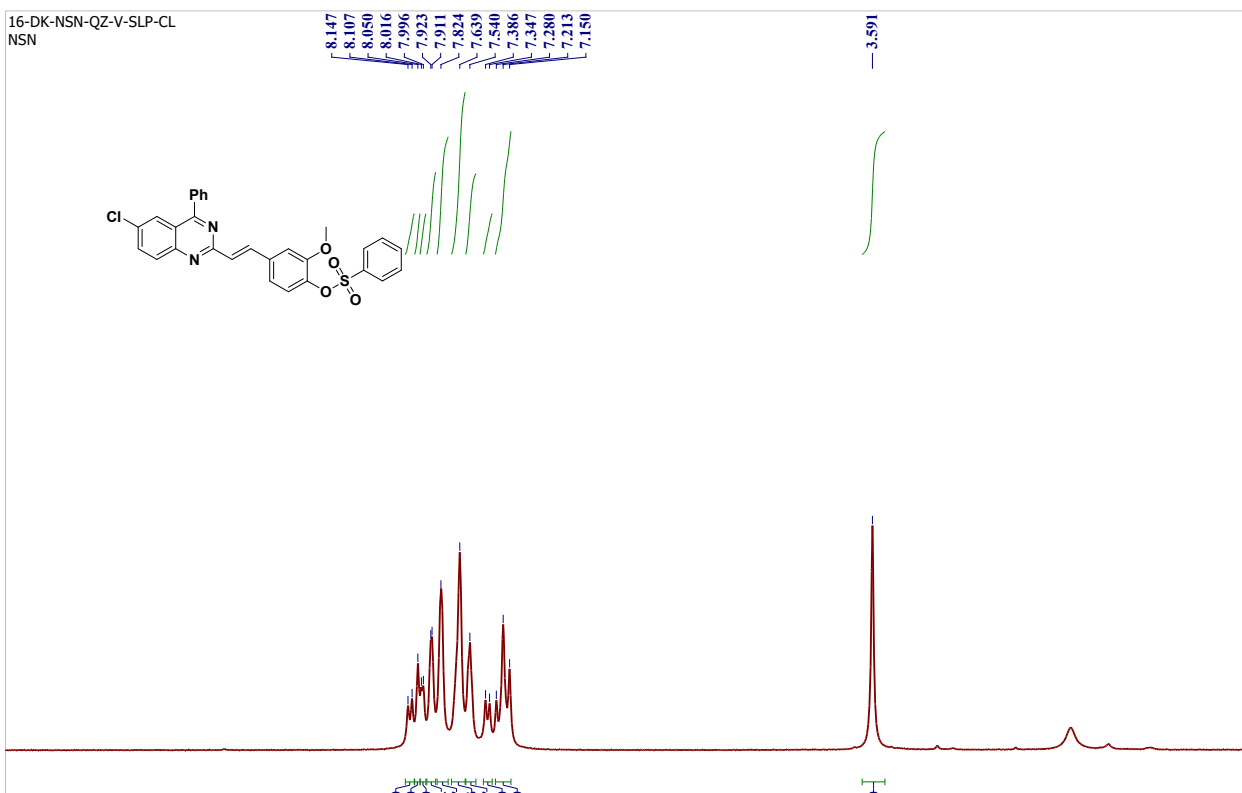
2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-6-methoxyphenyl benzenesulfonate (3h):

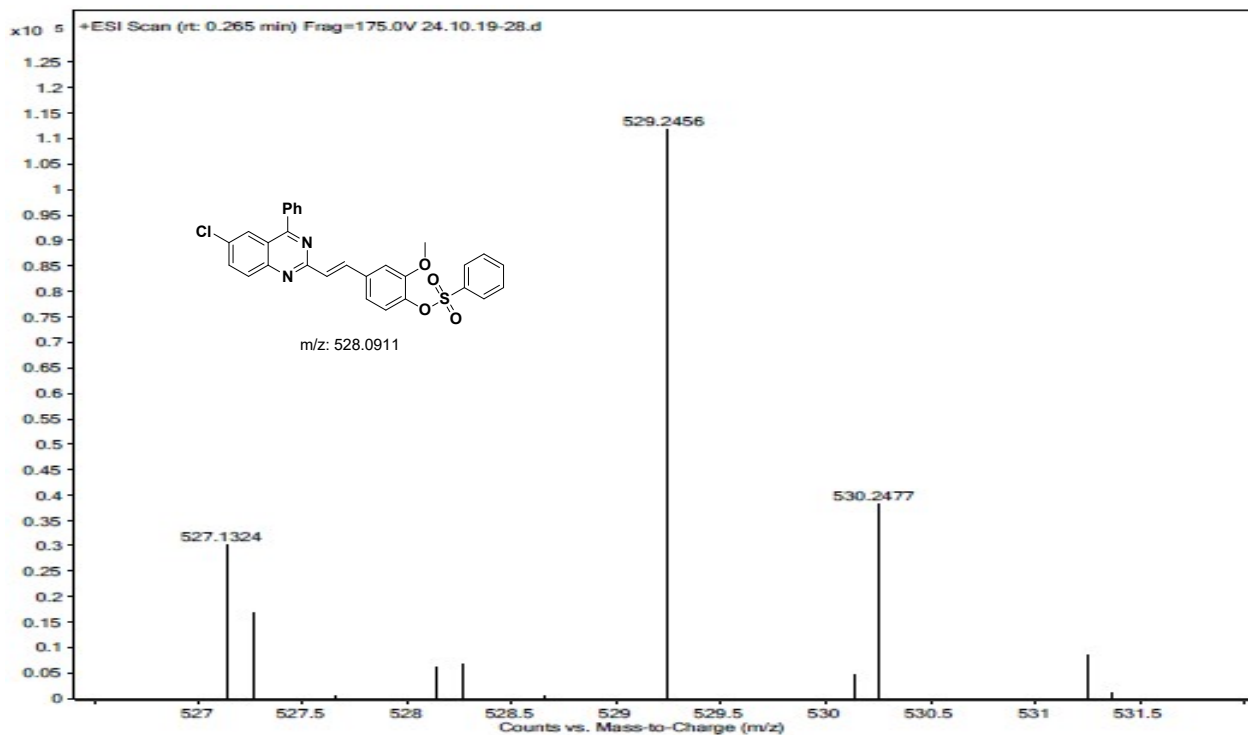


14-DK-NSN-QZ-OV-SLP-C13
N.SATHYA

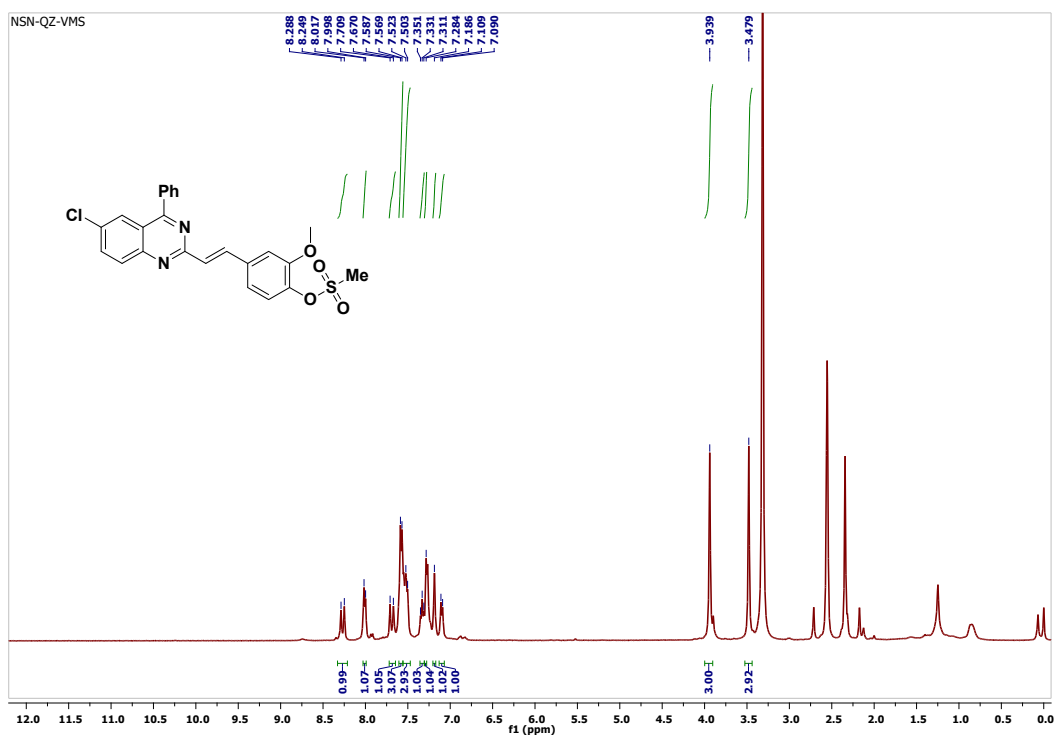


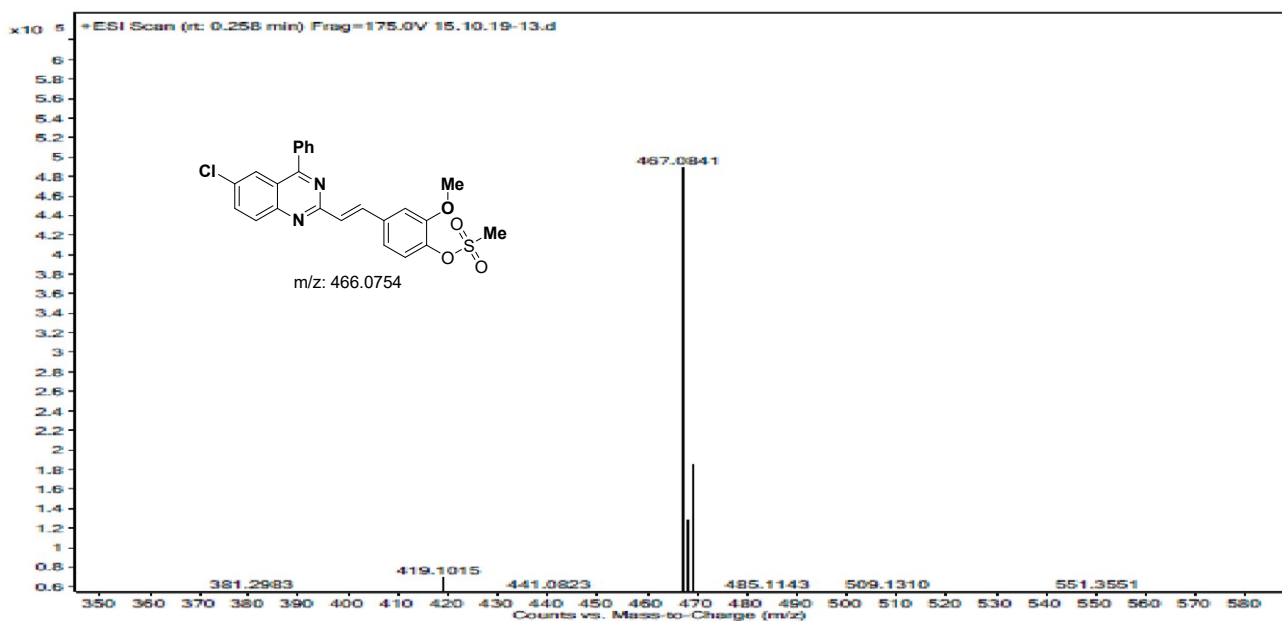
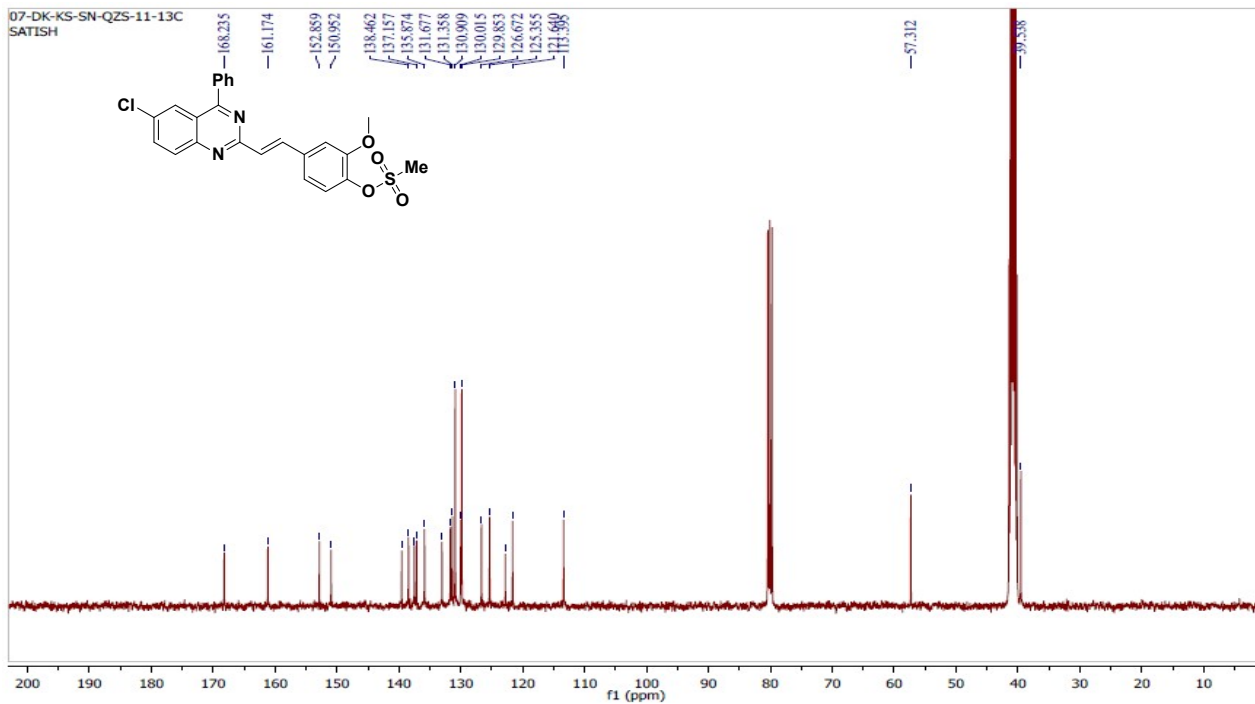
4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl benzenesulfonate (3i):



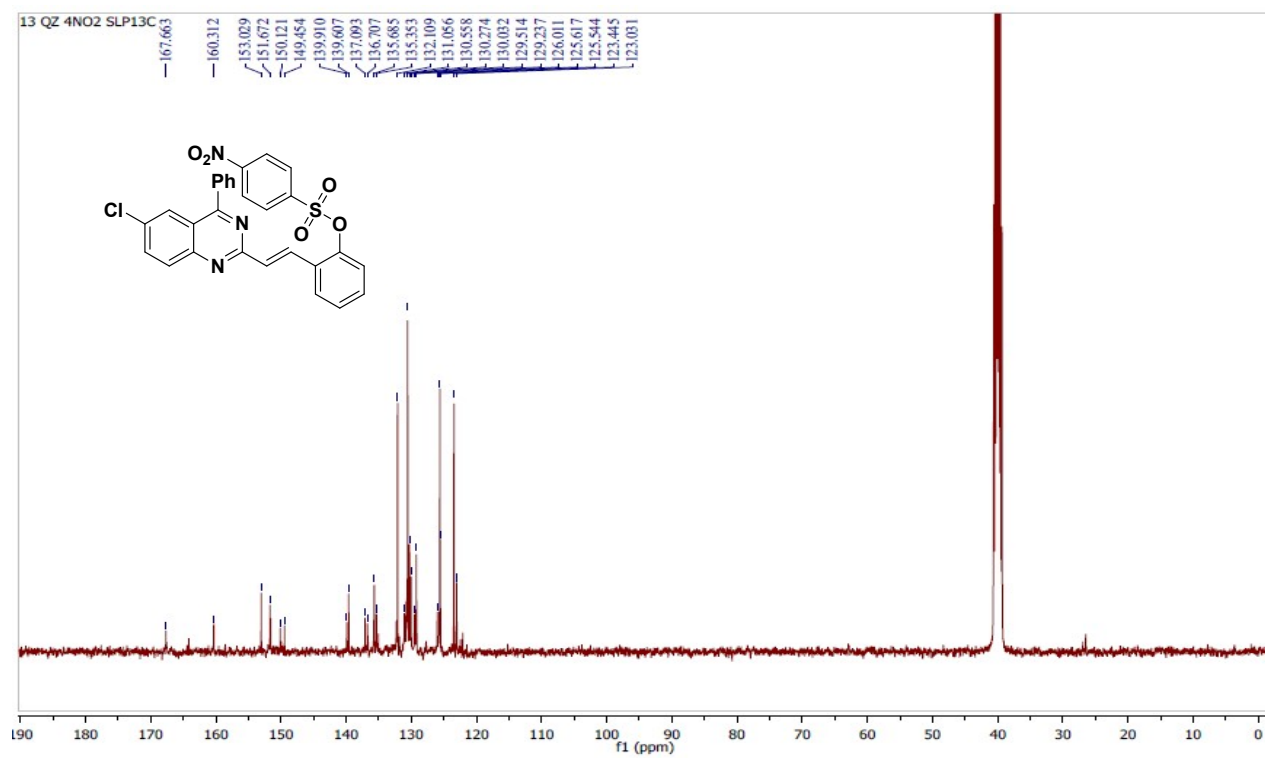
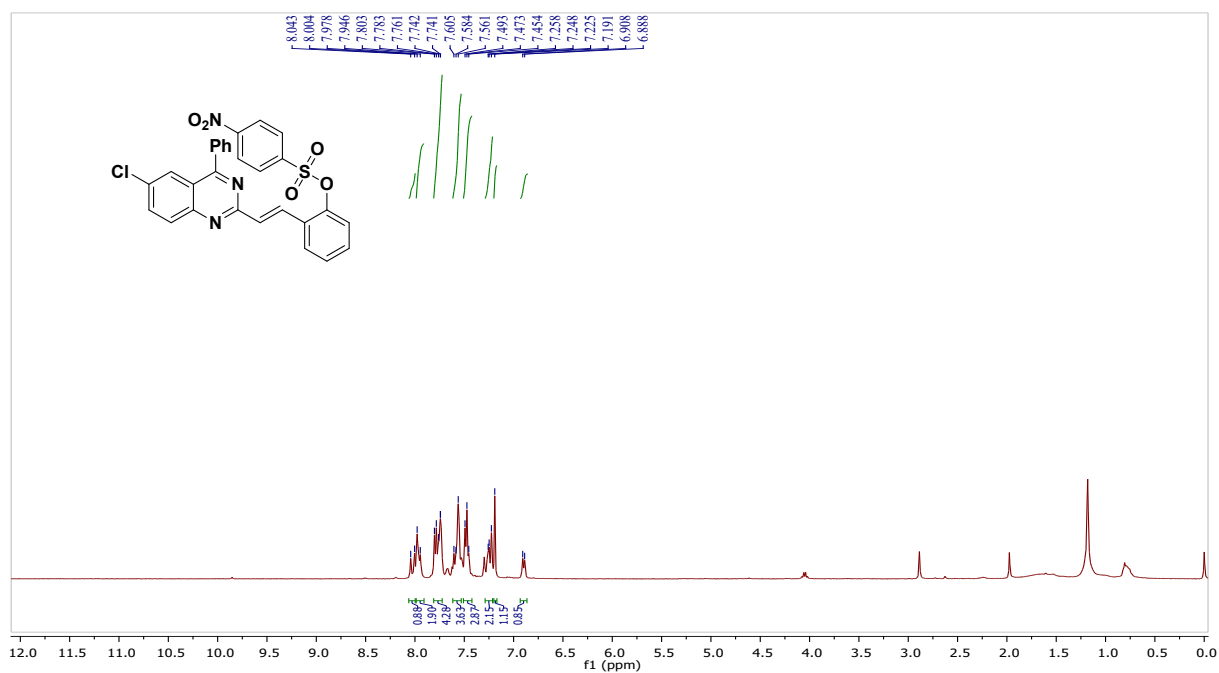


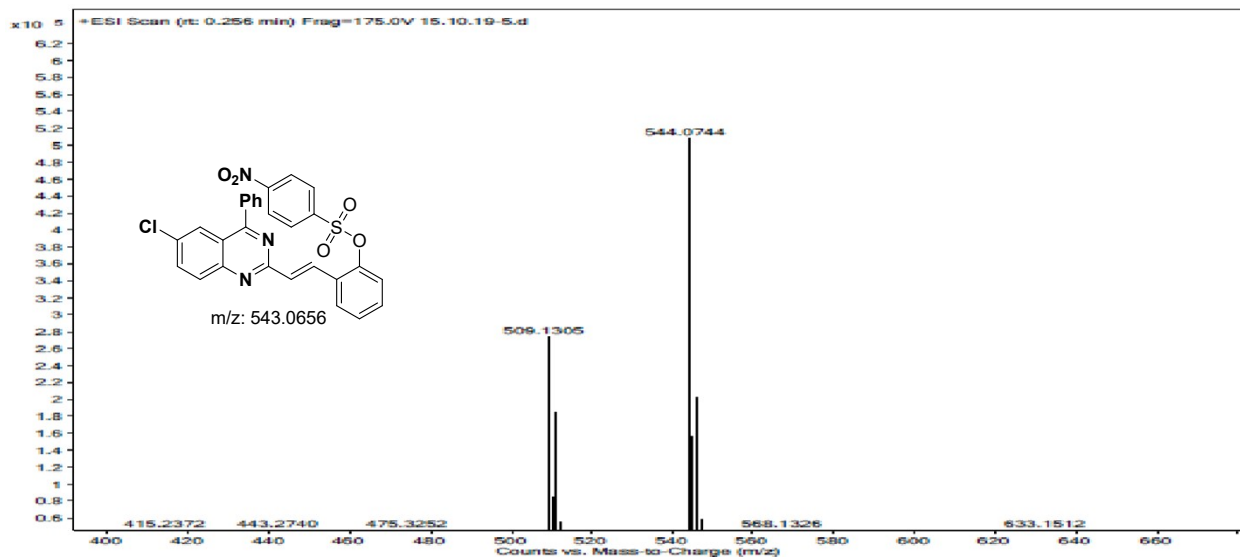
5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl methanesulfonate (3j):



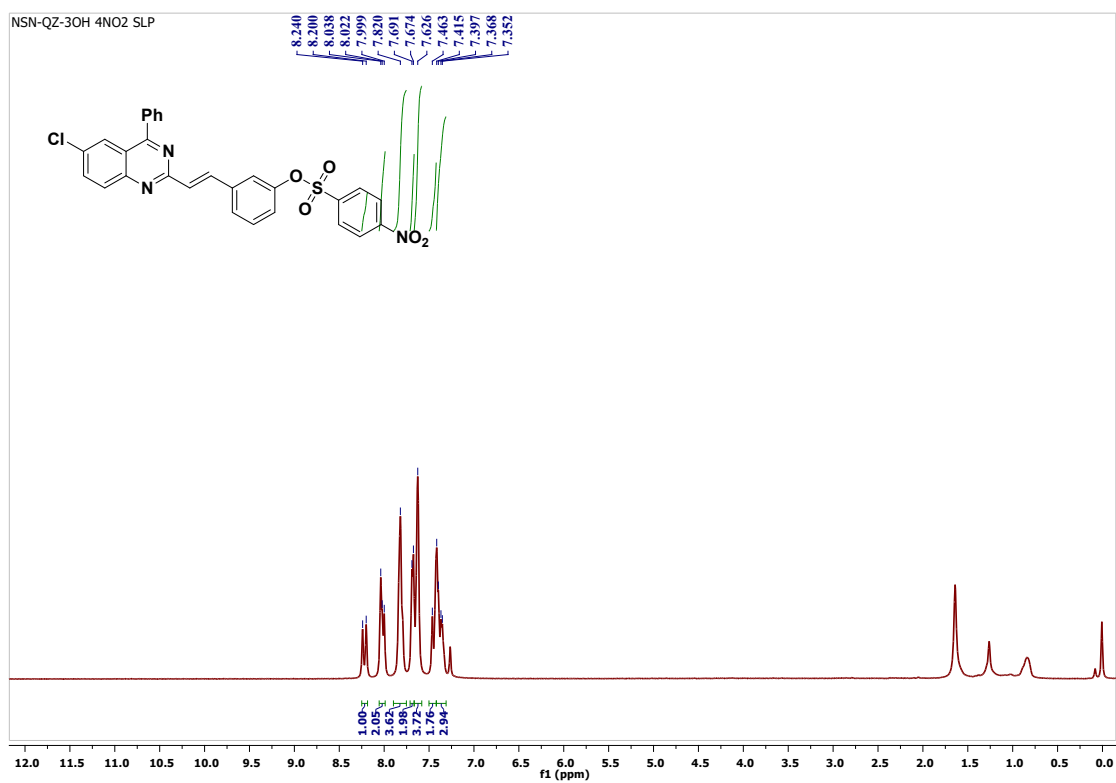


2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl-4-nitrobenzenesulfonate (3k):

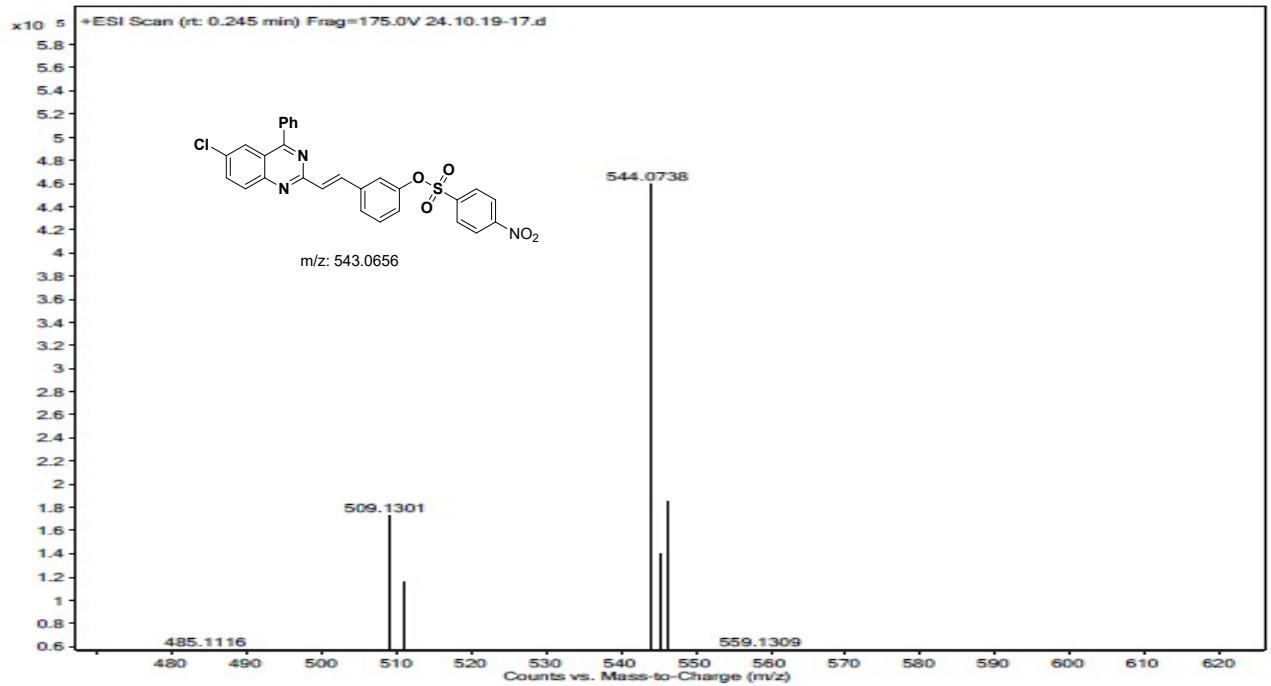
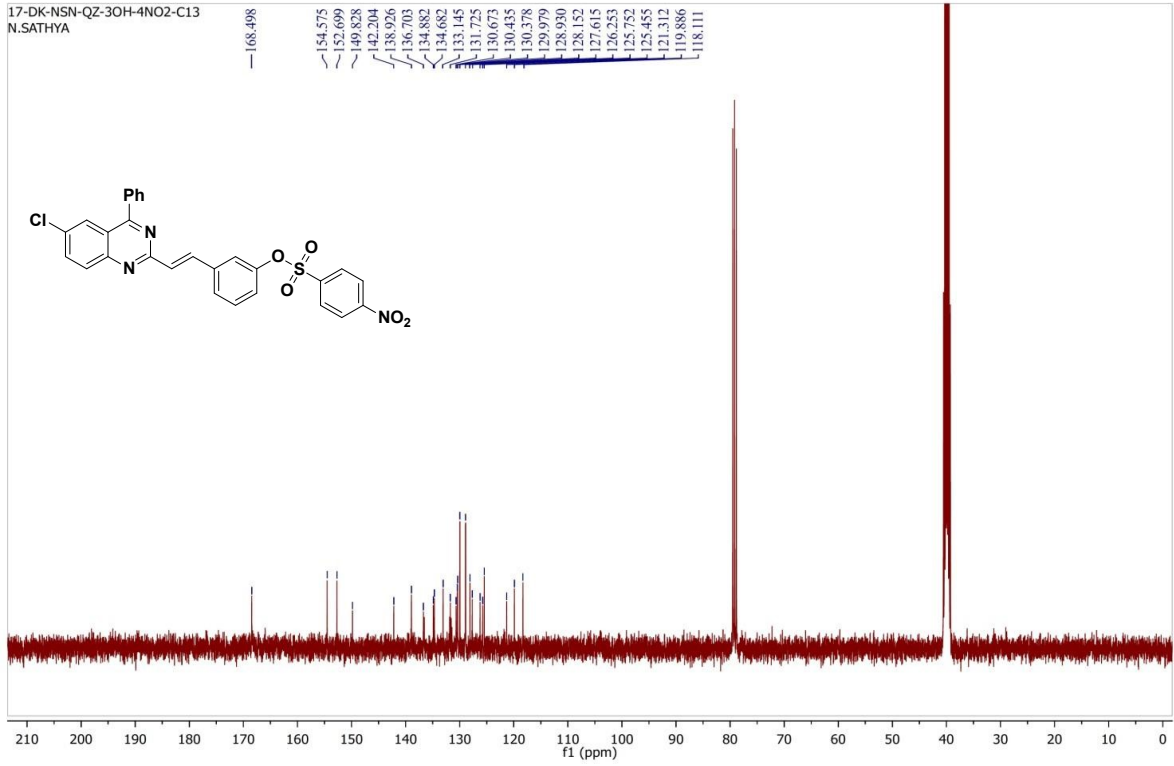




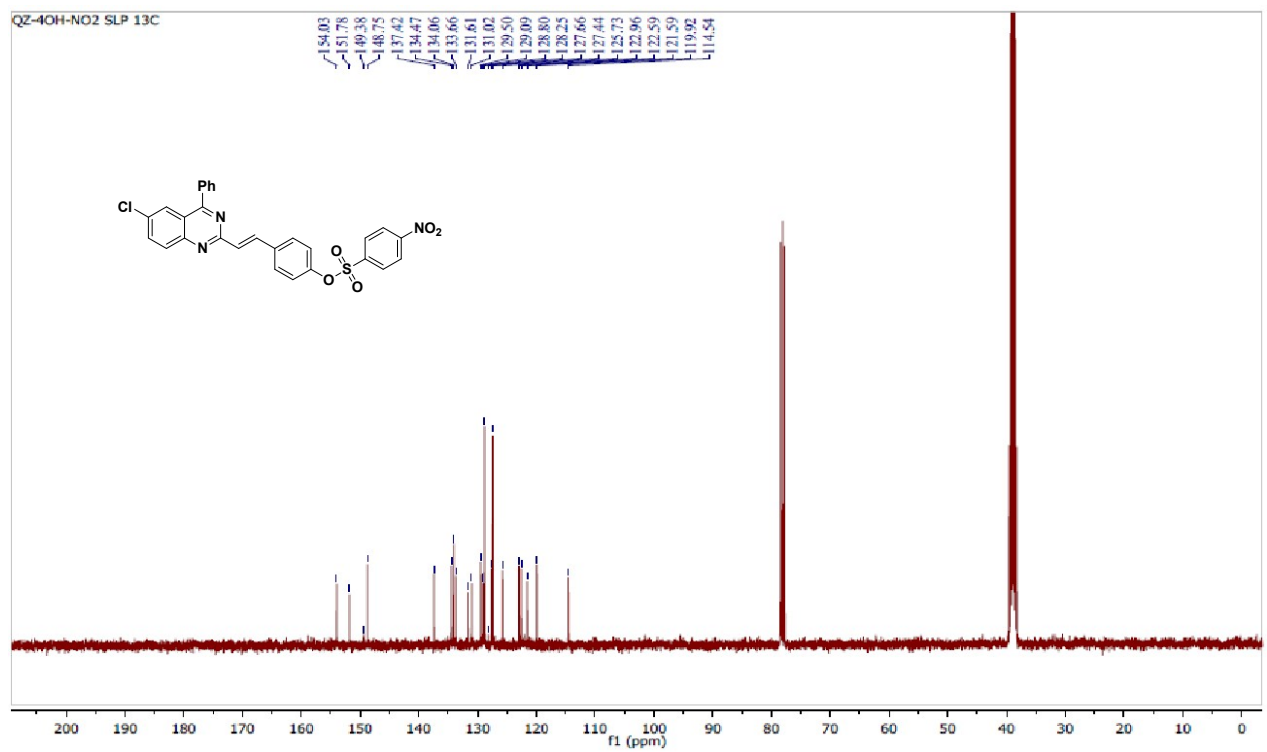
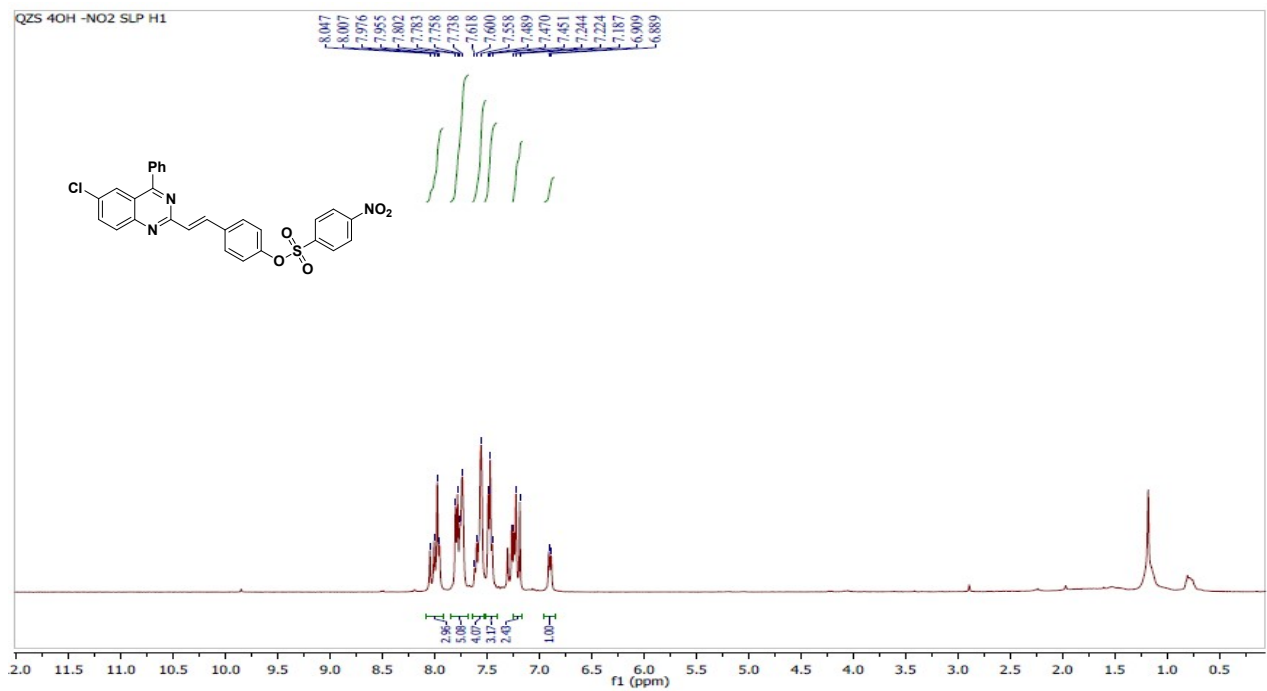
3-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl 4-nitrobenzenesulfonate (3l):

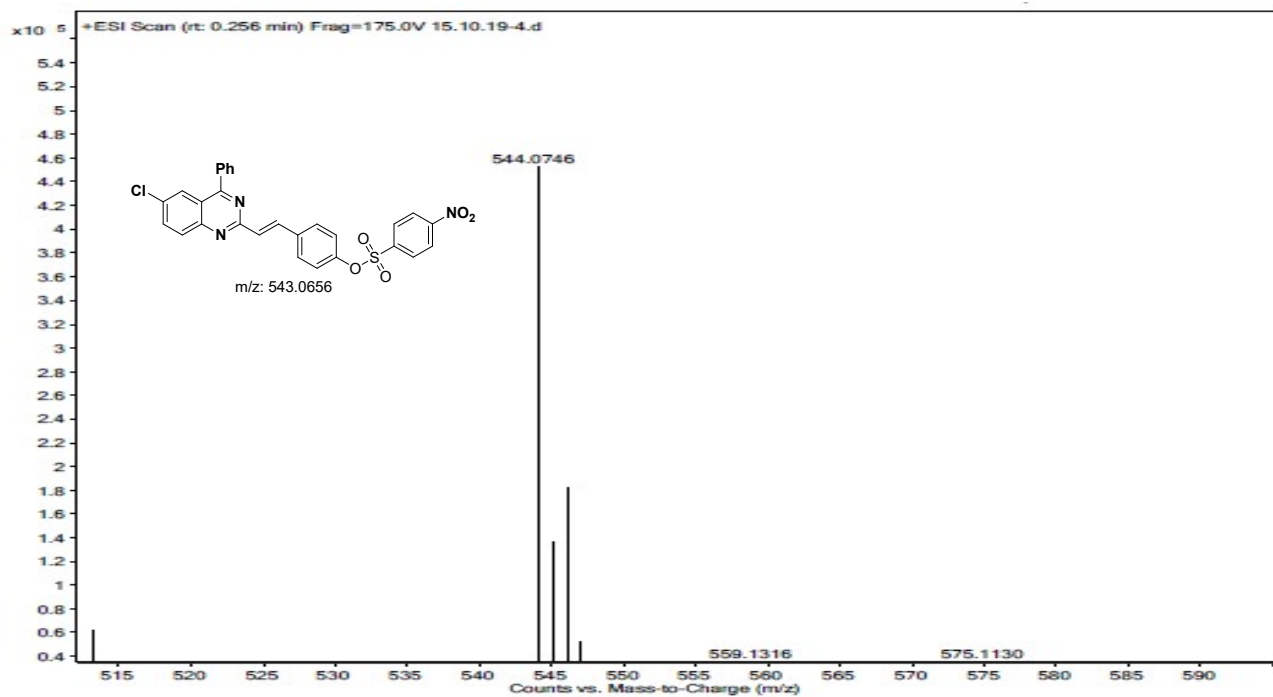


17-DK-NSN-QZ-3OH-4NO2-C13
N.SATHYA

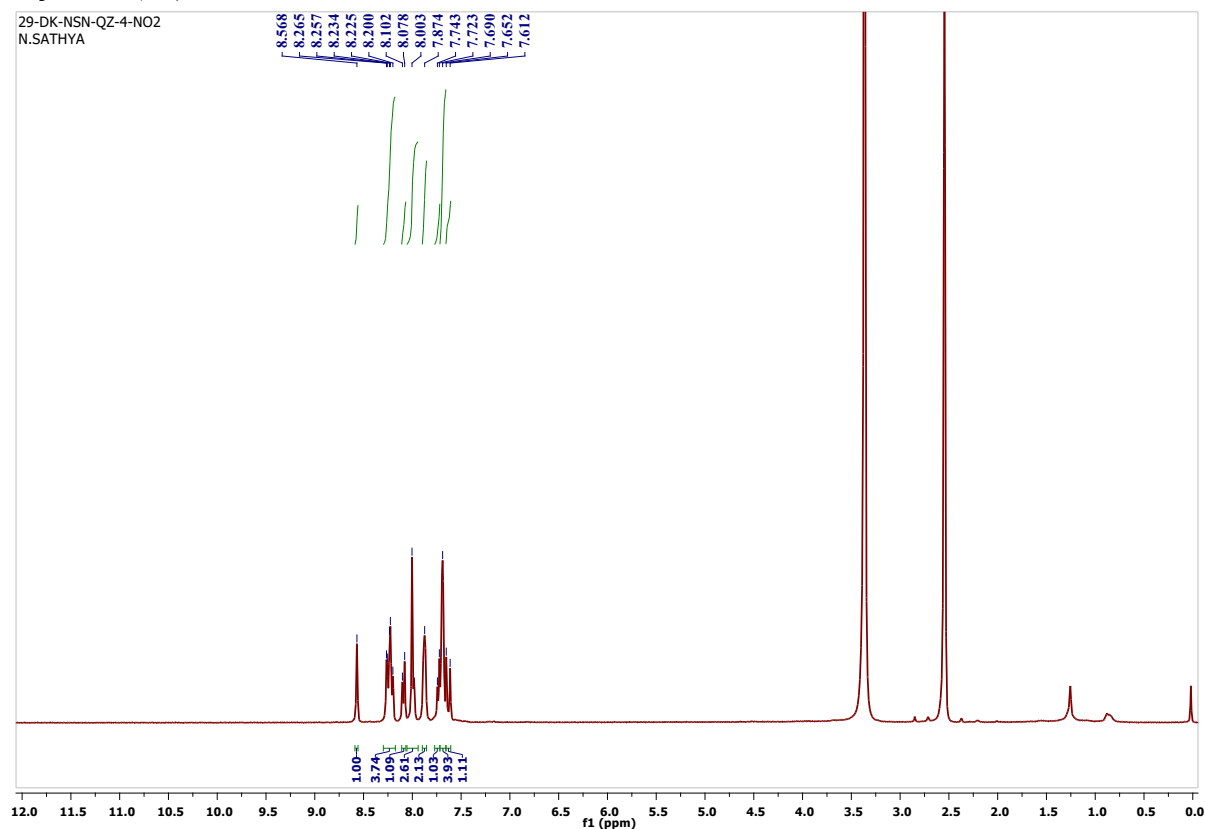


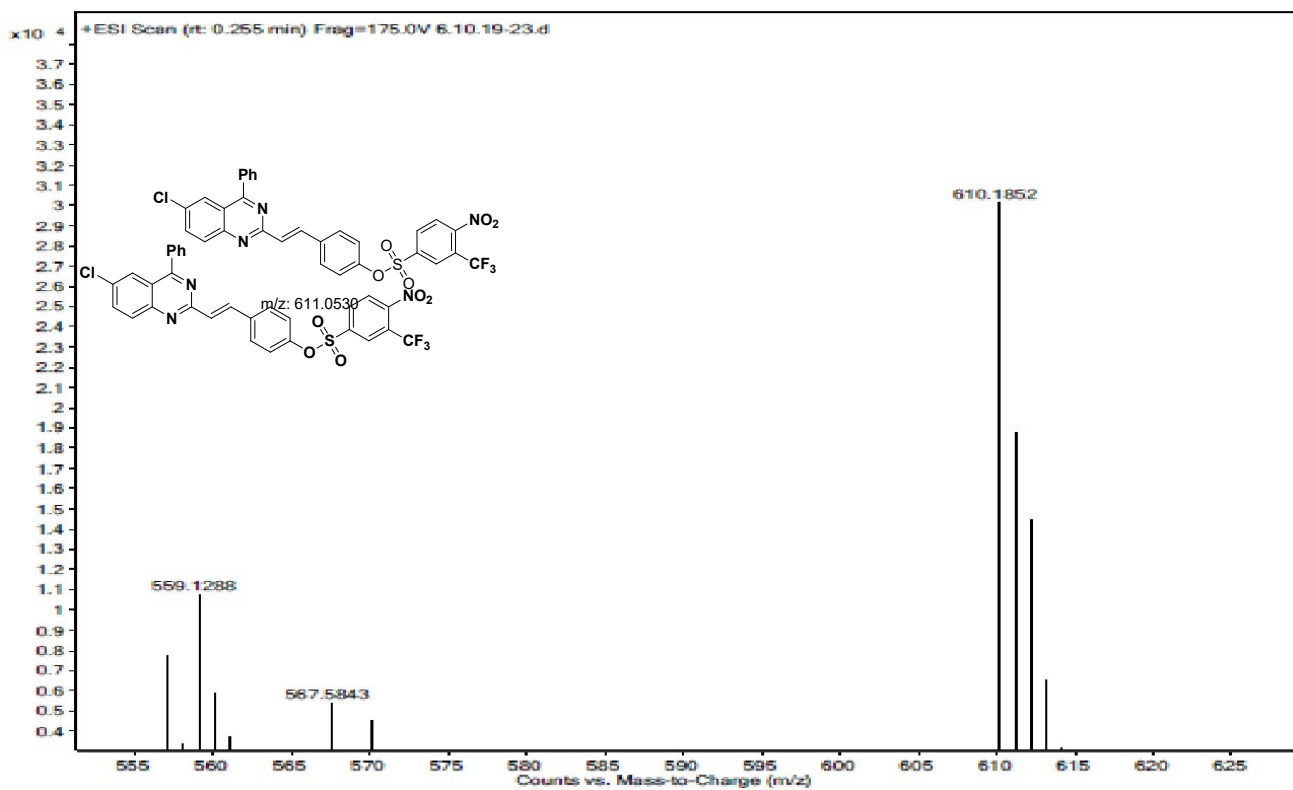
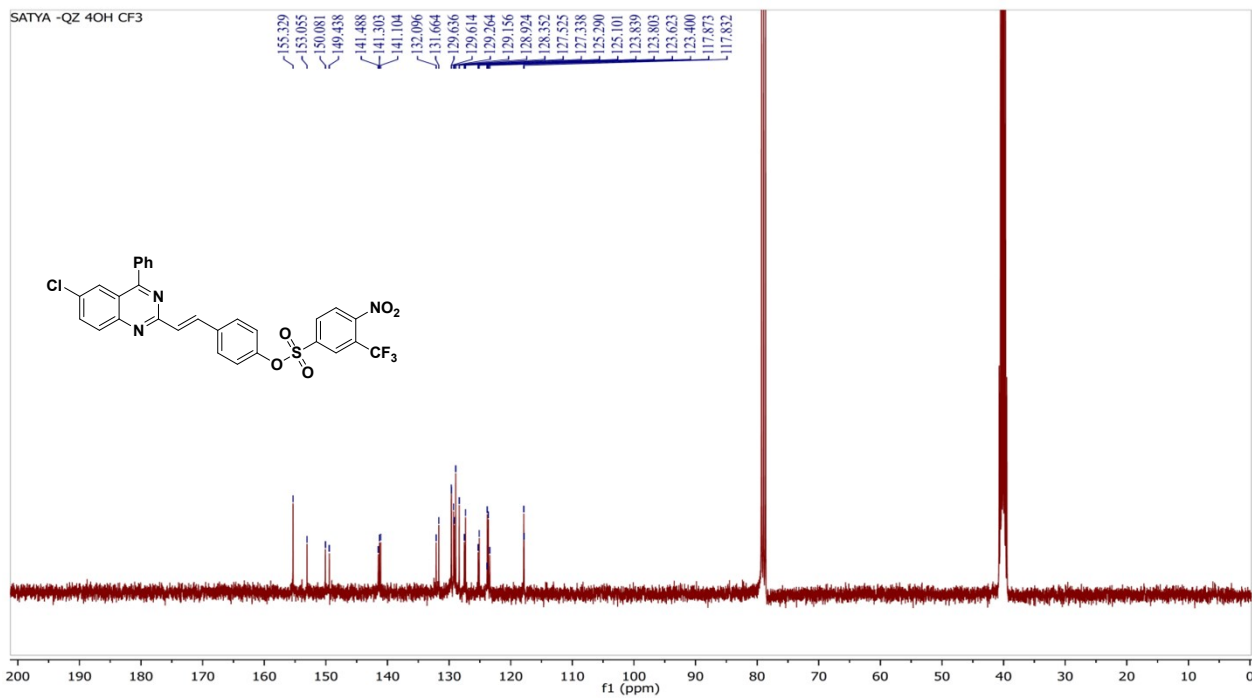
4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl-4-nitrobenzenesulfonate (3m):



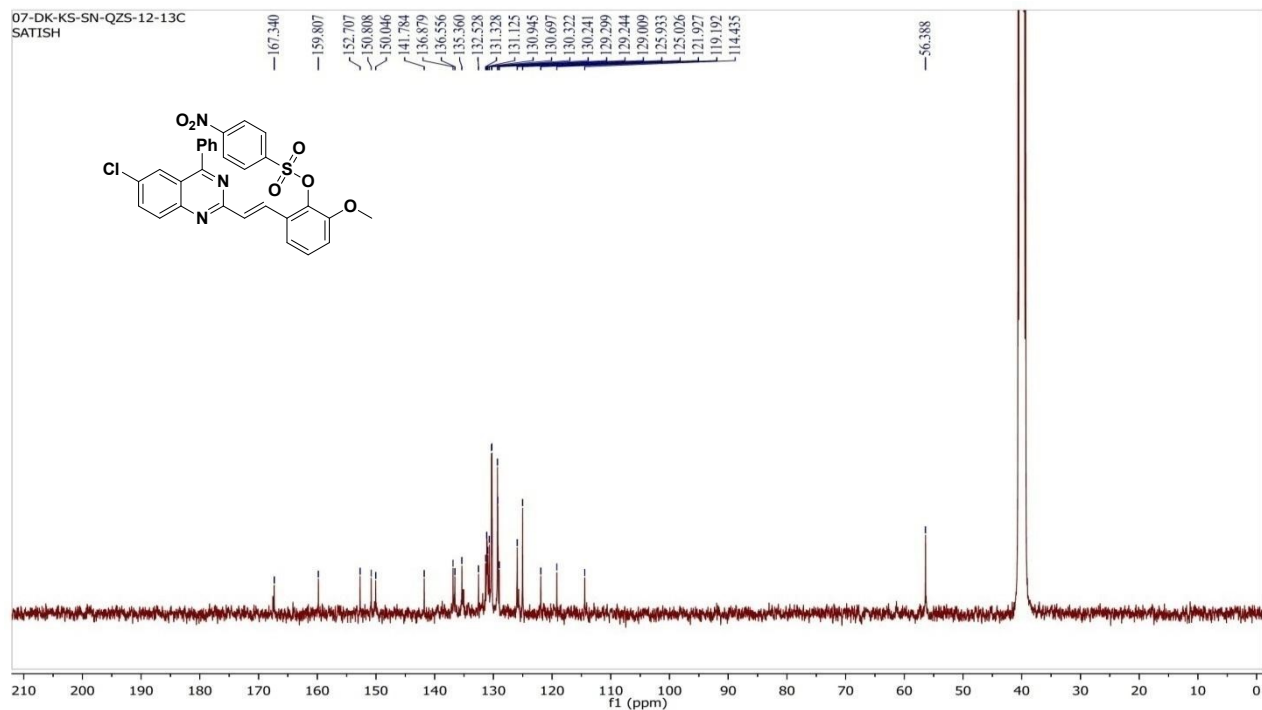
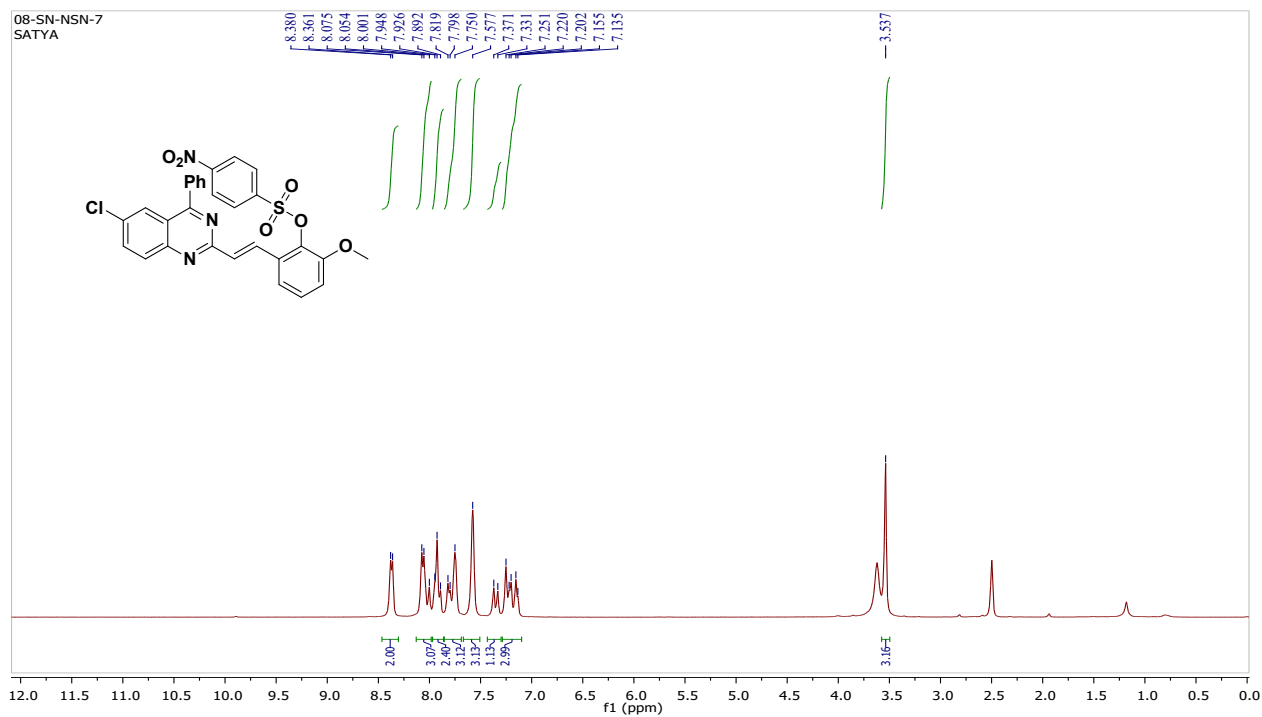


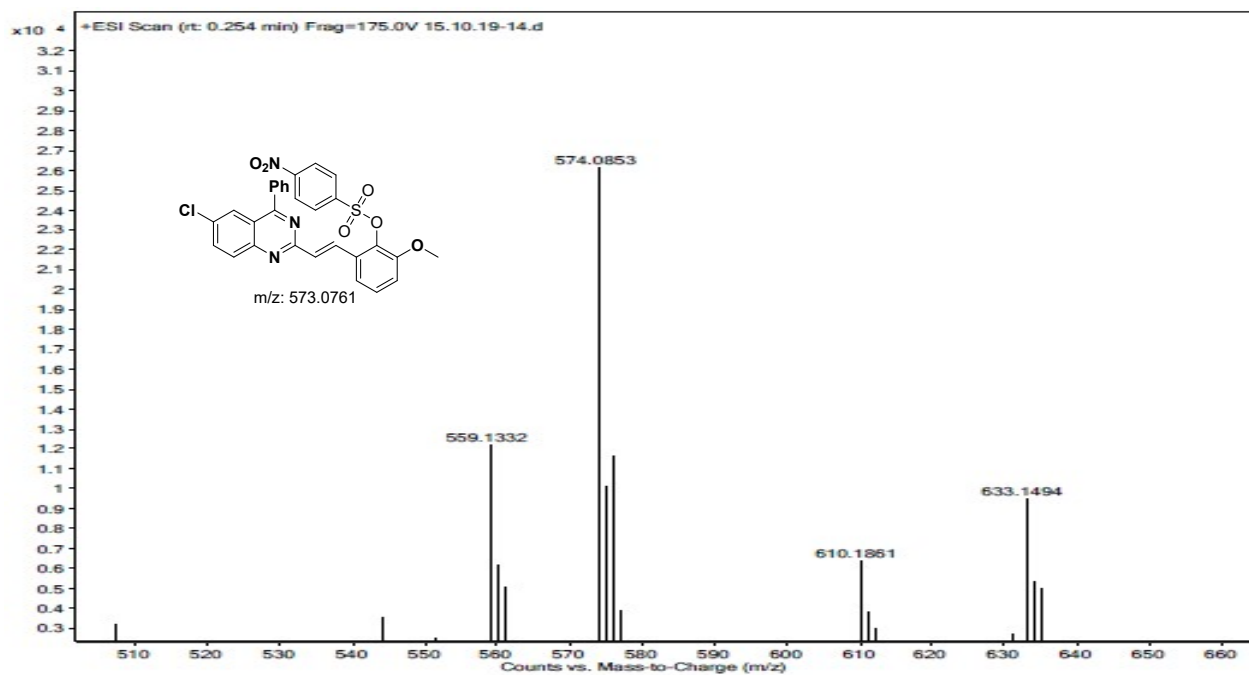
4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)phenyl-4-nitro-3-(trifluoromethyl) benzene sulfonate (3n):



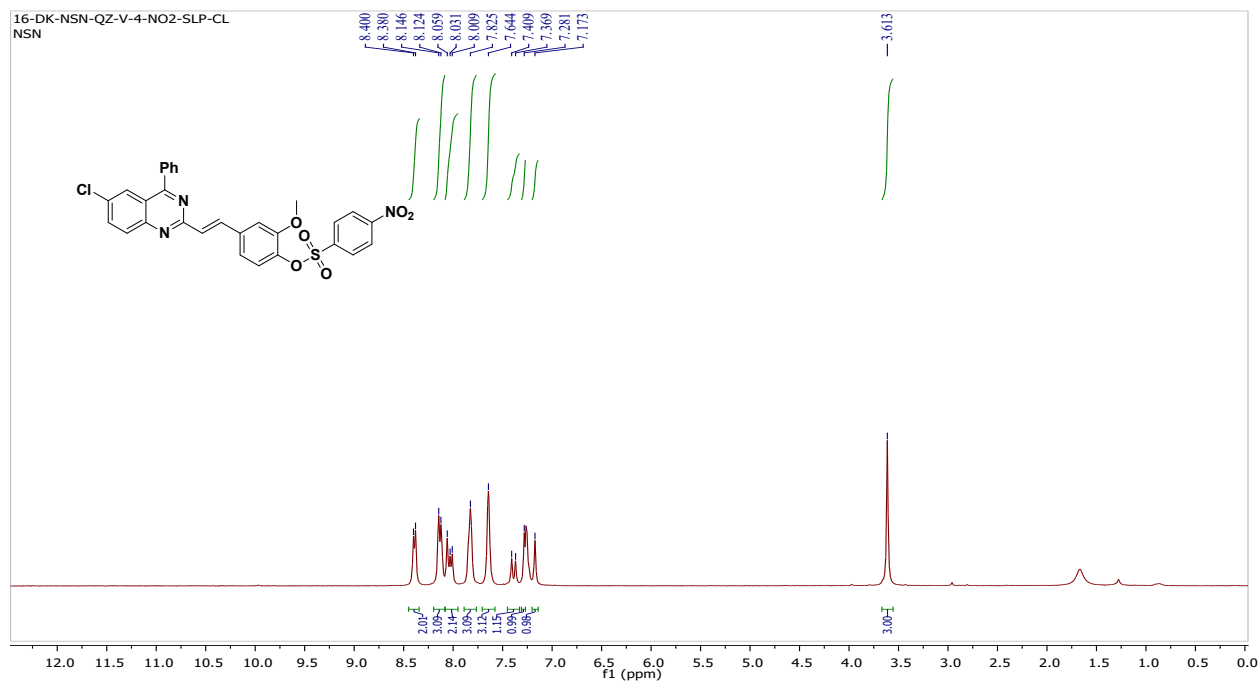


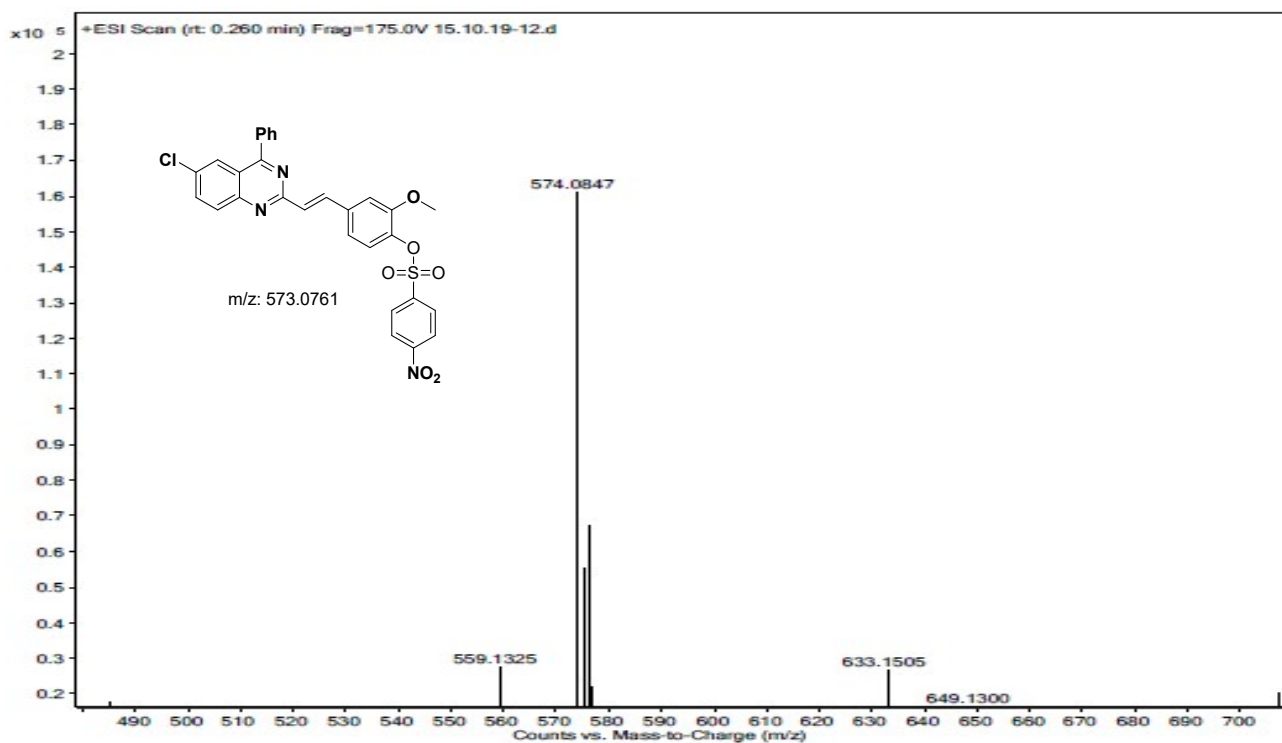
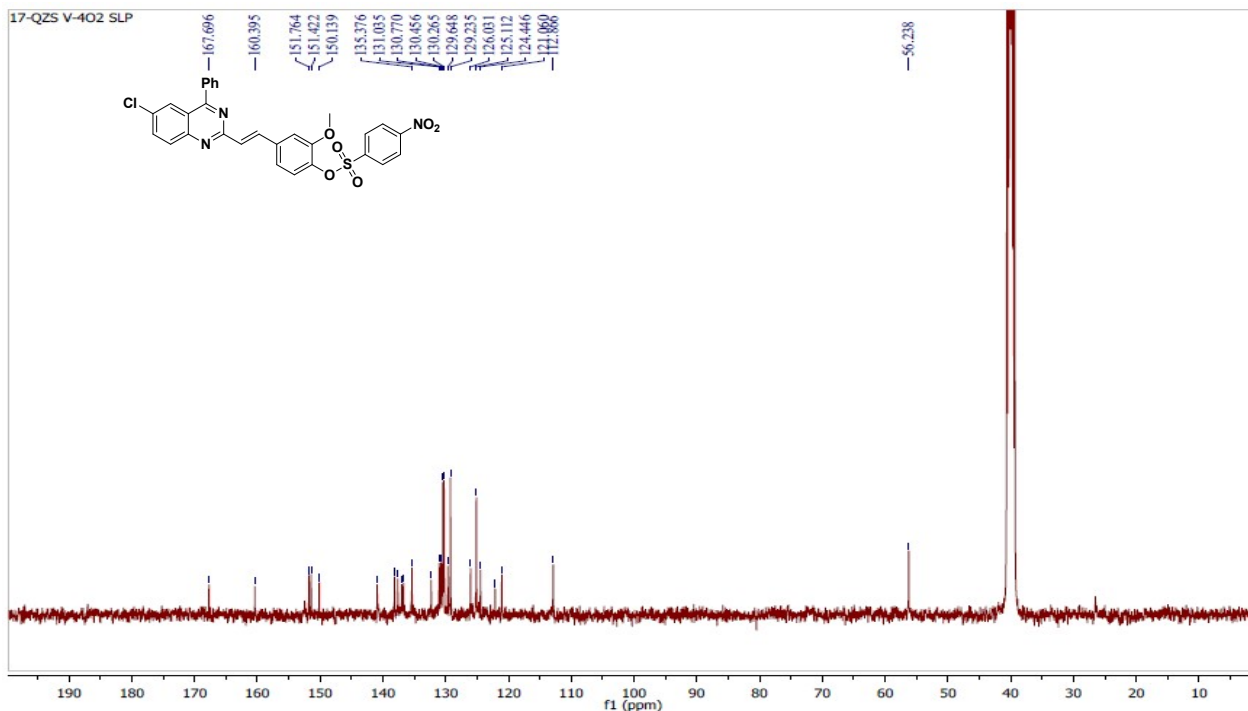
2-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-6-methoxyphenyl-4-nitrobenzenesulfonate (30):



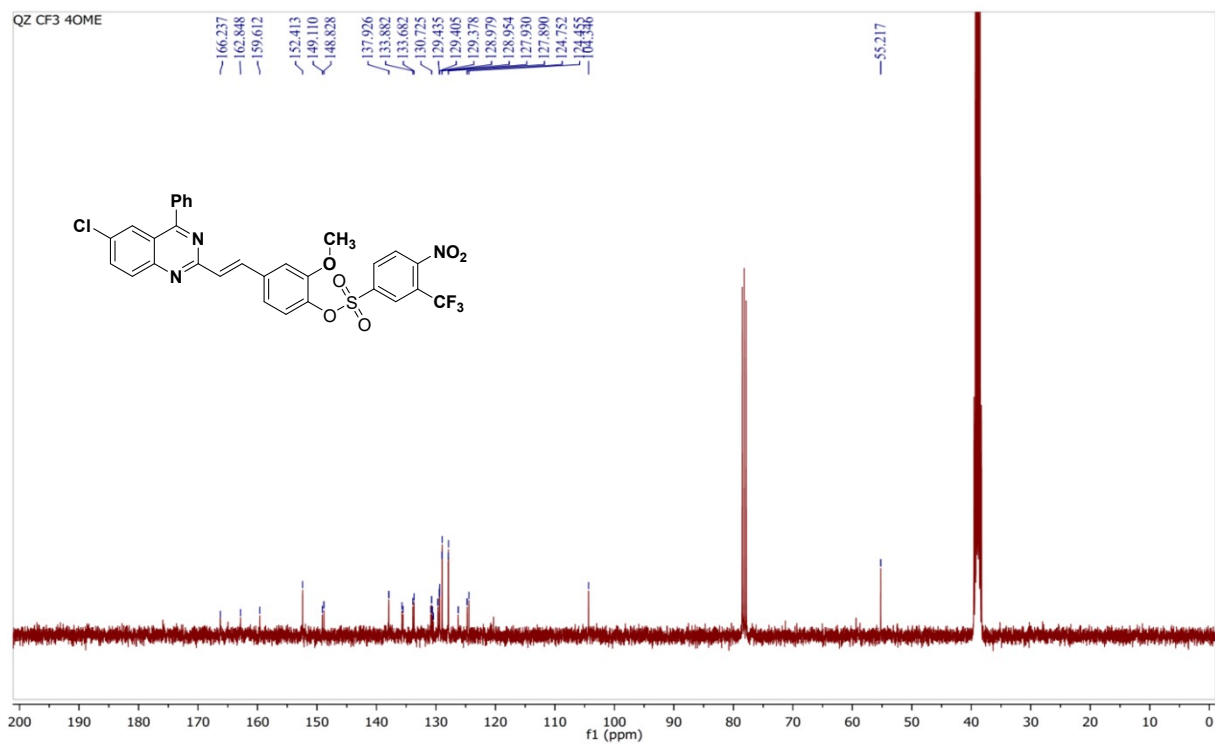
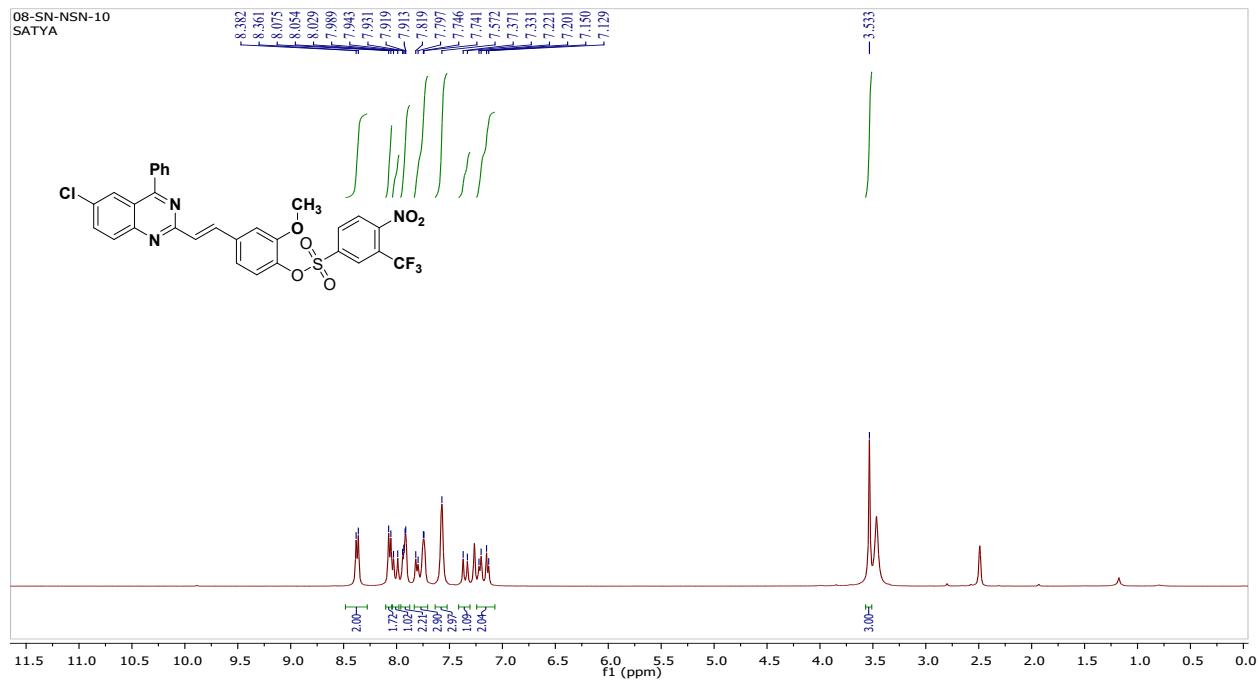


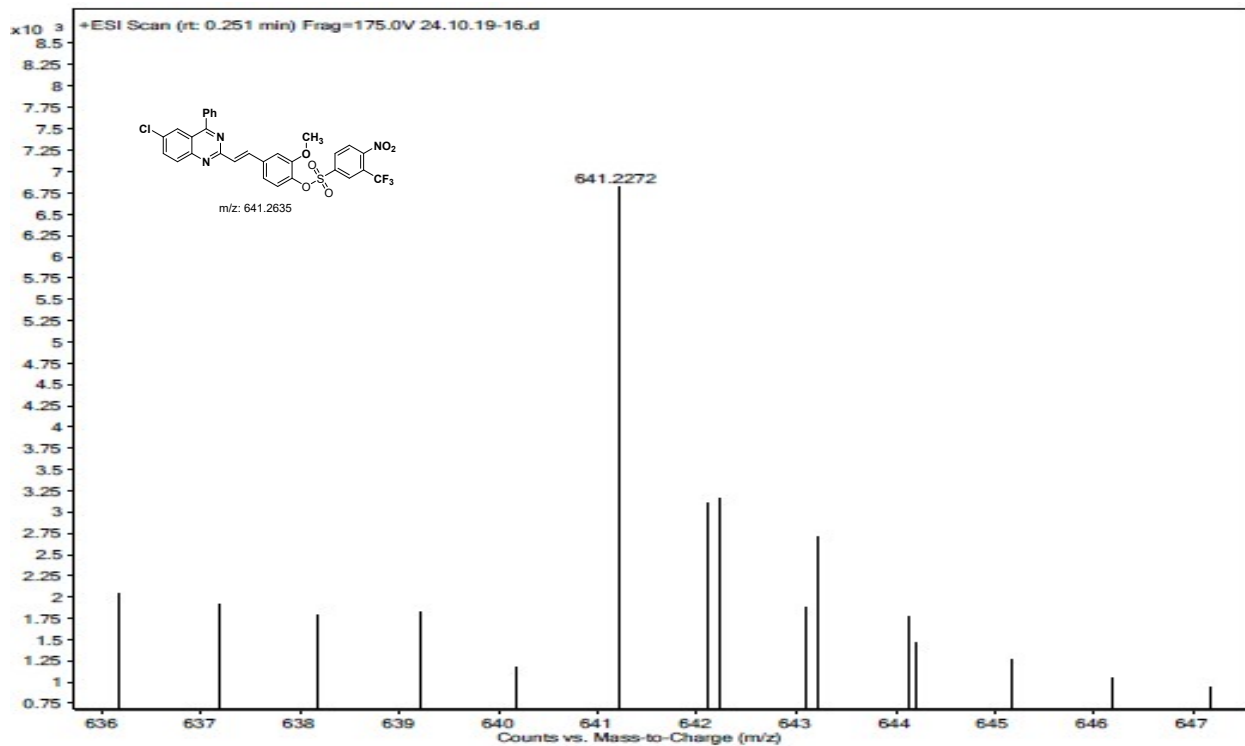
5-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl-4-nitrobenzenesulfonate (3p):



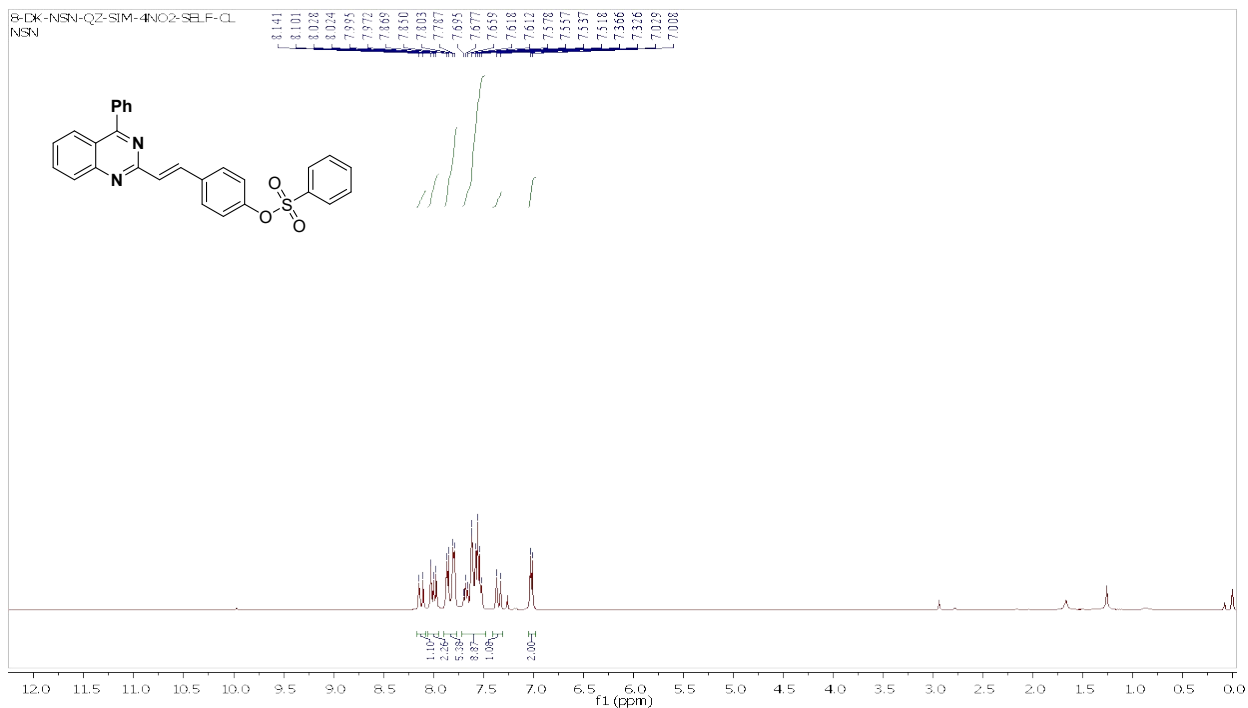


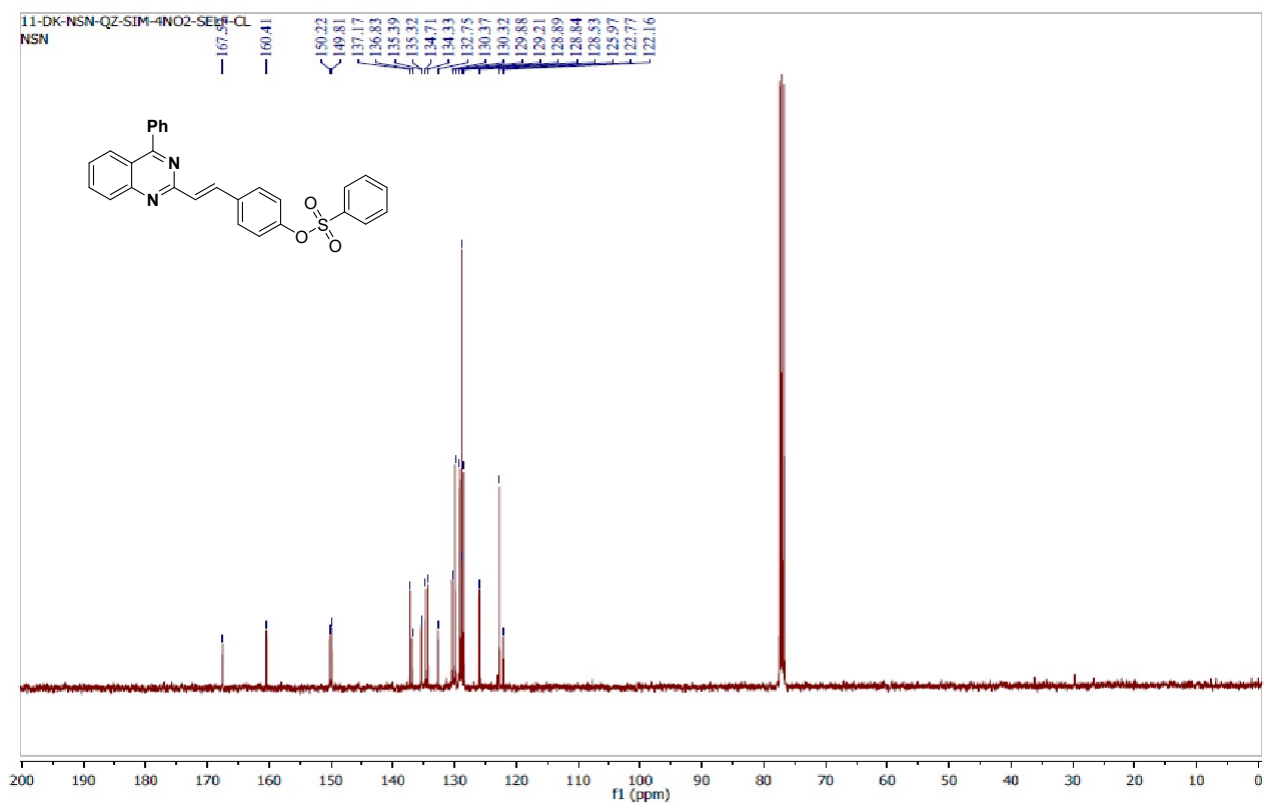
4-(2-(6-Chloro-4-phenylquinazolin-2-yl)vinyl)-2-methoxyphenyl,3-nitro-4-(tri fluoromethyl) benzenesulfonate (3q):



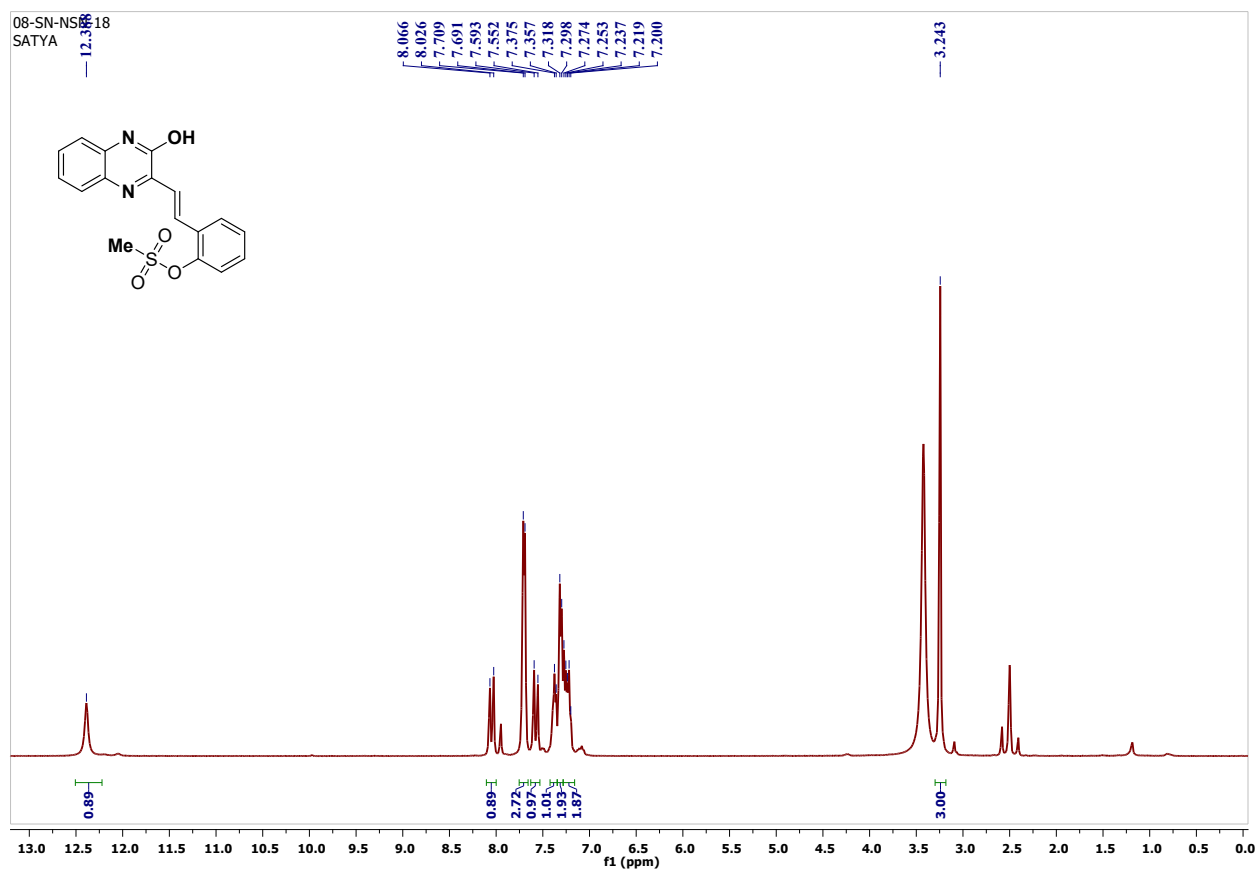


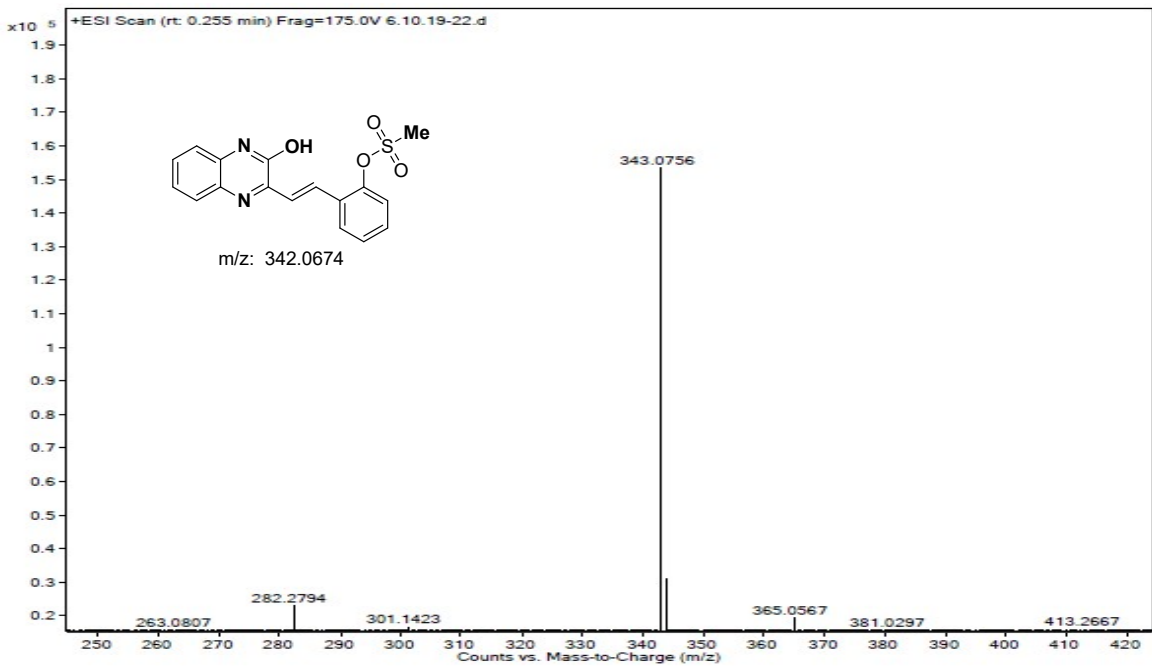
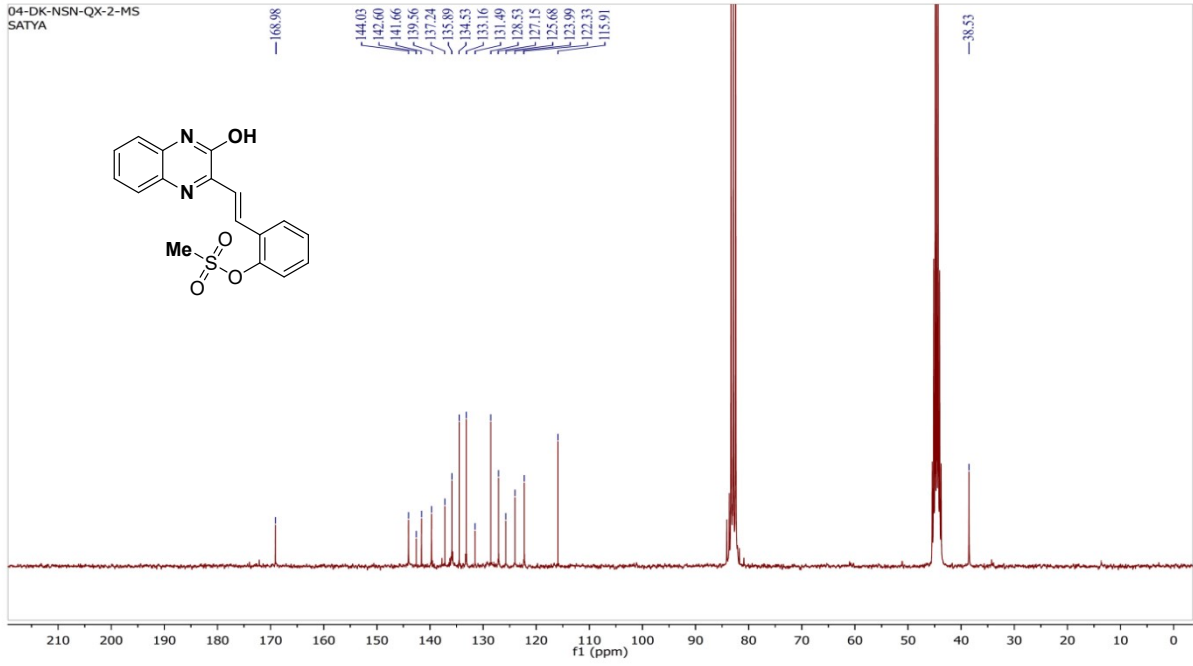
(E)-4-(2-(4-phenylquinazolin-2-yl)vinyl)phenyl benzenesulfonate (3r)



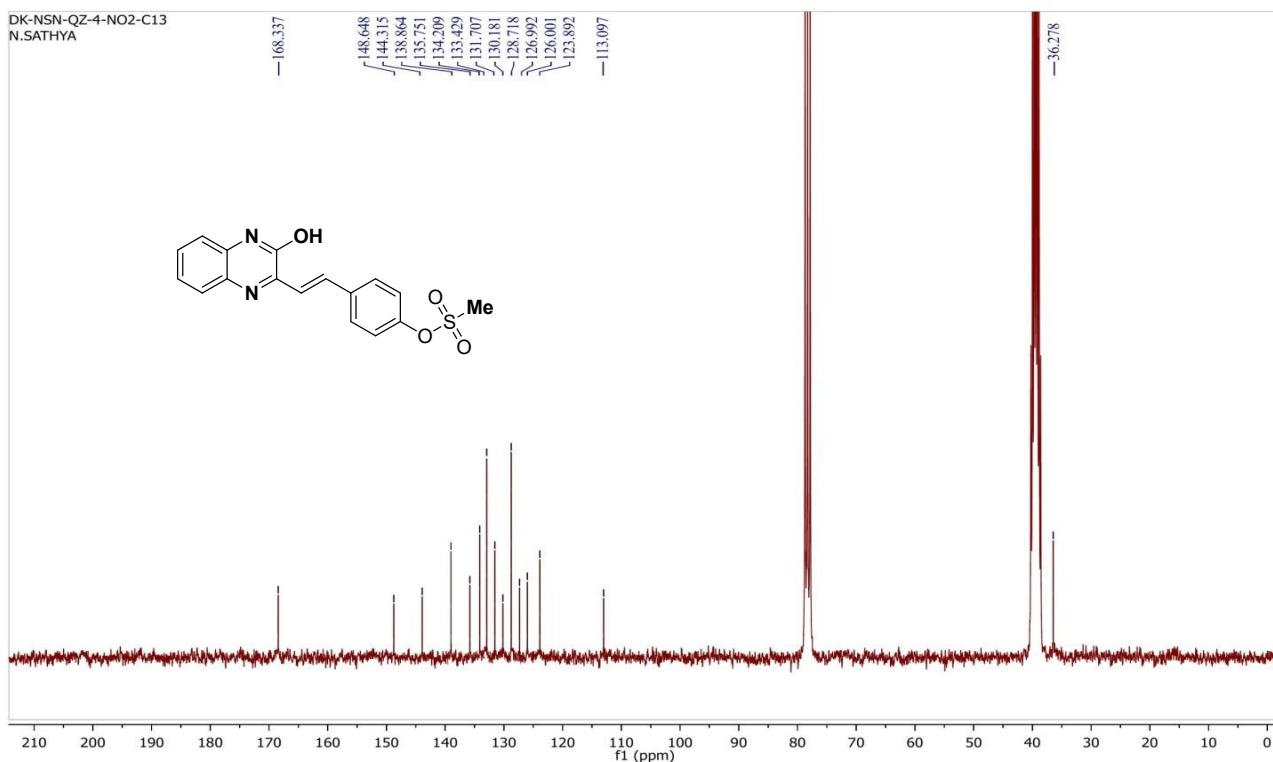
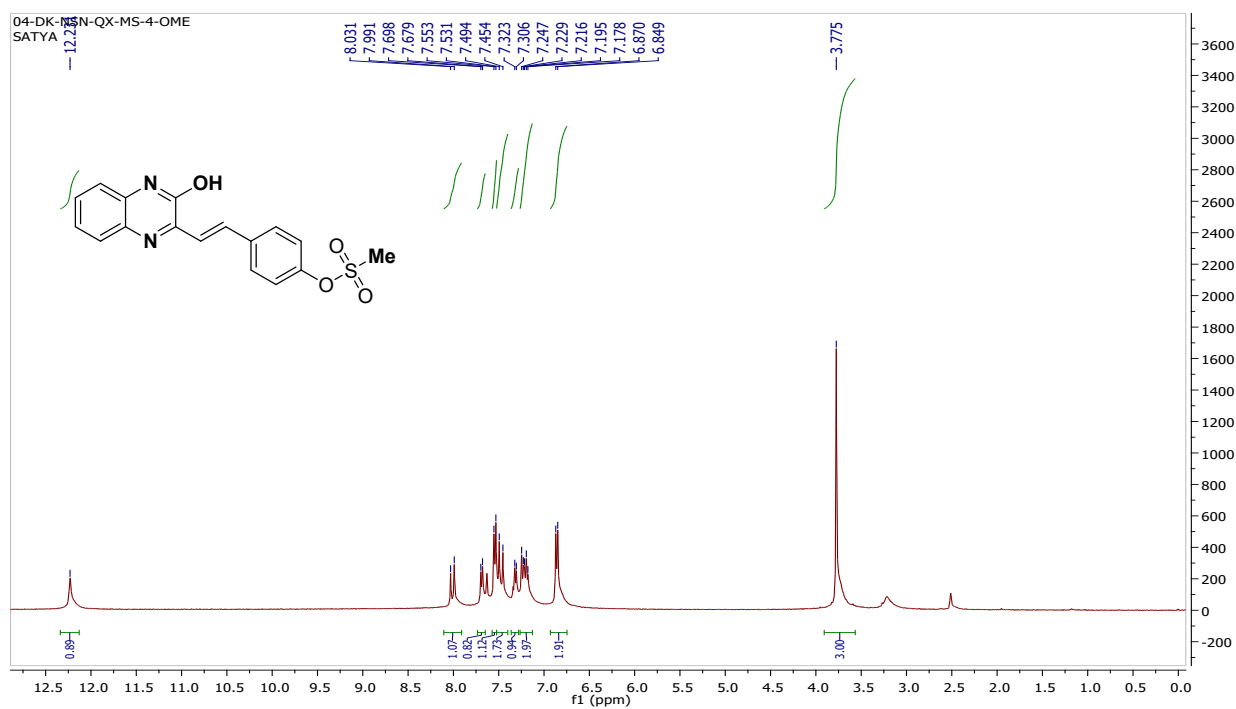


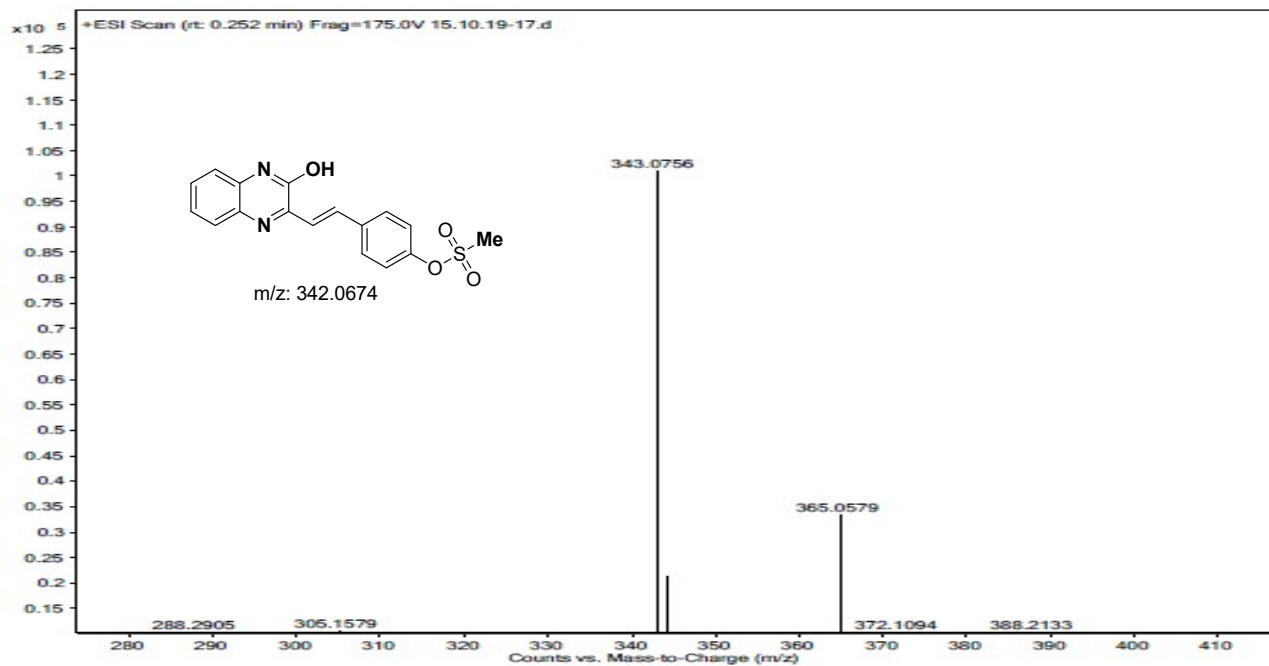
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl methanesulfonate (5a):



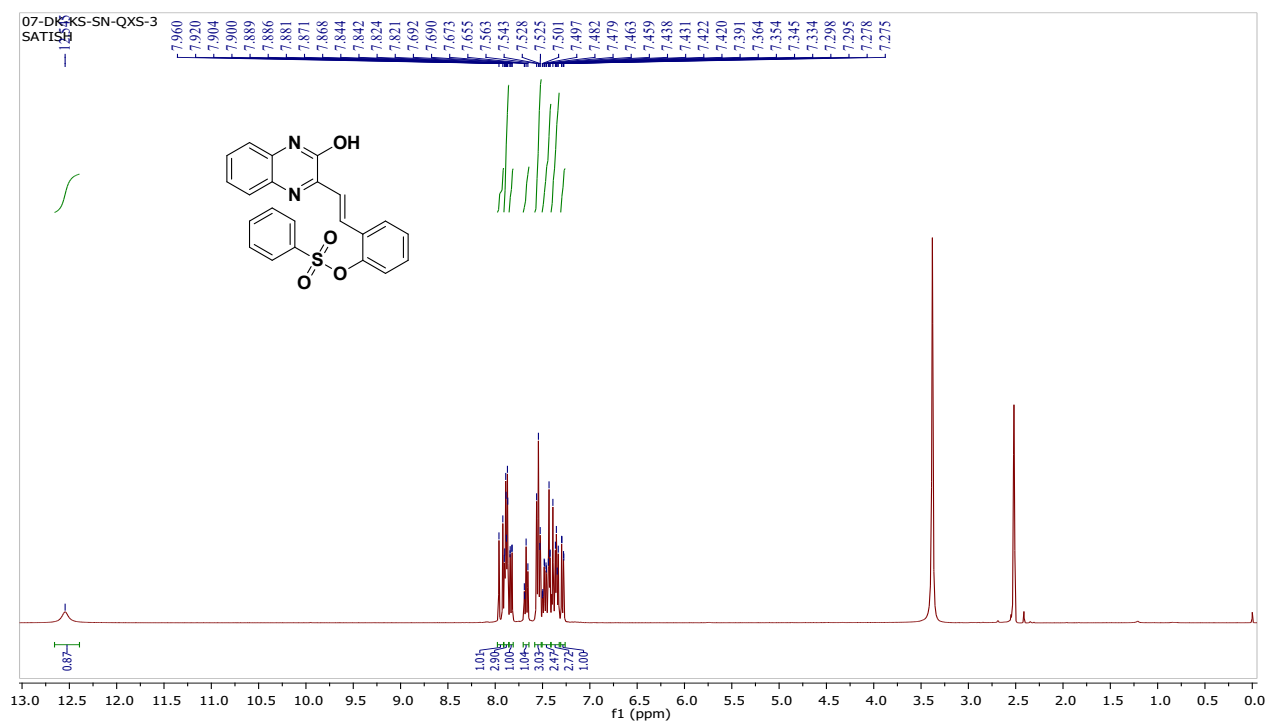


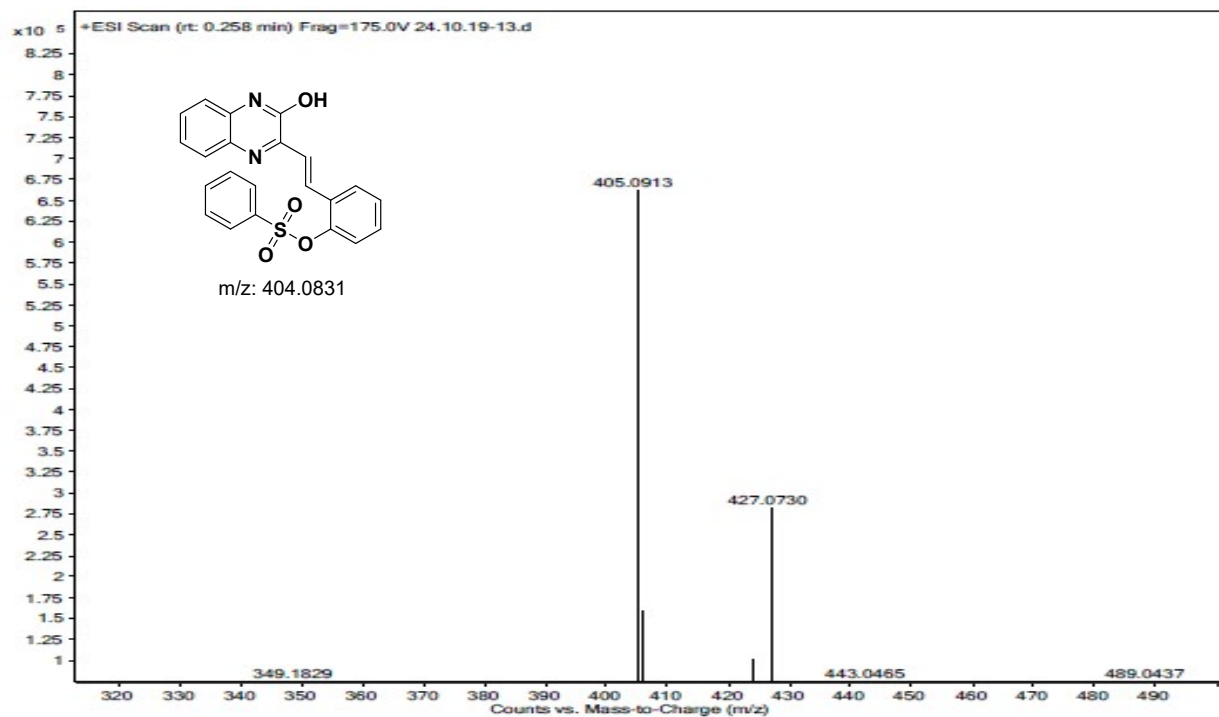
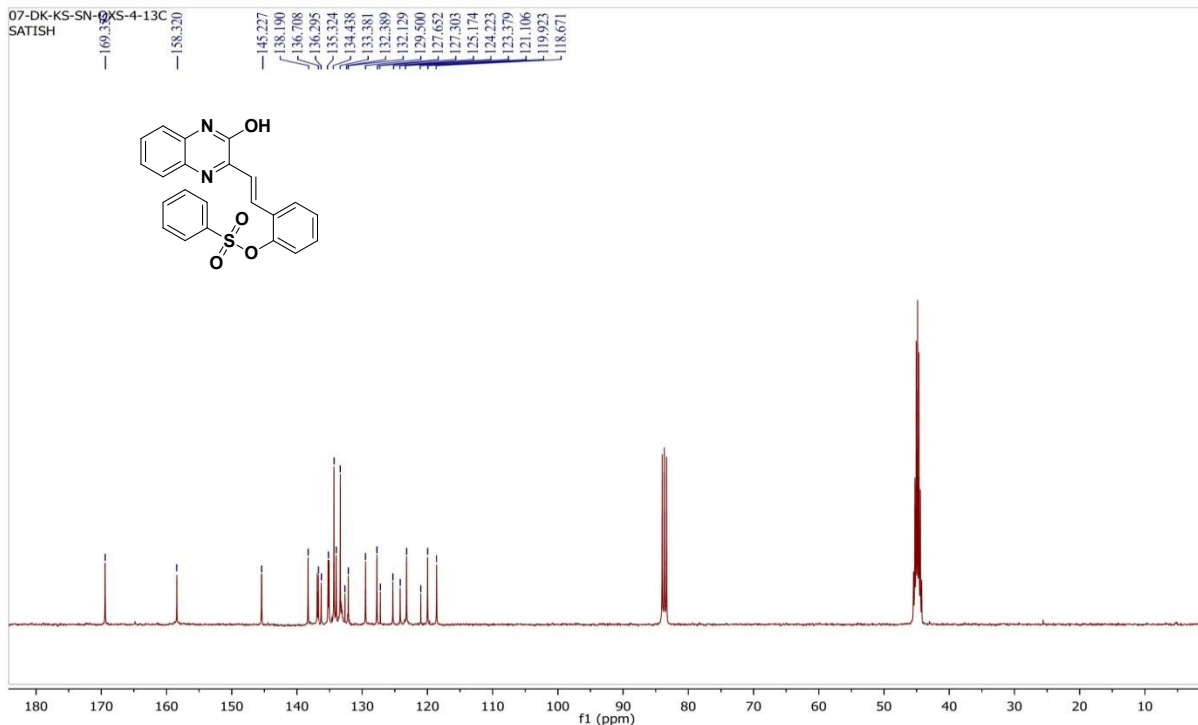
3-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl methanesulfonate (5b):



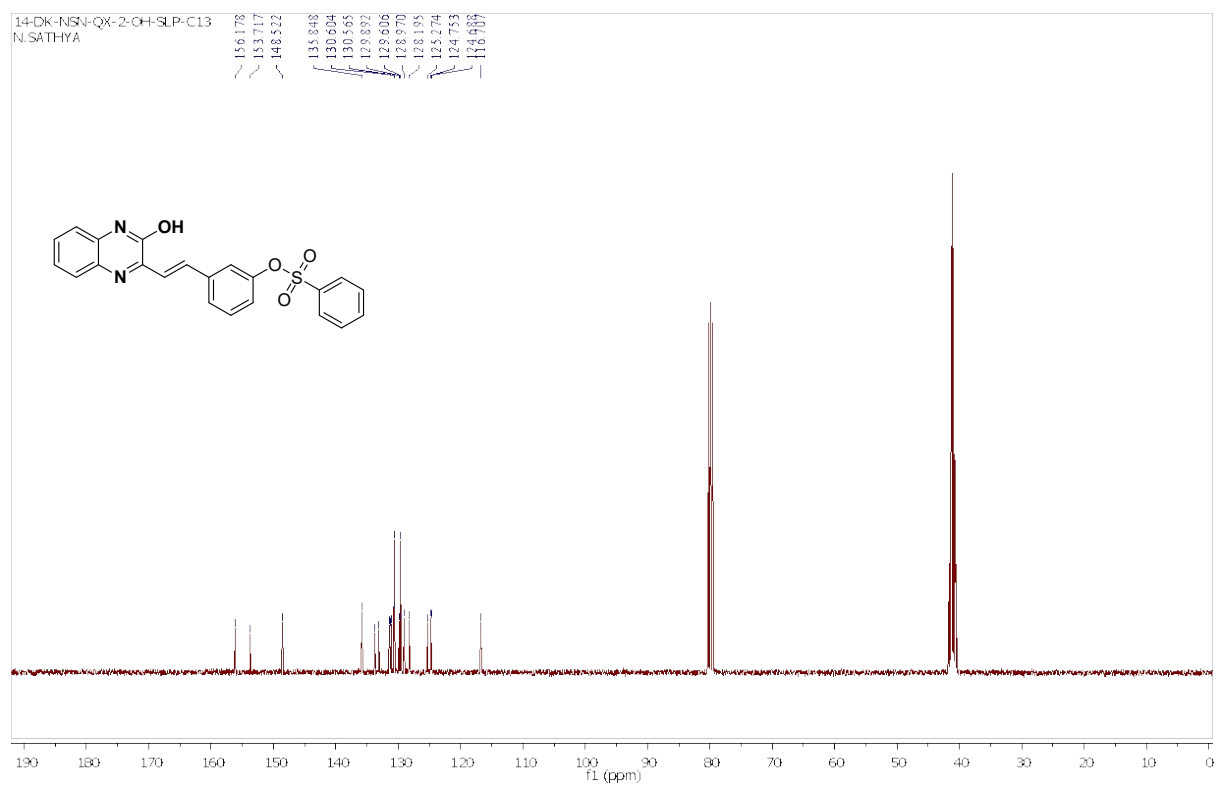
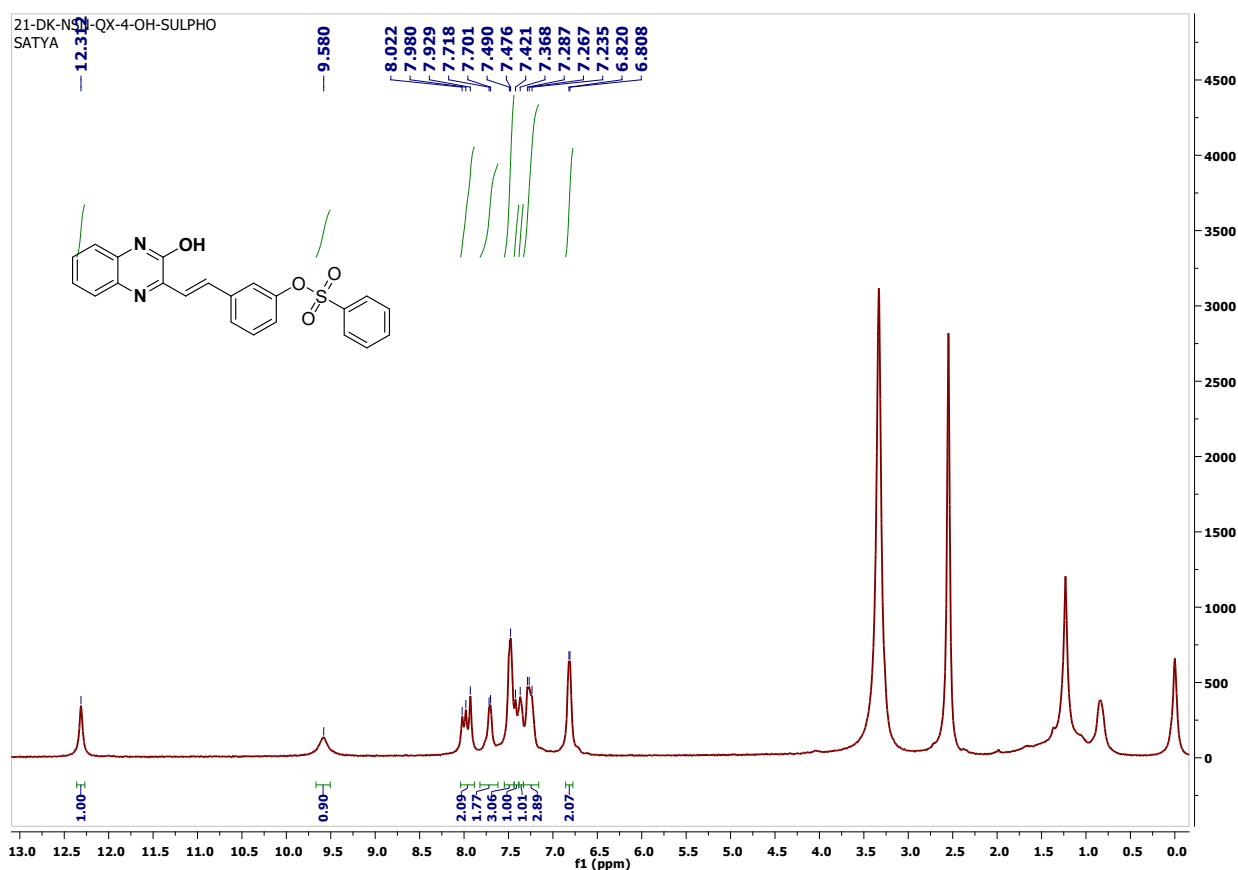


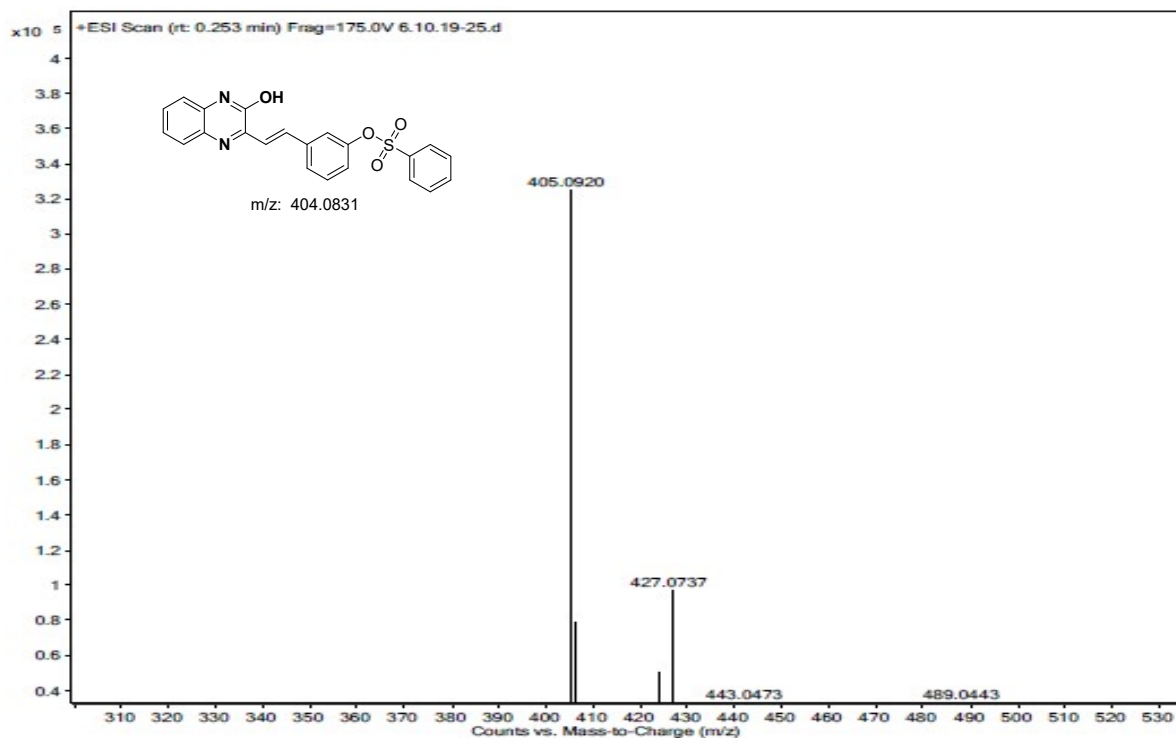
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (5c):



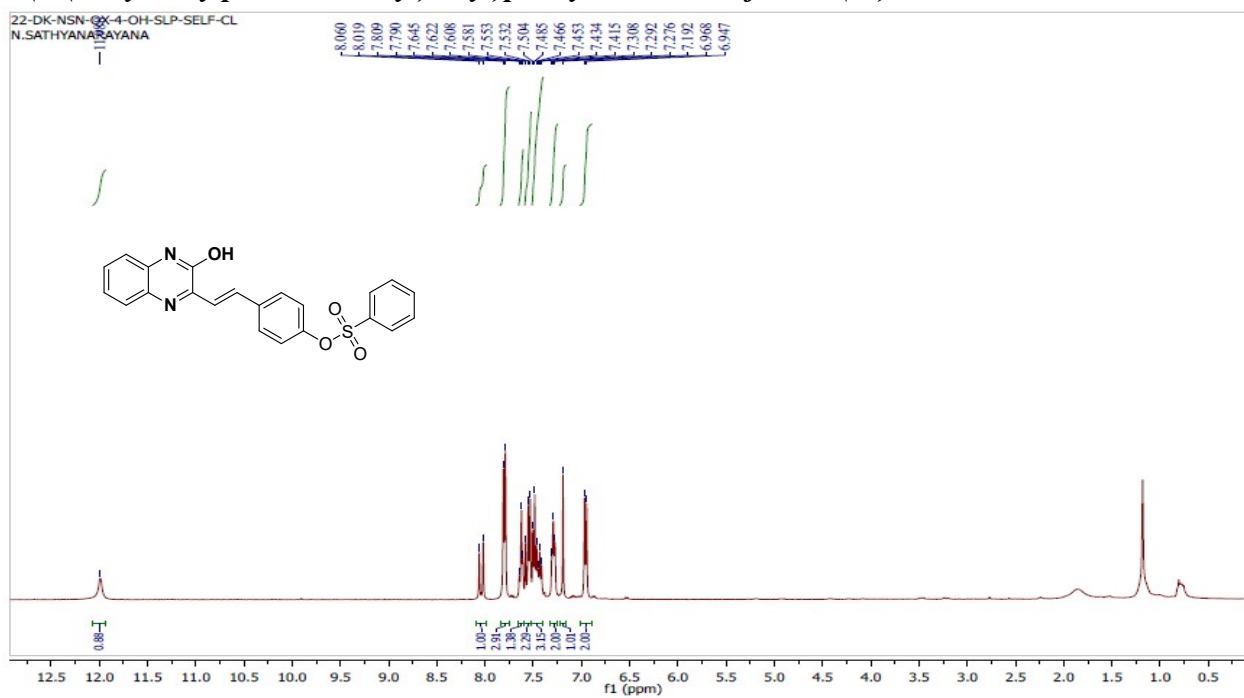


3-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (5d):

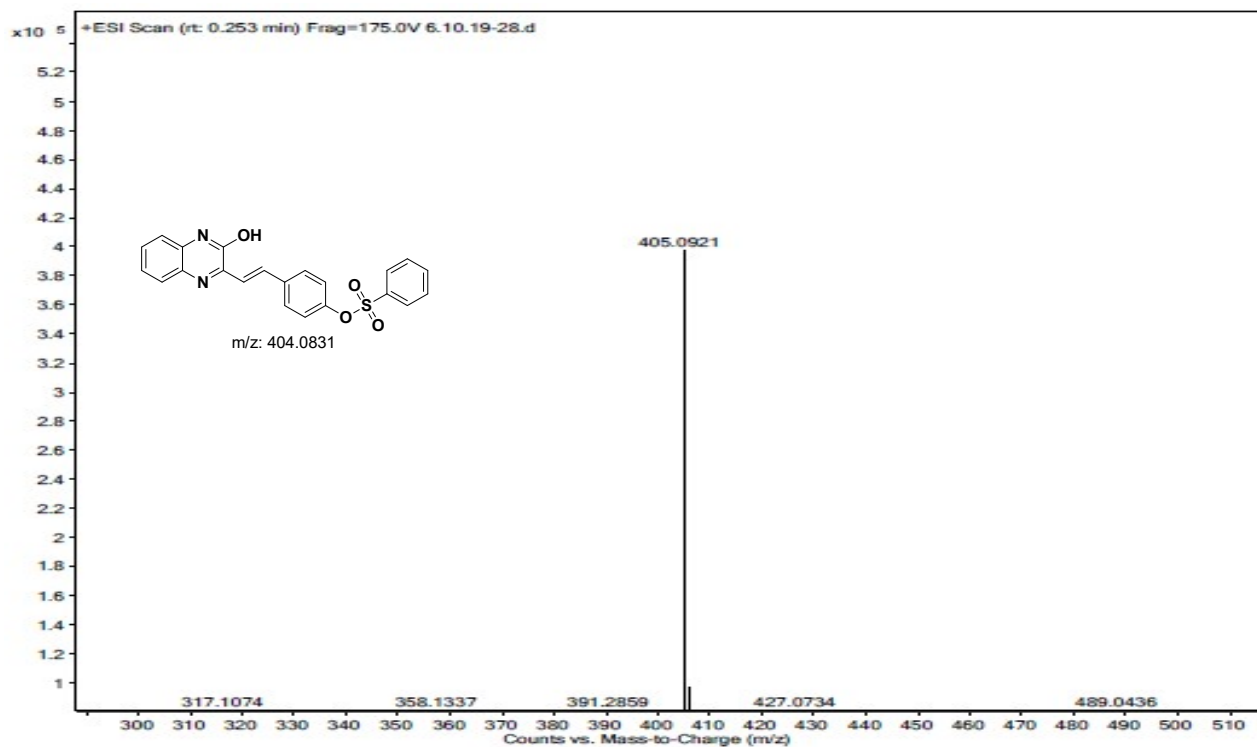
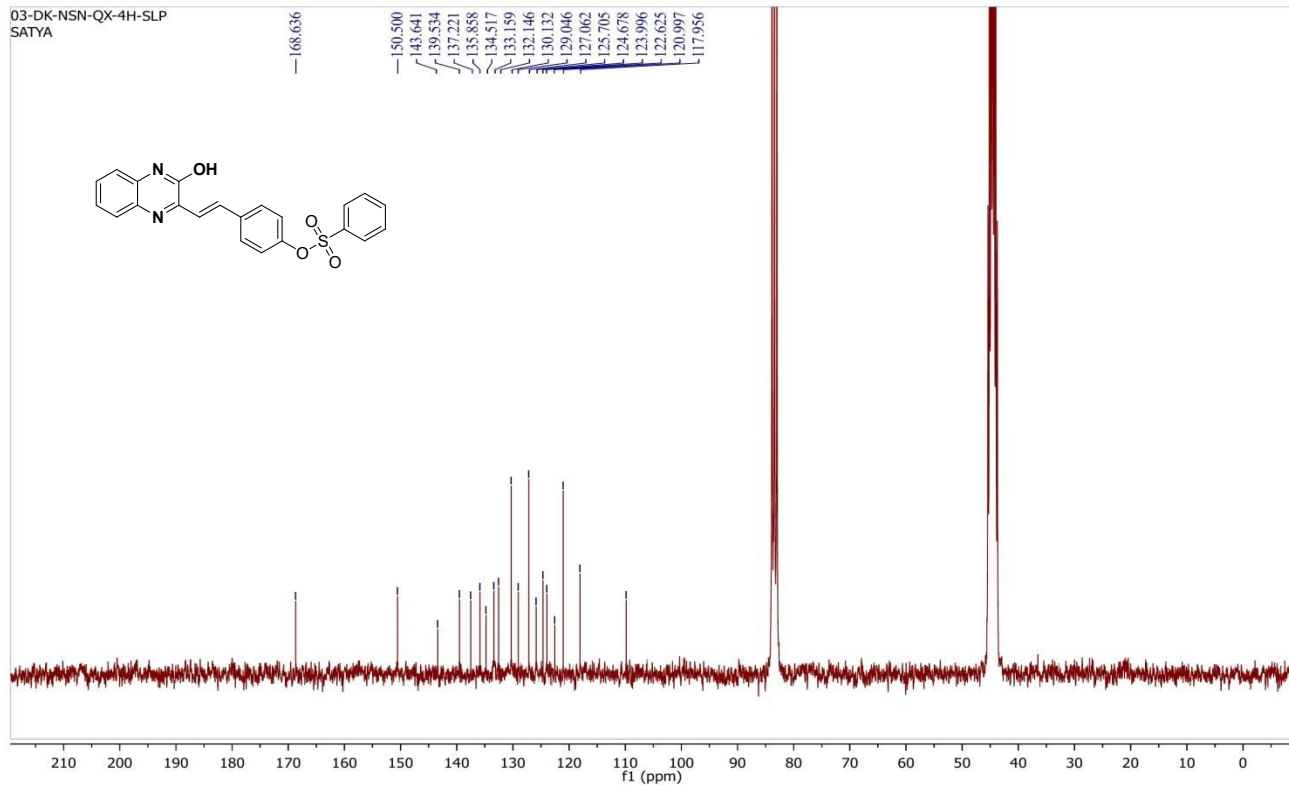




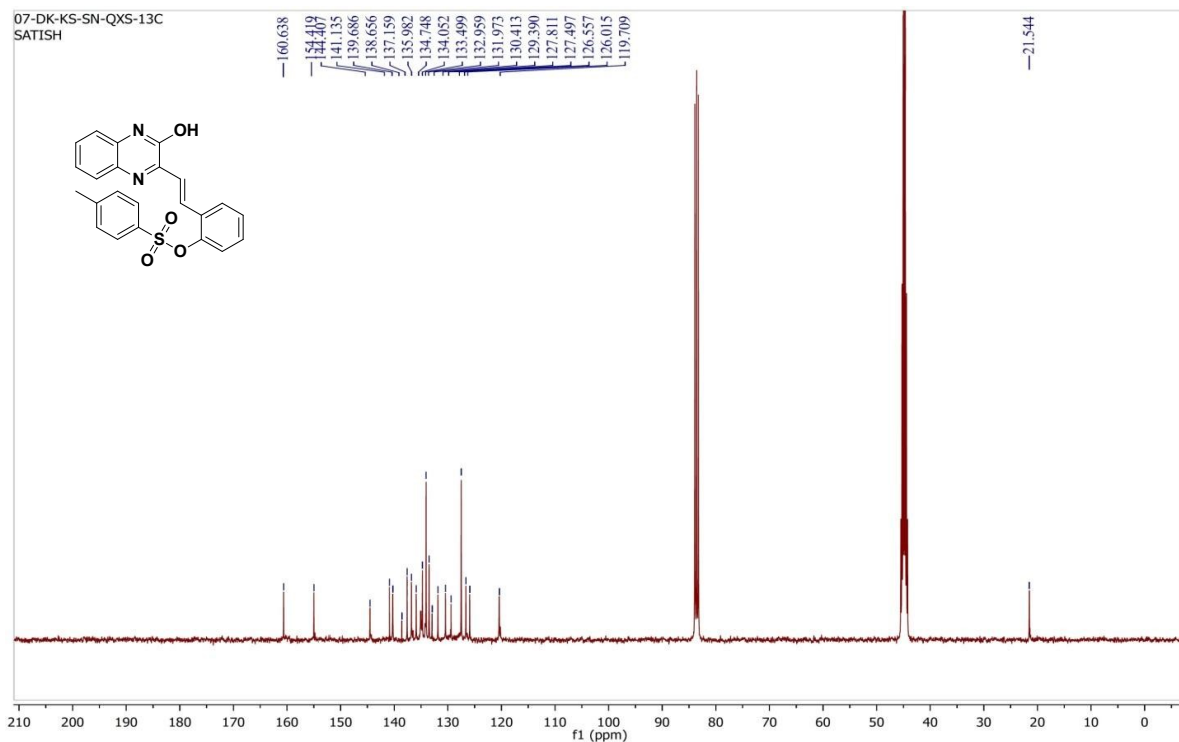
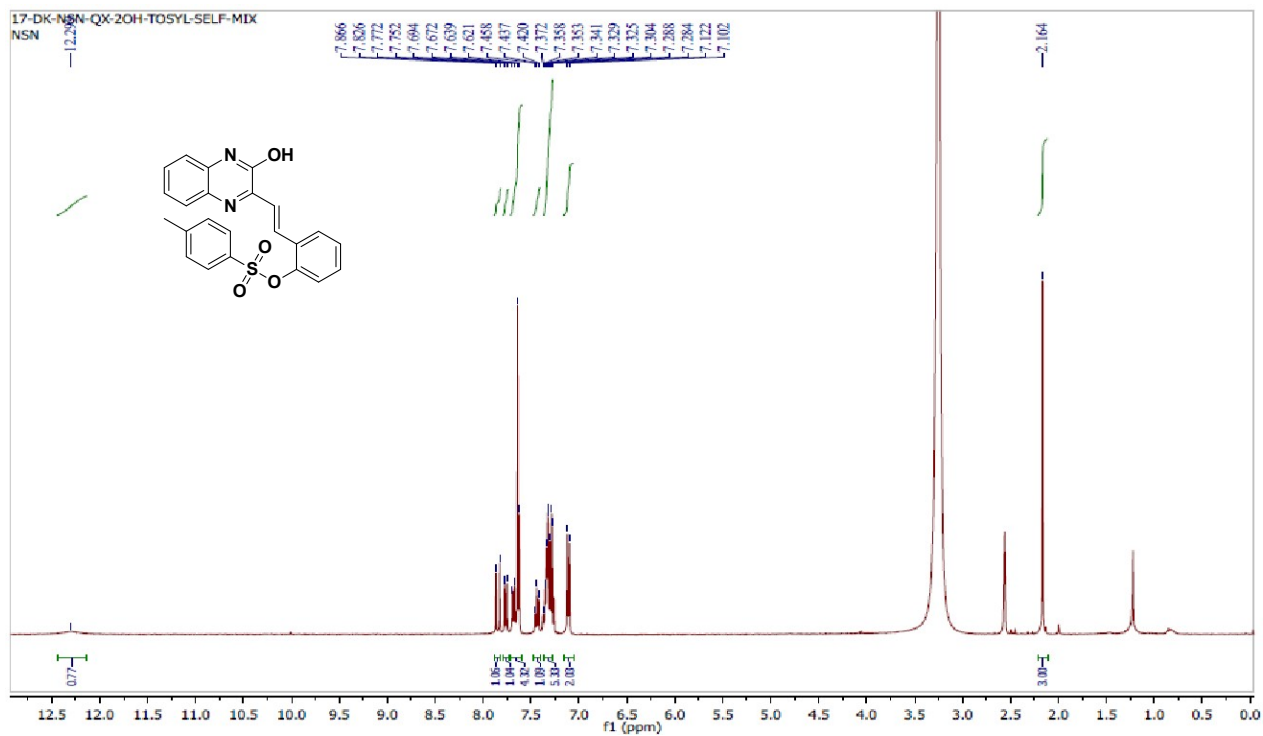
3-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (5e):

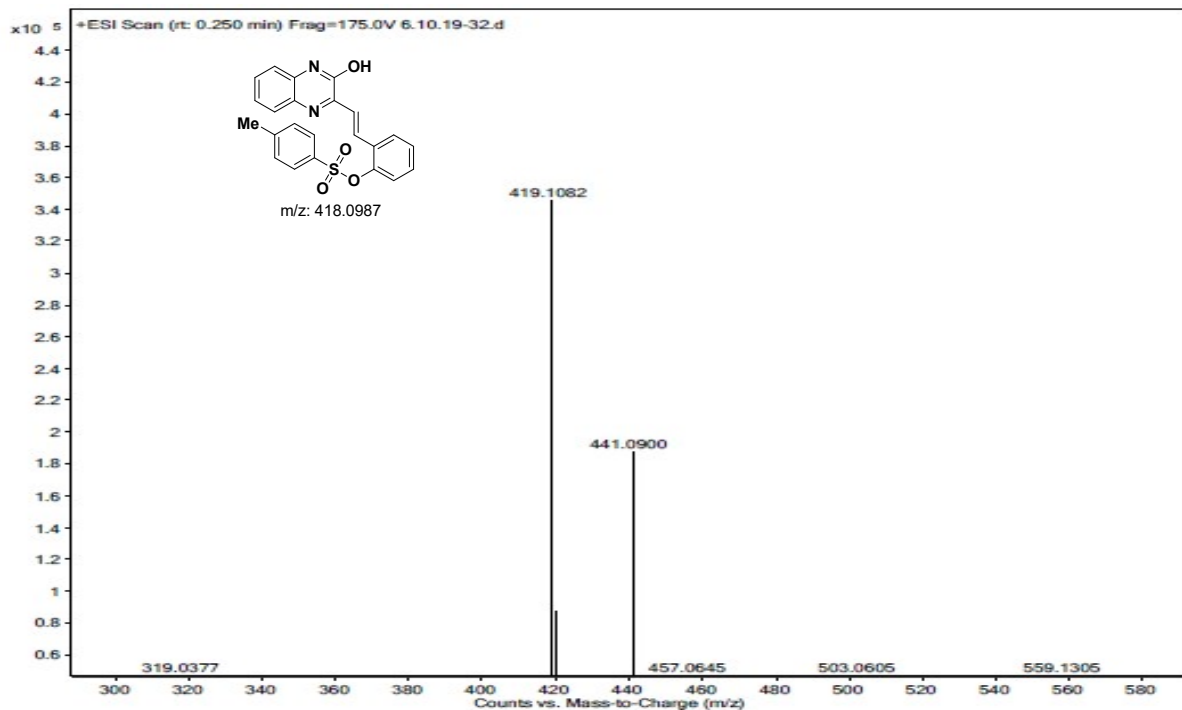


03-DK-NSN-QX-4H-SLP
SATYA

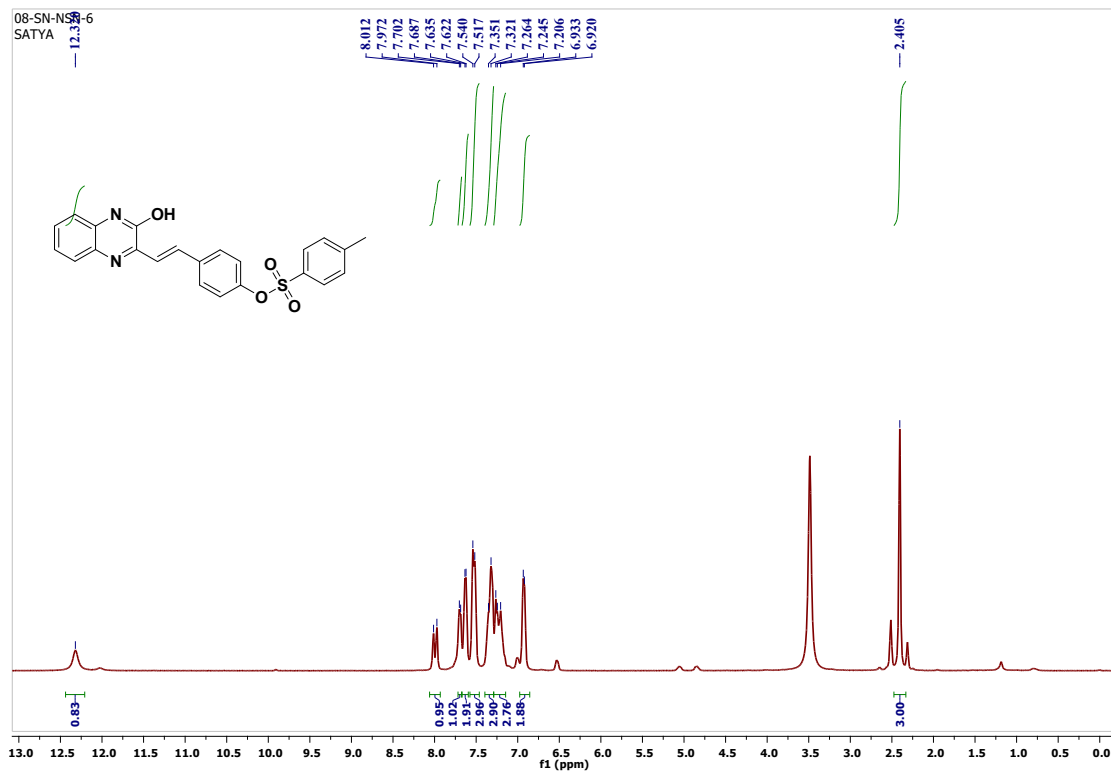


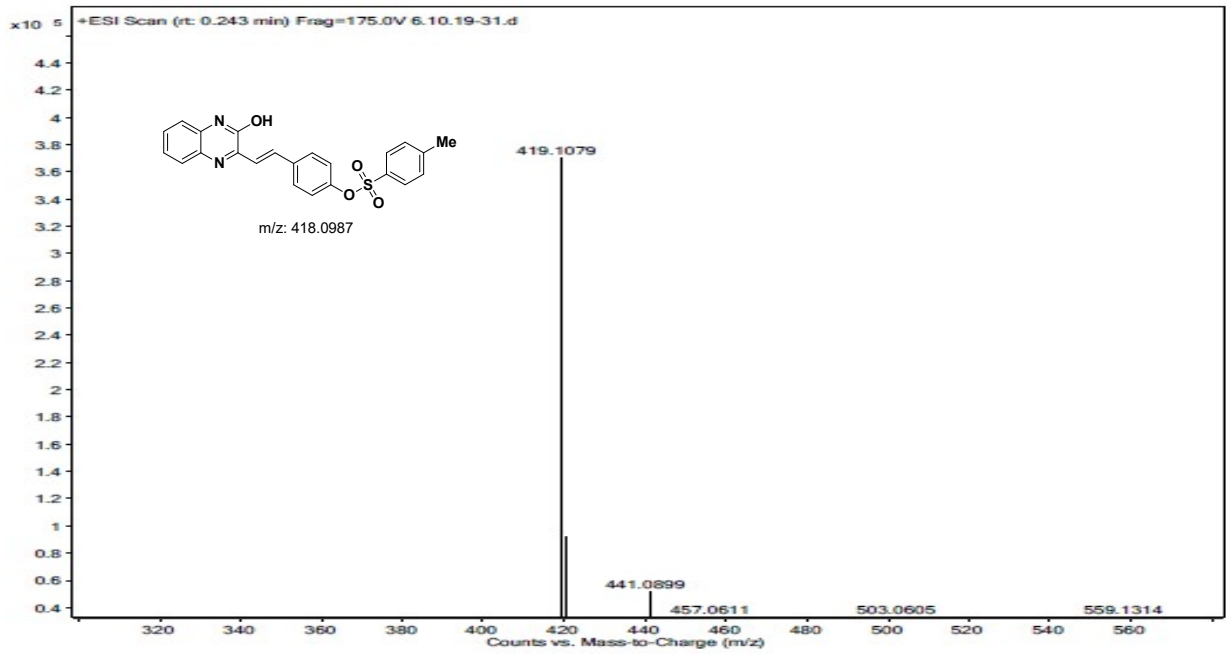
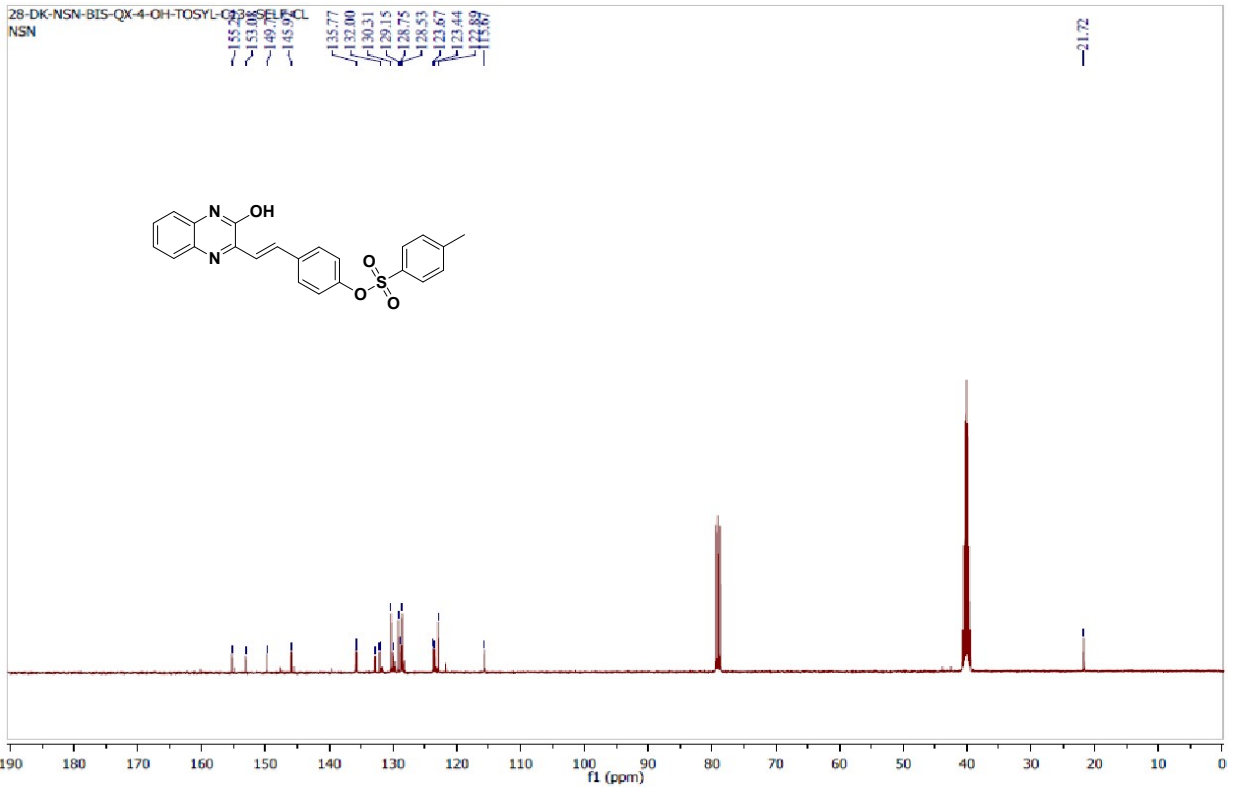
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl-4-methylbenzenesulfonate (5f):



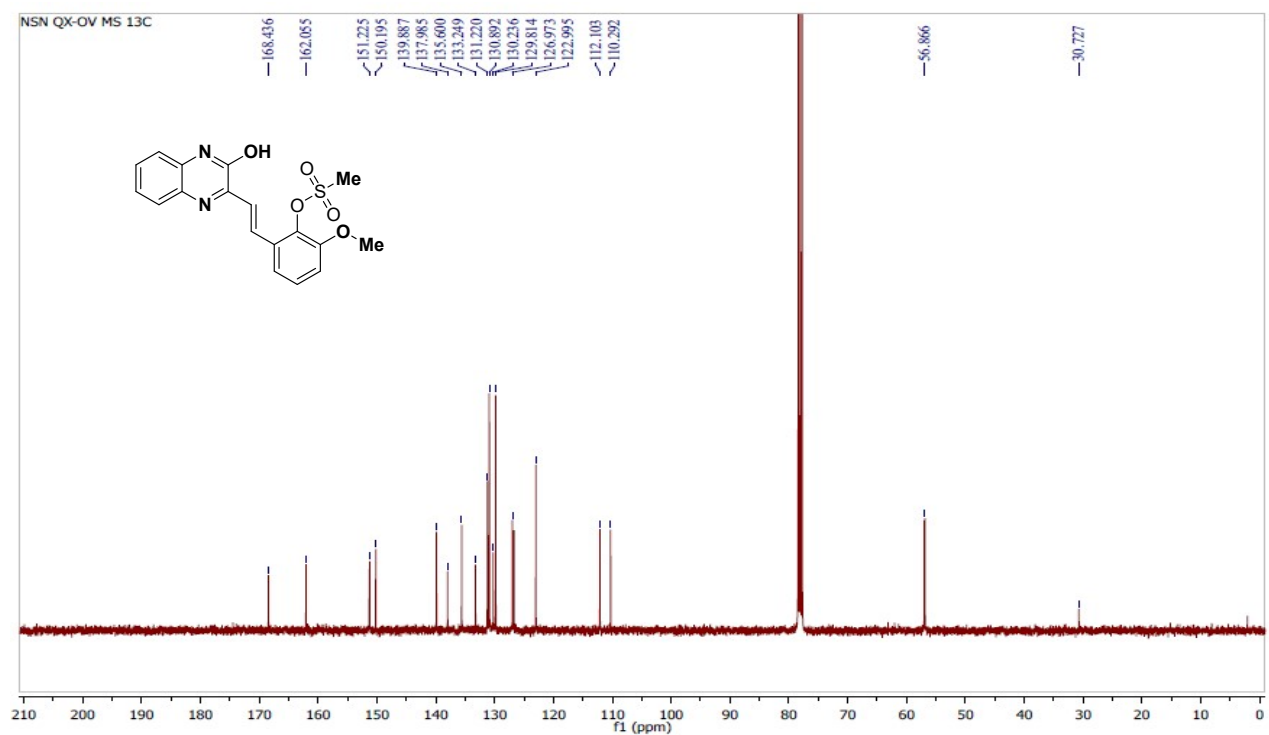
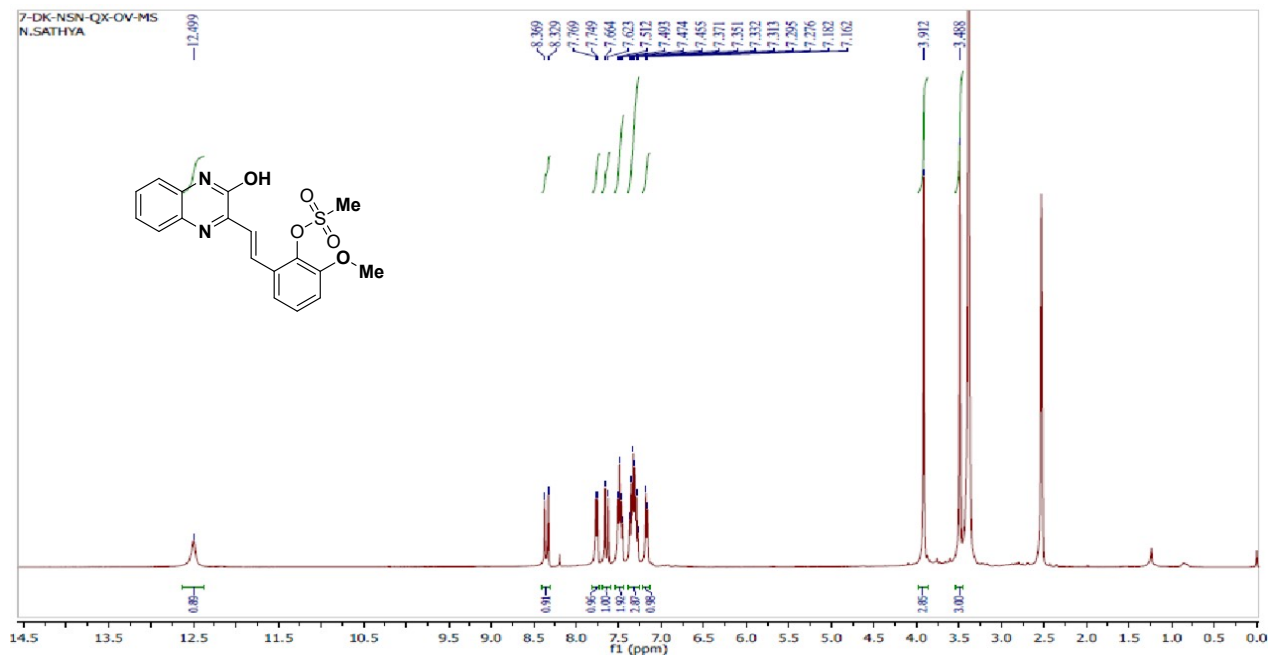


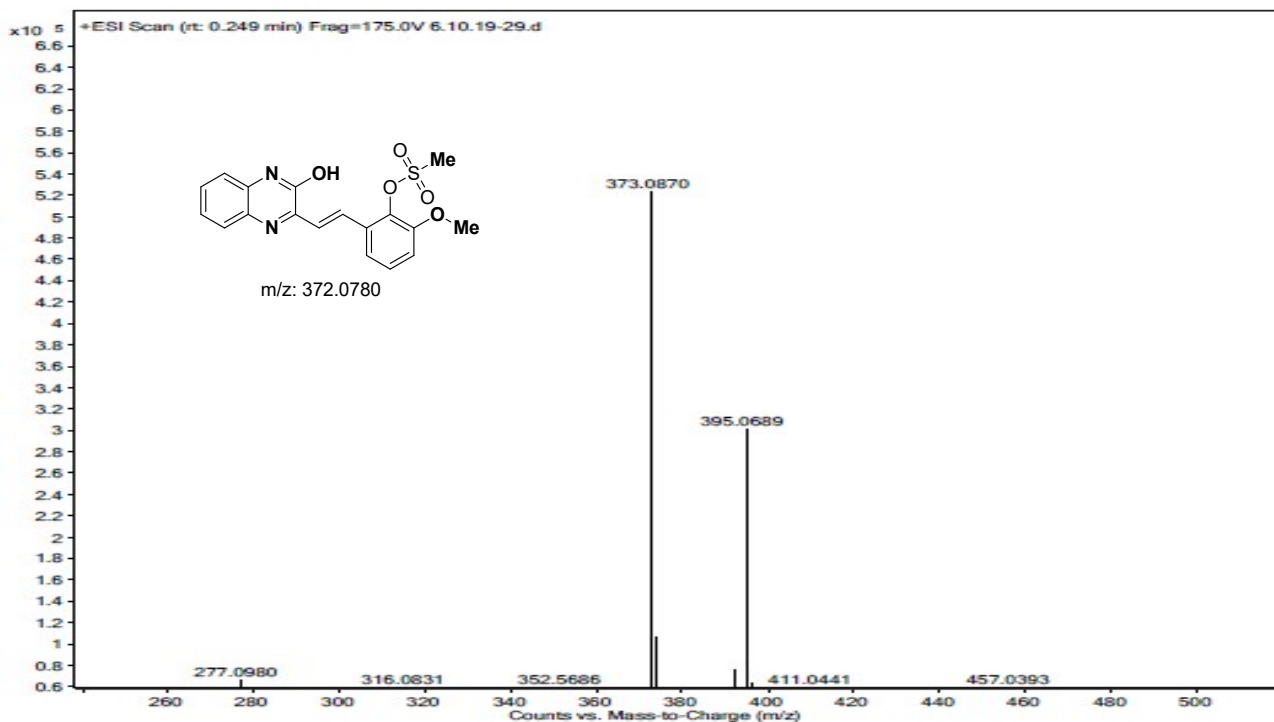
4-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl-4-methylbenzenesulfonate (5g):



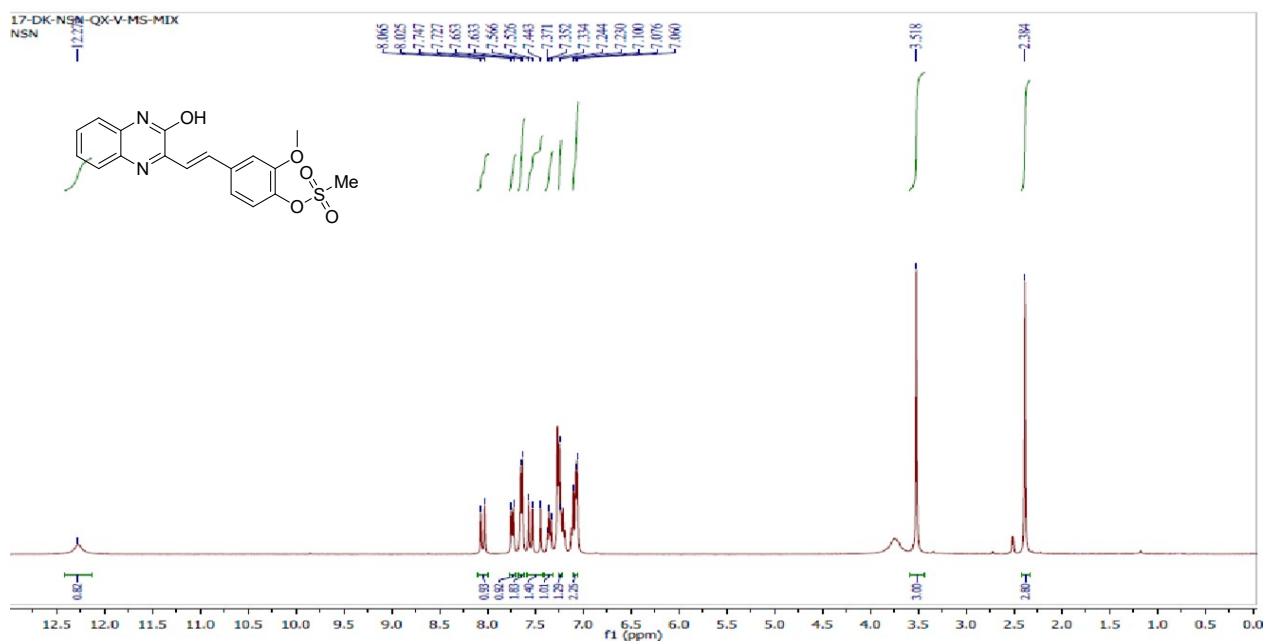


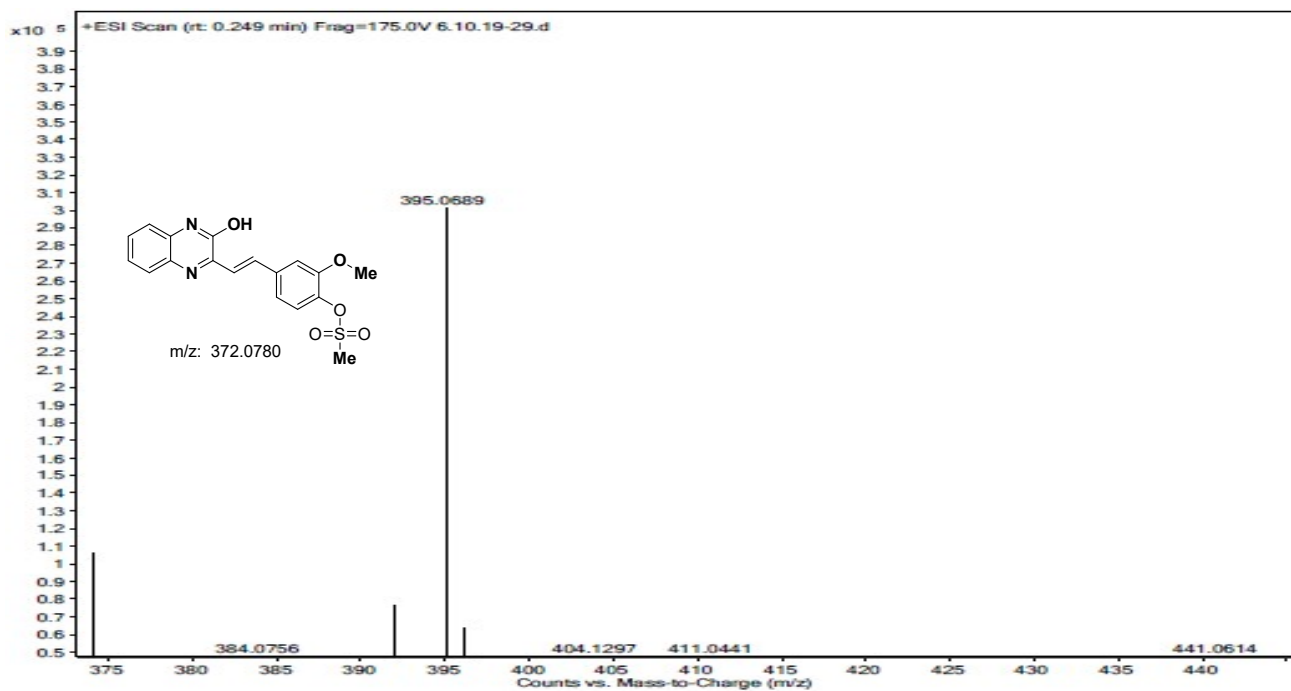
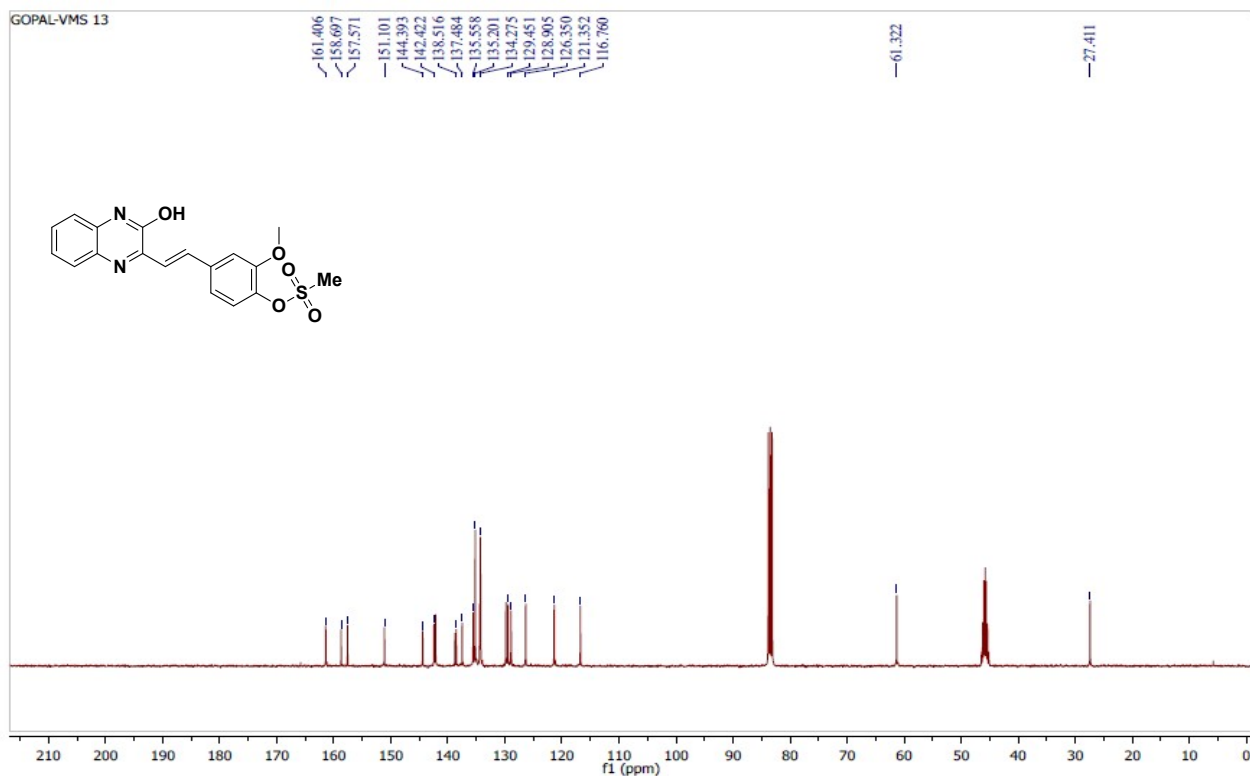
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-6-methoxyphenyl methanesulfonate (5h):



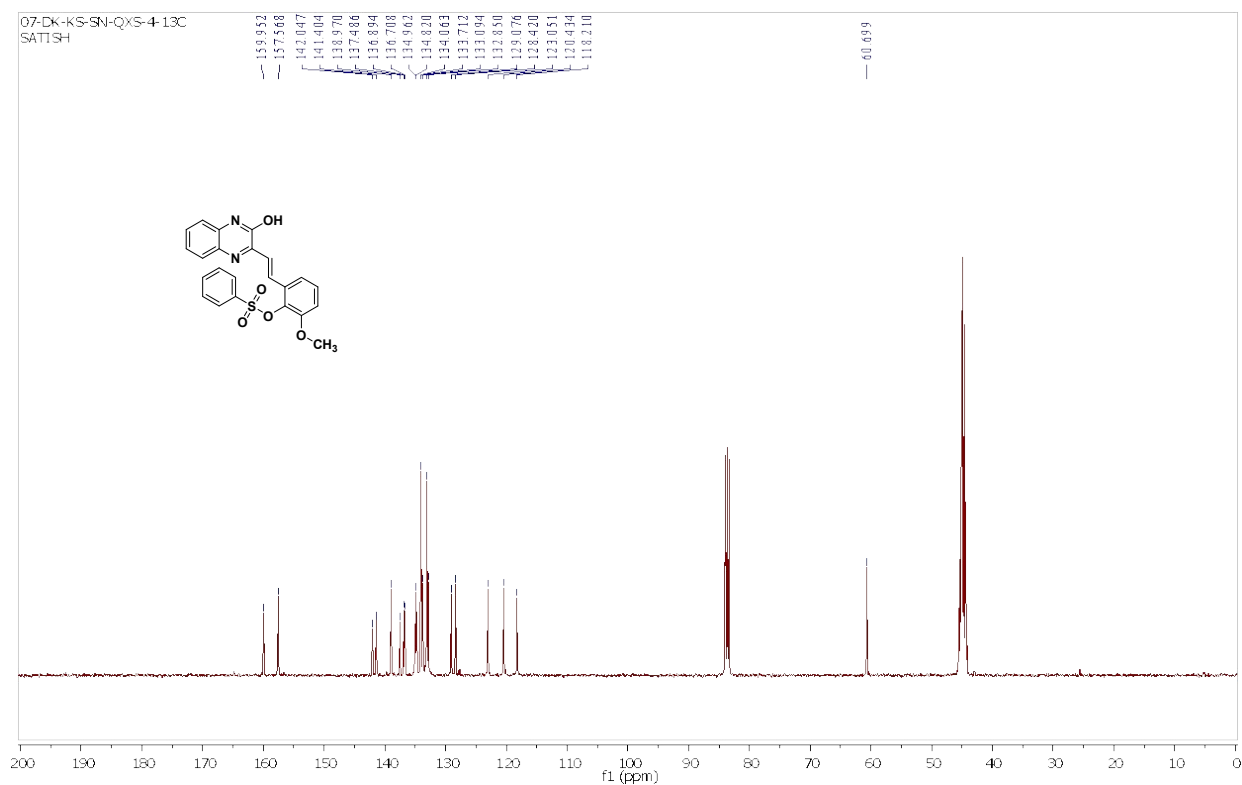
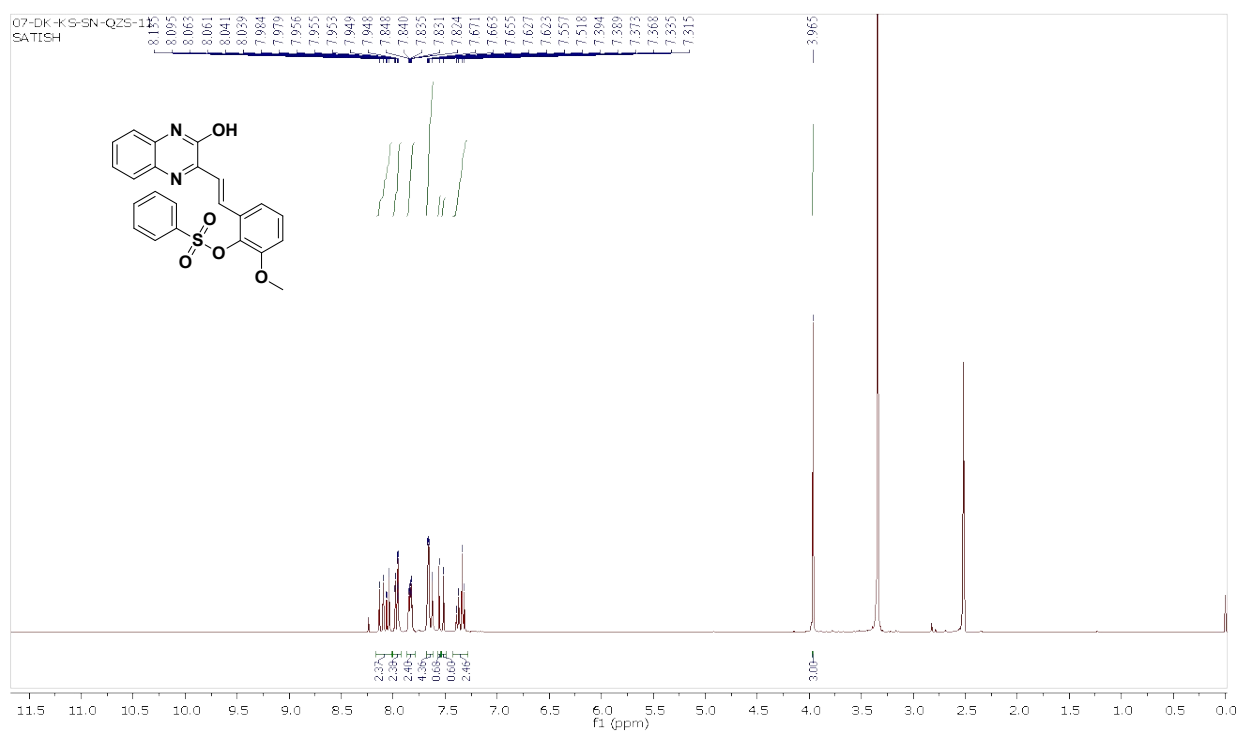


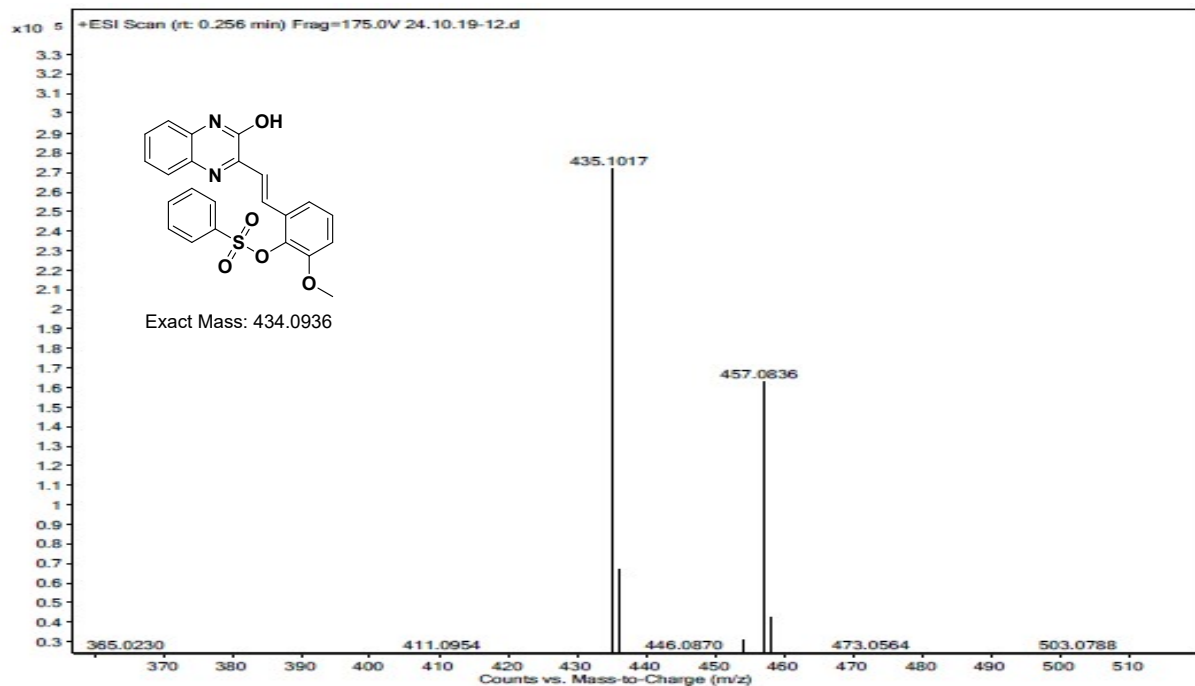
5-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-2-methoxyphenyl methanesulfonate (5i):



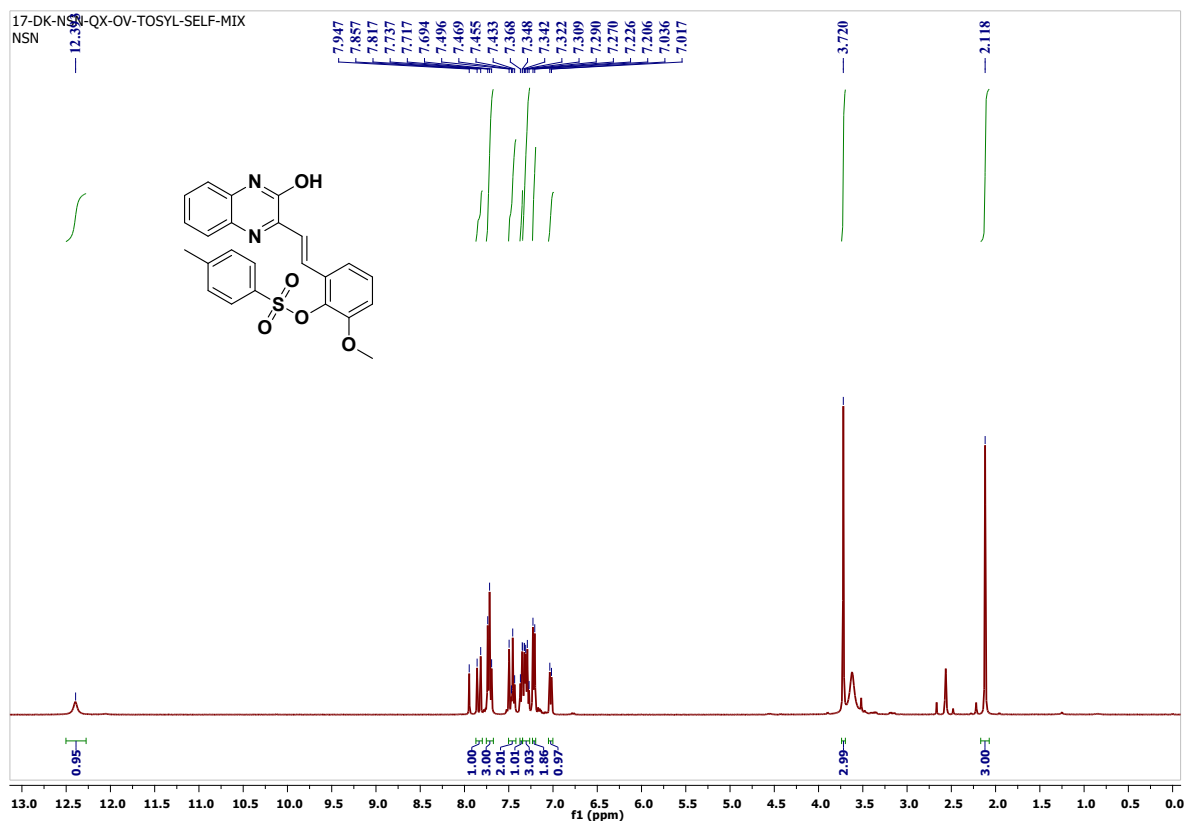


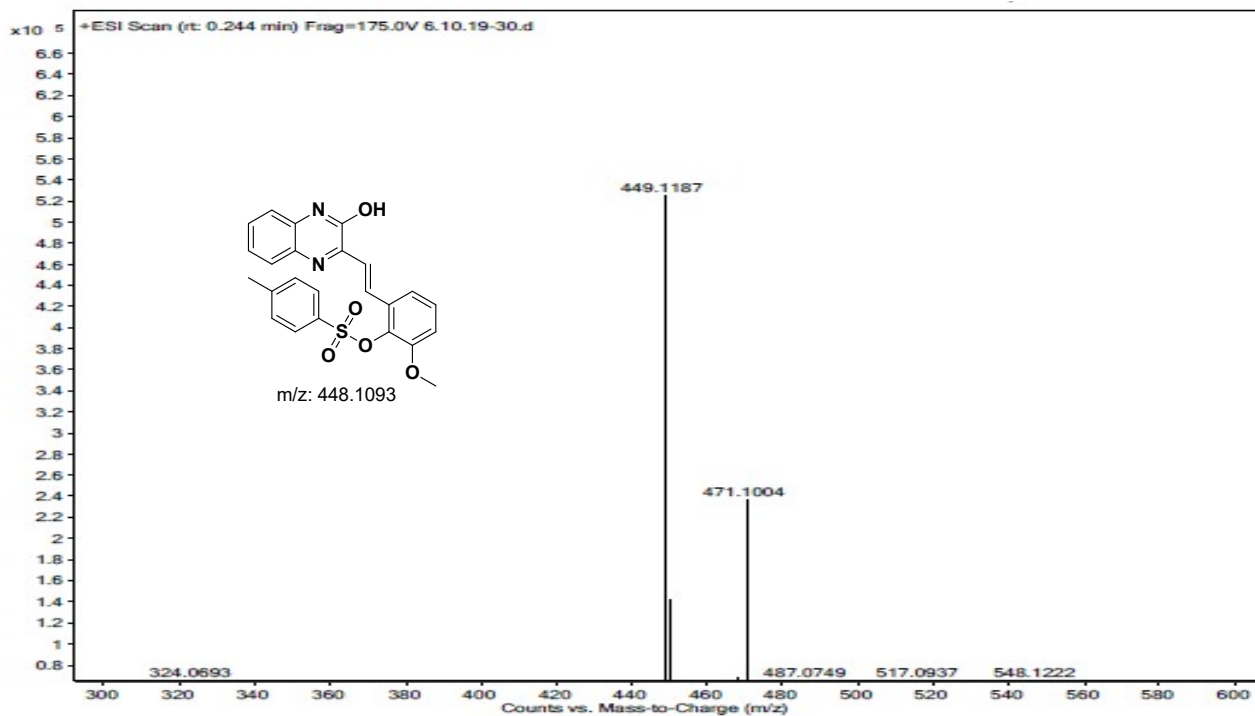
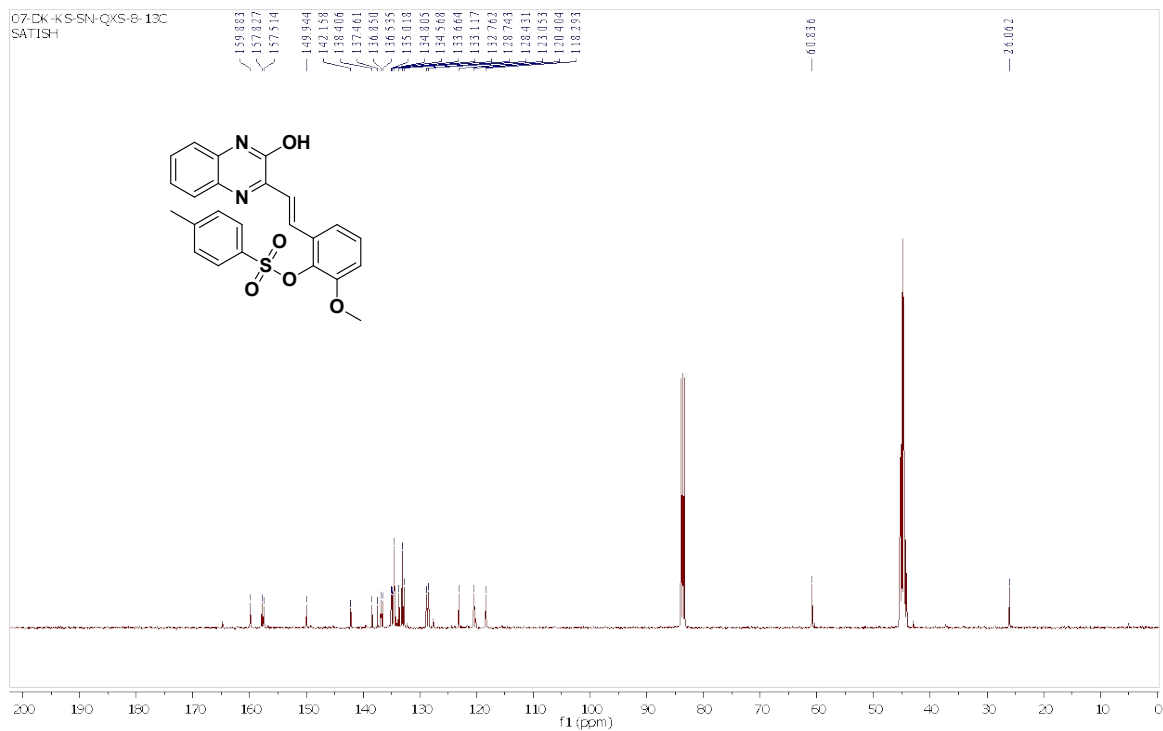
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (5j):



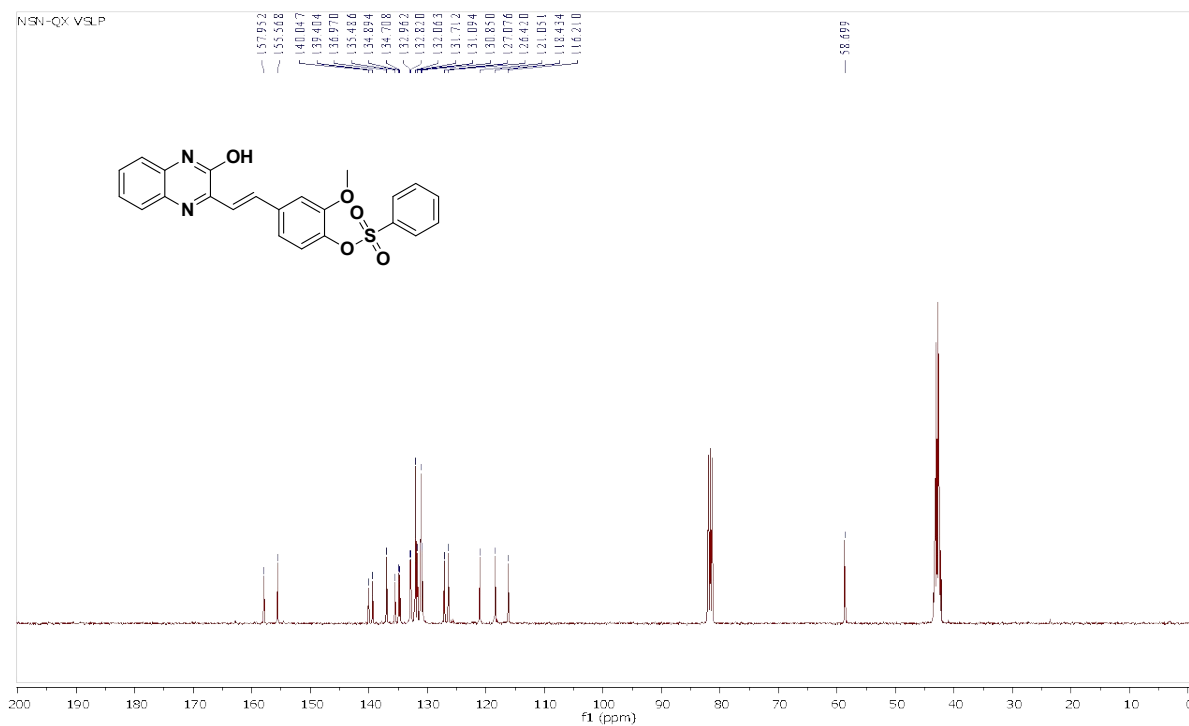
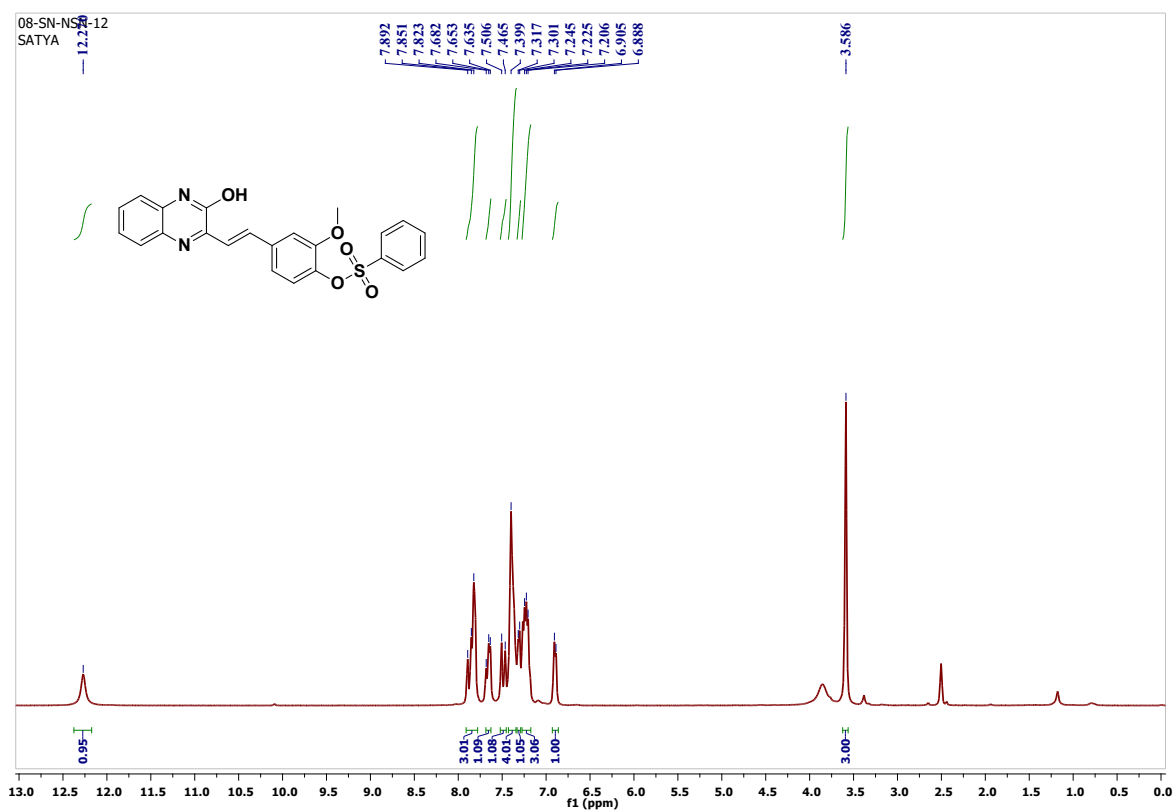


2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-6-methoxyphenyl 4-methylbenzenesulfonate (5k):

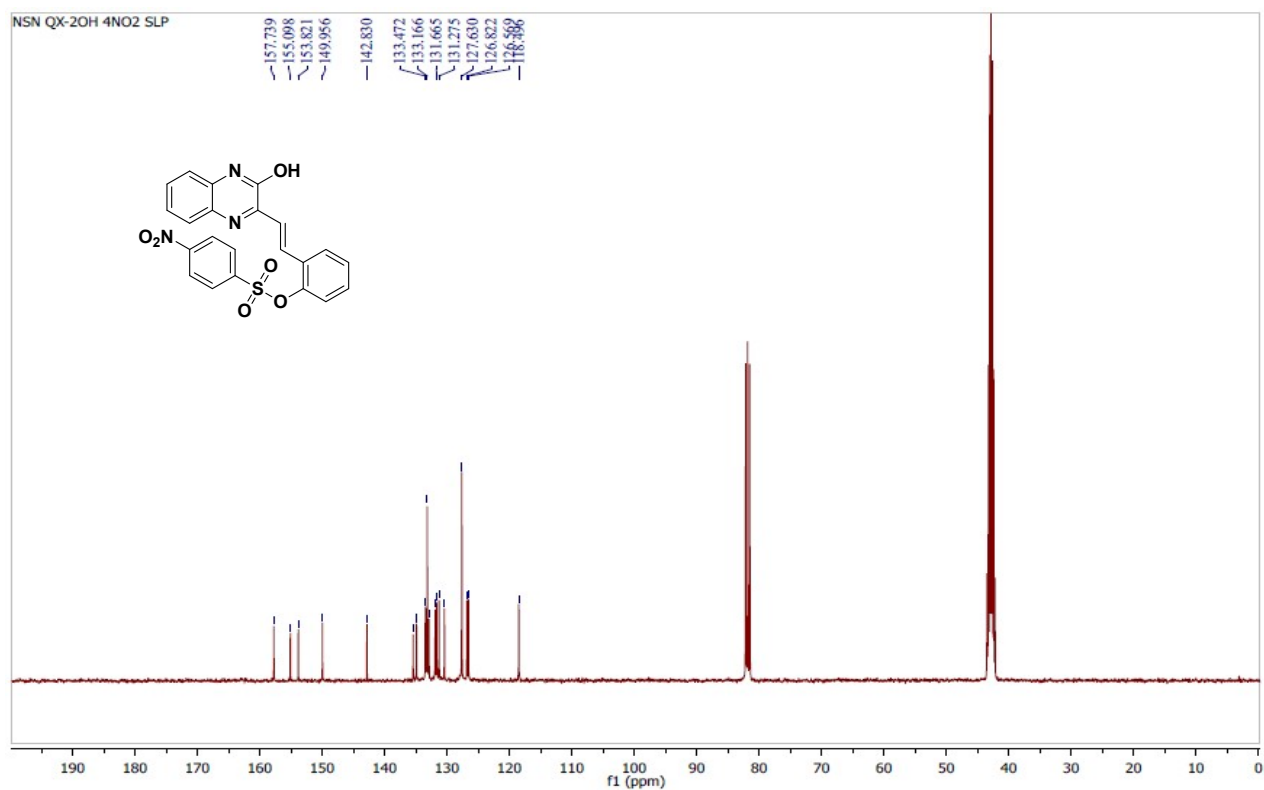
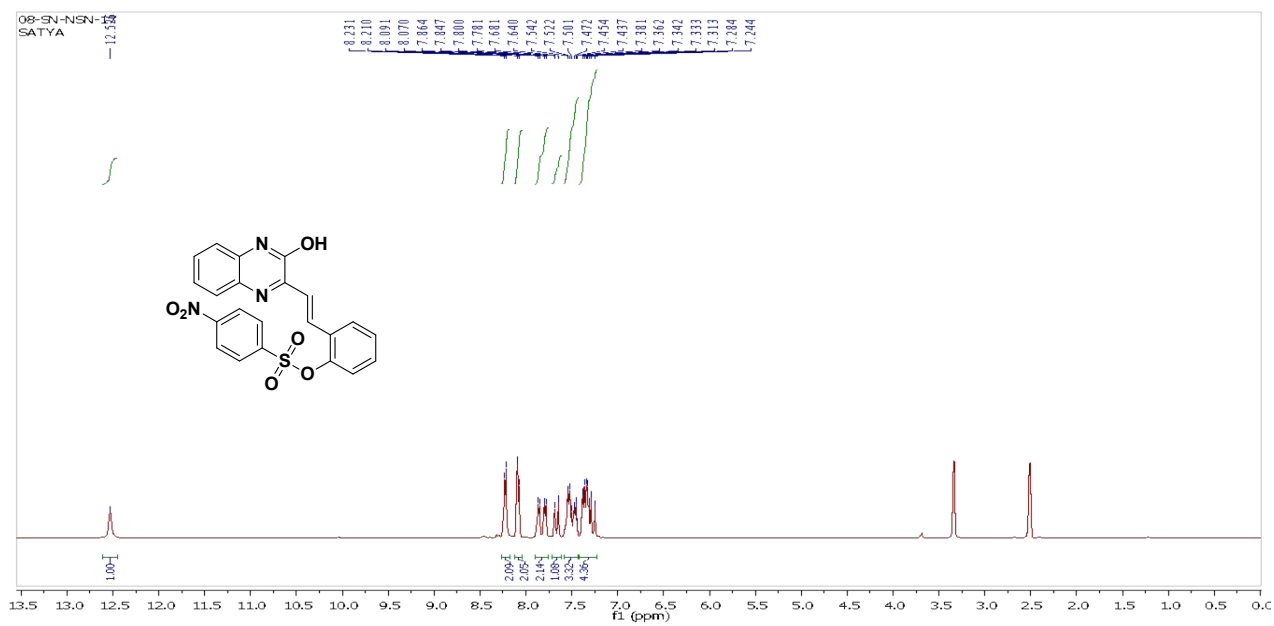


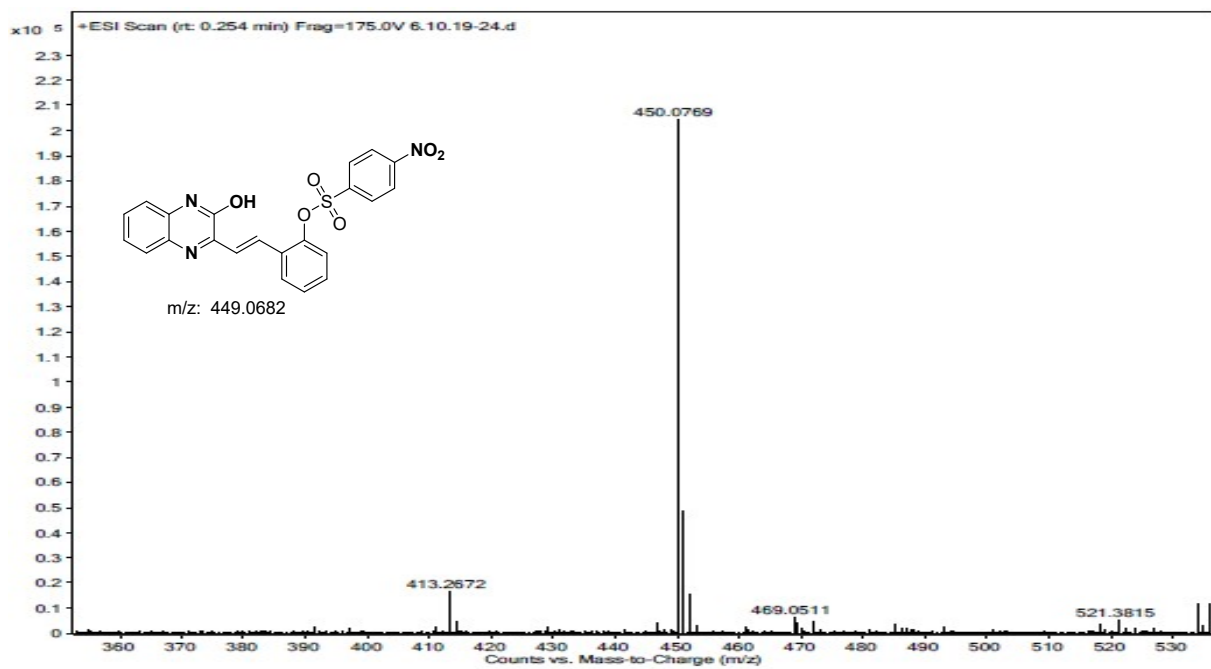


5-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-2-methoxyphenyl benzenesulfonate (5l):

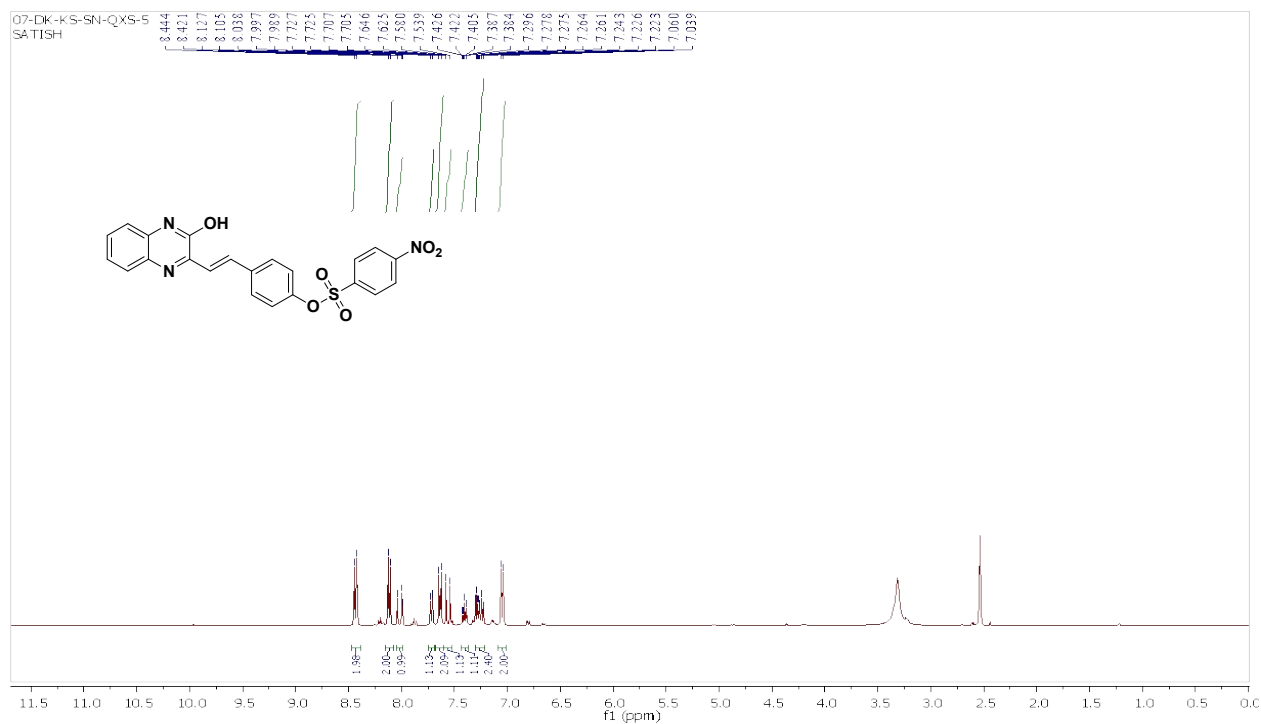


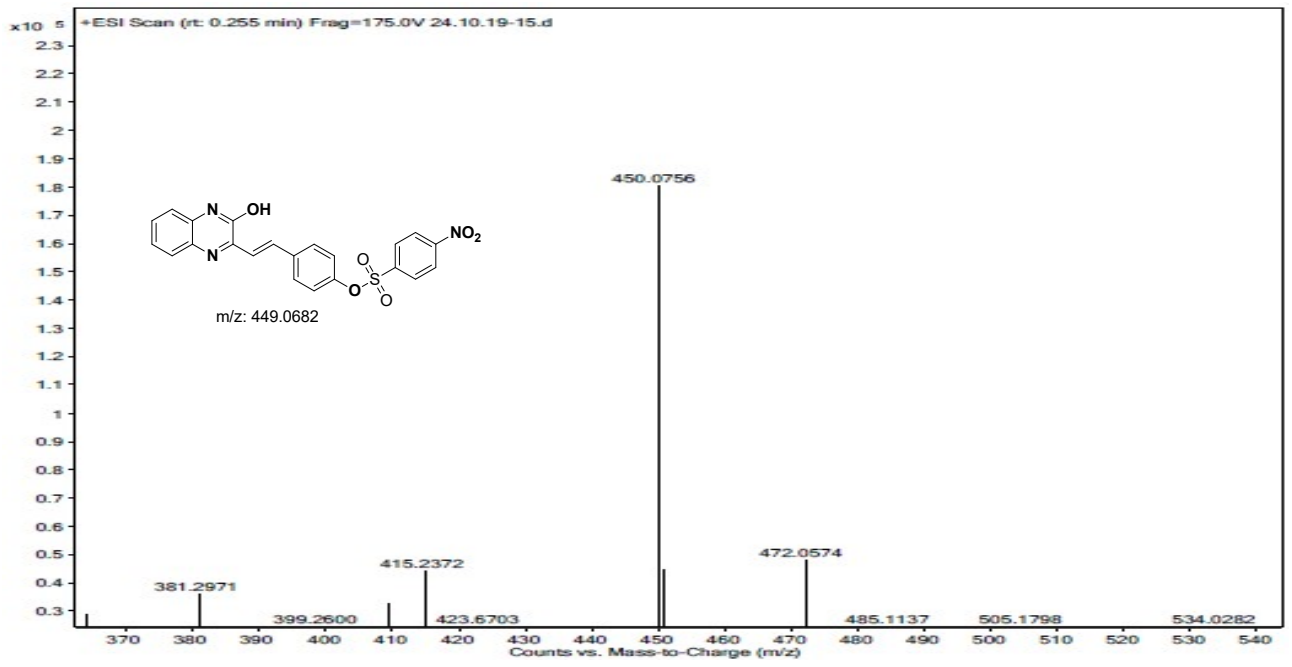
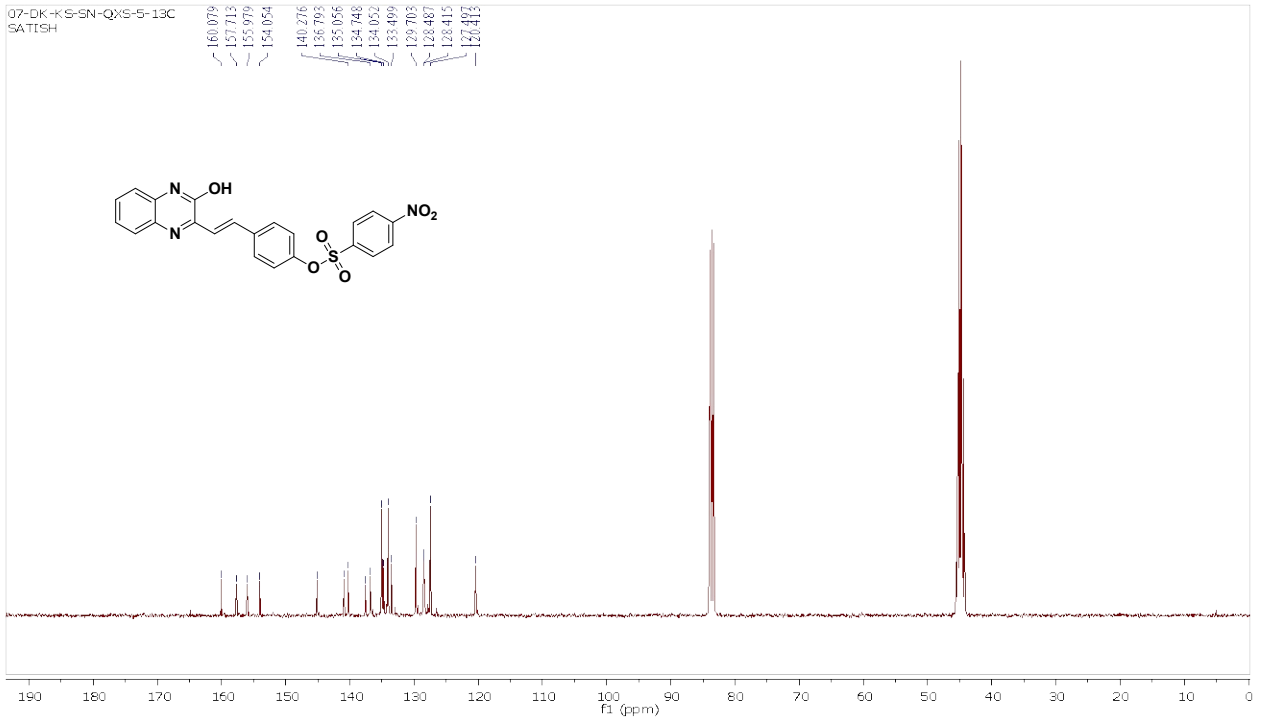
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl-4-nitrobenzenesulfonate (5m):



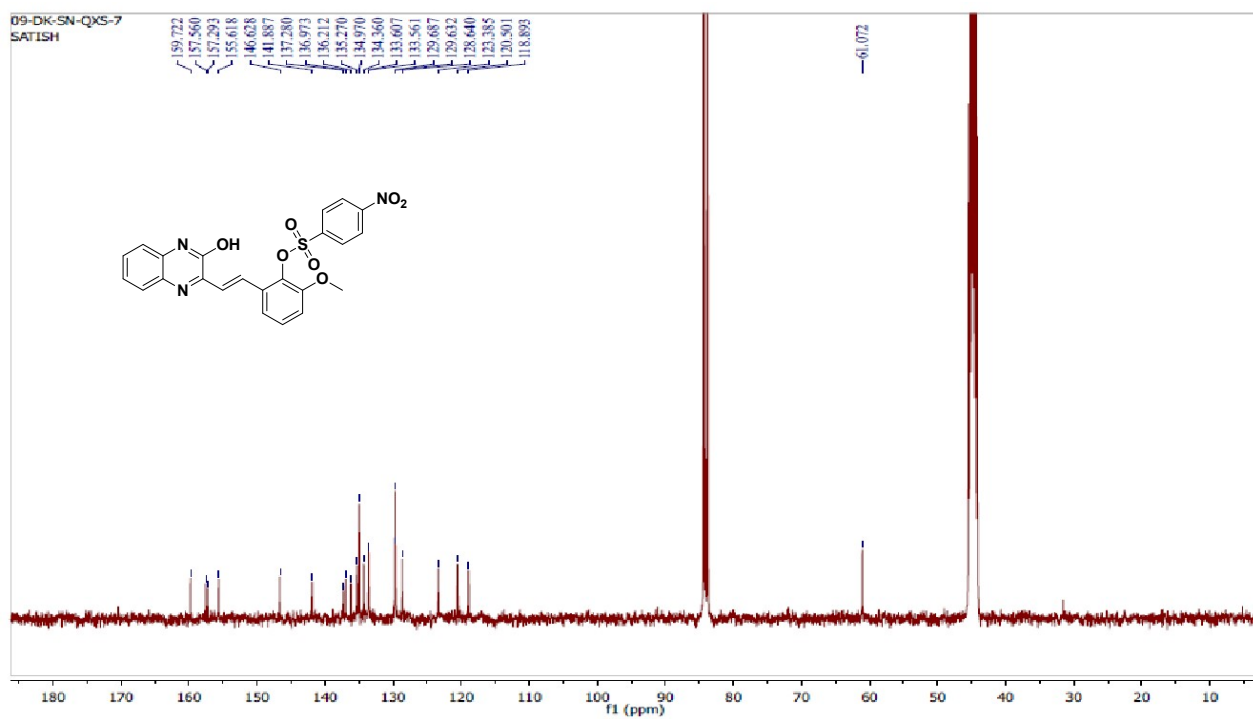
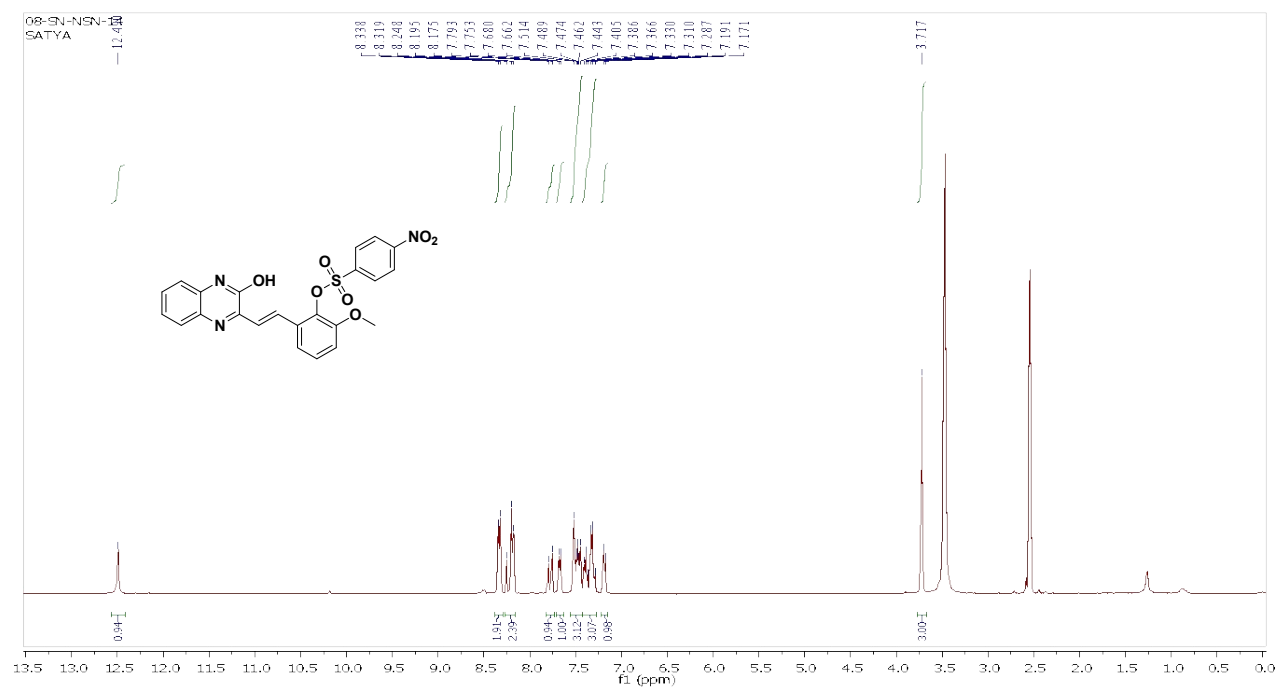


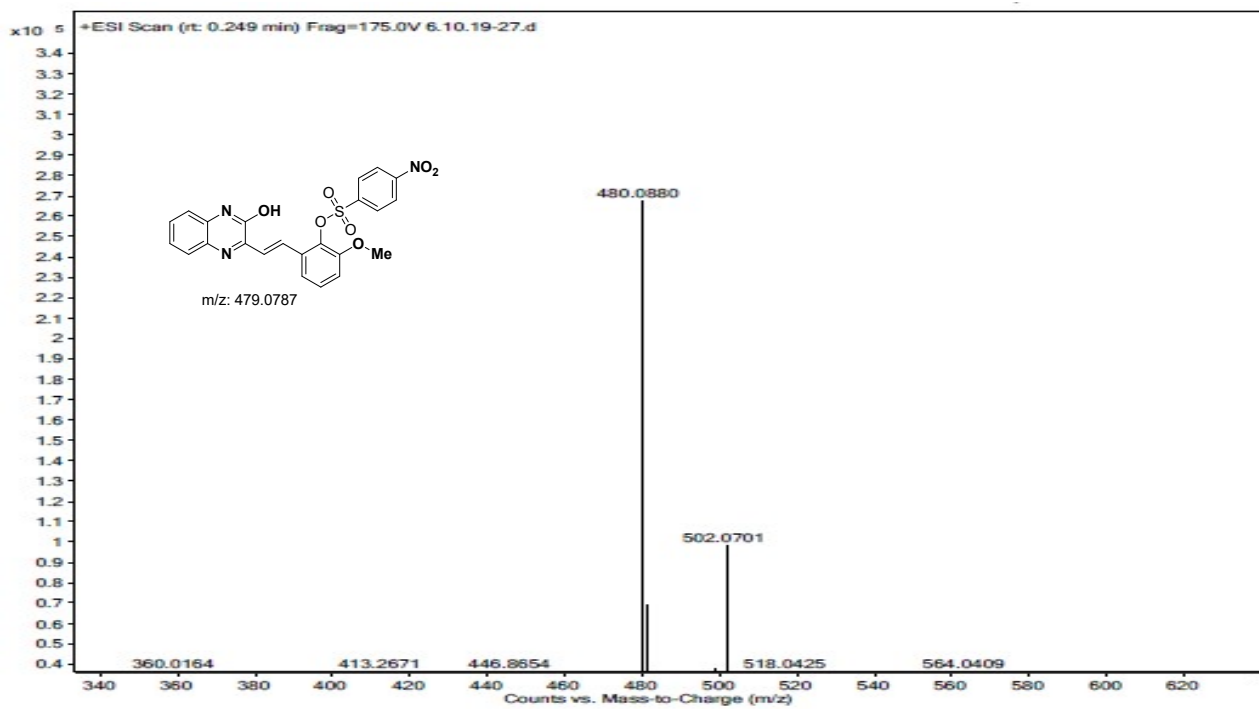
4-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl 4-nitrobenzenesulfonate (5n):



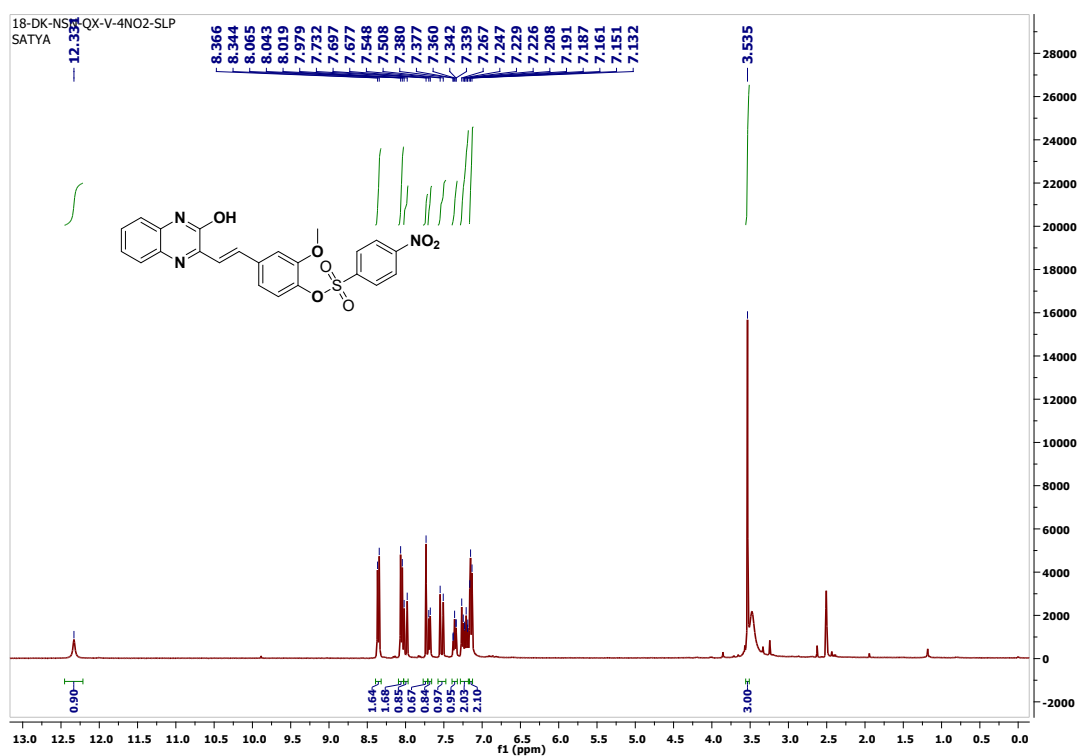


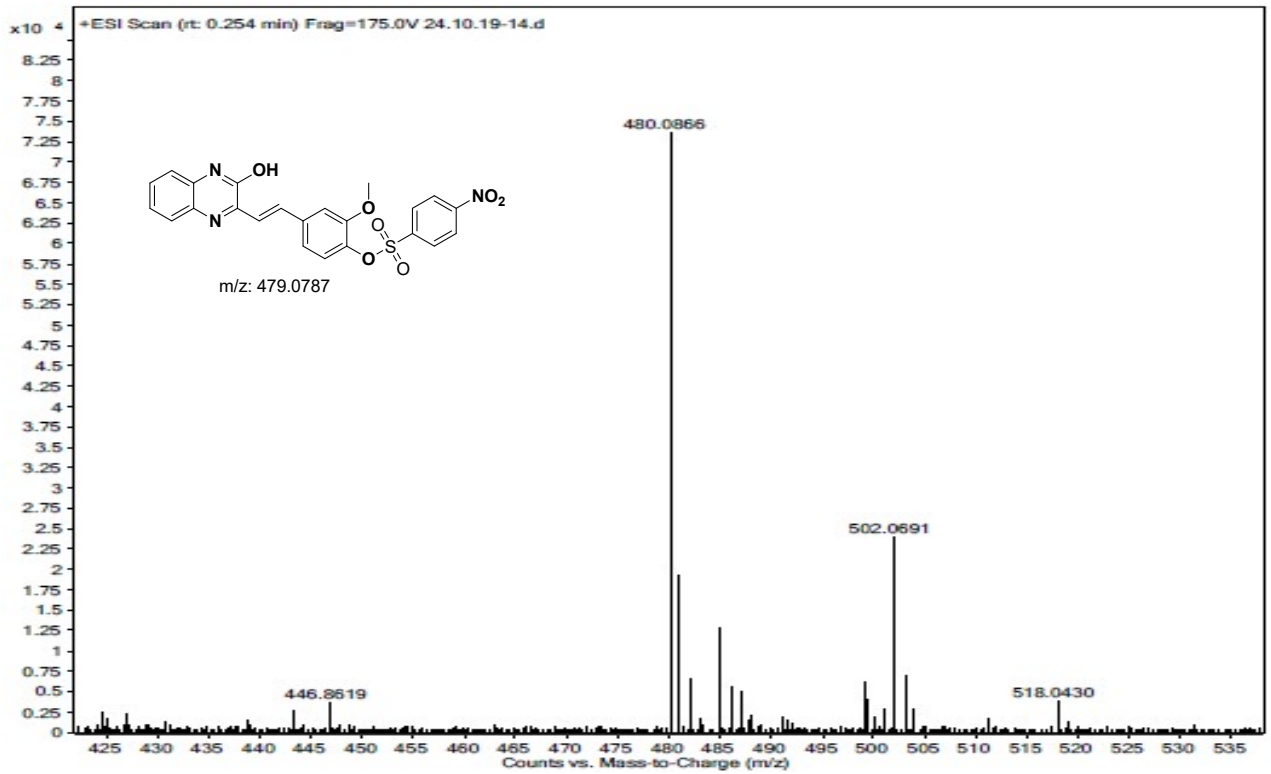
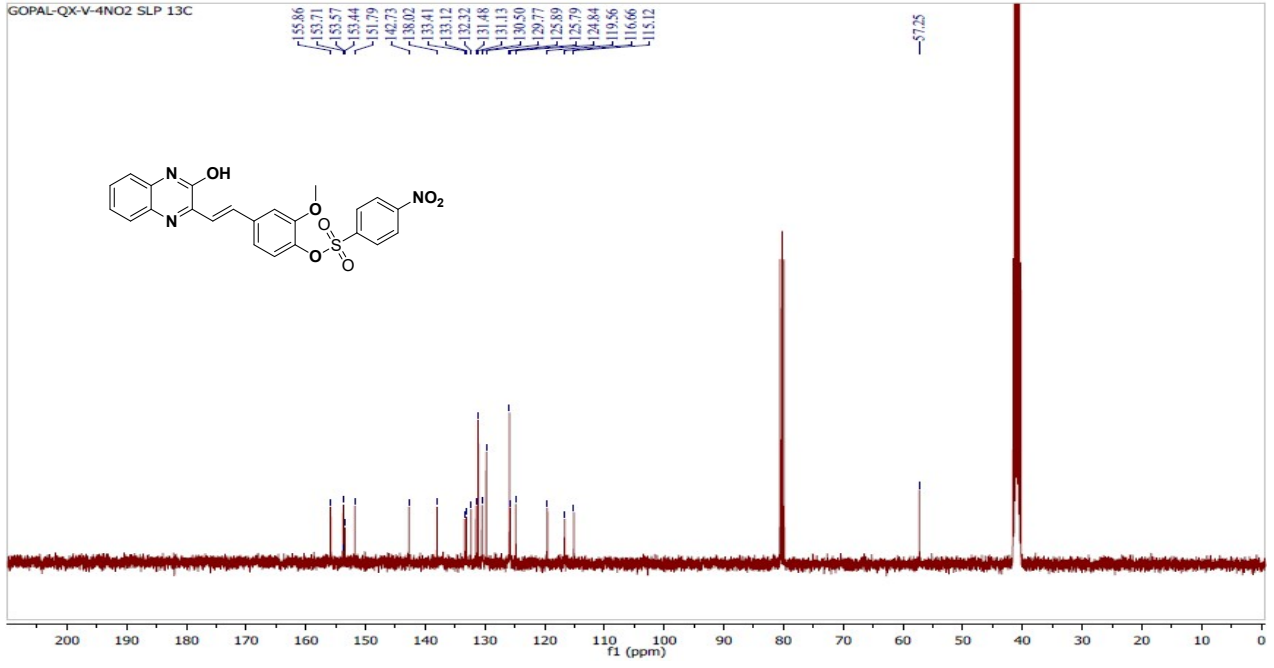
2-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-6-methoxyphenyl-4-nitrobenzenesulfonate (5o):





5-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)-2-methoxyphenyl-4-nitrobenzenesulfonate (5p):





NOESY-2D NMR of the compound 5e:

4-(2-(3-Hydroxyquinoxalin-2-yl)vinyl)phenyl benzenesulfonate (5e):

