

Supporting Information

Selectfluor-Mediated Tandem Cyclization of Enaminones with diselenides toward the synthesis of 3-Selenylated Chromones

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1 General information

All chemicals were commercially available and used as received without further. Column chromatography was performed using 300-400 mesh silica. Nuclear magnetic resonance spectra were recorded on Bruker Avance 400 MHz spectrometer. ^1H NMR spectra are recorded in parts per million from tetramethylsilane. Data were reported as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, m = multiplet and br = broad), coupling constant in Hz and integration. ^{13}C NMR spectra were recorded in parts per million from tetramethylsilane. ^{19}F NMR spectra were recorded in parts per million with fluorobenzene as external standard. High resolution mass spectra (HR MS) was performed using a Thermo Scientific Q Exactive Hybrid Quadrupole-Orbitrap mass spectrometer equipped with an EASY Spray nanospray source operated in positive ion mode. IR spectra were recorded on WQF-510 Fourier transform infrared spectrophotometer. Melting points were measured on an XT4A microscopic apparatus uncorrected.

2 Copies of spectra of products

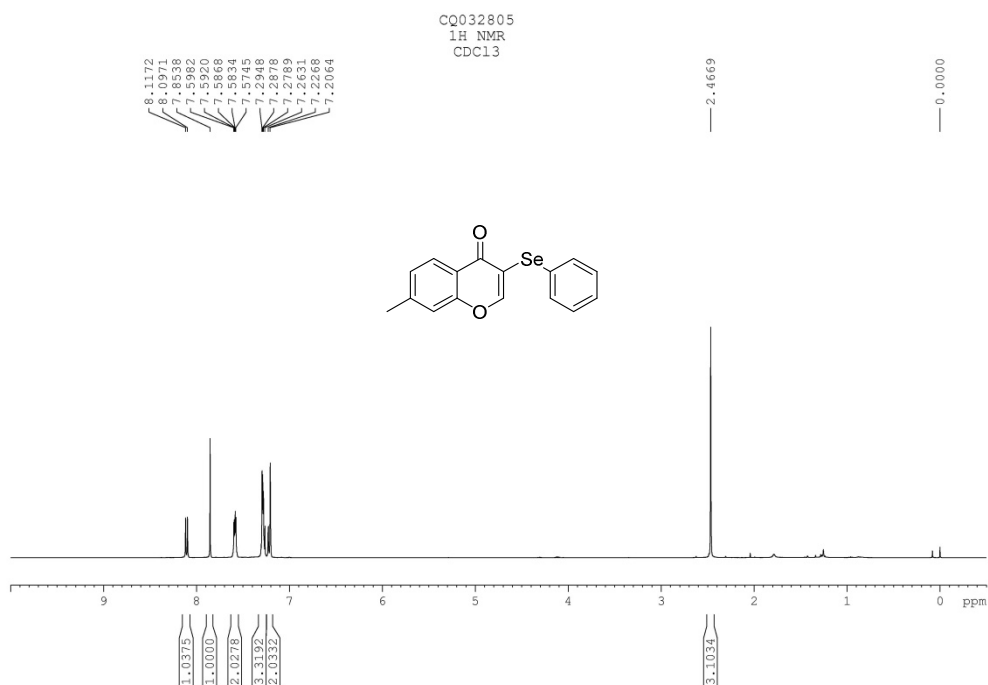


Fig. 1 ¹H NMR spectrum of compound 3aa

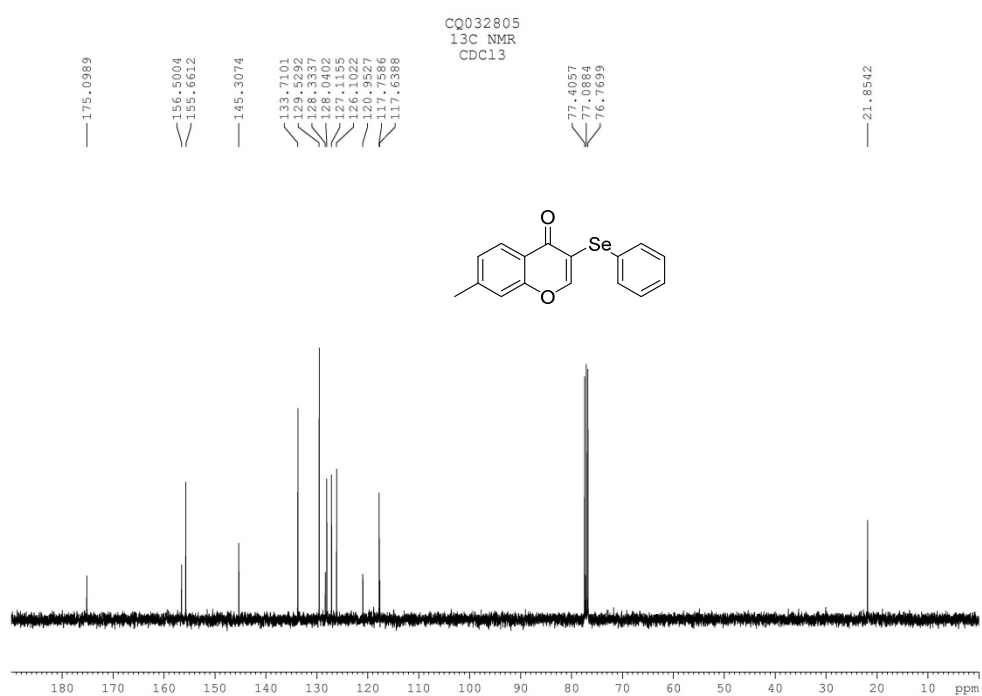


Fig. 2 ¹³C NMR spectrum of compound 3aa

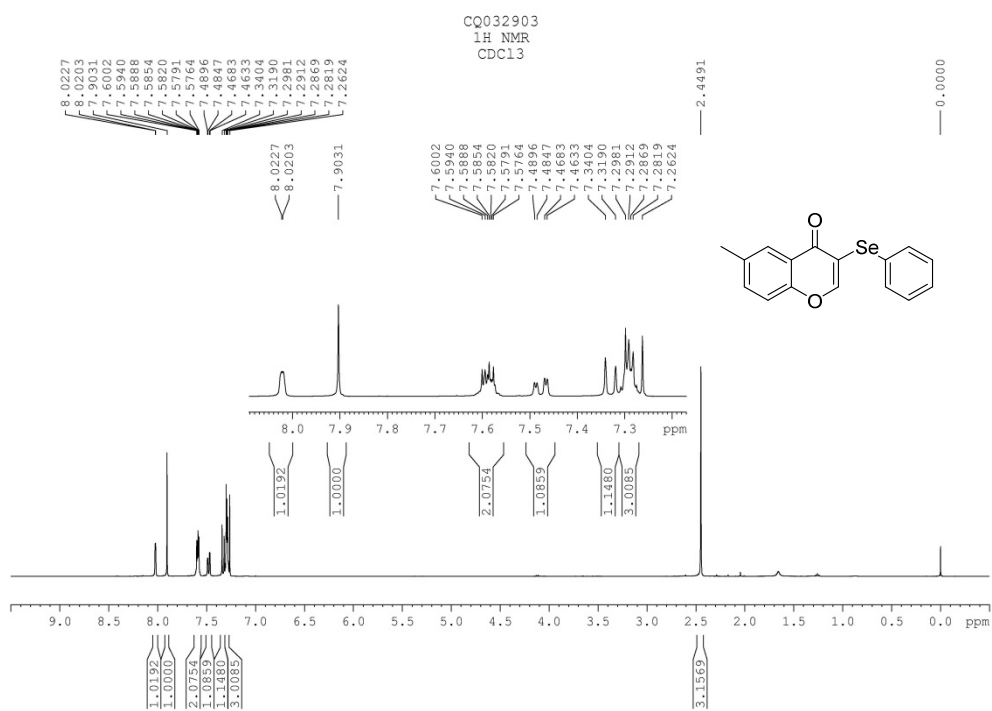


Fig. 3 ^1H NMR spectrum of compound **3ba**

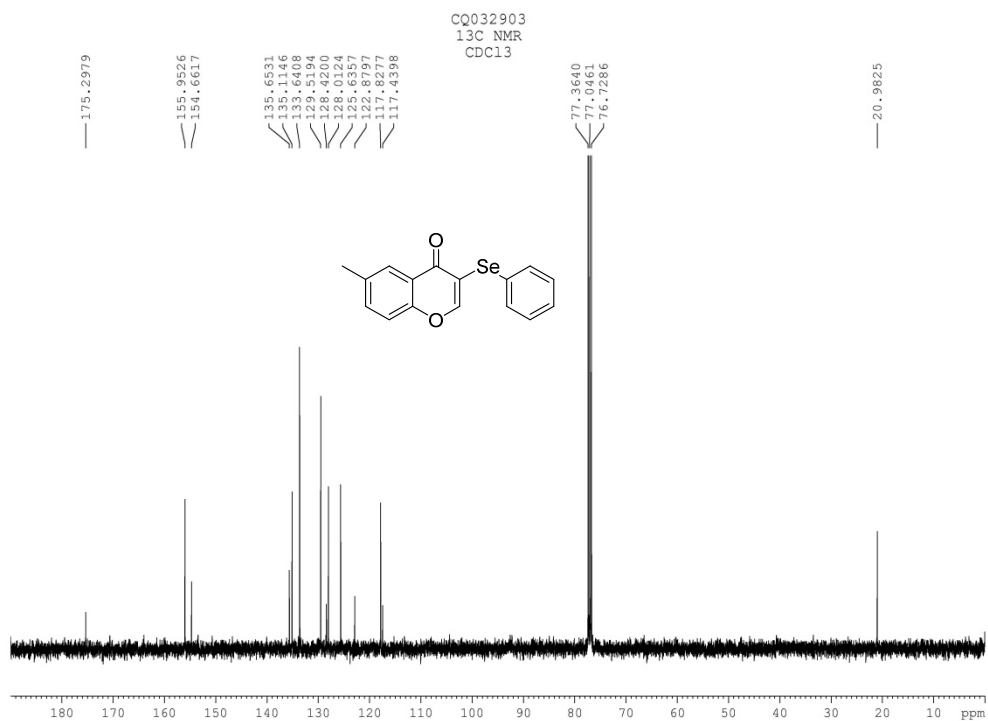


Fig. 4 ^{13}C NMR spectrum of compound **3ba**

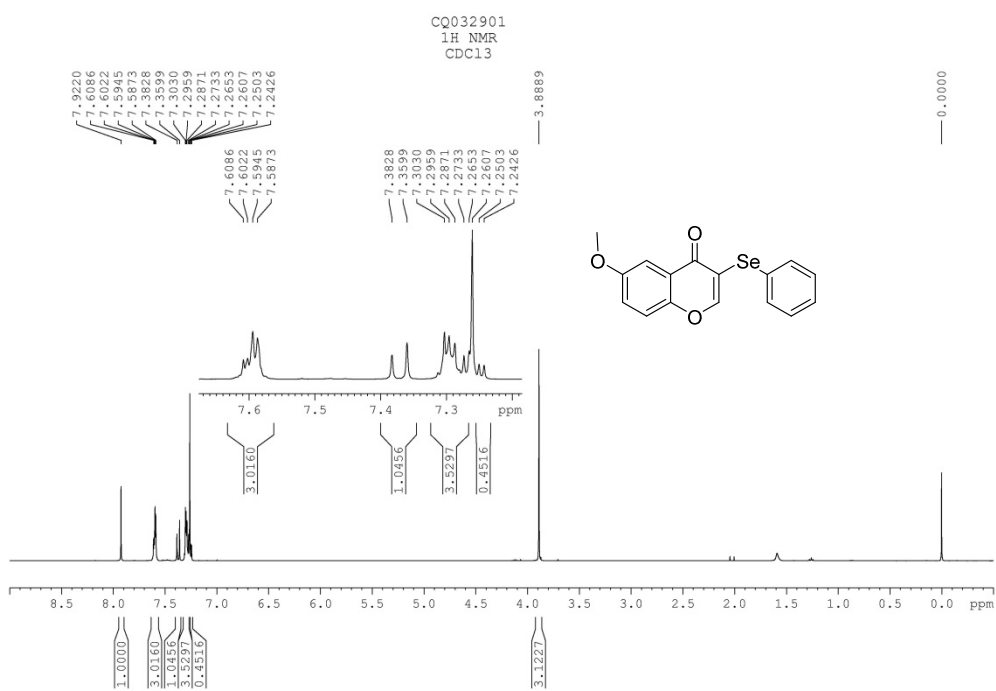


Fig. 5 ¹H NMR spectrum of compound 3ca

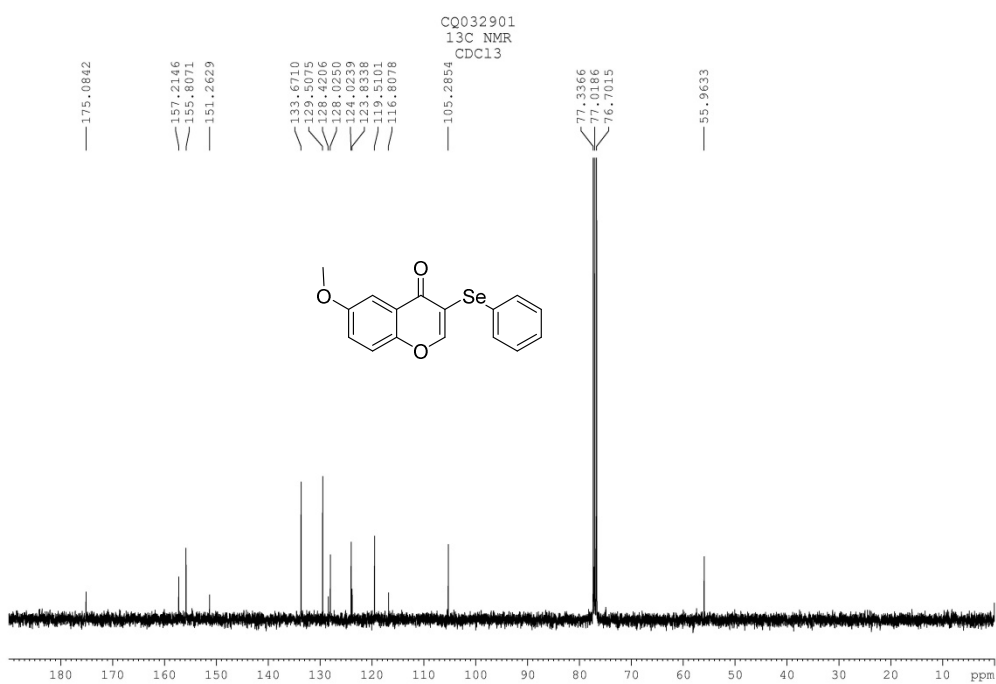


Fig. 6 ¹³C NMR spectrum of compound 3ca

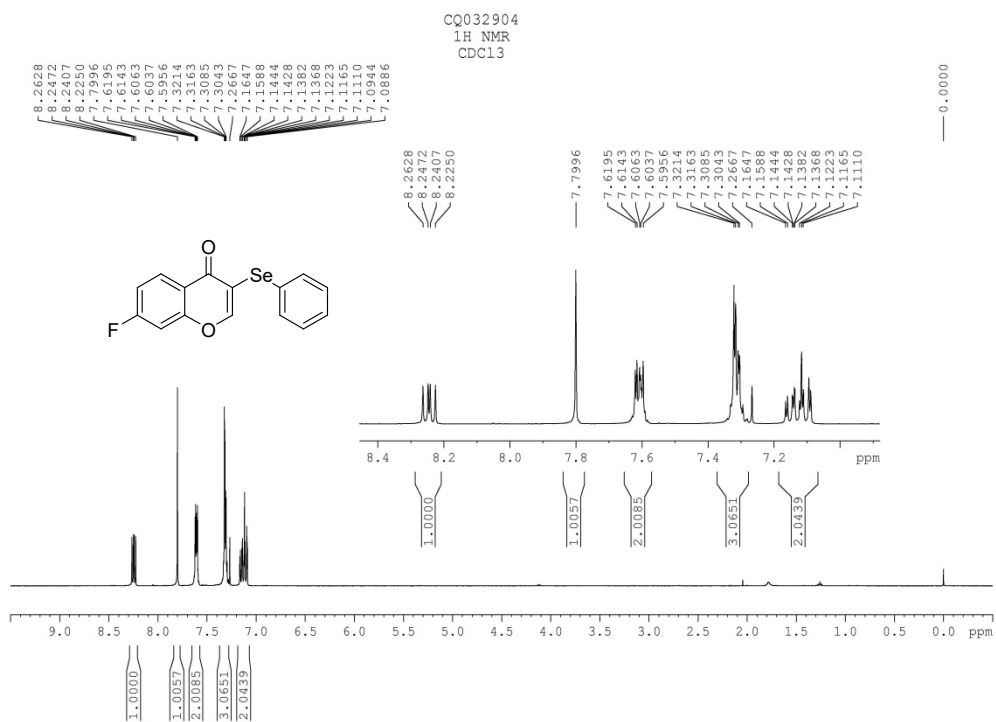


Fig. 7 ¹H NMR spectrum of compound 3da

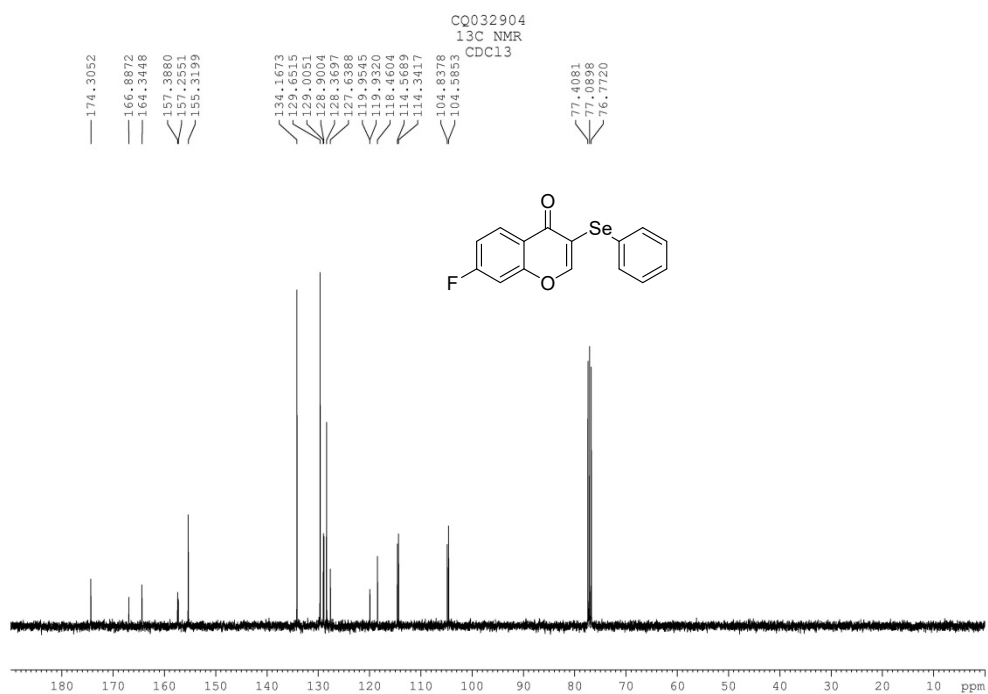


Fig. 8 ¹³C NMR spectrum of compound 3da

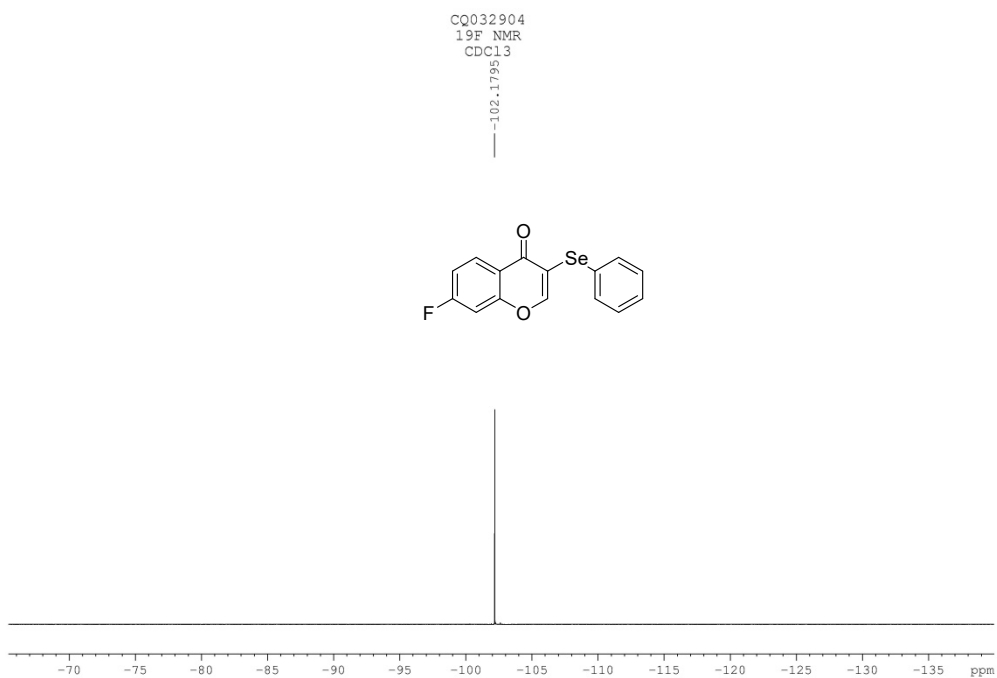


Fig. 9 ¹⁹F NMR spectrum of compound 3da

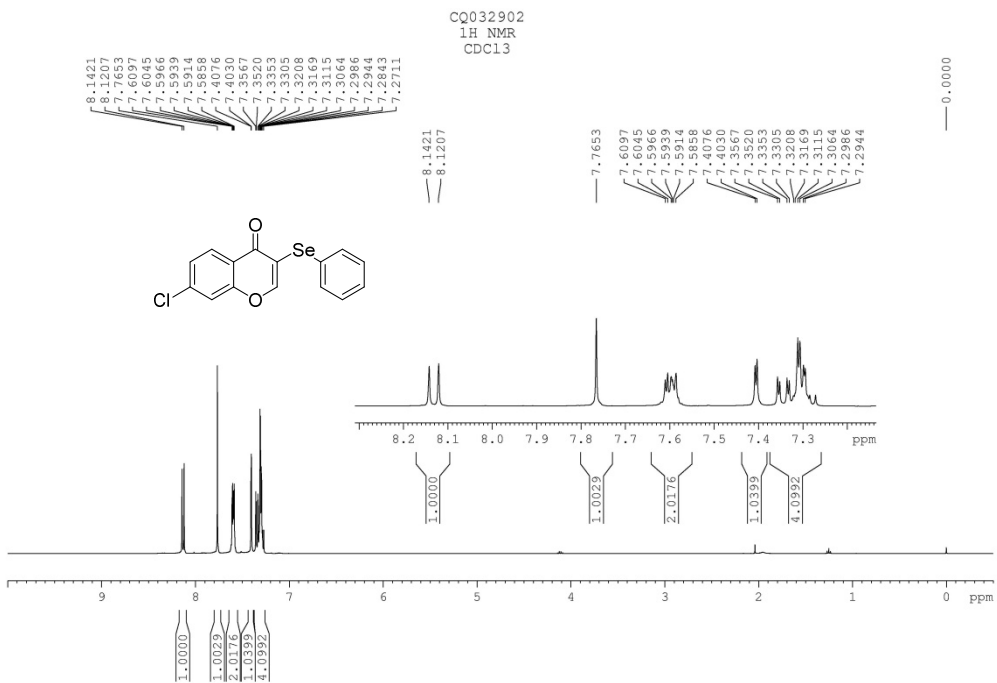


Fig. 10 ¹H NMR spectrum of compound 3ea

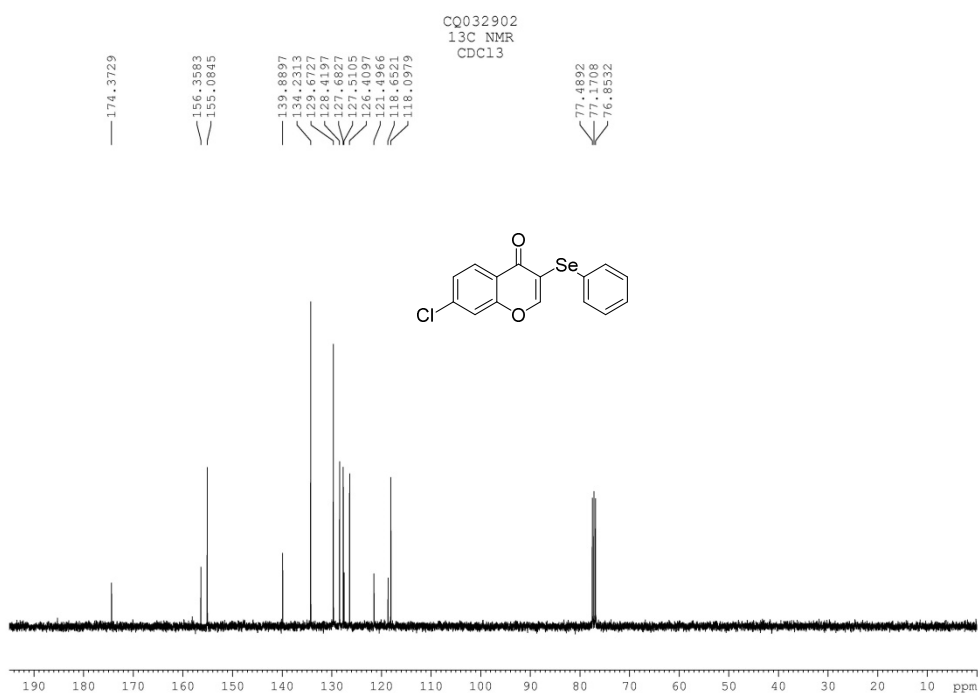


Fig. 11 ¹³C NMR spectrum of compound 3ea

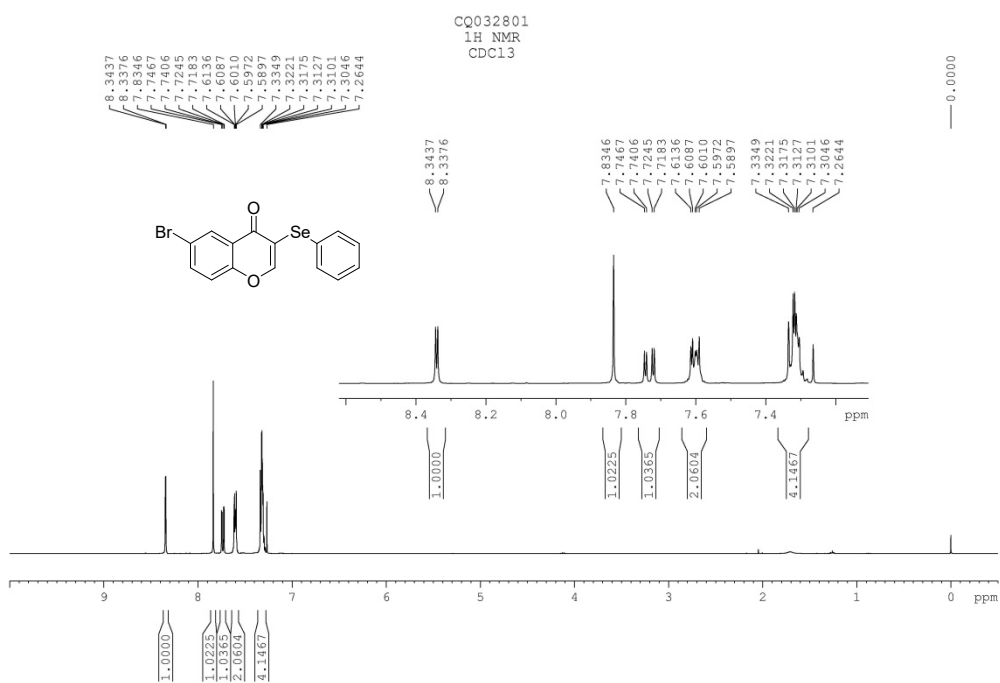


Fig. 12 ¹H NMR spectrum of compound 3fa

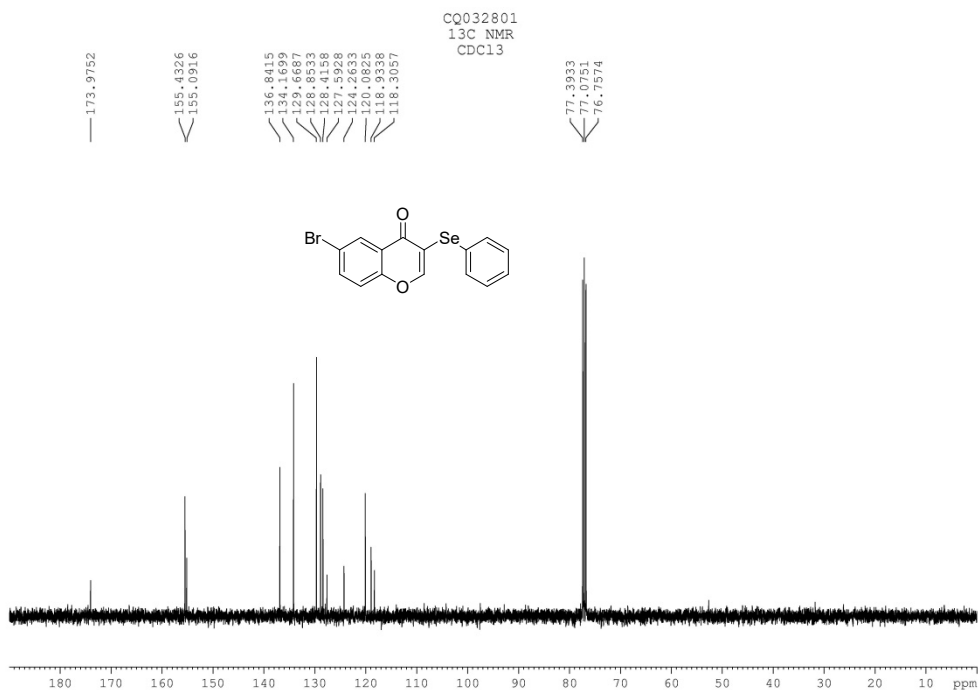


Fig. 13 ¹³C NMR spectrum of compound 3fa

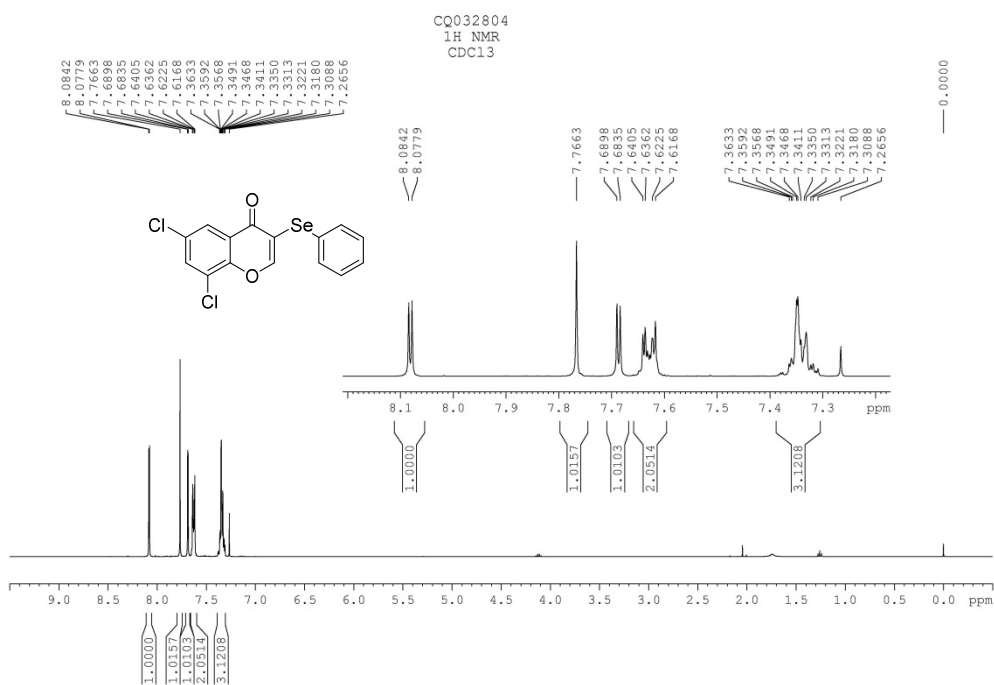


Fig. 14 ¹H NMR spectrum of compound 3ga

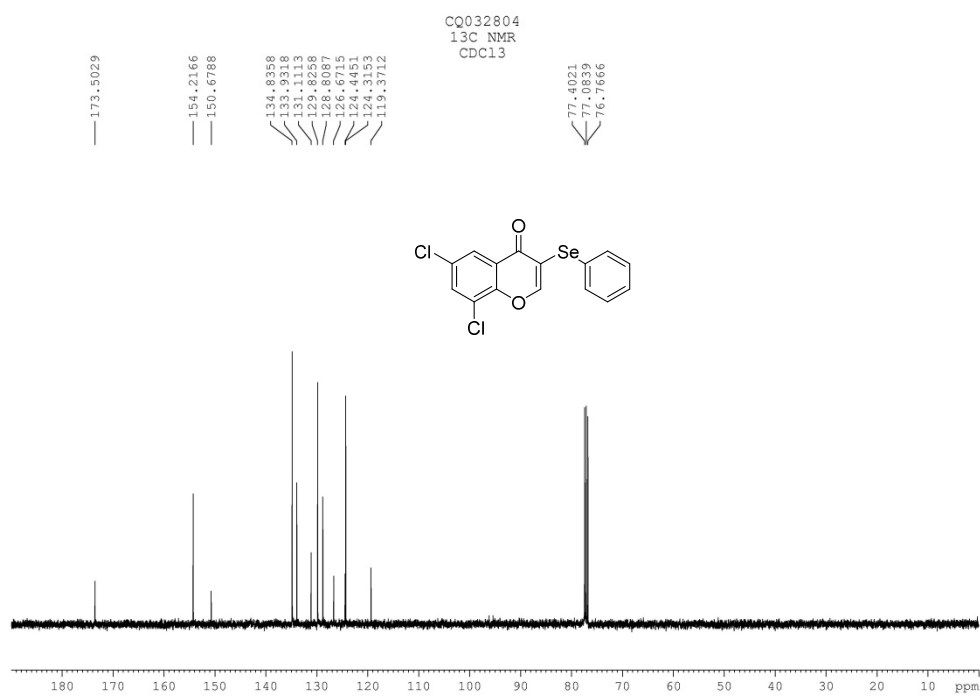


Fig. 15 ^{13}C NMR spectrum of compound **3ga**

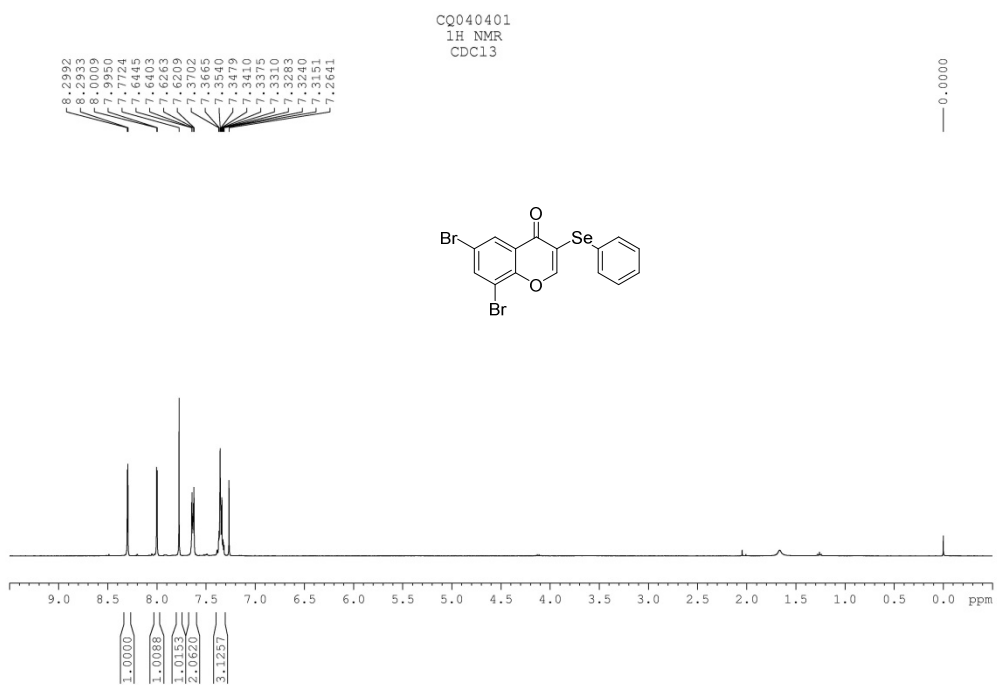


Fig. 16 ^1H NMR spectrum of compound **3ha**

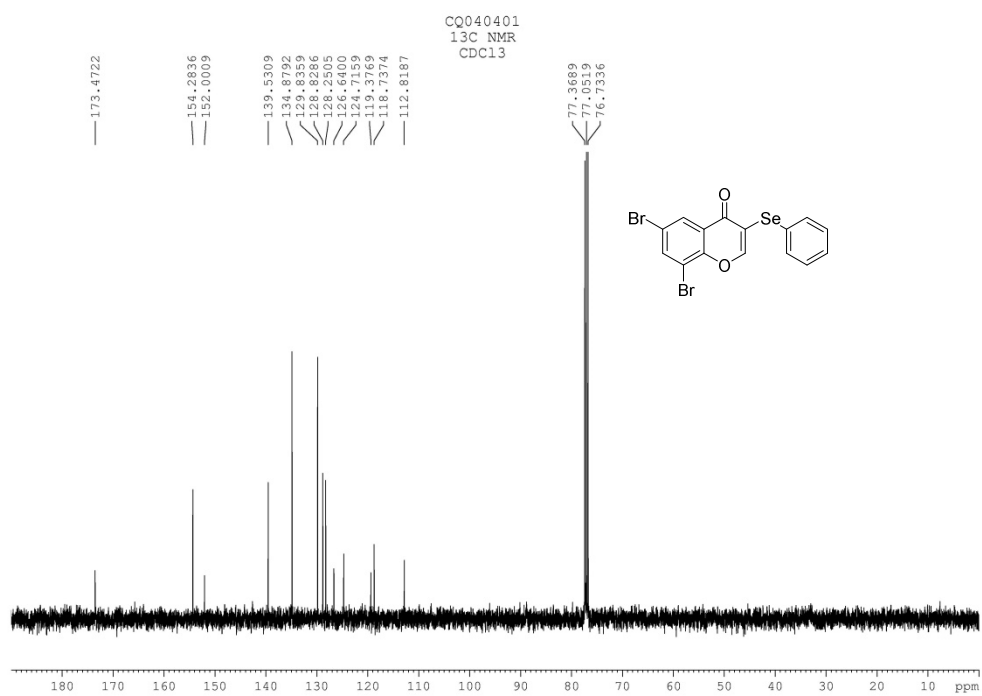


Fig. 17 ¹³C NMR spectrum of compound 3ha

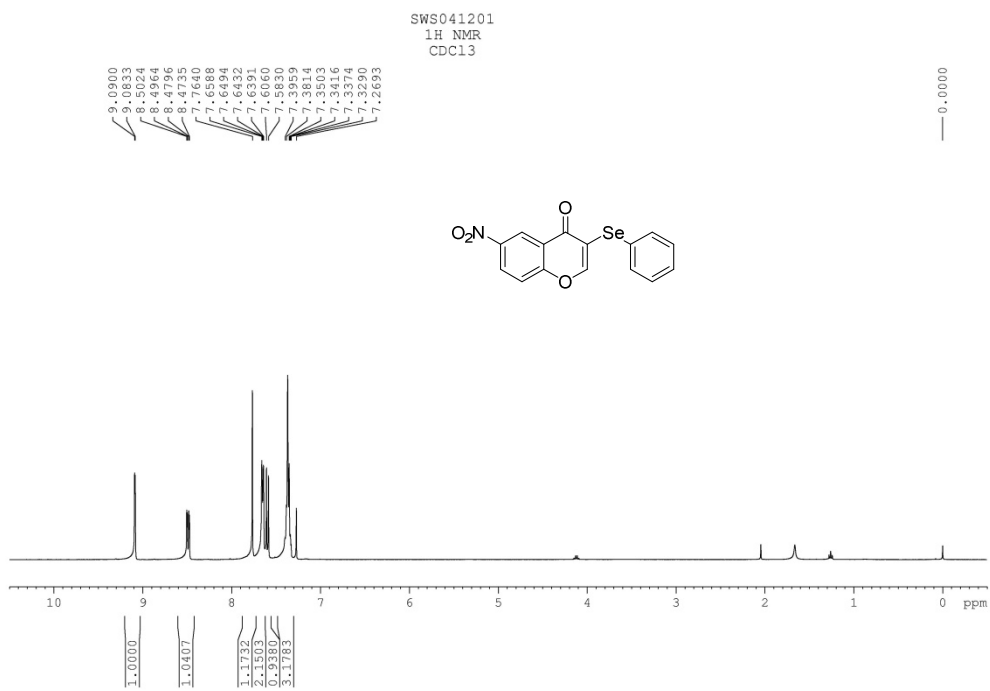


Fig. 18 ¹H NMR spectrum of compound 3ia

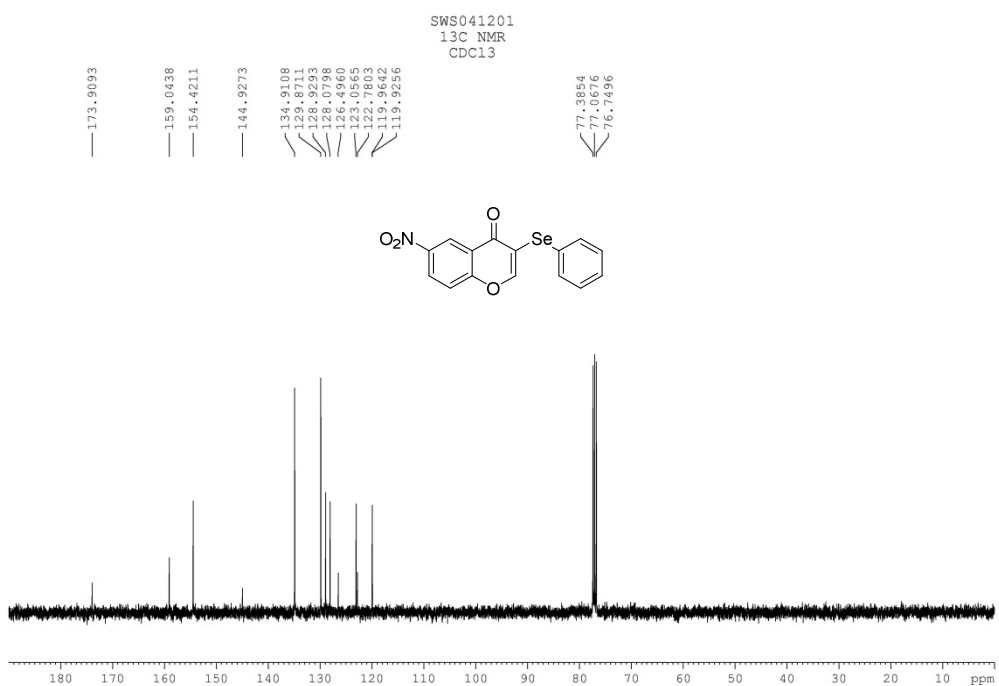


Fig. 19 ¹³C NMR spectrum of compound 3ia

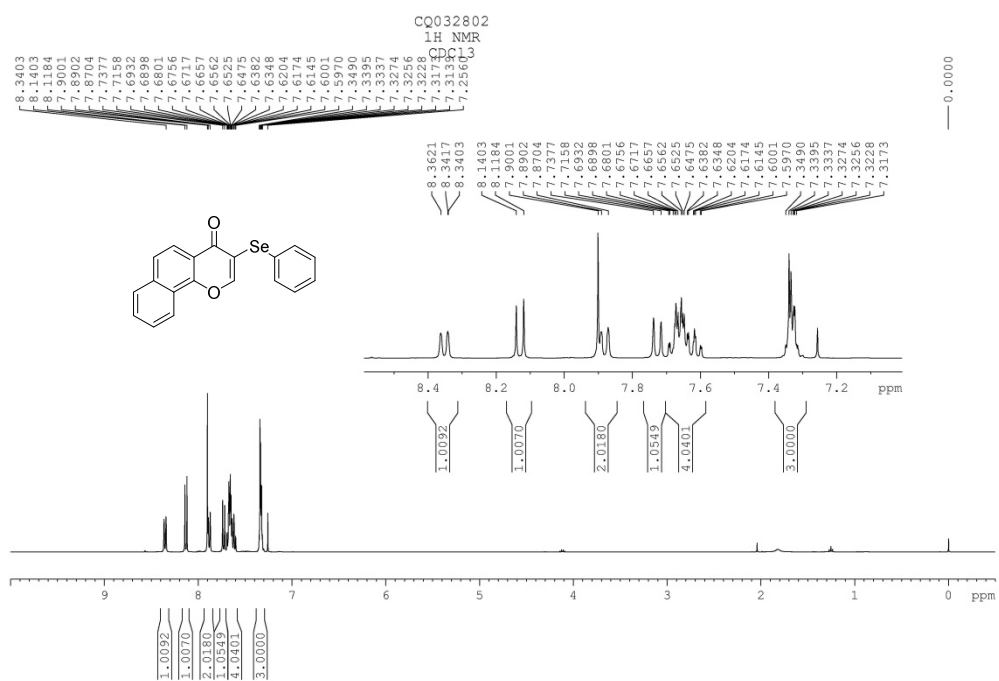


Fig. 20 ¹H NMR spectrum of compound 3ja

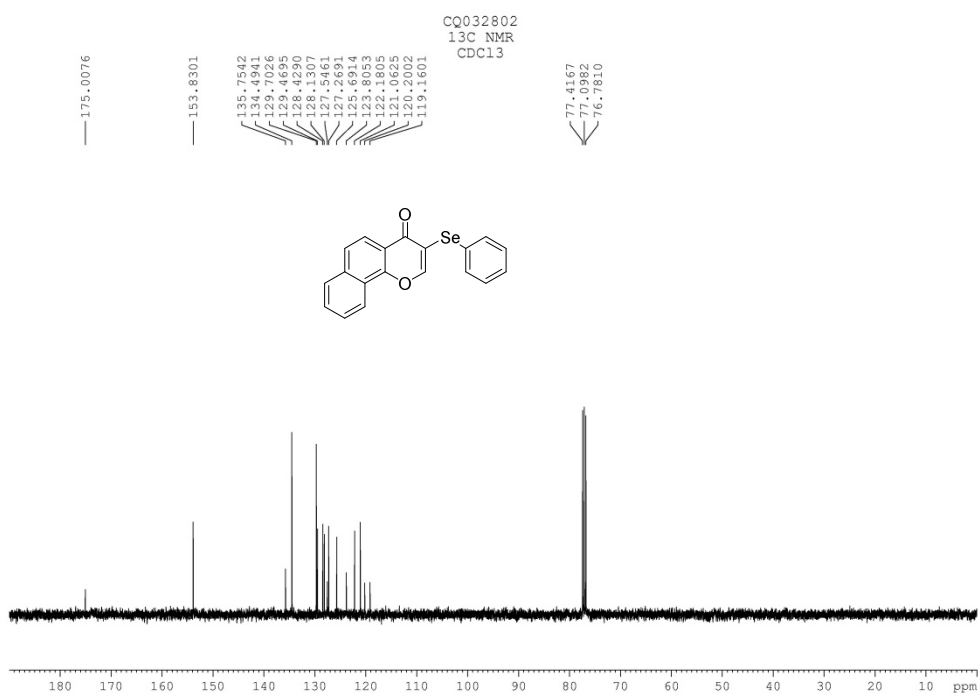


Fig. 21 ¹³C NMR spectrum of compound 3ja

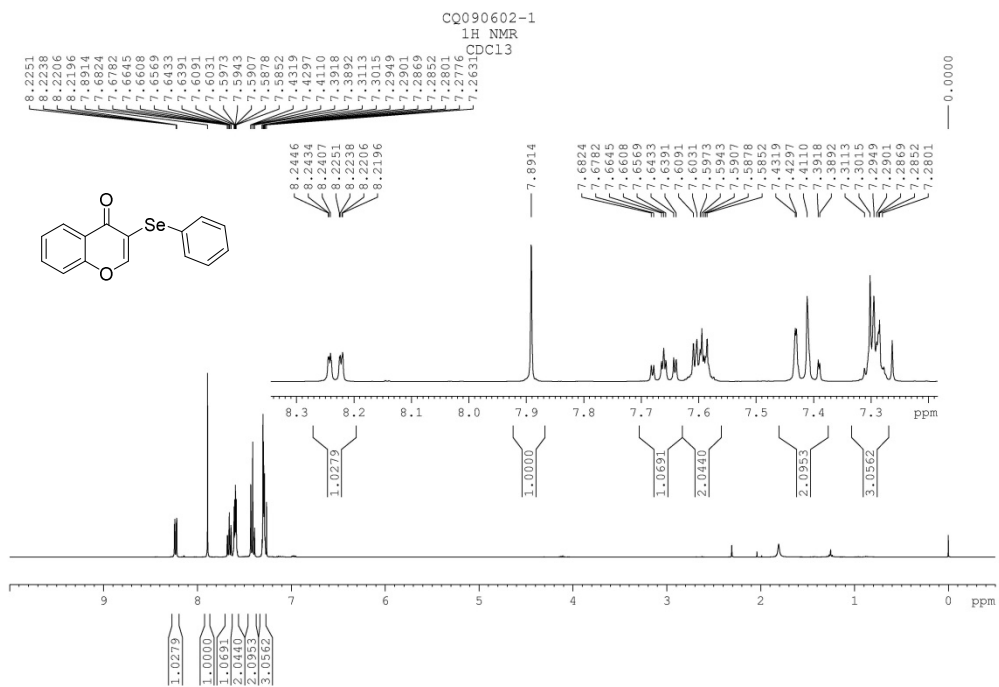


Fig. 22 ¹H NMR spectrum of compound 3a

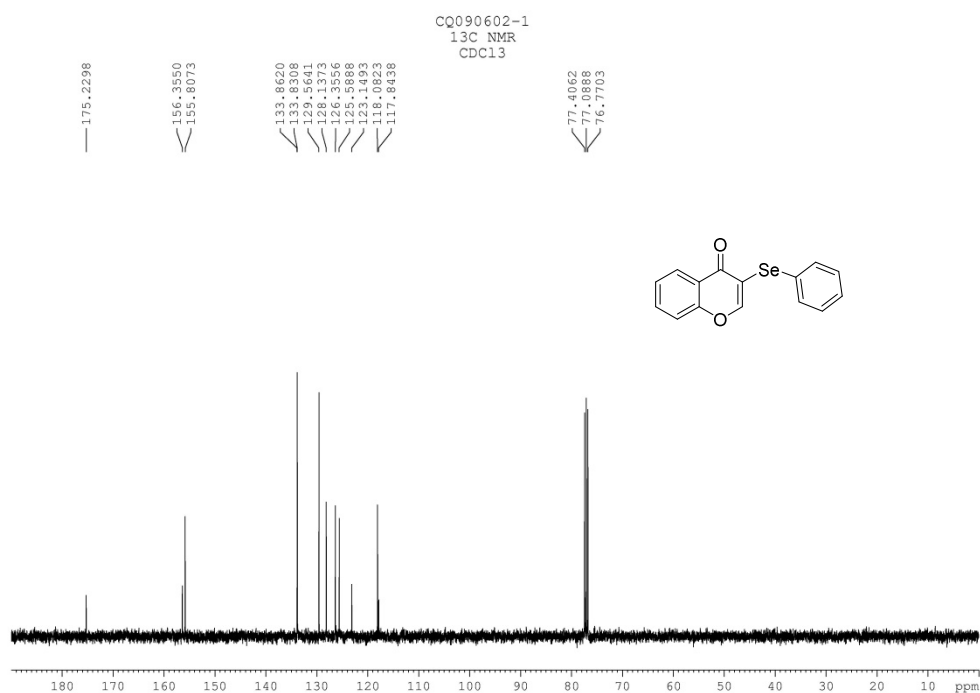


Fig. 23 ¹³C NMR spectrum of compound 3a

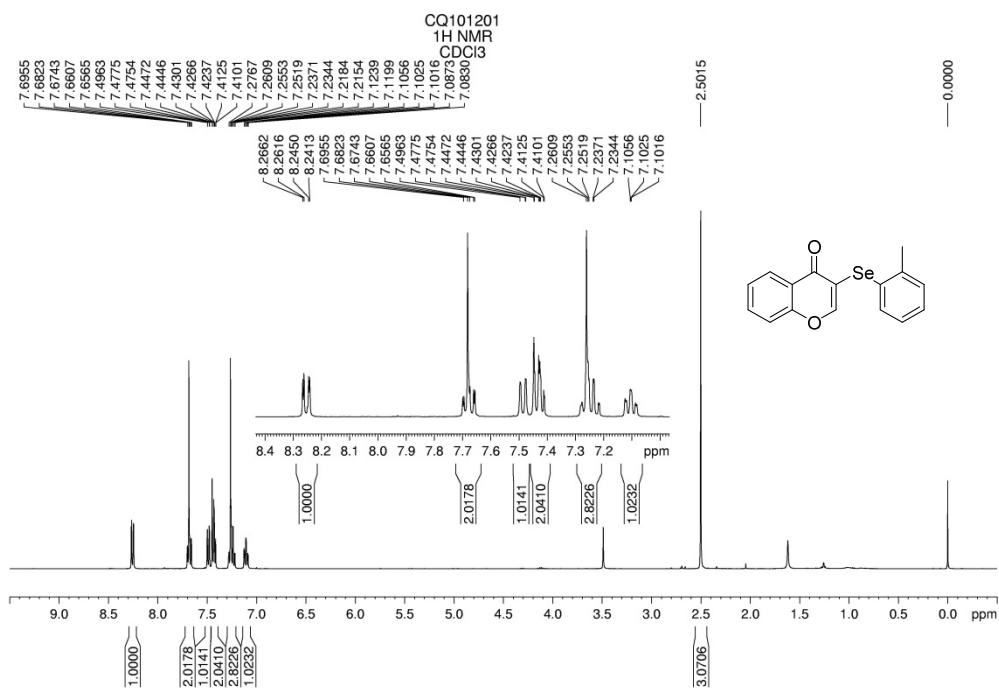


Fig. 24 ¹H NMR spectrum of compound 3b

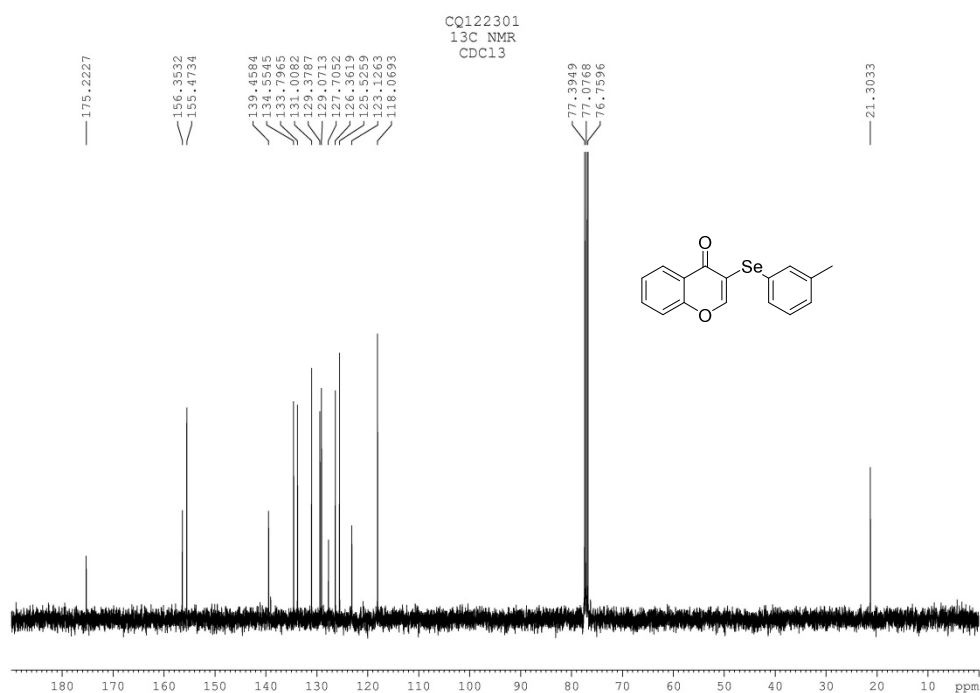


Fig. 27 ^{13}C NMR spectrum of compound **3c**

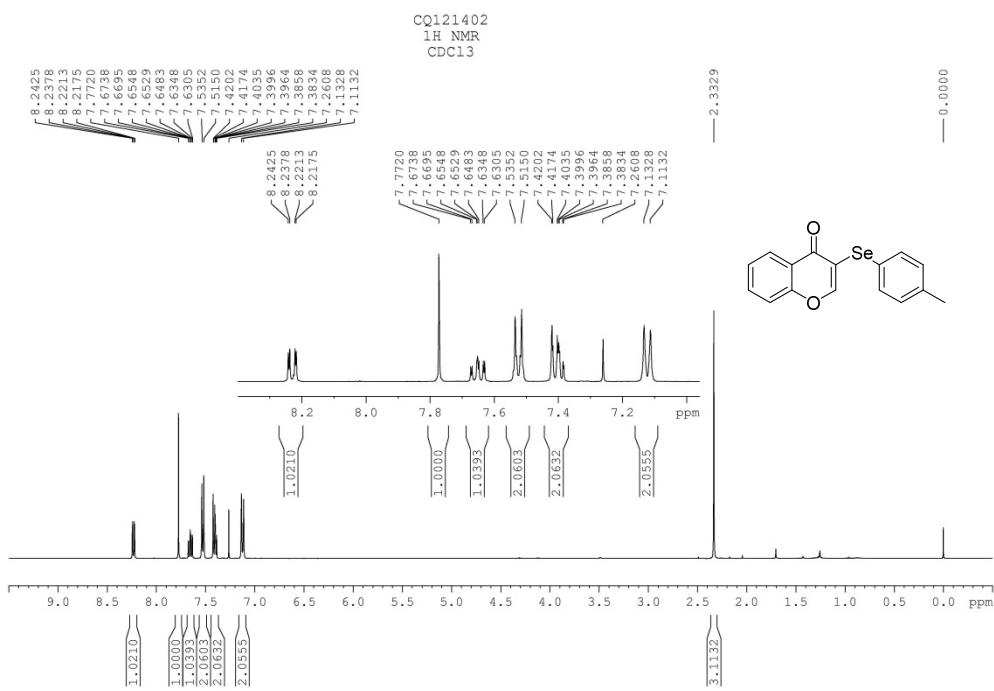


Fig. 28 ^1H NMR spectrum of compound **3d**

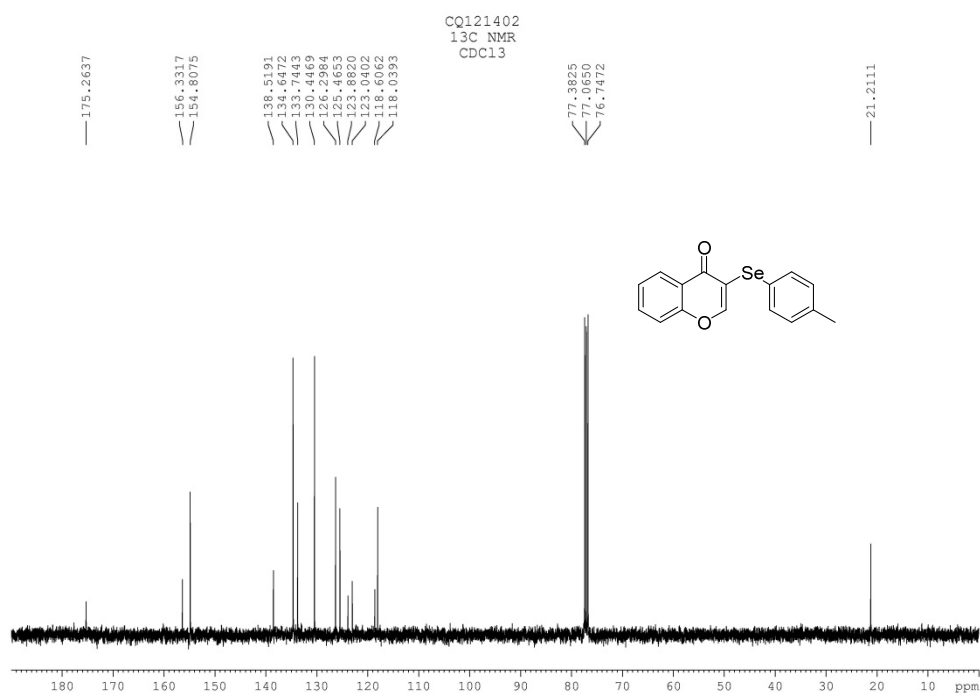


Fig. 29 ^{13}C NMR spectrum of compound 3d

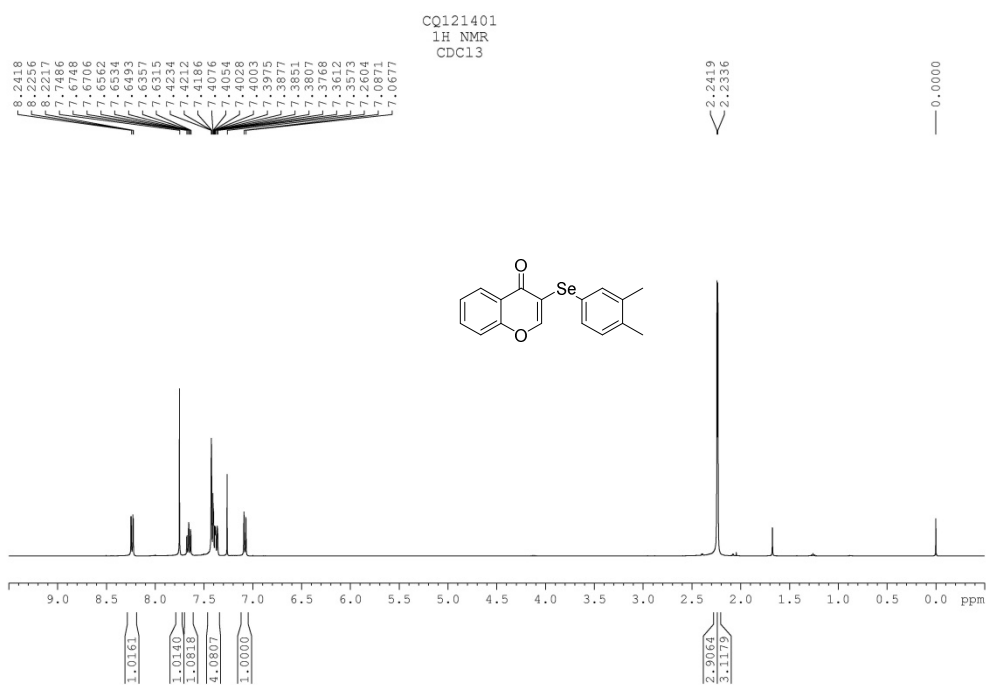


Fig. 30 ^1H NMR spectrum of compound 3e

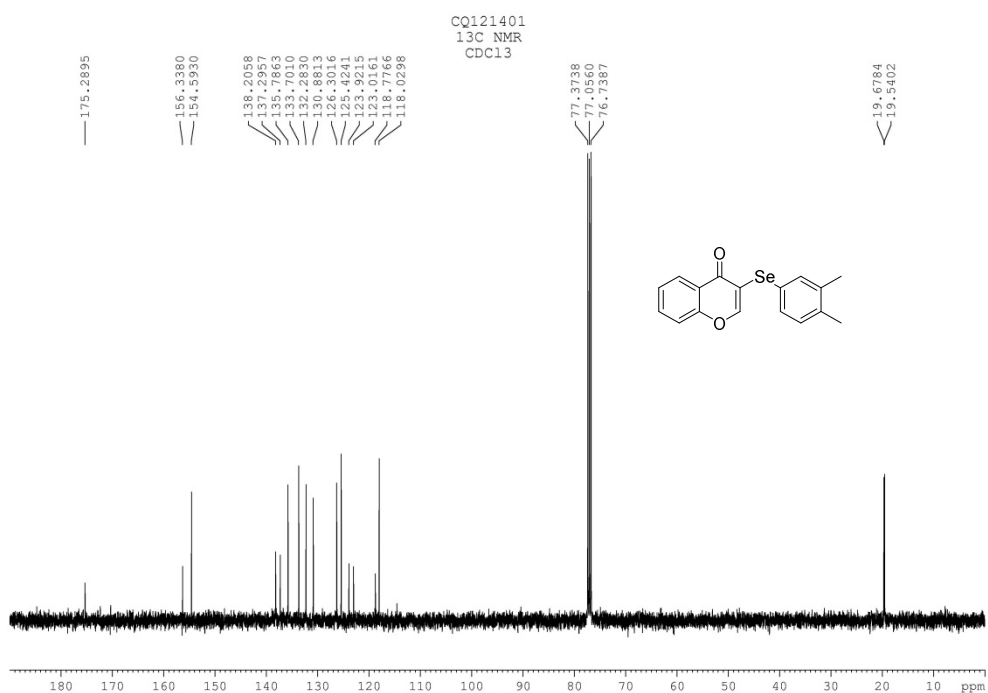


Fig. 31 ¹³C NMR spectrum of compound 3e

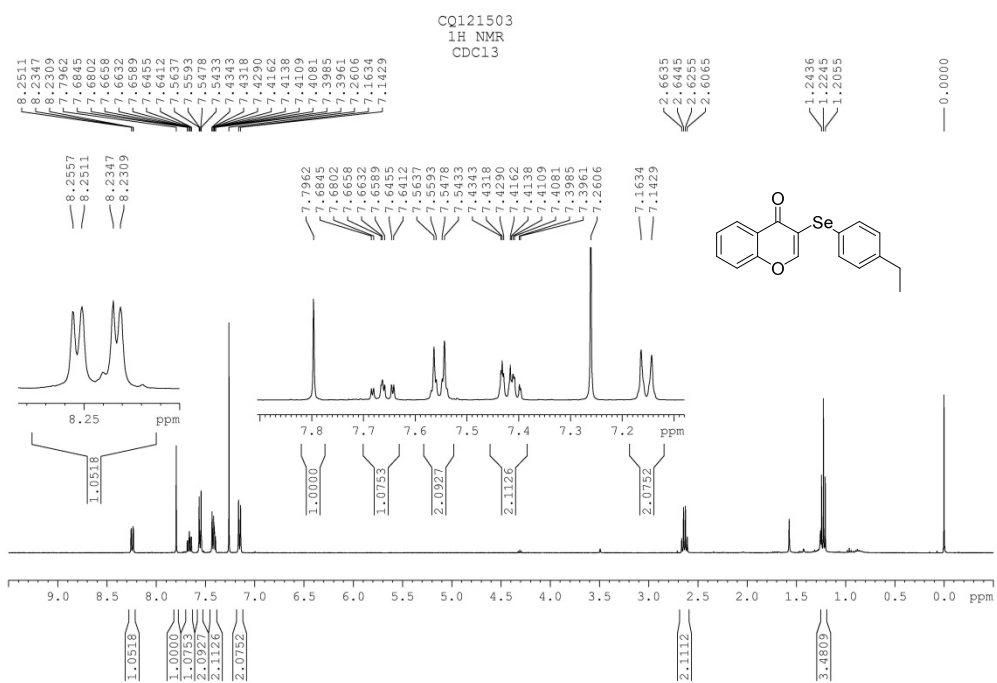


Fig. 32 ¹H NMR spectrum of compound 3f

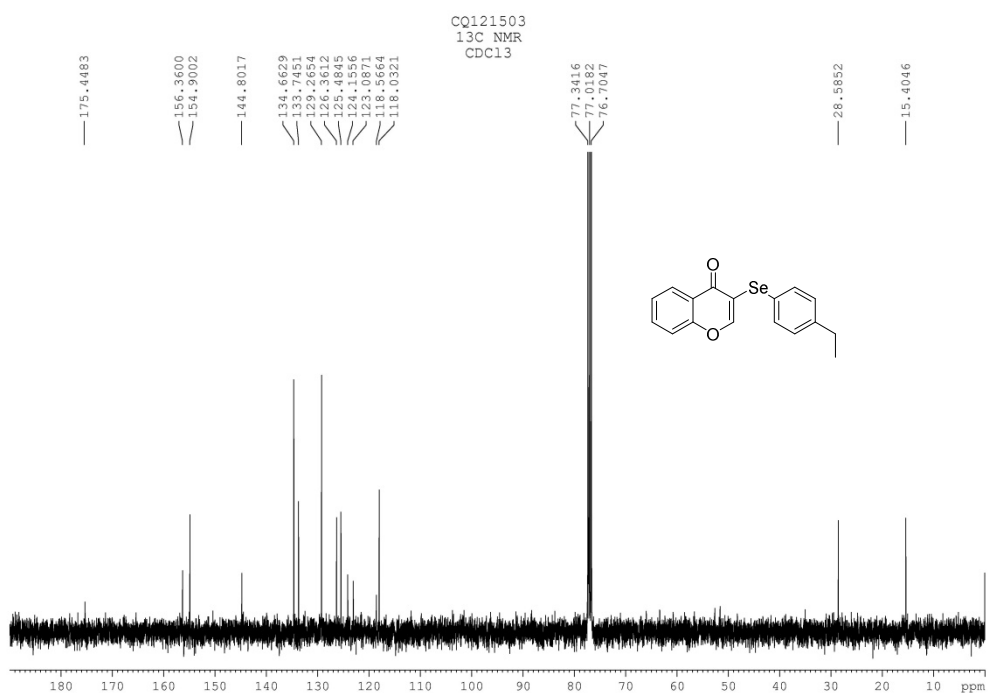


Fig. 33 ^{13}C NMR spectrum of compound 3f

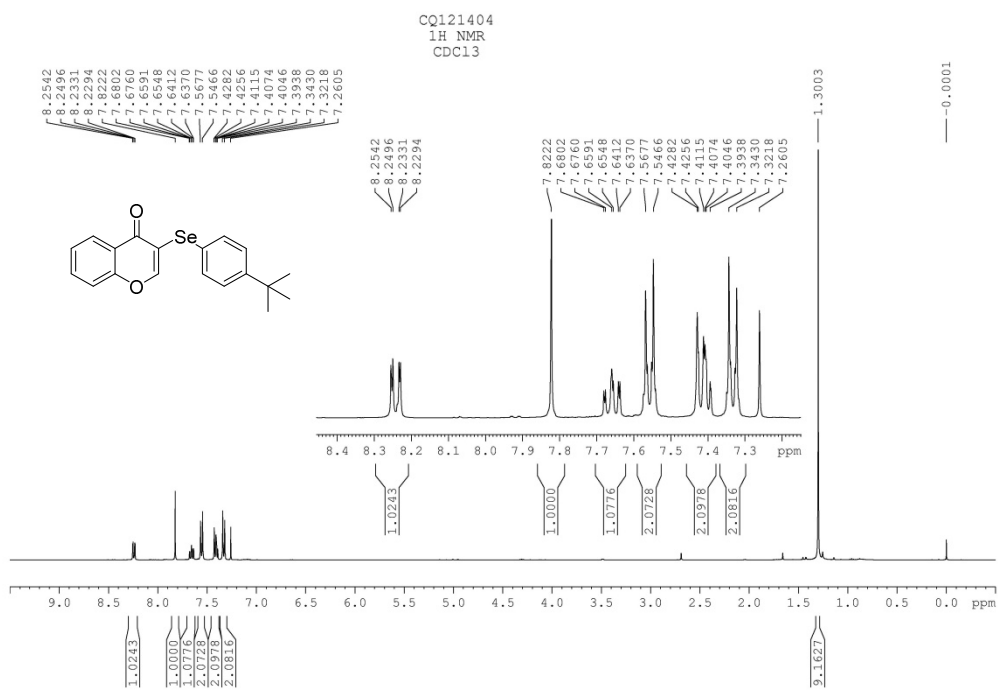


Fig. 34 ^1H NMR spectrum of compound 3g

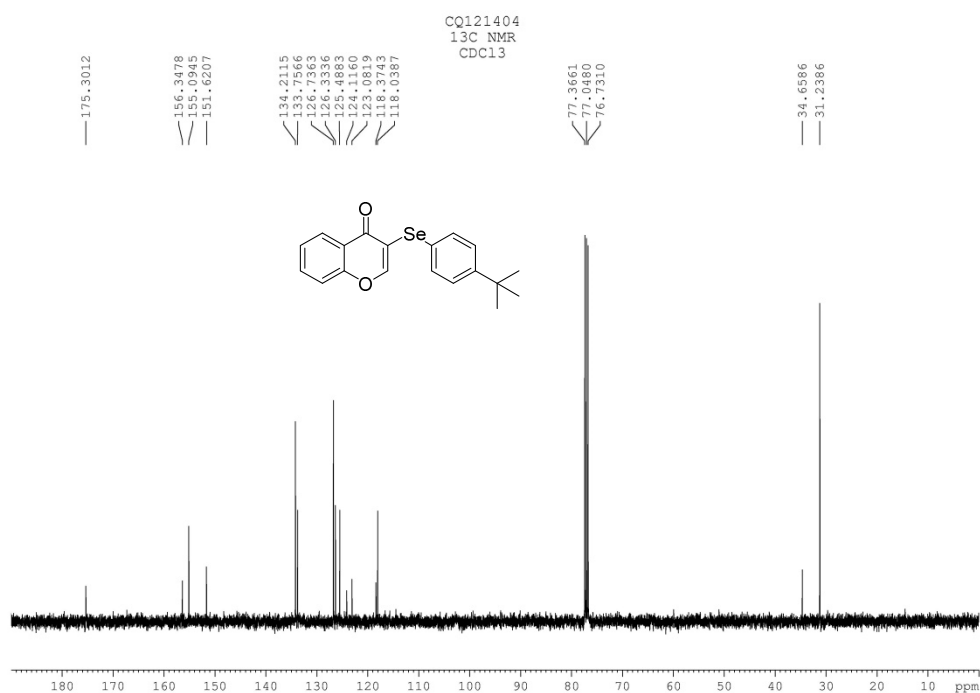


Fig. 35 ^{13}C NMR spectrum of compound **3g**

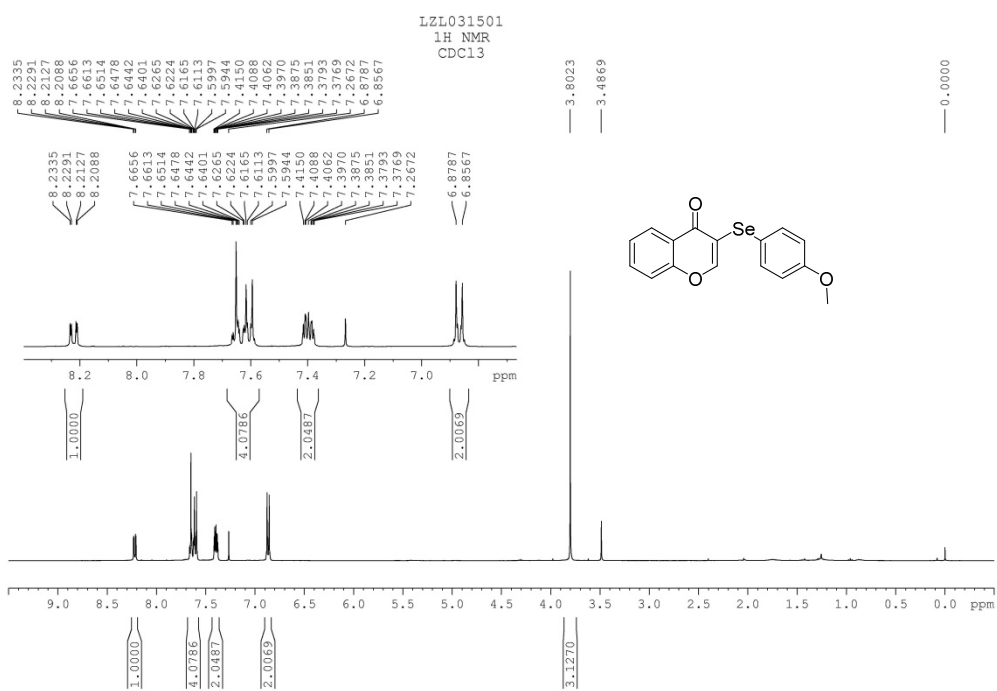


Fig. 36 ^1H NMR spectrum of compound **3h**

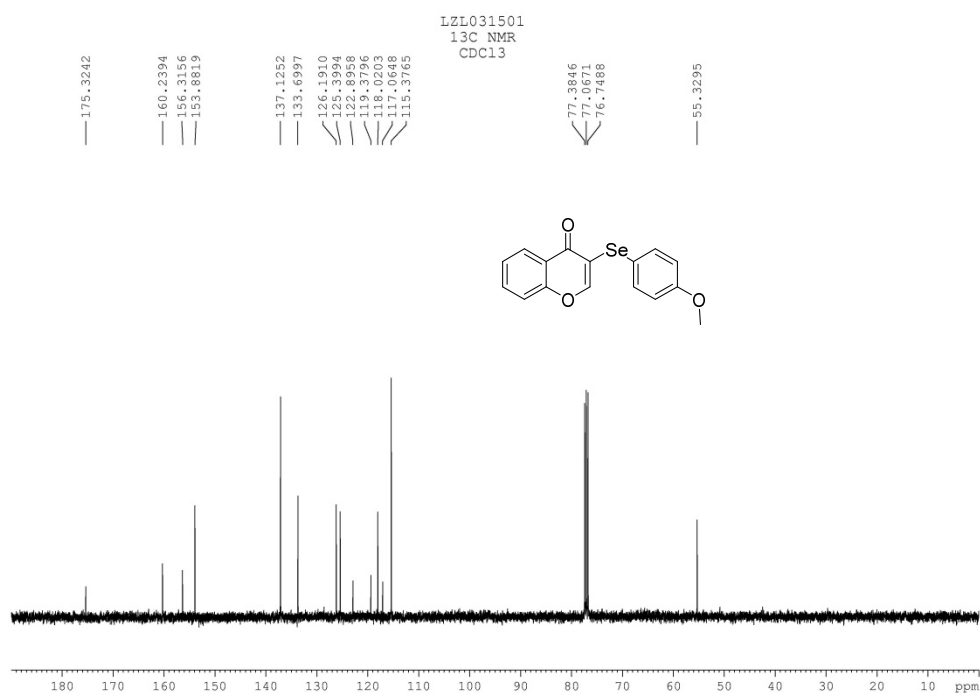


Fig. 37 ^{13}C NMR spectrum of compound **3h**

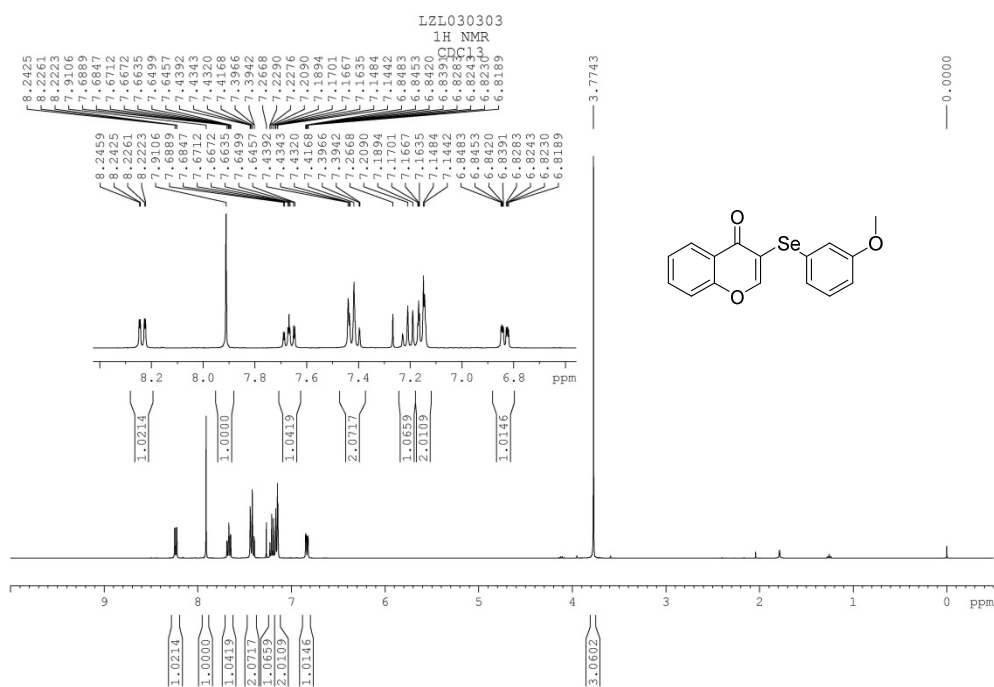


Fig. 38 ^1H NMR spectrum of compound **3i**

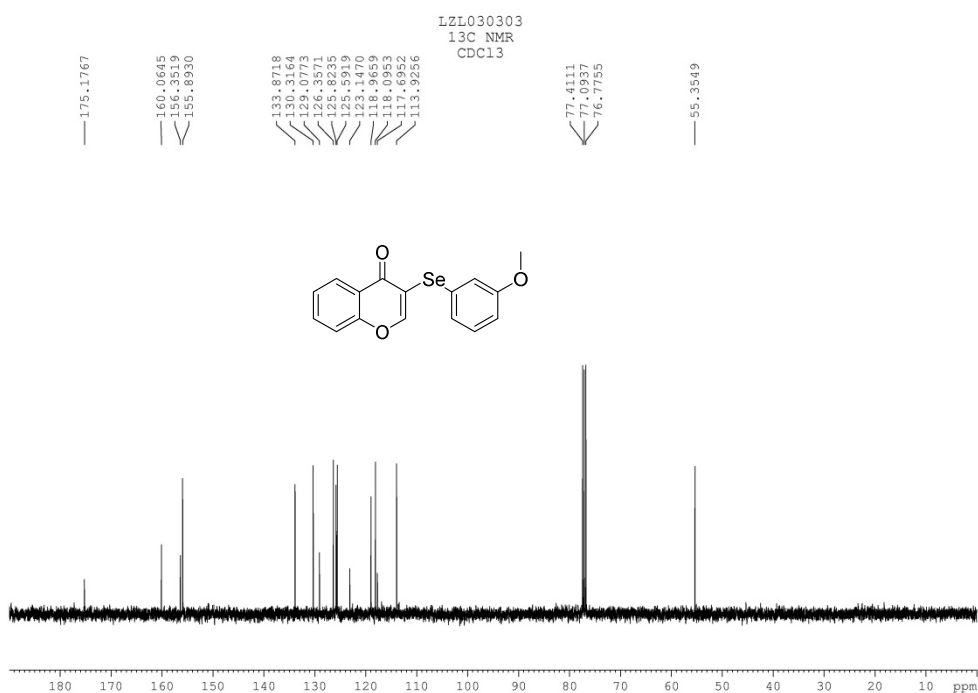


Fig. 39 ^{13}C NMR spectrum of compound 3i

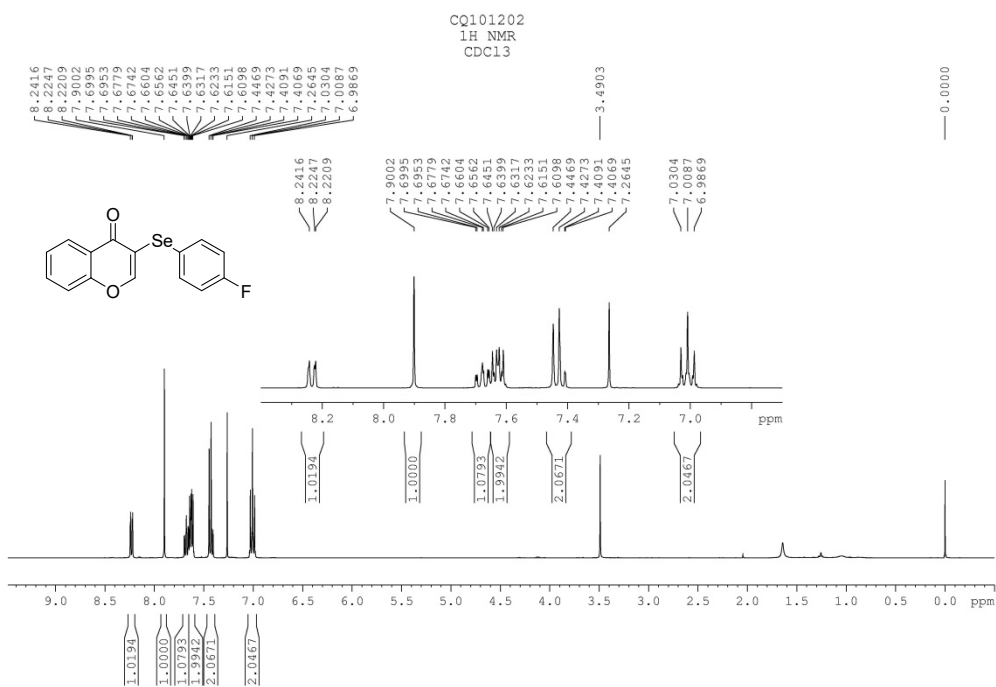


Fig. 40 ^1H NMR spectrum of compound 3j

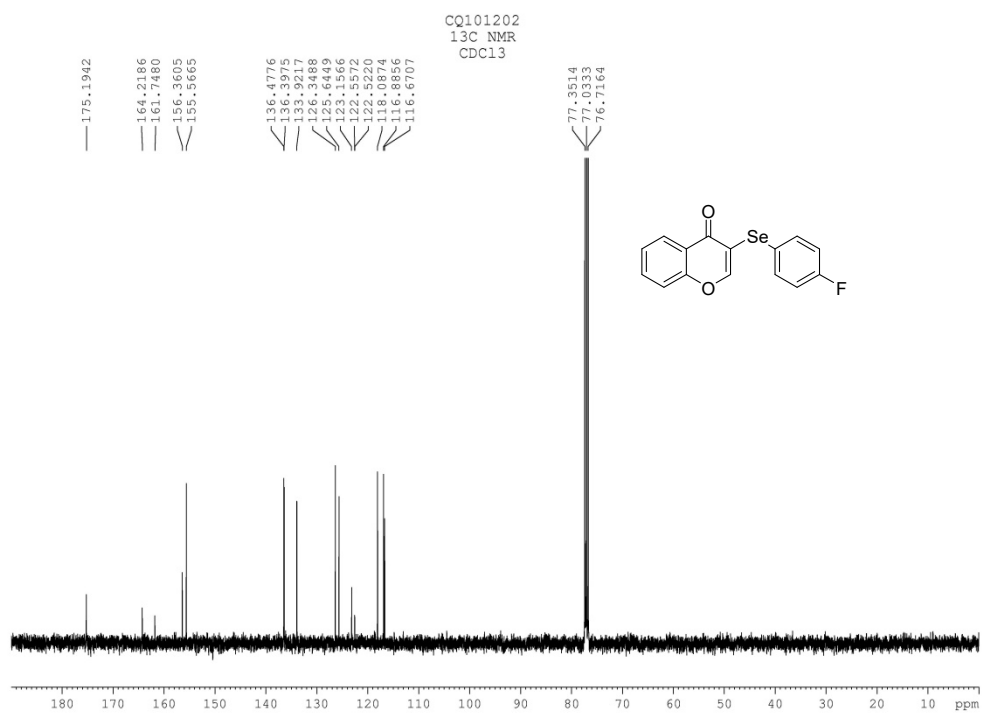


Fig. 41 ¹³C NMR spectrum of compound 3j

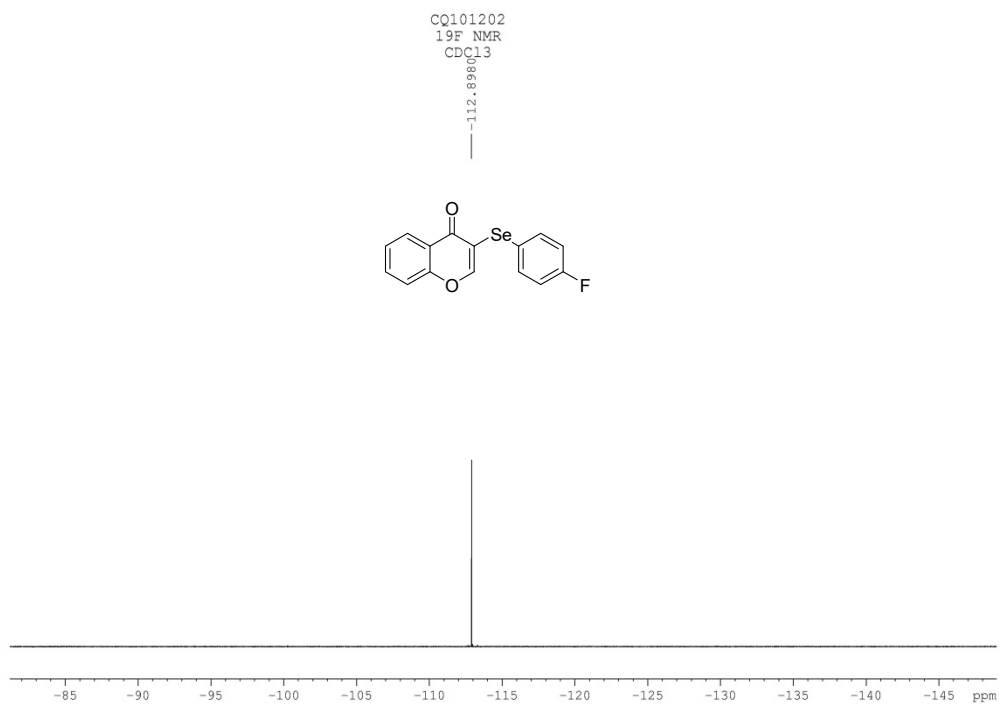


Fig. 42 ¹⁹F NMR spectrum of compound 3j

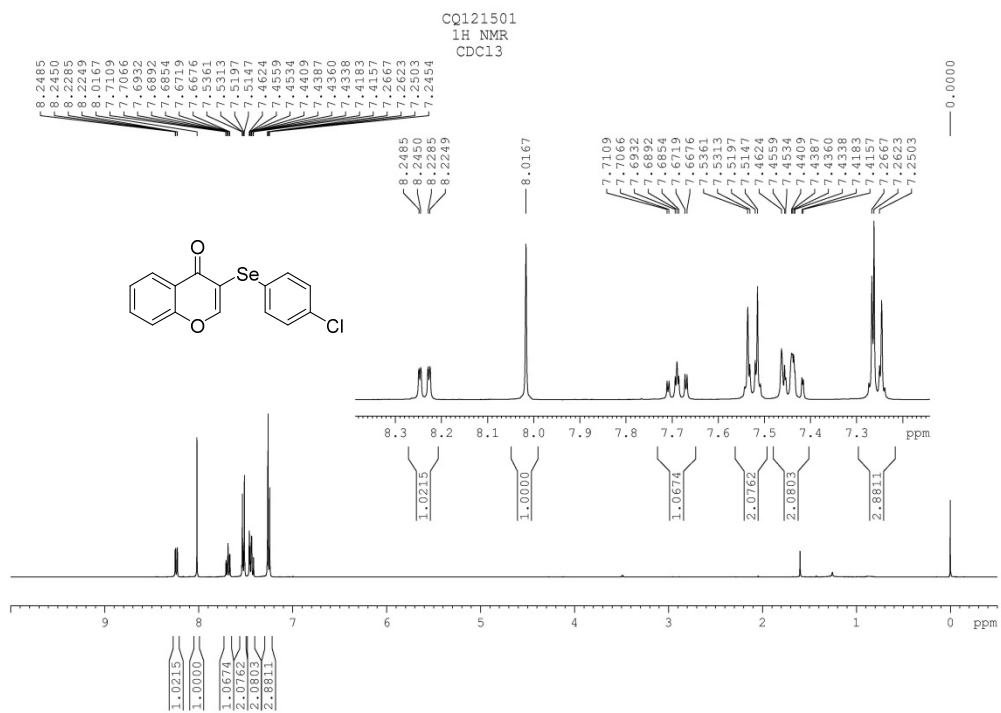


Fig. 43 ^1H NMR spectrum of compound 3k

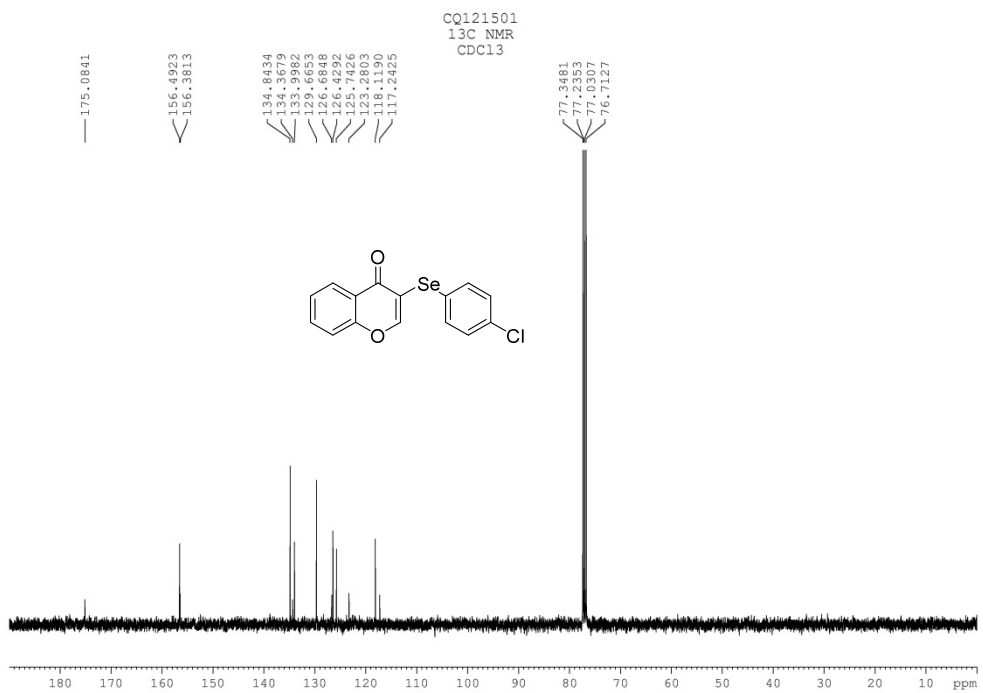


Fig. 44 ^{13}C NMR spectrum of compound 3k

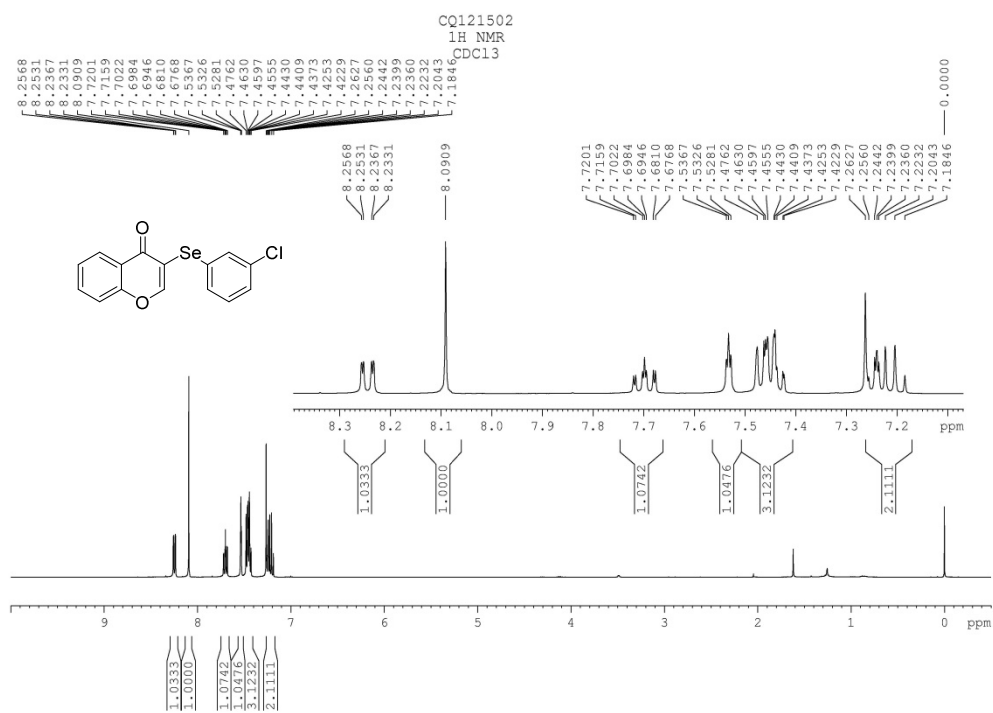


Fig. 45 ^1H NMR spectrum of compound 3I

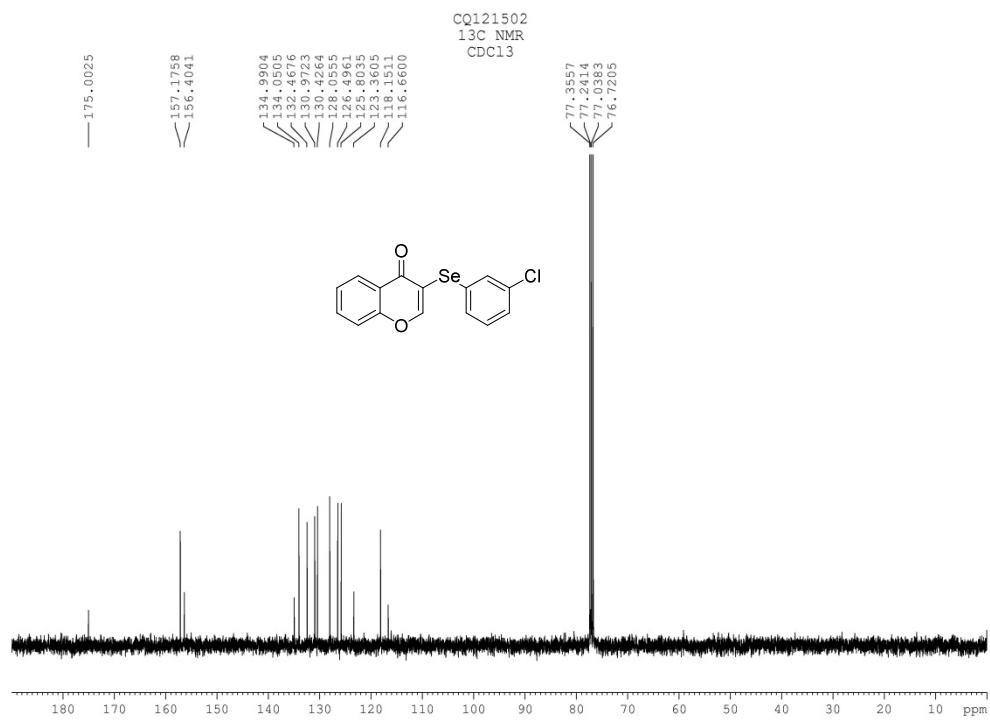


Fig. 46 ^{13}C NMR spectrum of compound 3I

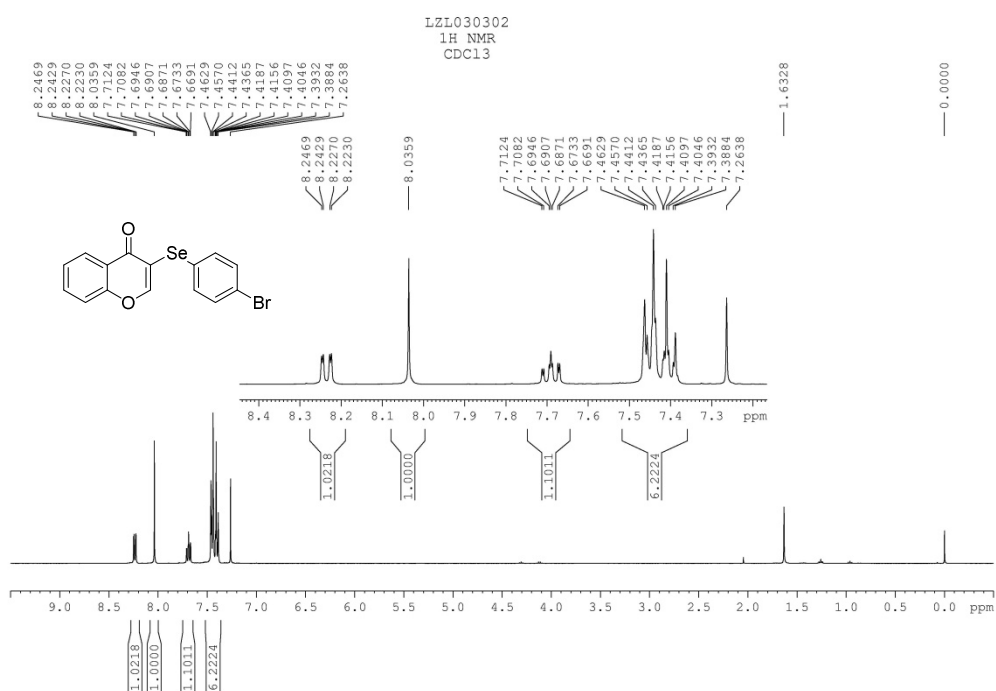


Fig. 47 ^1H NMR spectrum of compound 3m

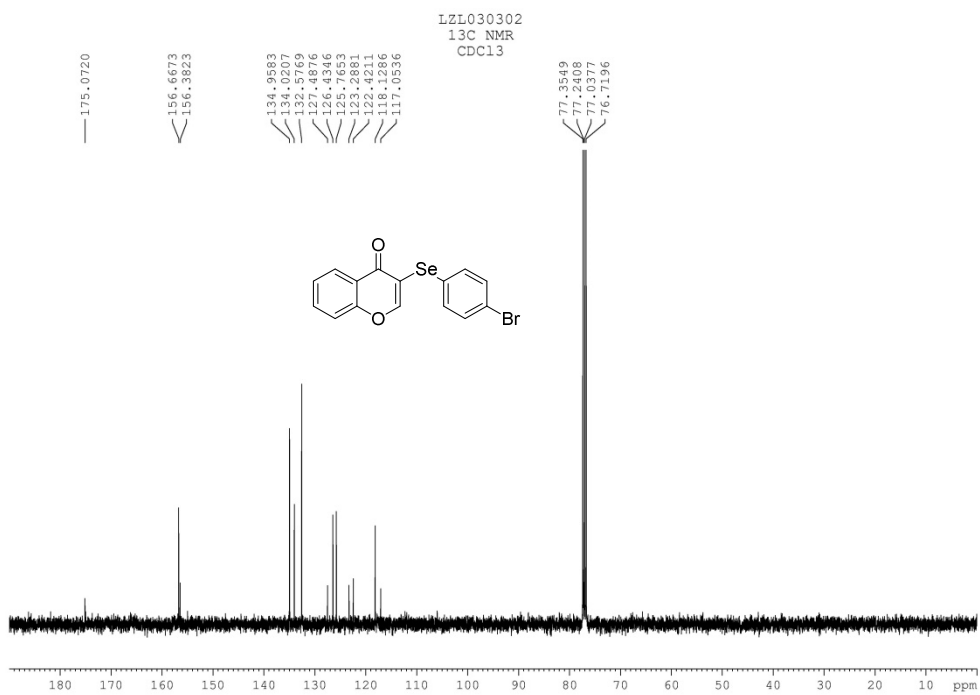


Fig. 48 ^{13}C NMR spectrum of compound 3m

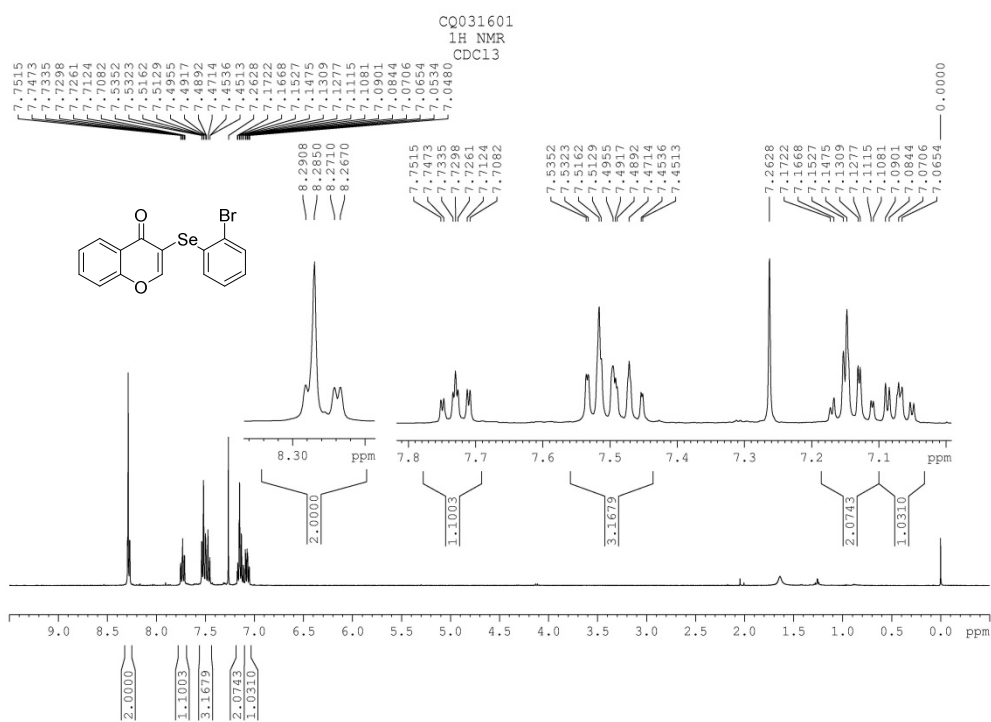


Fig. 49 ¹H NMR spectrum of compound 3n

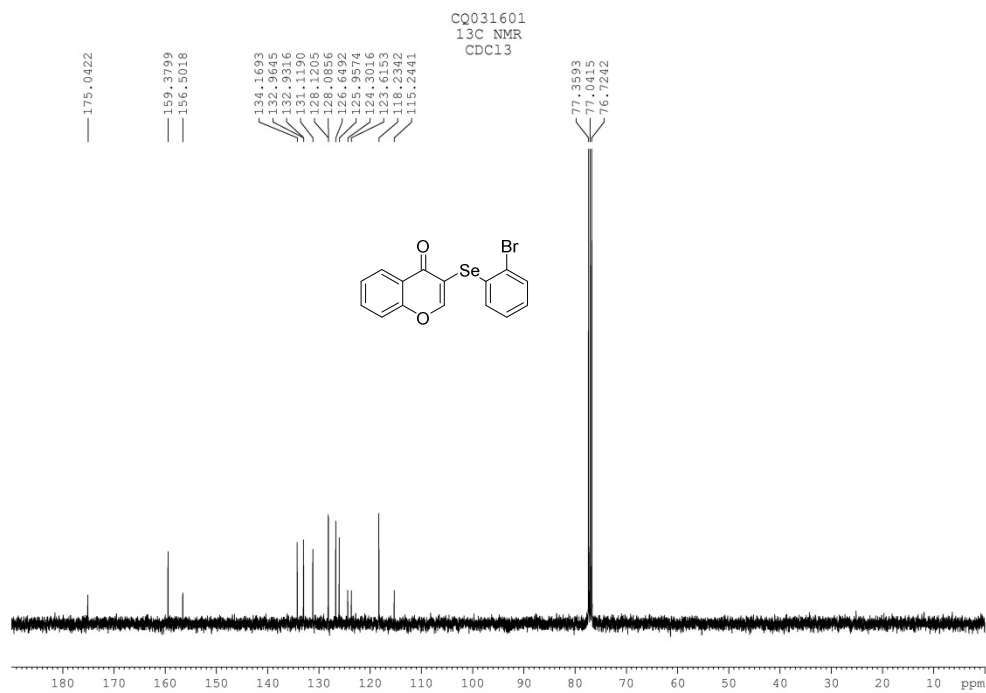


Fig. 50 ¹³C NMR spectrum of compound 3n

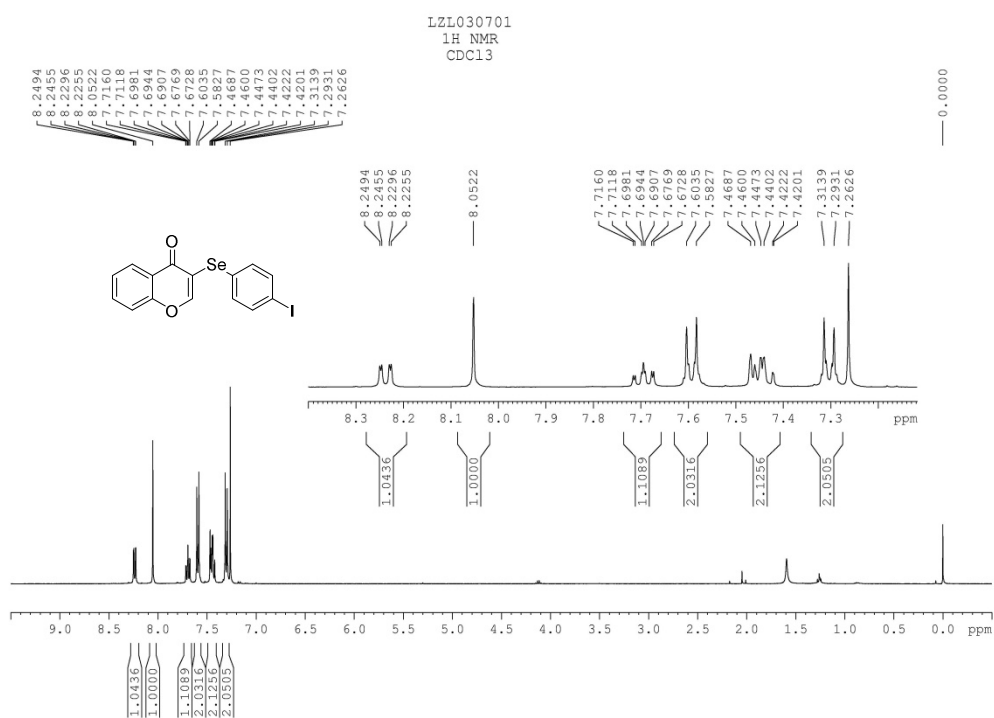


Fig. 51 ¹H NMR spectrum of compound 3o

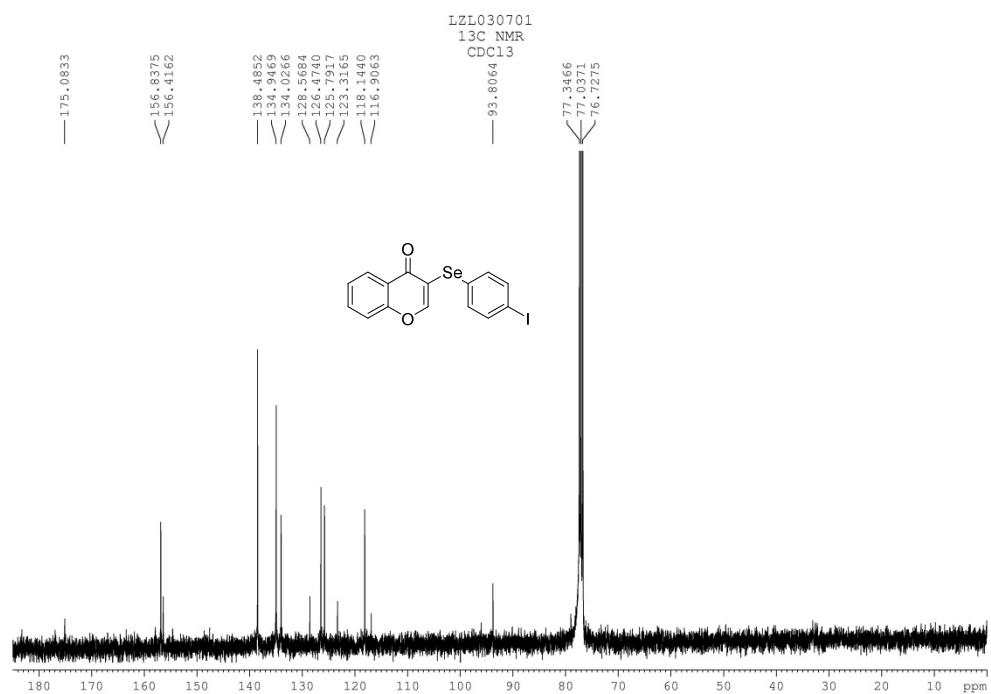


Fig. 52 ¹³C NMR spectrum of compound 3o

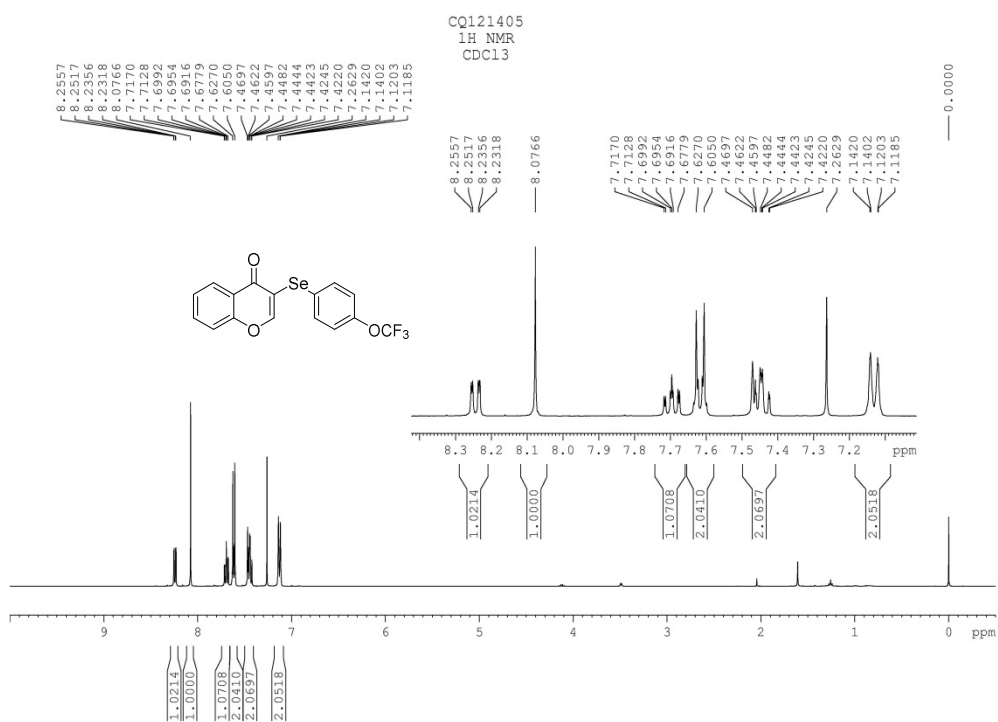


Fig. 53 ¹H NMR spectrum of compound 3p

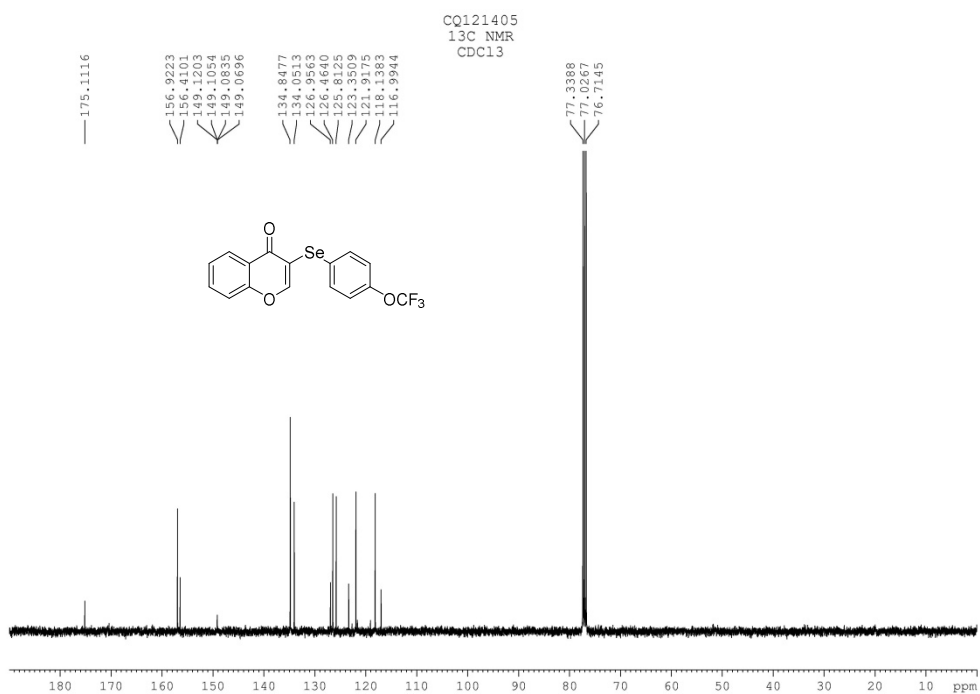


Fig. 54 ¹³C NMR spectrum of compound 3p

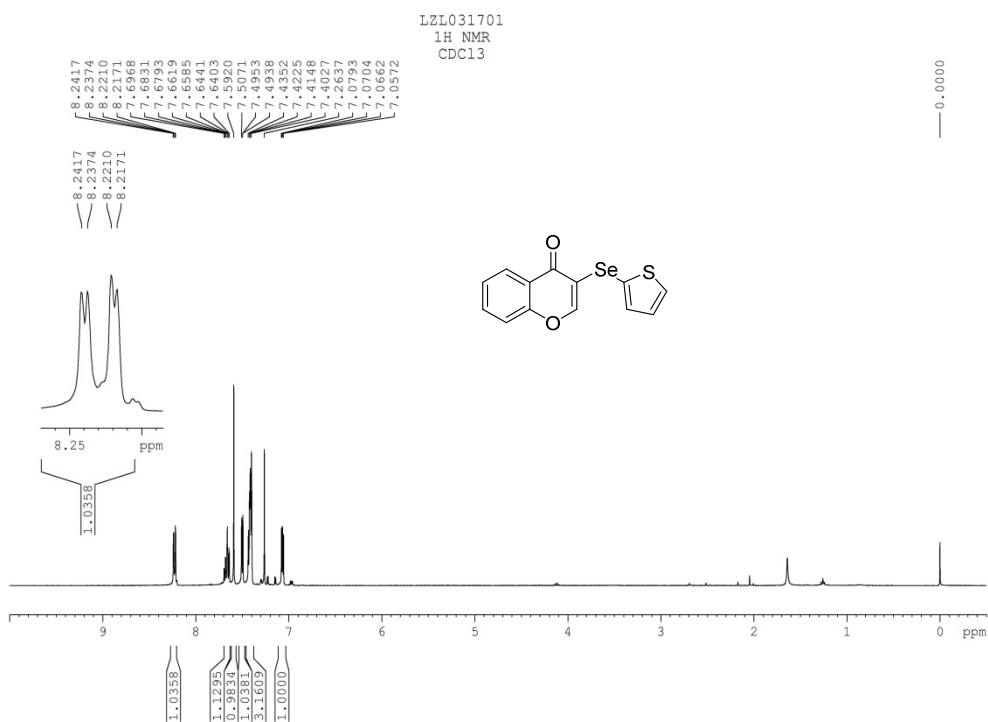


Fig. 57 ^1H NMR spectrum of compound 3r

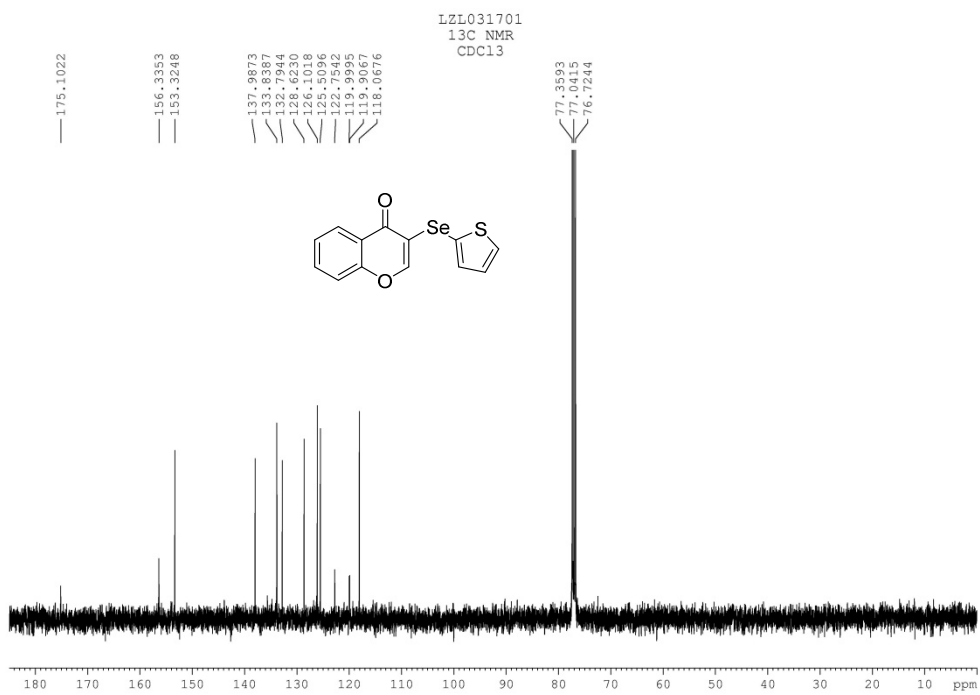


Fig. 58 ^{13}C NMR spectrum of compound 3r

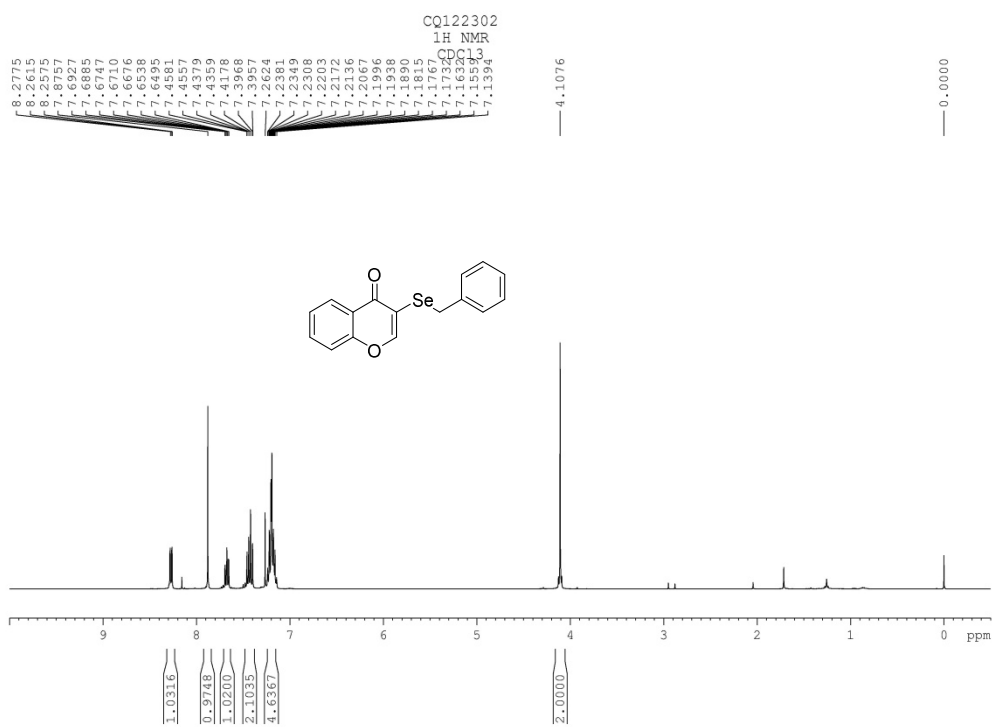


Fig. 59 ^1H NMR spectrum of compound **3s**

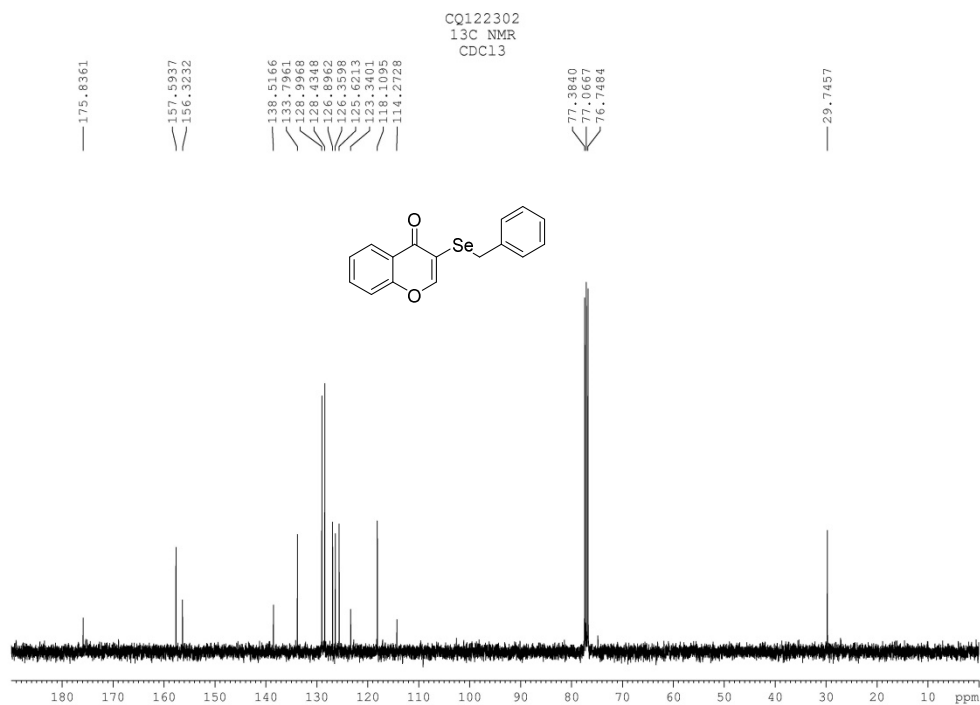


Fig. 60 ^{13}C NMR spectrum of compound **3s**

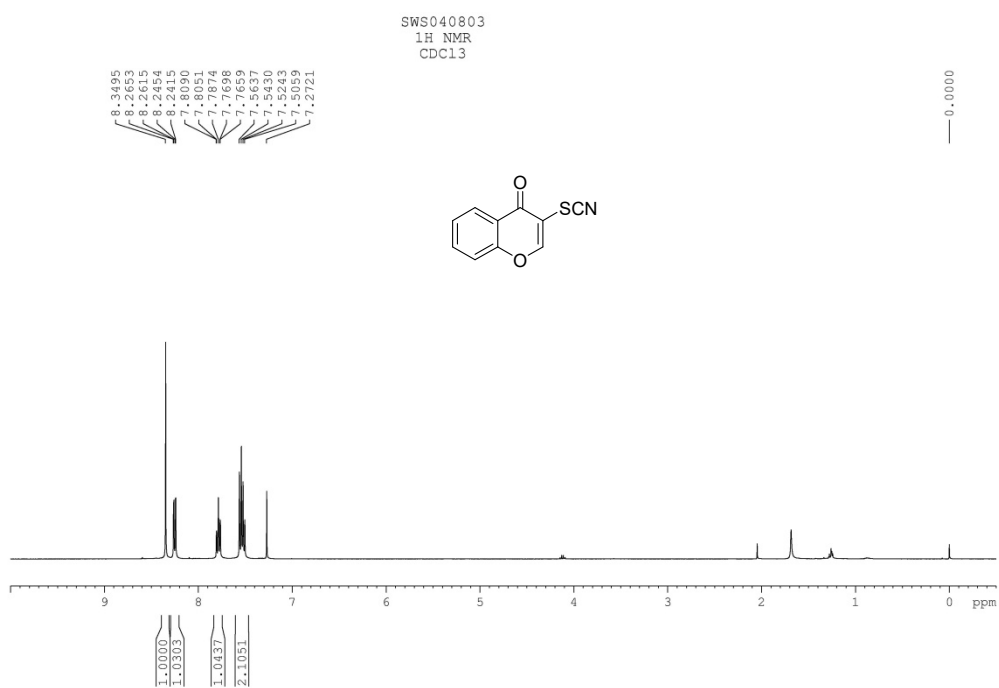


Fig. 61 ¹H NMR spectrum of compound 5a

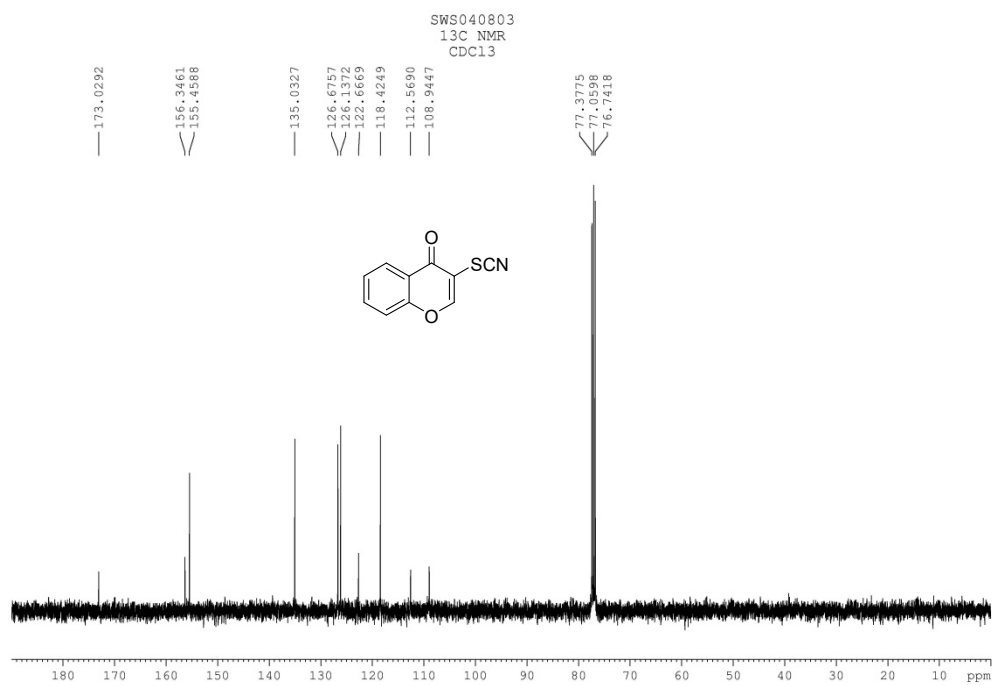


Fig. 62 ¹³C NMR spectrum of compound 5a

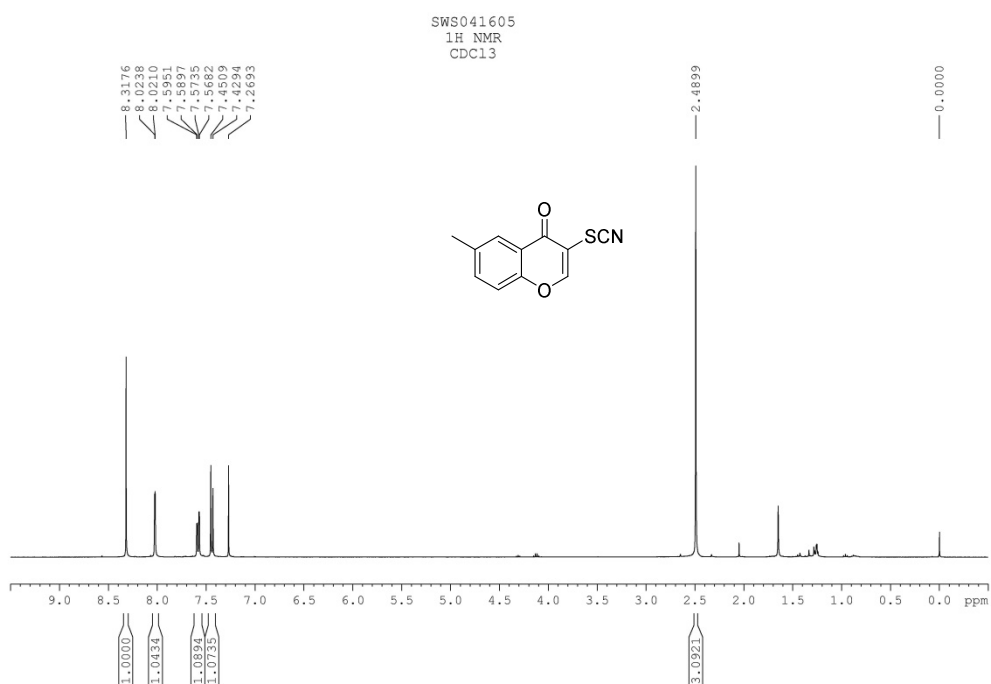


Fig. 63 ^1H NMR spectrum of compound 5b

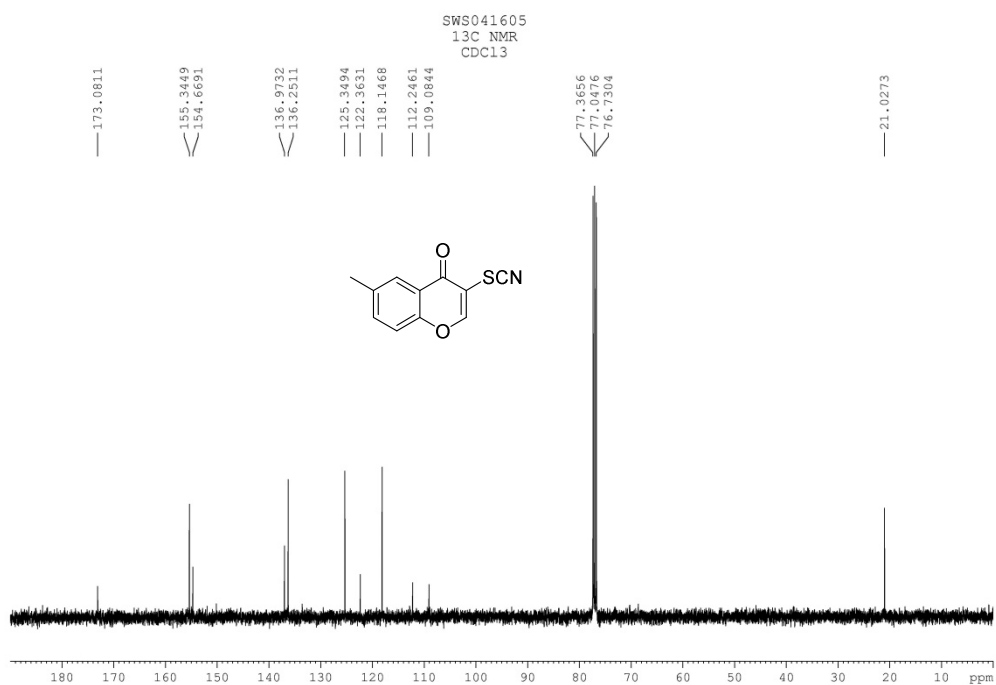


Fig. 64 ^{13}C NMR spectrum of compound 5b

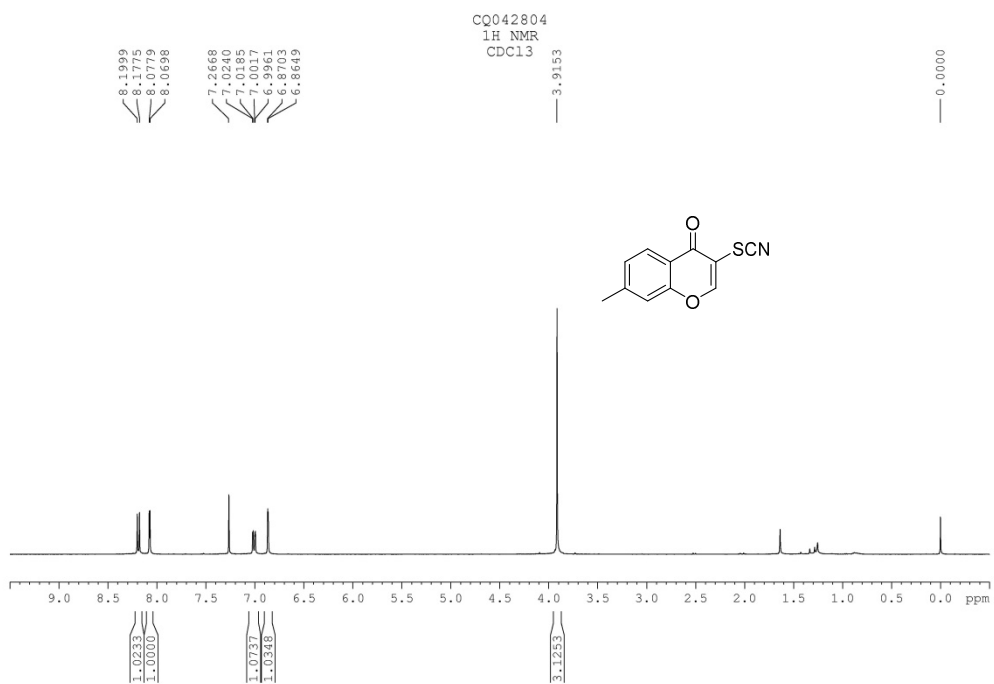


Fig. 65 ^1H NMR spectrum of compound **5c**

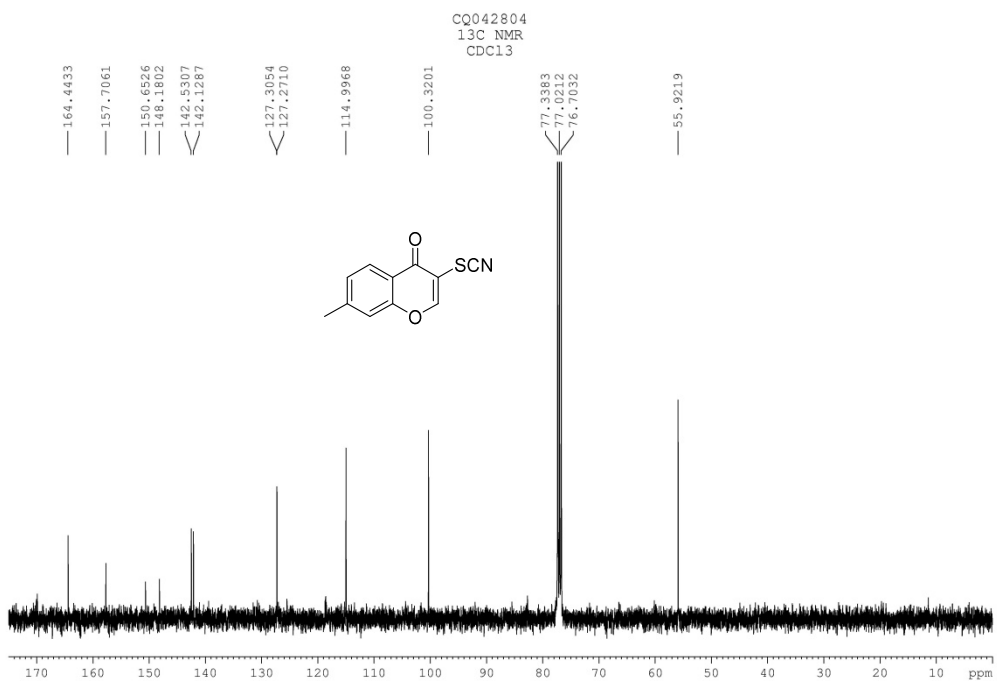


Fig. 66 ^{13}C NMR spectrum of compound **5c**

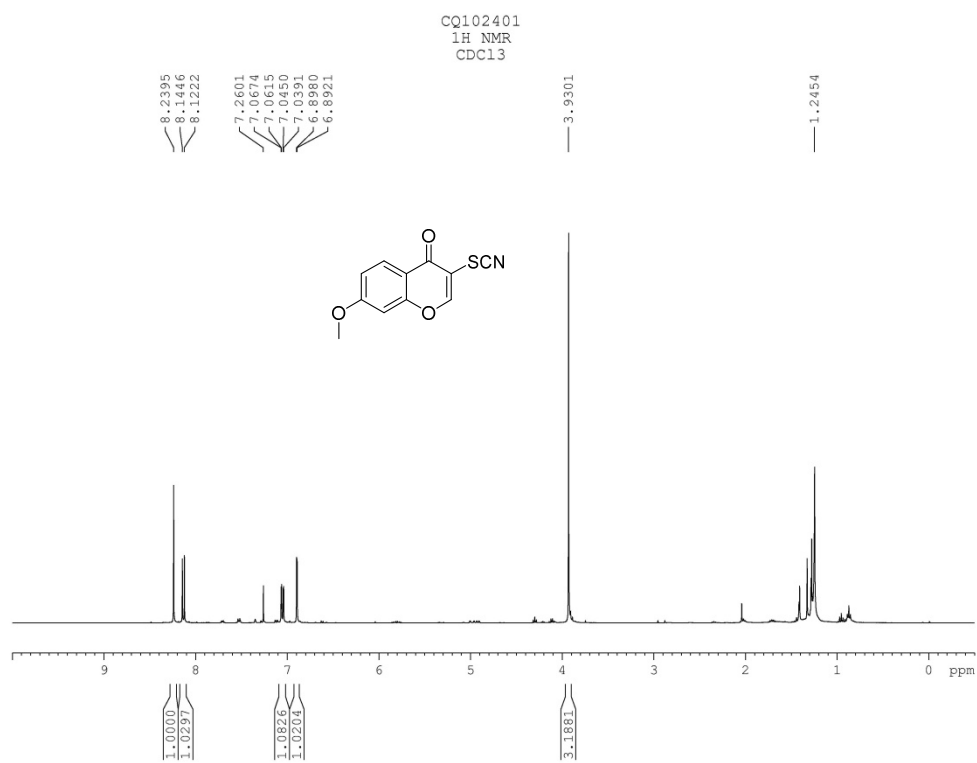


Fig. 67 ^1H NMR spectrum of compound **5d**

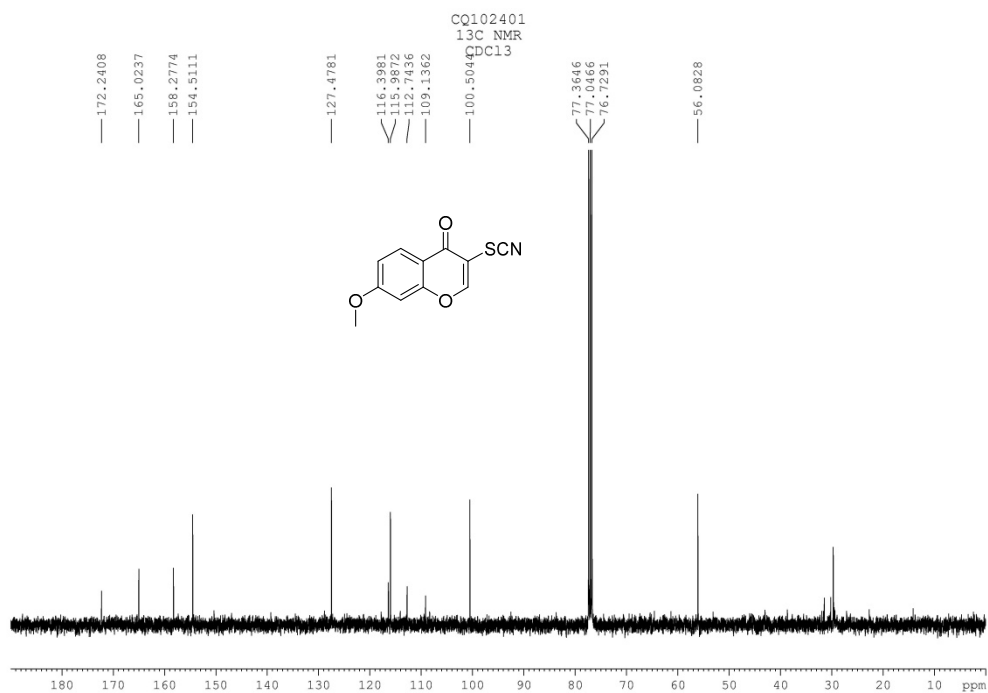


Fig. 68 ^{13}C NMR spectrum of compound **5d**

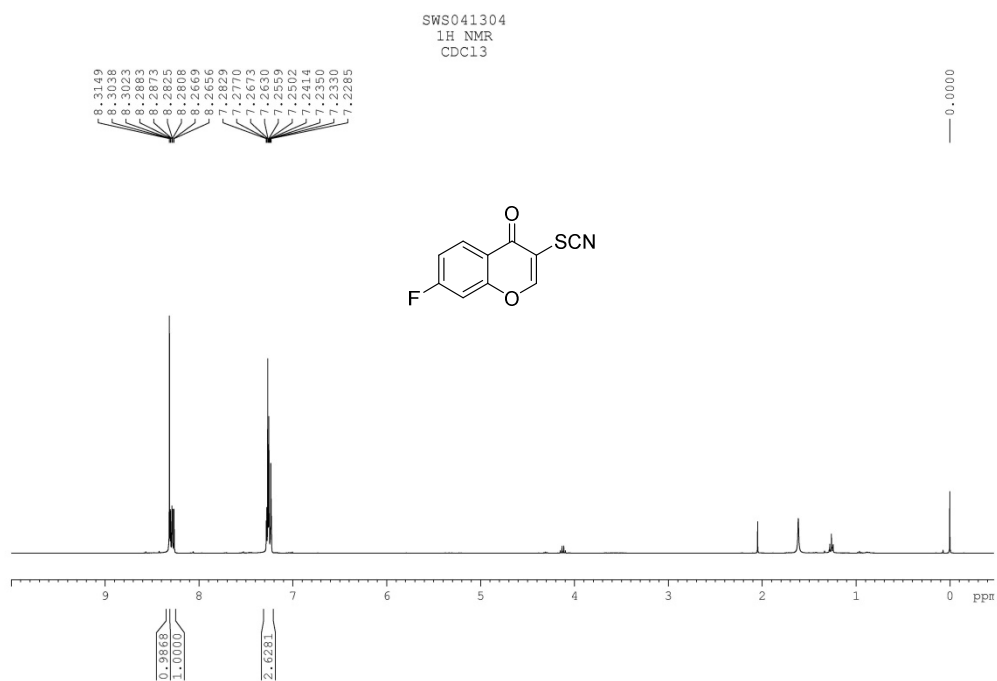


Fig. 69 ¹H NMR spectrum of compound 5e

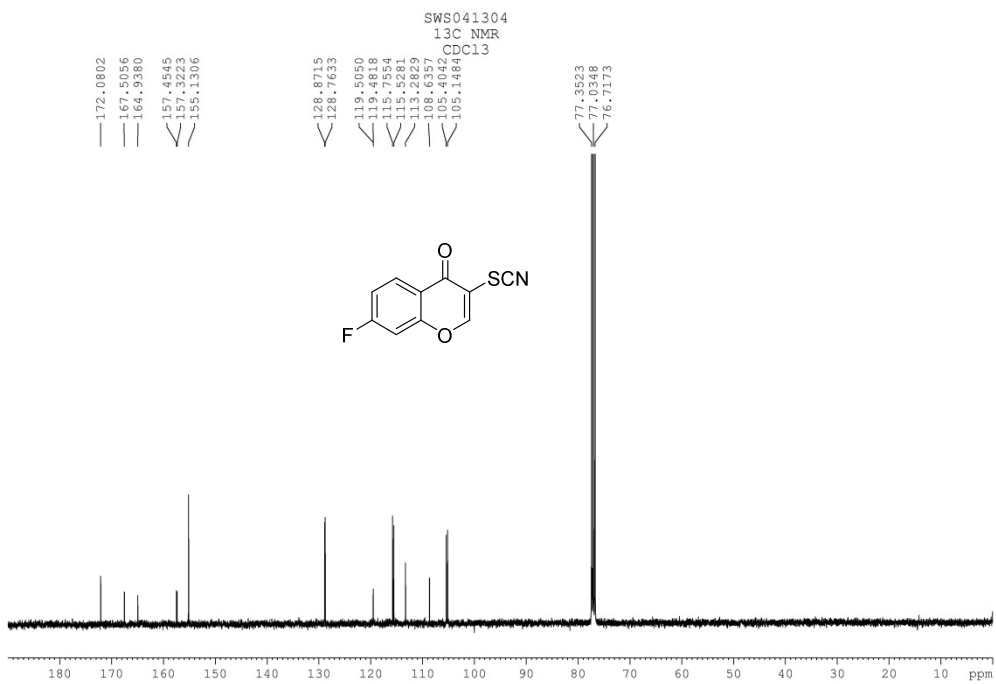


Fig. 70 ¹³C NMR spectrum of compound 5e

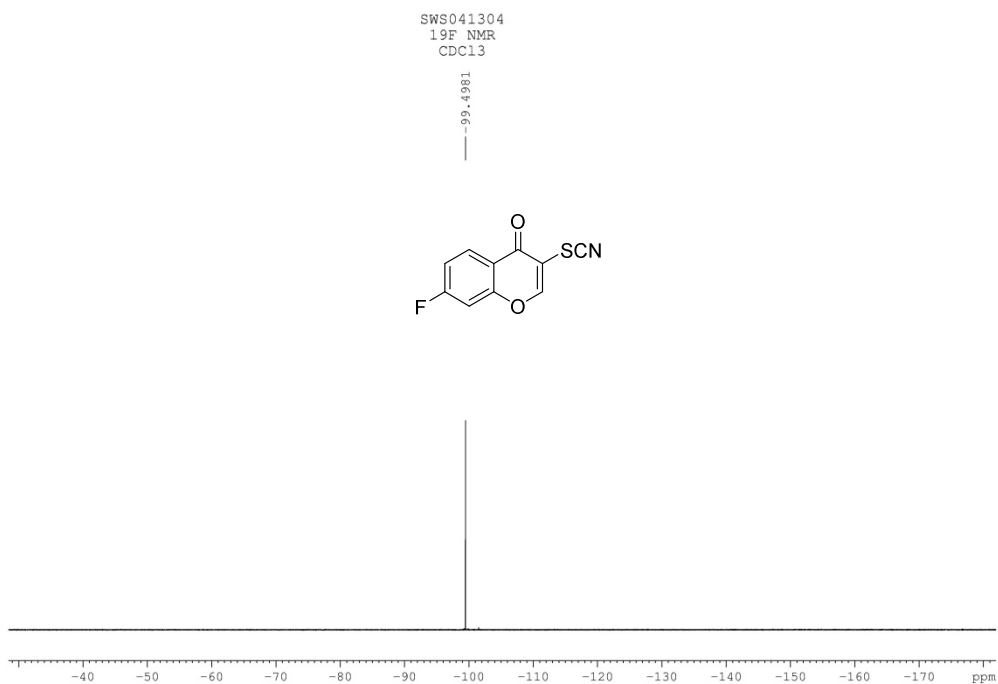


Fig. 71 ¹⁹F NMR spectrum of compound **5e**

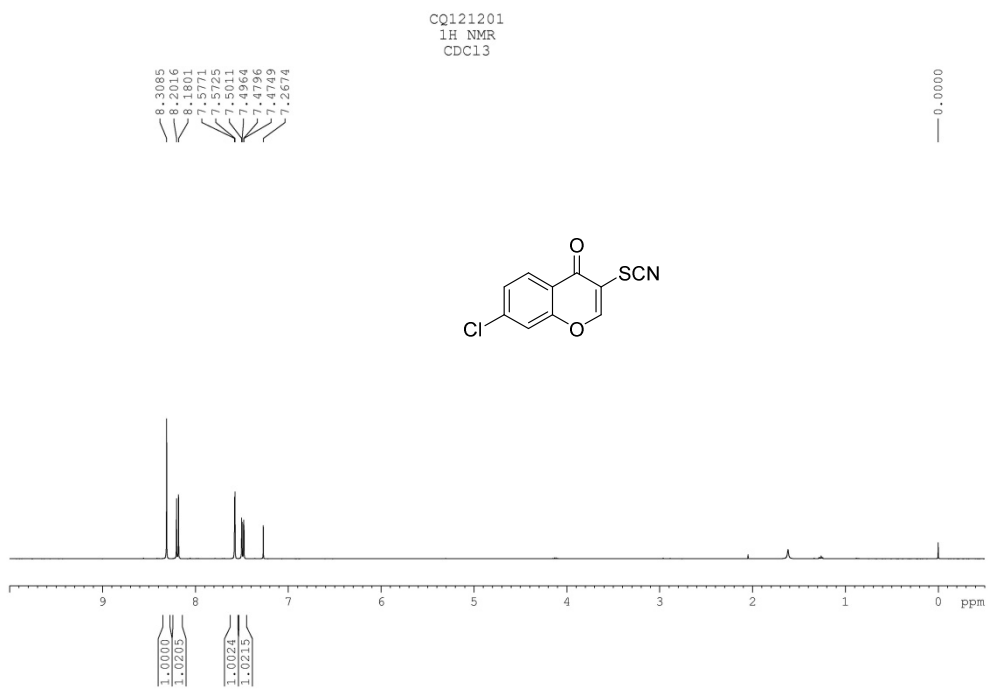


Fig. 72 ¹H NMR spectrum of compound **5f**

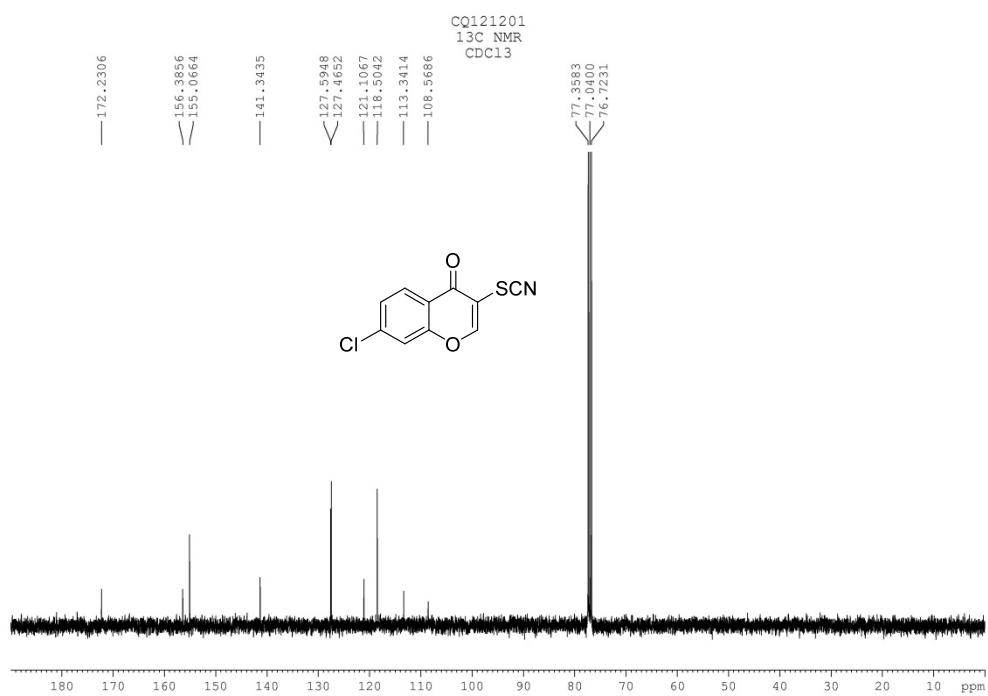


Fig. 73 ^{13}C NMR spectrum of compound 5f

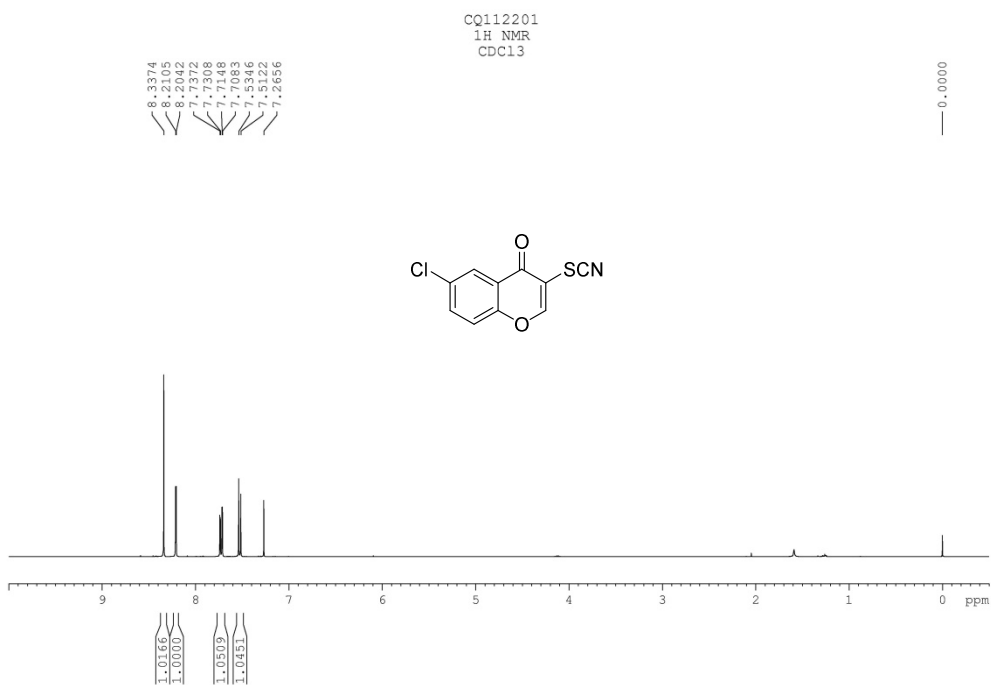


Fig. 74 ^1H NMR spectrum of compound 5g

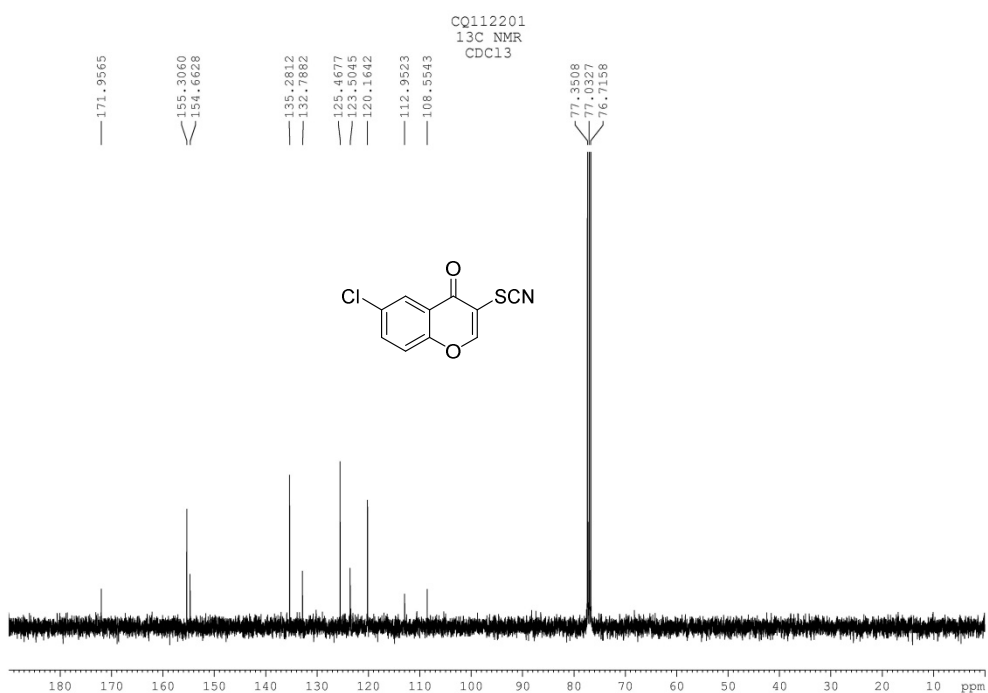


Fig. 75 ¹³C NMR spectrum of compound 5g

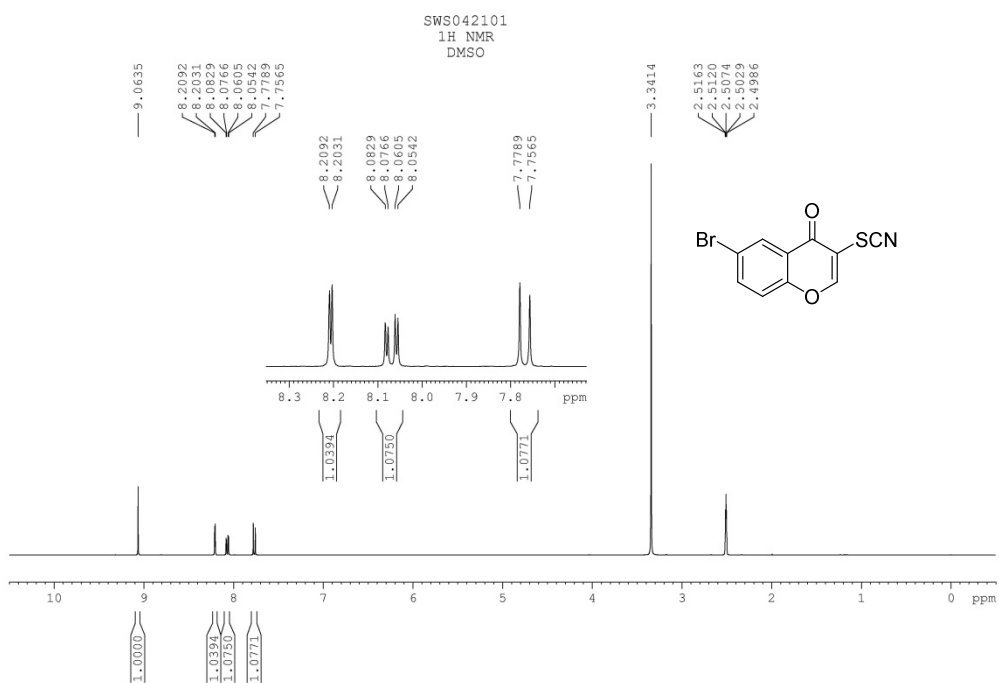


Fig. 76 ¹H NMR spectrum of compound 5h

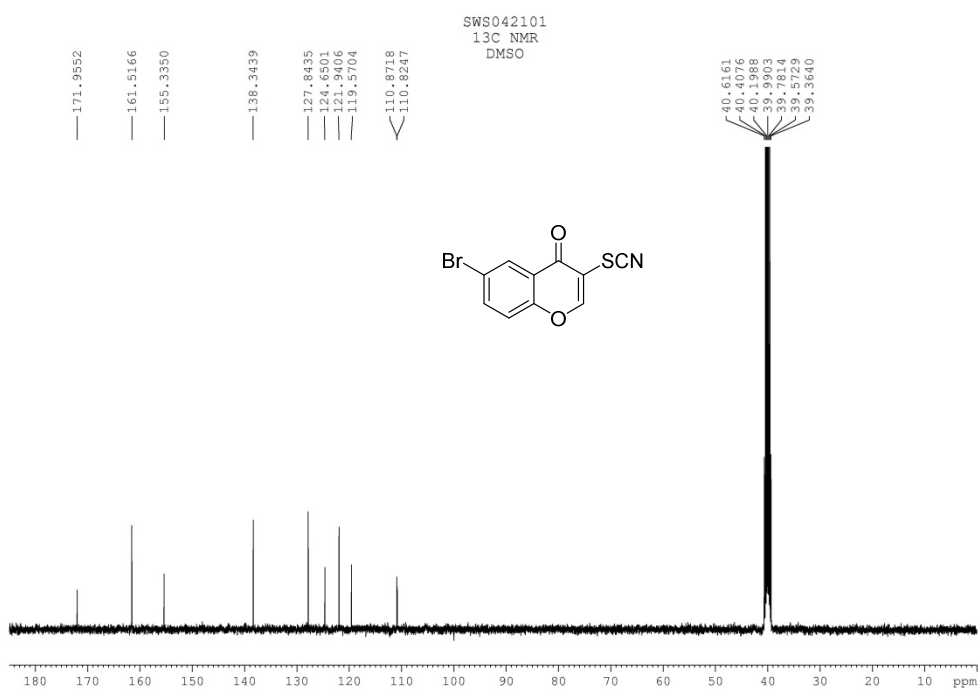


Fig. 77 ¹³C NMR spectrum of compound 5h

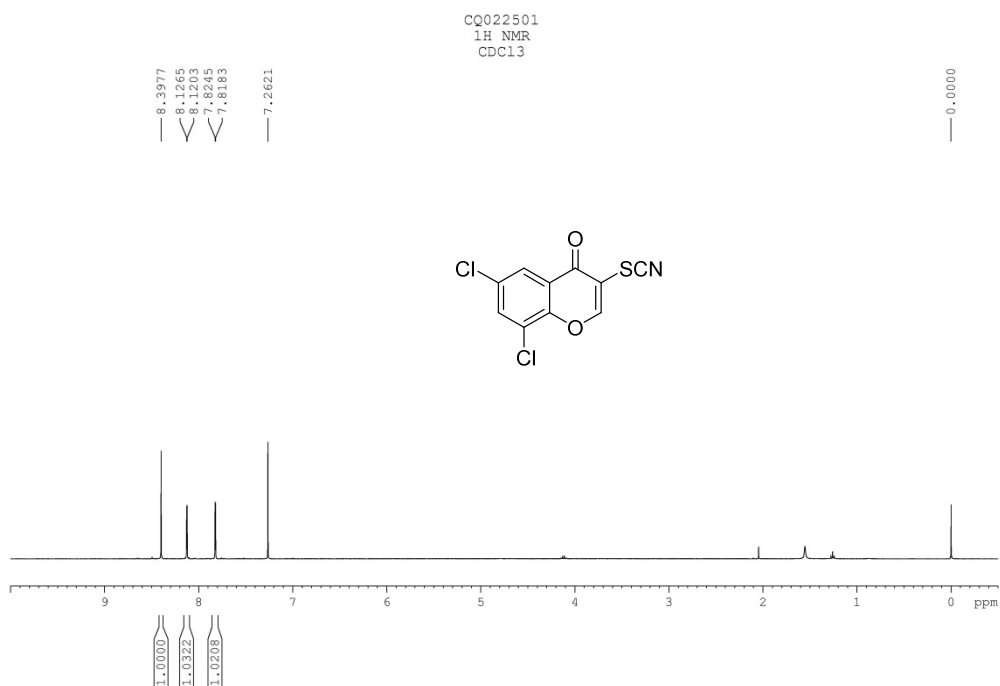


Fig. 78 ¹H NMR spectrum of compound 5j

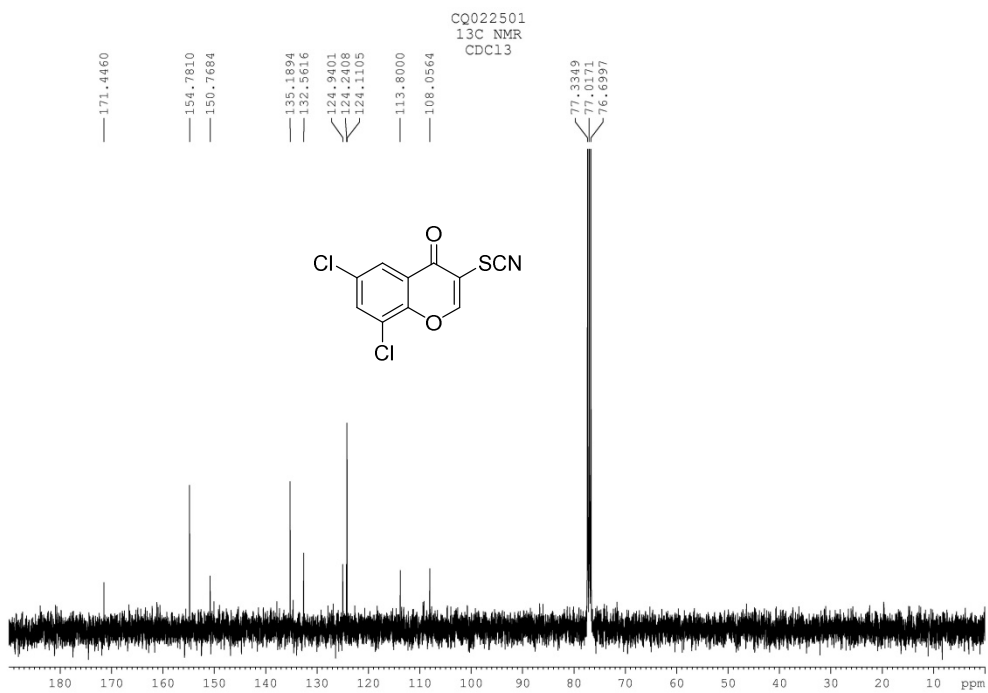


Fig. 79 ^{13}C NMR spectrum of compound 5j

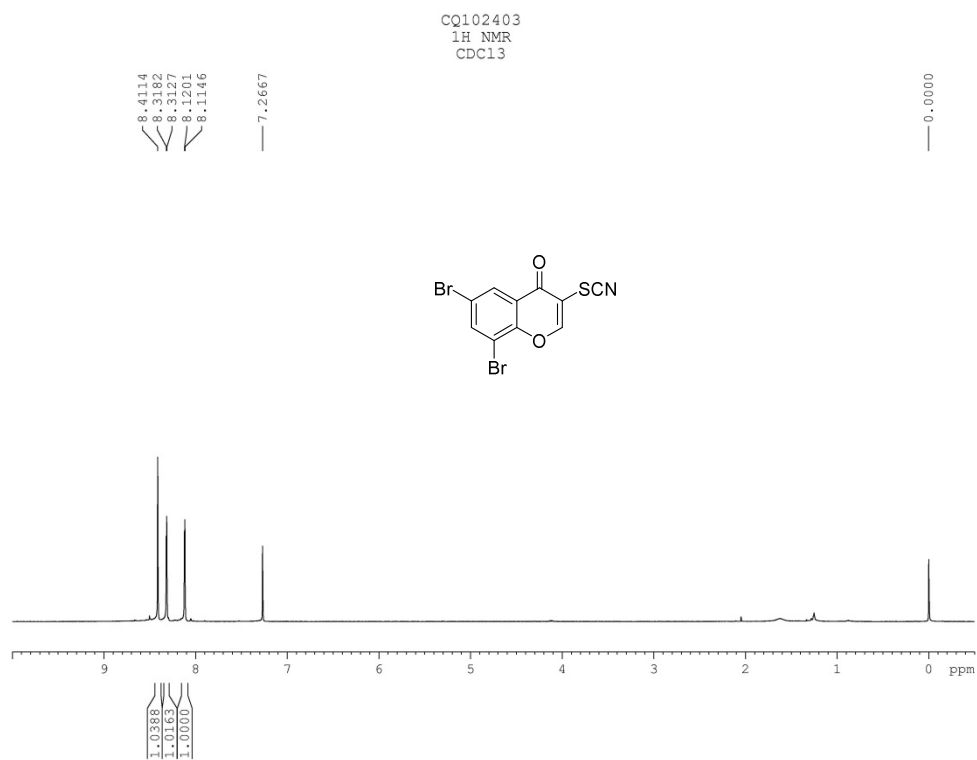


Fig. 80 ^1H NMR spectrum of compound 5k

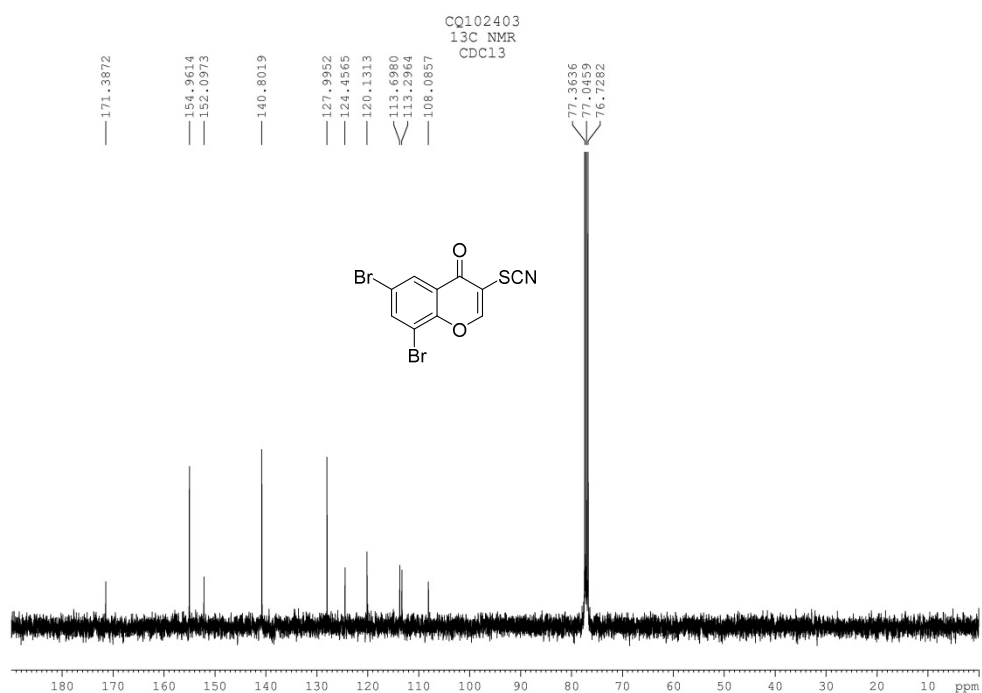


Fig. 81 ¹³C NMR spectrum of compound 5k

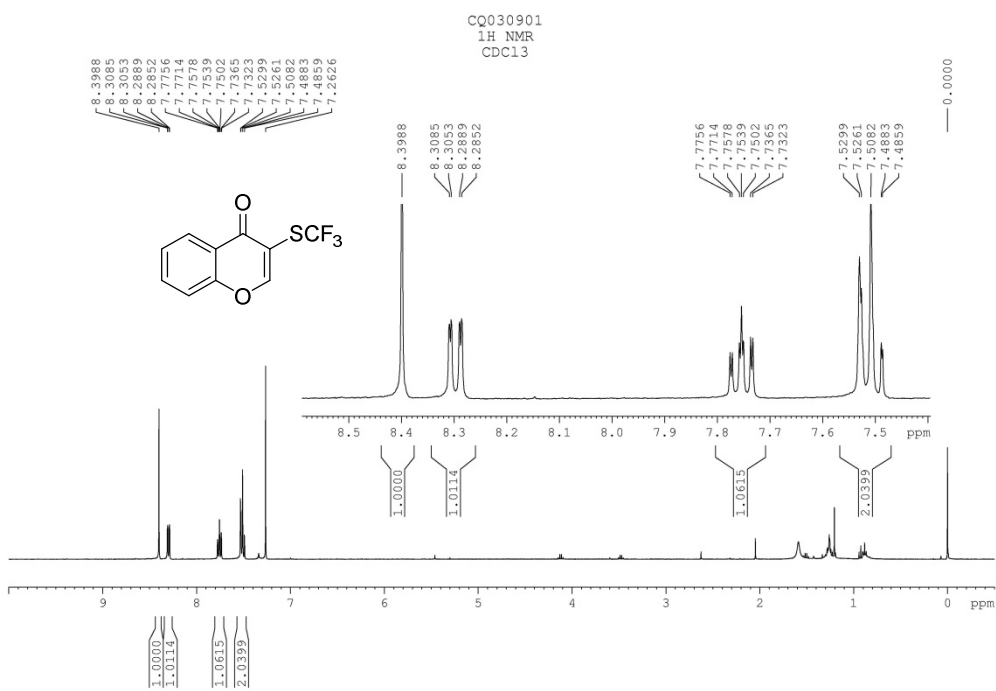


Fig. 82 ¹H NMR spectrum of compound 6a

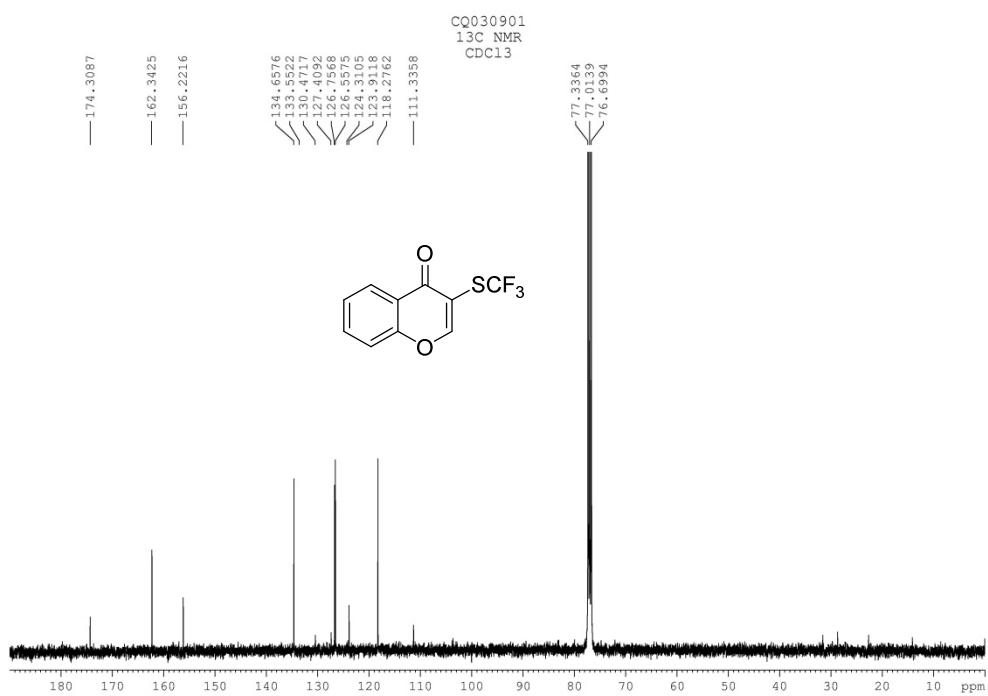


Fig. 83 ¹³C NMR spectrum of compound **6a**

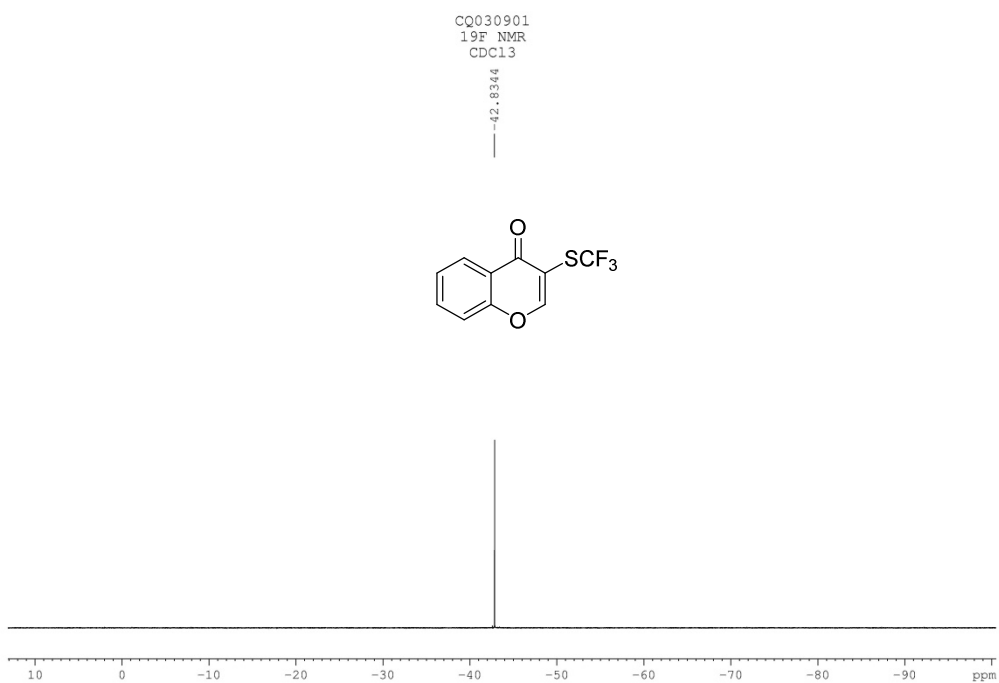


Fig. 84 ¹⁹F NMR spectrum of compound **6a**