

Supporting Information

Fluorination-Triggered Tandem Cyclization of Styrene-type Carboxylic Acid to Access 3-Aryl Isocoumarin Derivatives under Microwave Irradiation

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1. Screening the reaction condition

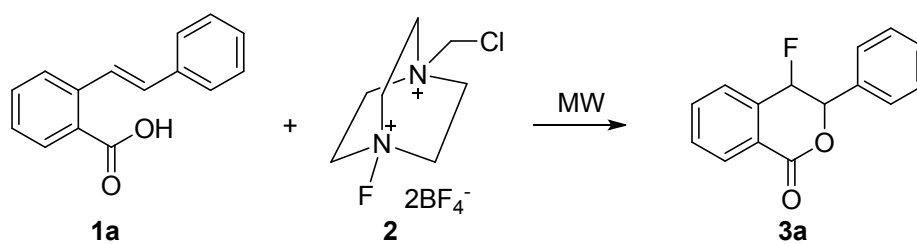


Table S1 Screening the molar ratio of reaction substrates^a

Entry	The molar ratio of 1a and 2	Yields (%) ^b
1	2:1	50
2	1:1	58
3	1:1.2	63
4	1:1.5	70
5	1:2.0	61

^a Reaction conditions: (E)-2-styrylbenzoic acid **1a** (0.2 mmol, 44.8 mg), Selectfluor reagent **2**, in 3.0 mL CH_3CN solvent, 100 °C for 0.5 h.

^b Isolated yield.

2. Copies of spectra of products

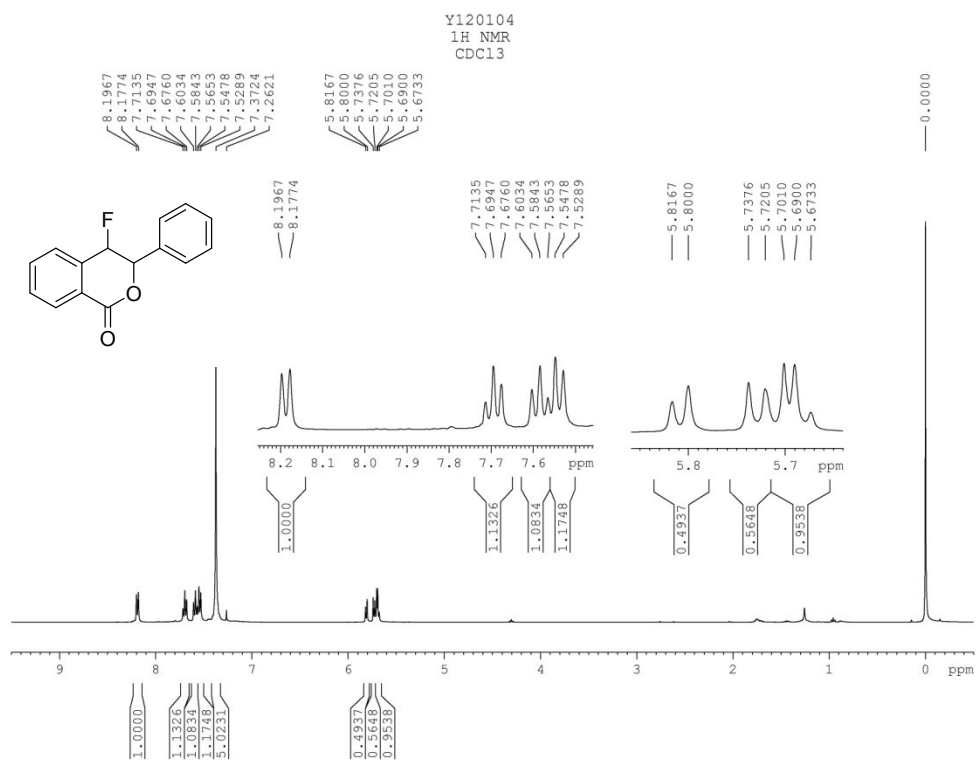


Fig. 1 ¹H NMR spectrum of compound 3a

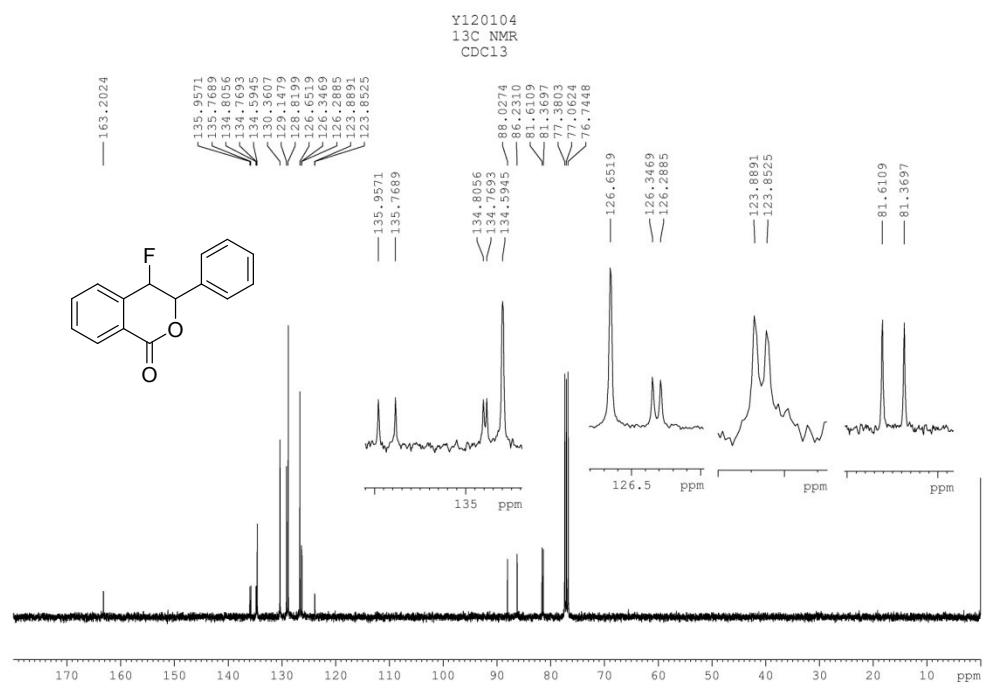


Fig. 2 ¹³C NMR spectrum of compound 3a

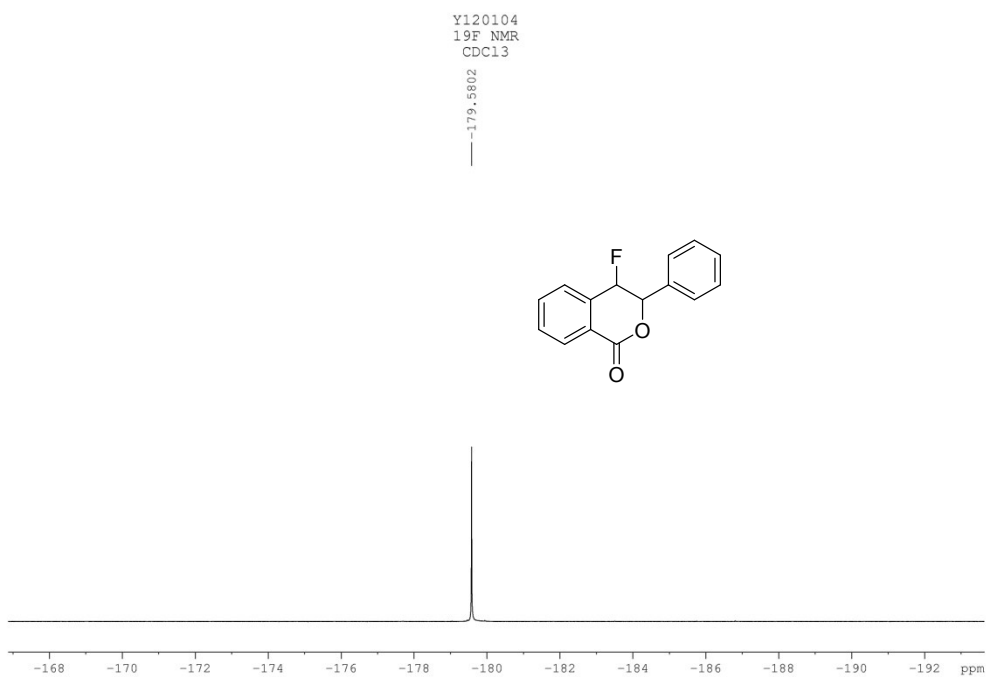


Fig. 3 ¹⁹F NMR spectrum of compound 3a

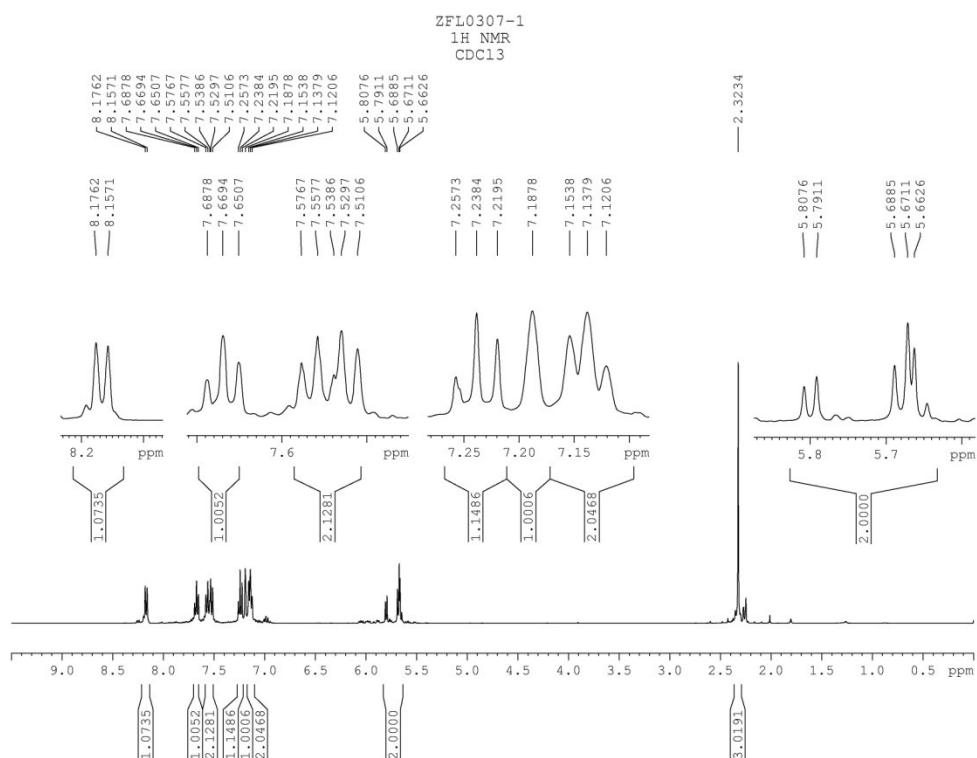


Fig. 4 ¹H NMR spectrum of compound 3b

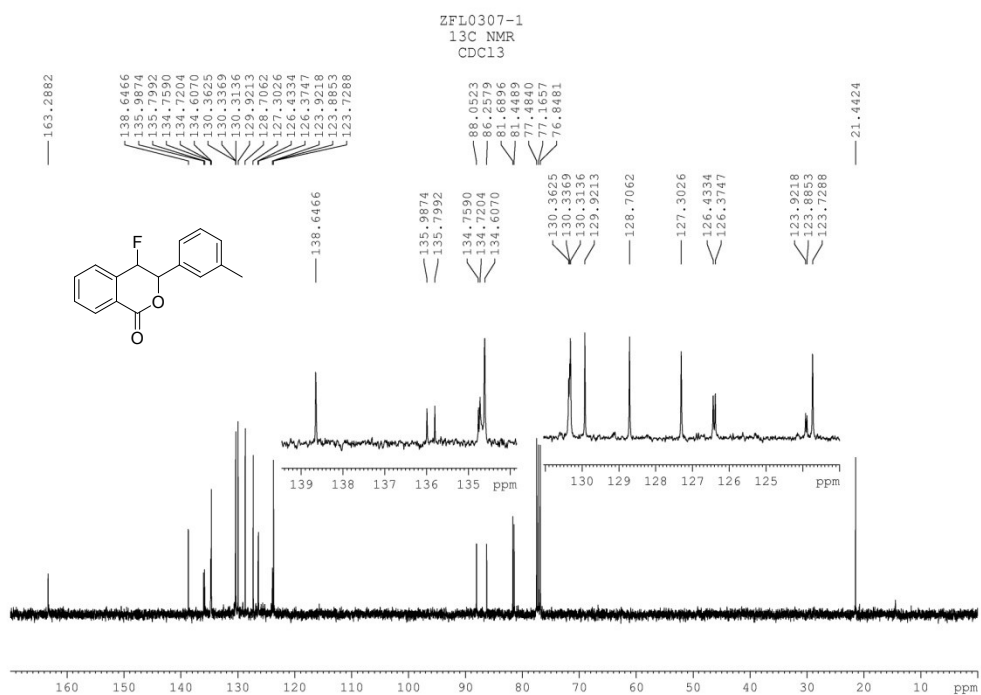


Fig. 5 ¹³C NMR spectrum of compound **3b**

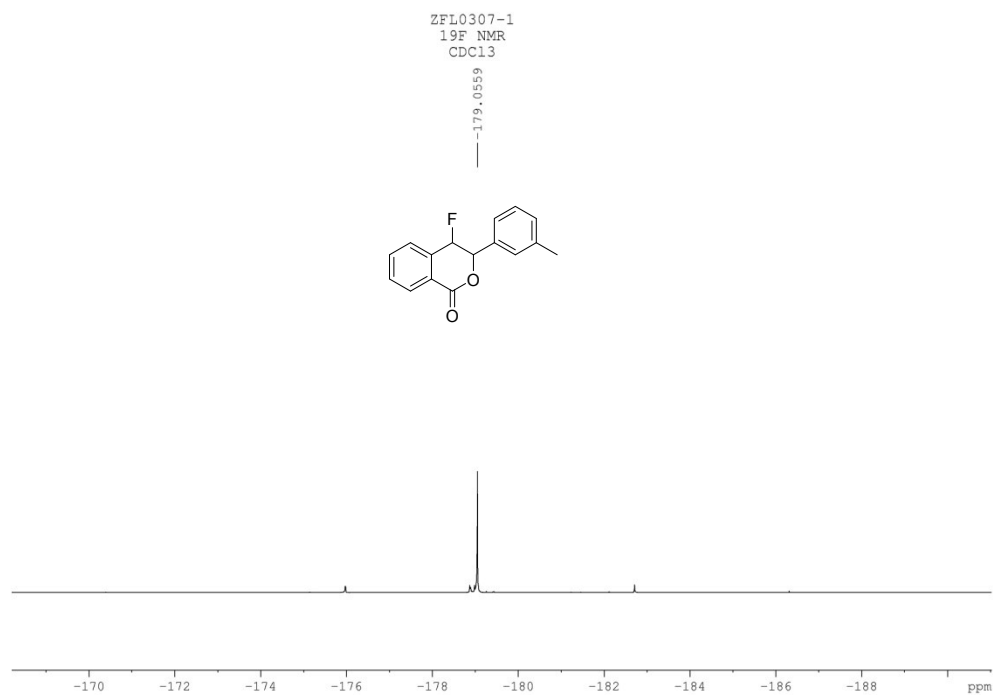


Fig. 6 ¹⁹F NMR spectrum of compound **3b**

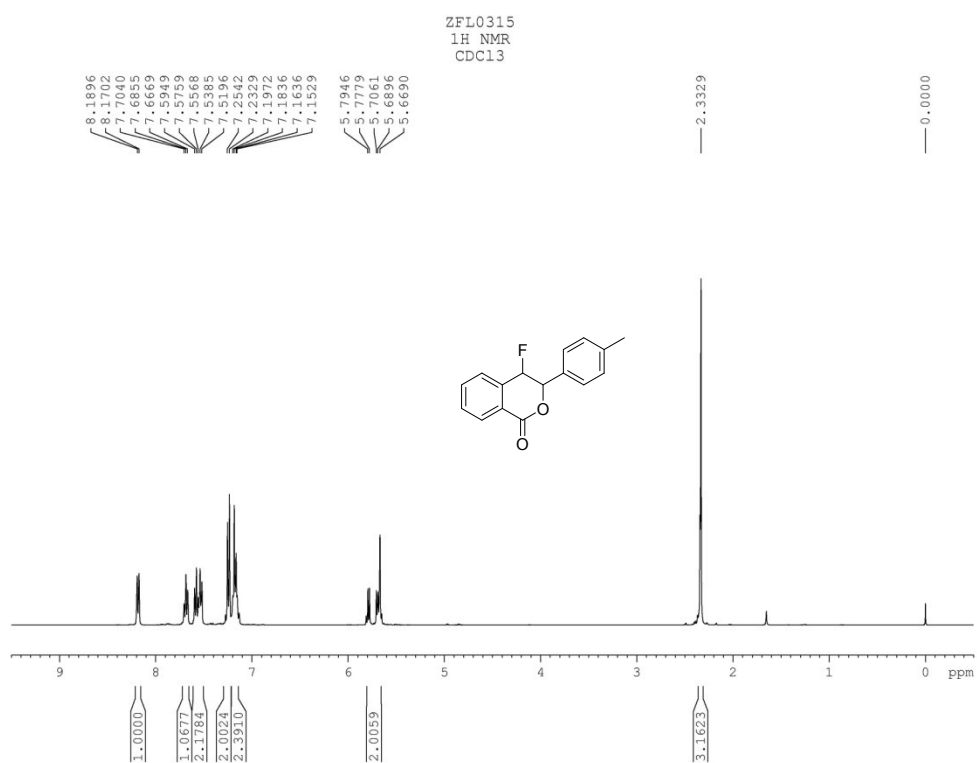


Fig. 7 ¹H NMR spectrum of compound 3c

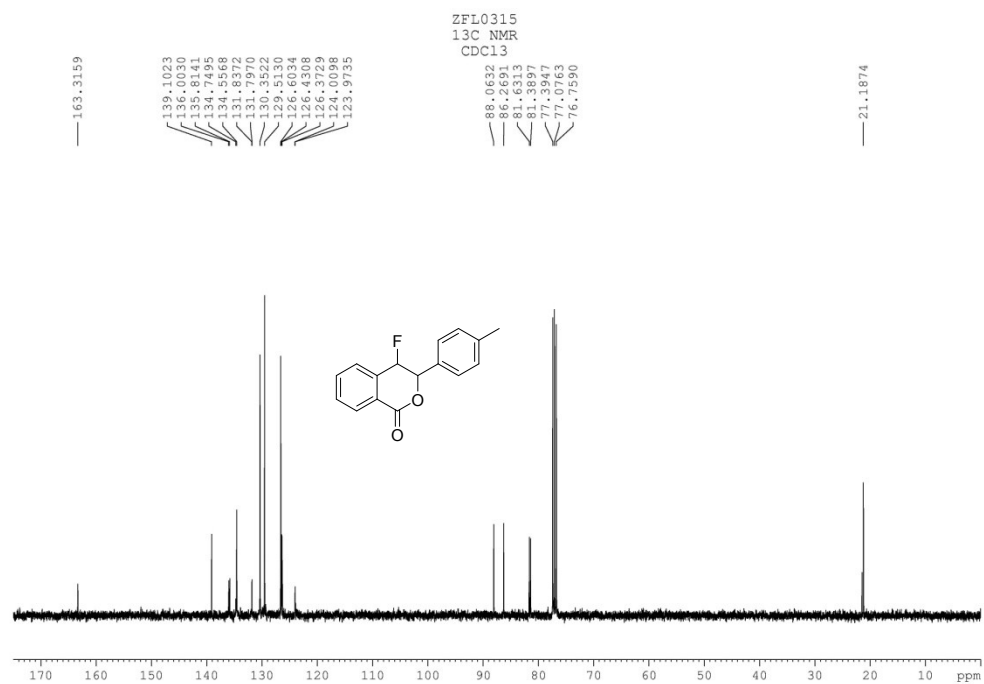


Fig. 8 ¹³C NMR spectrum of compound 3c

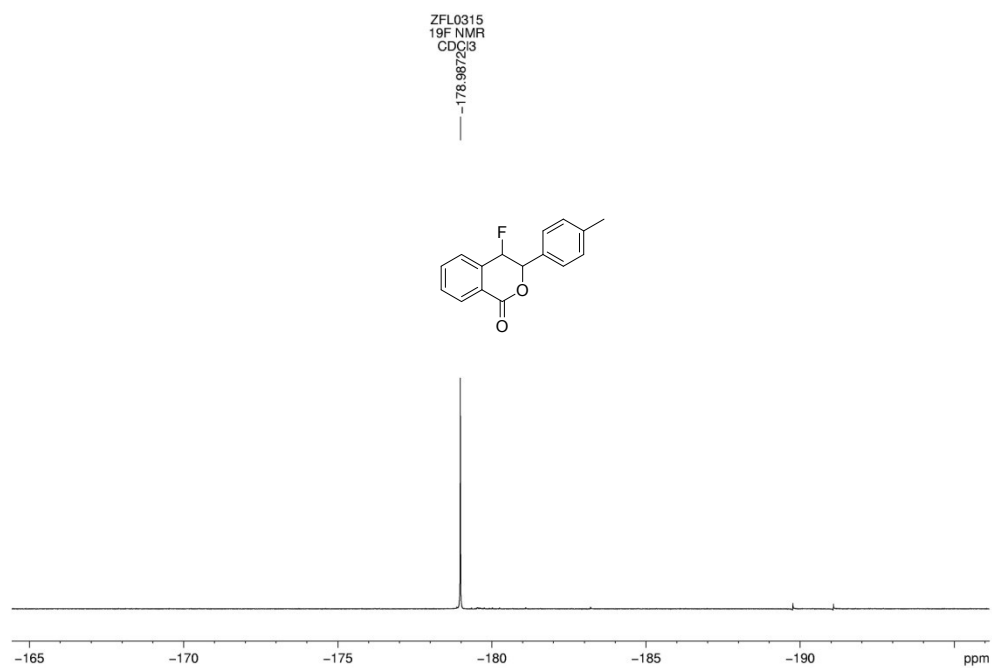


Fig. 9 ¹⁹F NMR spectrum of compound 3c

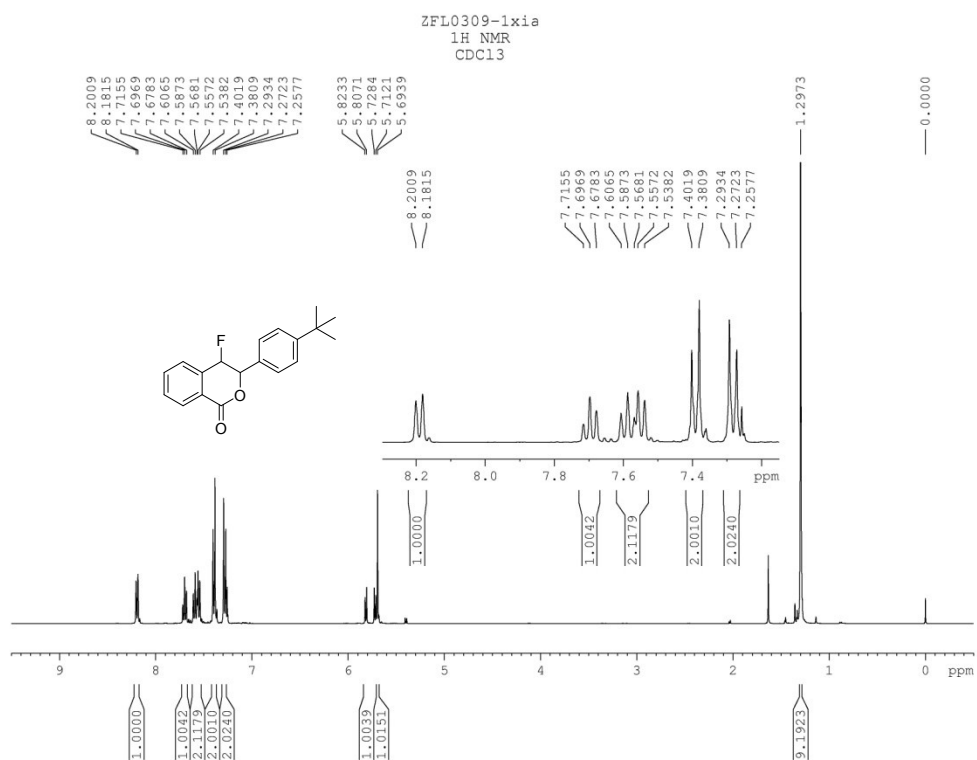


Fig. 10 ¹H NMR spectrum of compound 3d

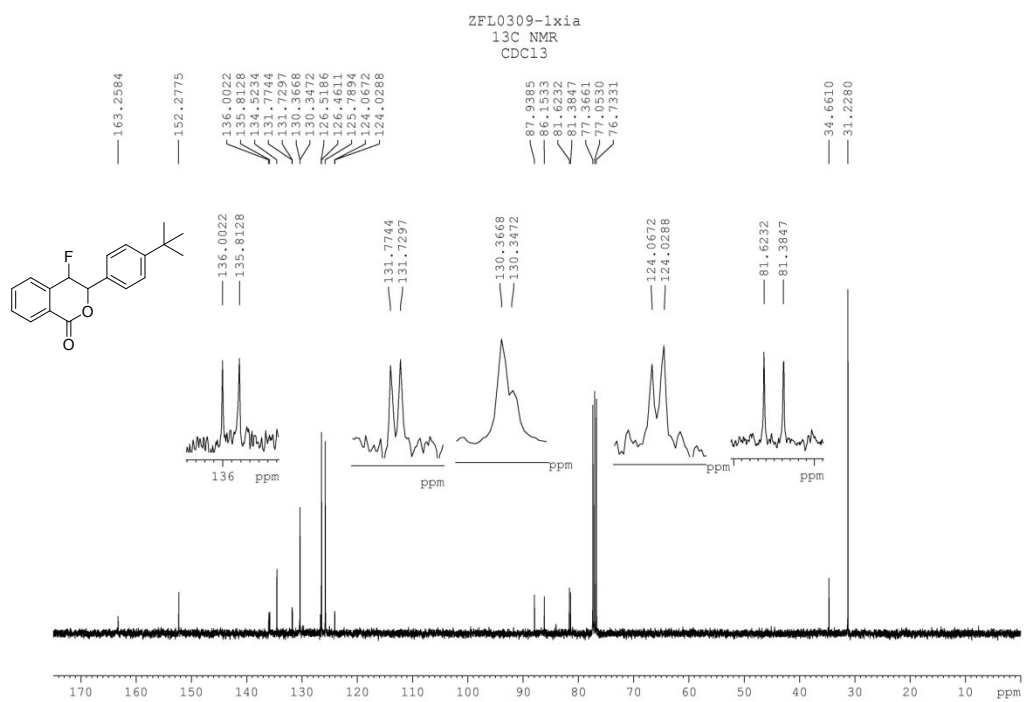


Fig. 11 ¹³C NMR spectrum of compound 3d

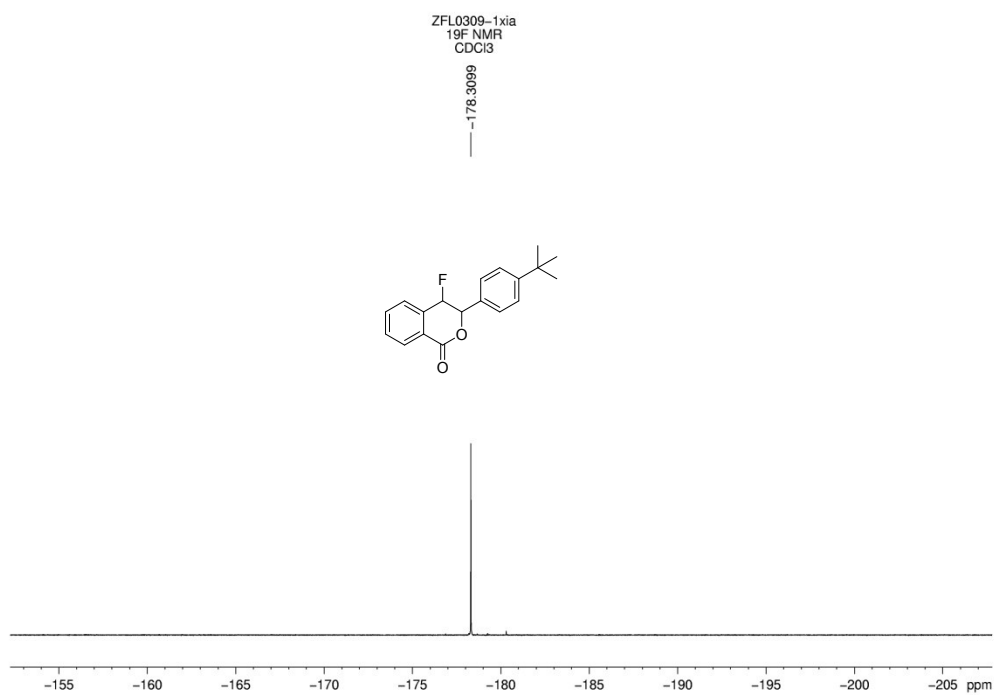


Fig. 12 ¹⁹F NMR spectrum of compound 3d

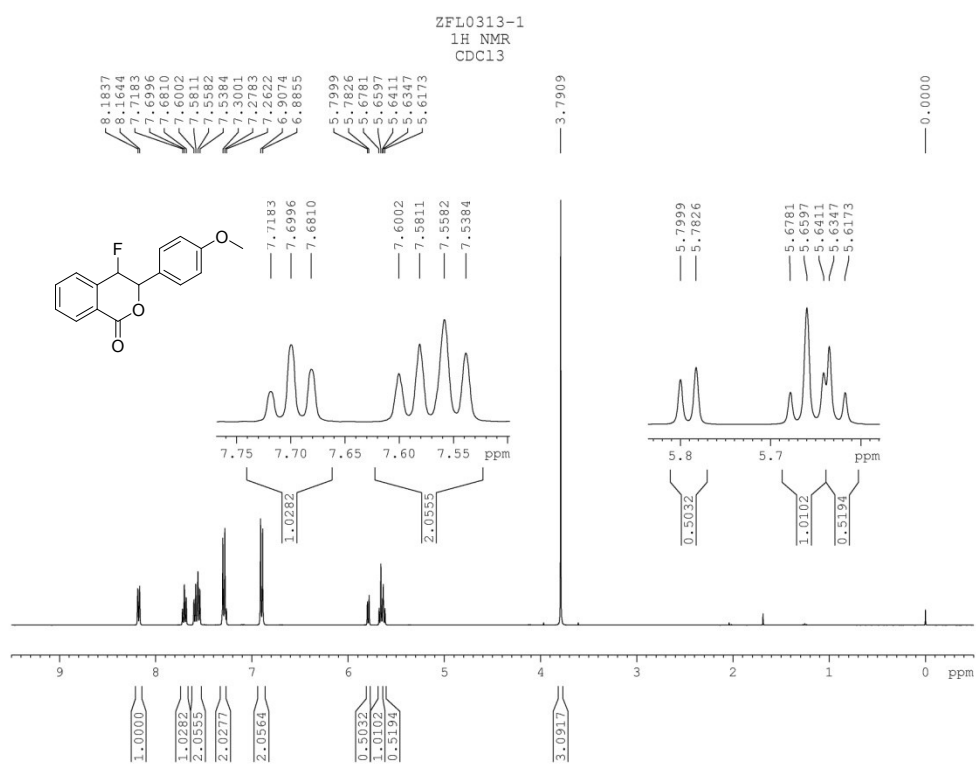


Fig. 13 ¹H NMR spectrum of compound 3e

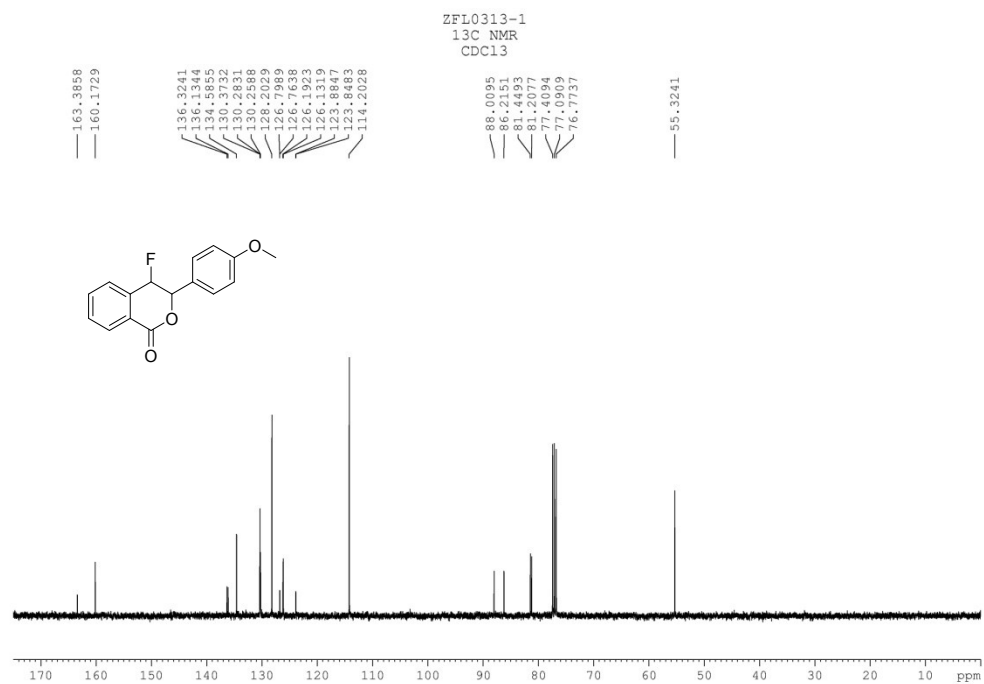


Fig. 14 ¹³C NMR spectrum of compound 3e

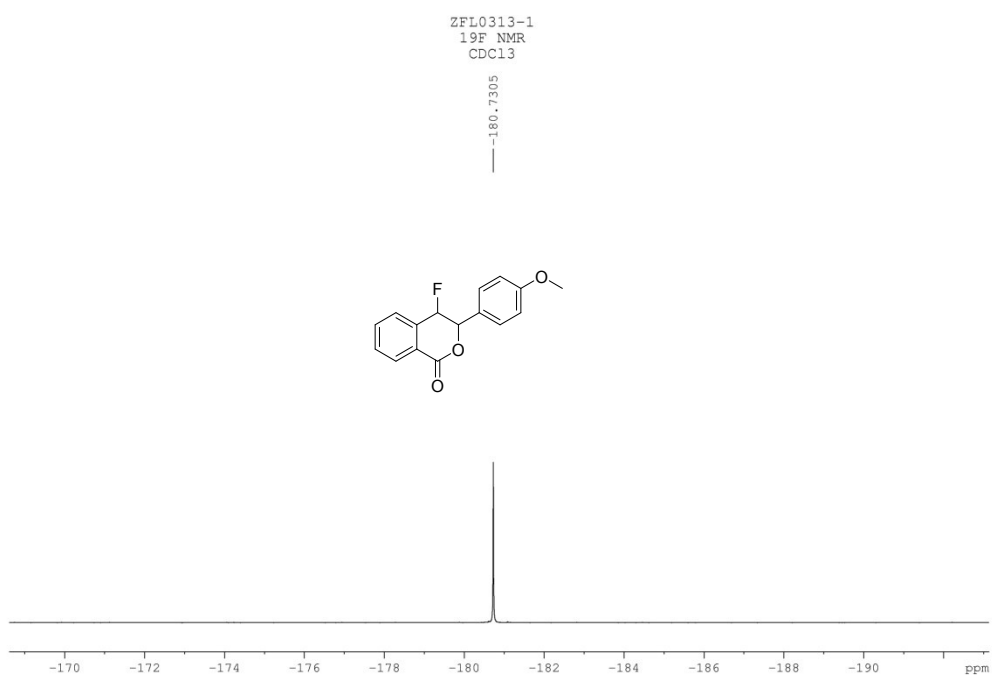


Fig. 15 ¹⁹F NMR spectrum of compound 3e

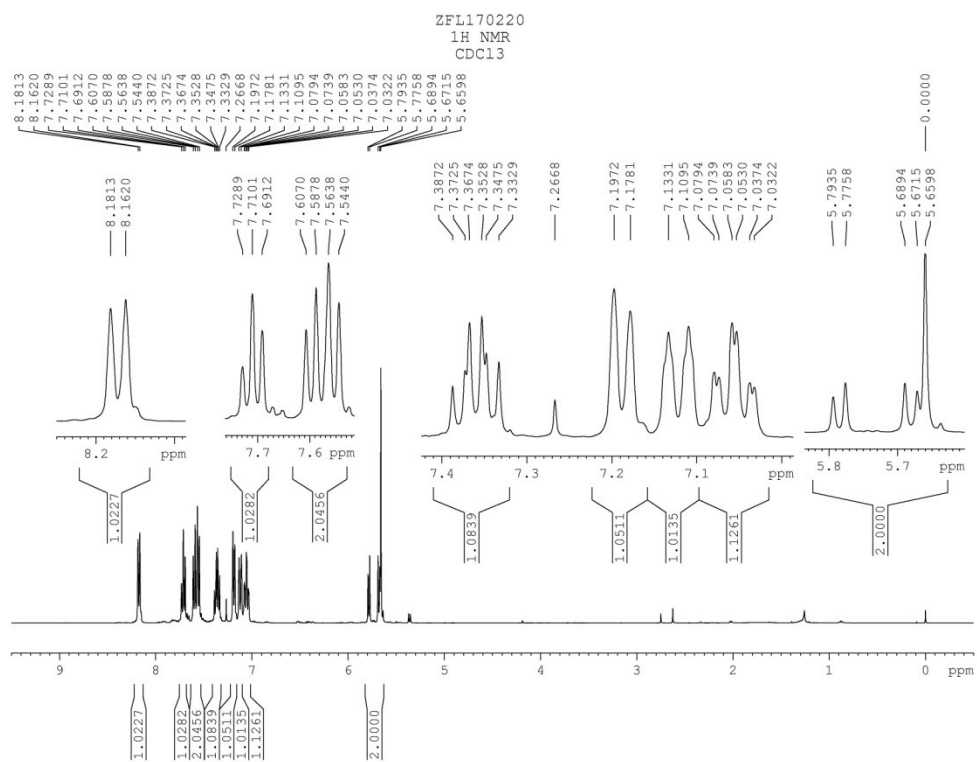


Fig. 16 ¹H NMR spectrum of compound 3f

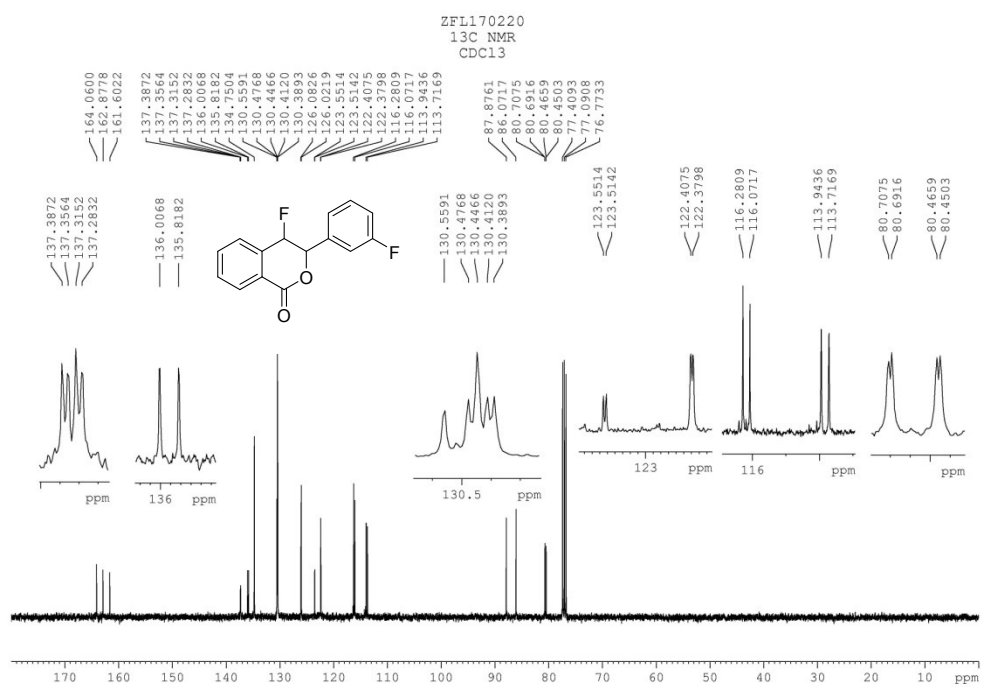


Fig. 17 ¹³C NMR spectrum of compound **3f**

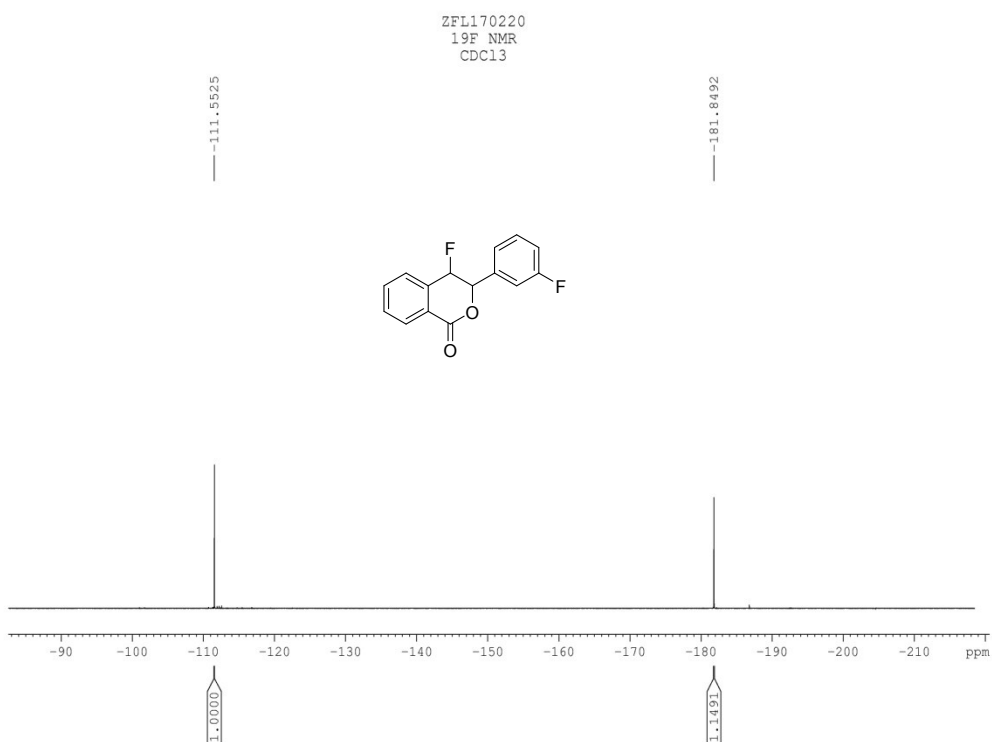


Fig. 18 ¹⁹F NMR spectrum of compound **3f**

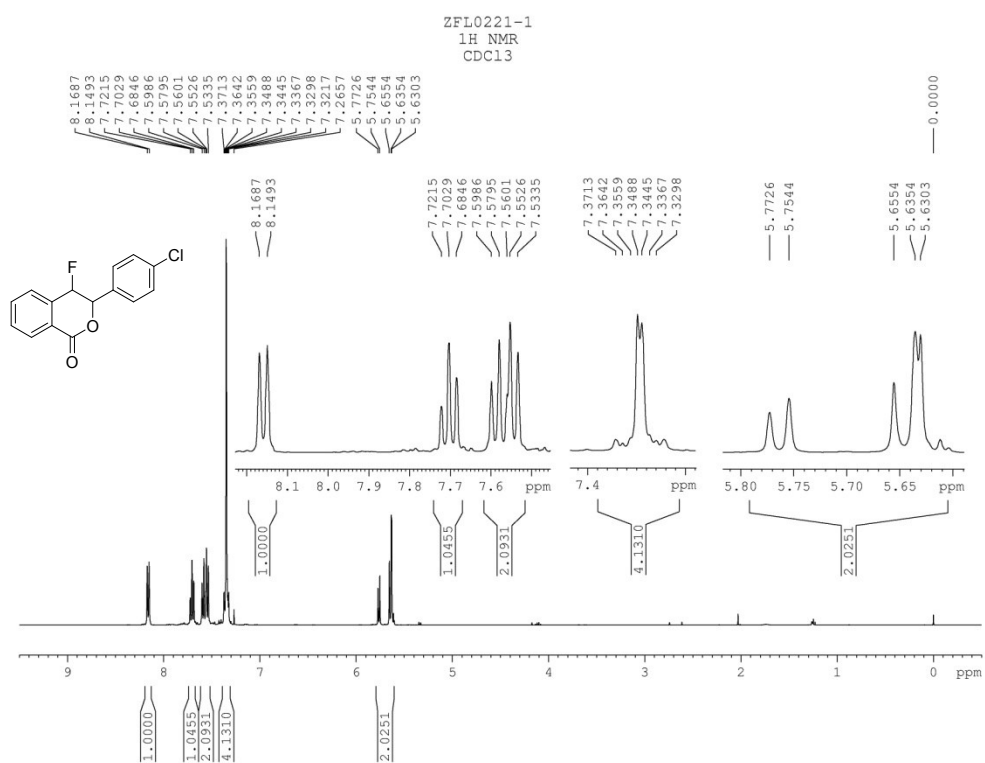


Fig. 19 ¹H NMR spectrum of compound 3g

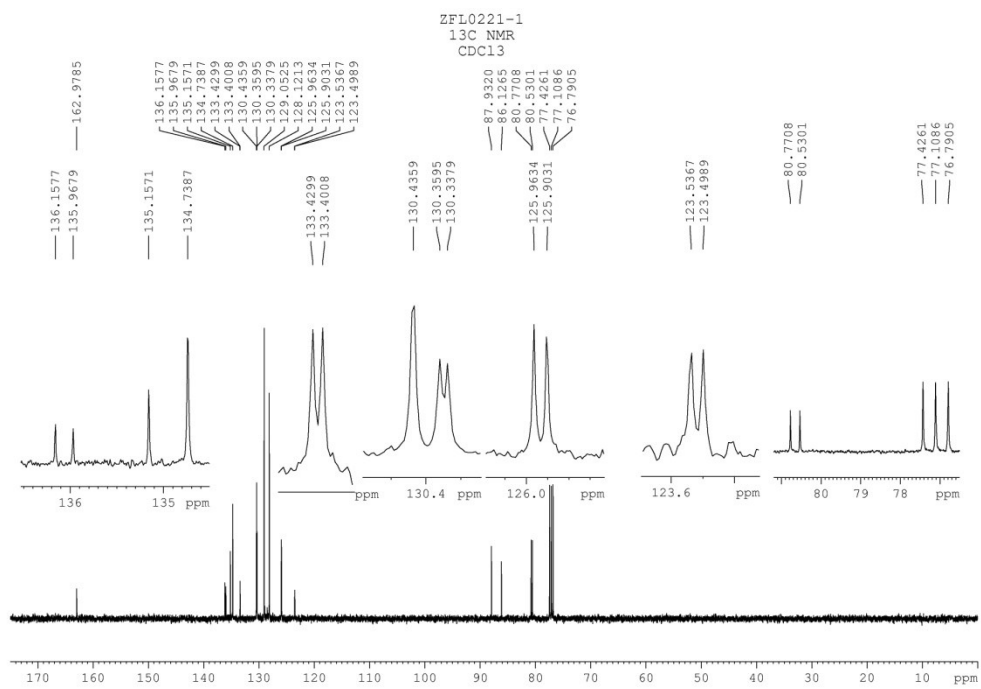


Fig. 20 ¹³C NMR spectrum of compound 3g

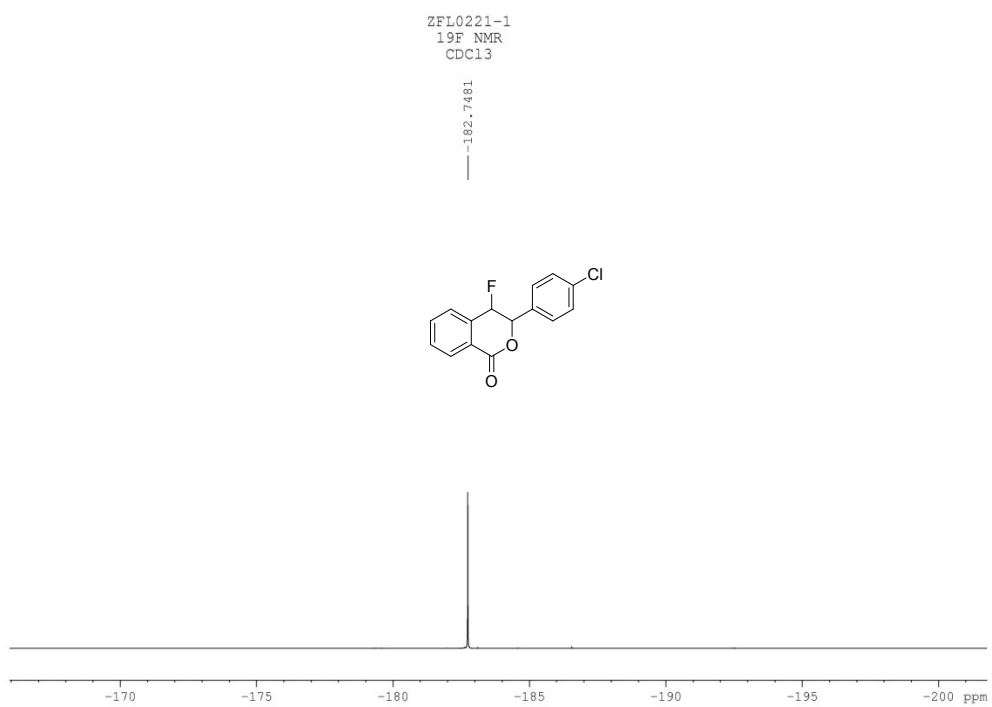


Fig. 21 ¹⁹F NMR spectrum of compound 3g

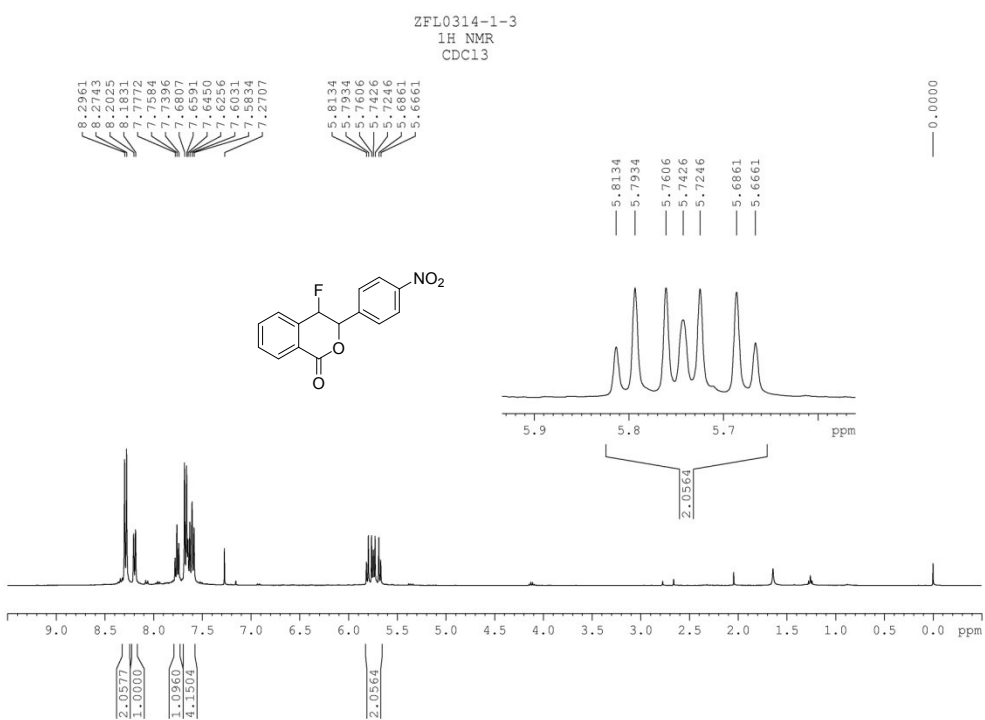


Fig. 22 ¹H NMR spectrum of compound 3h

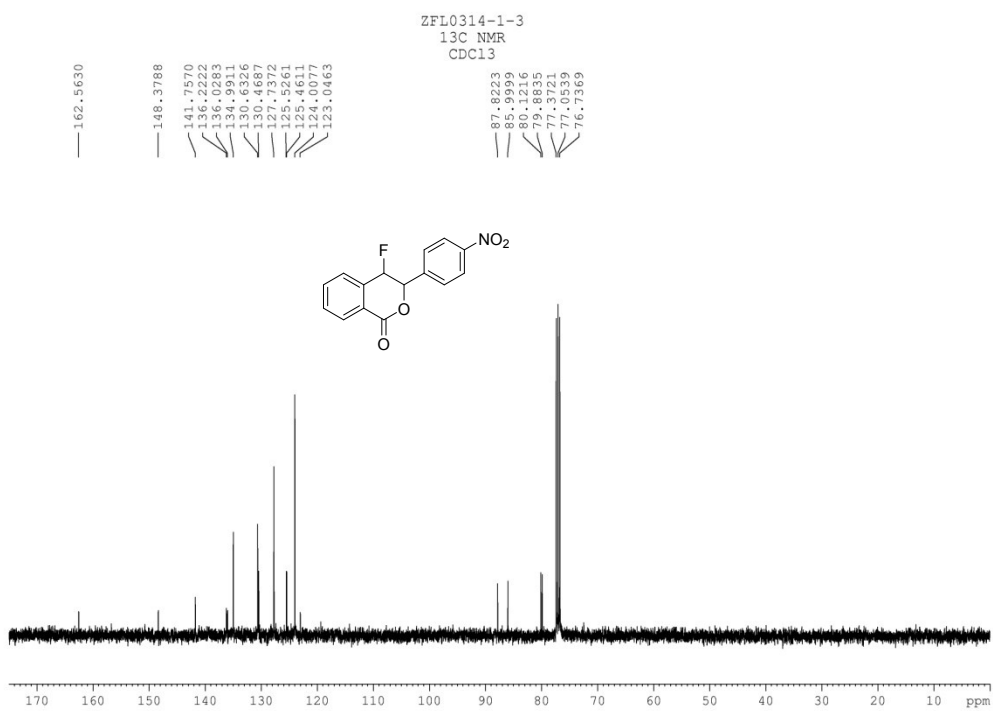


Fig. 23 ¹³C NMR spectrum of compound **3h**

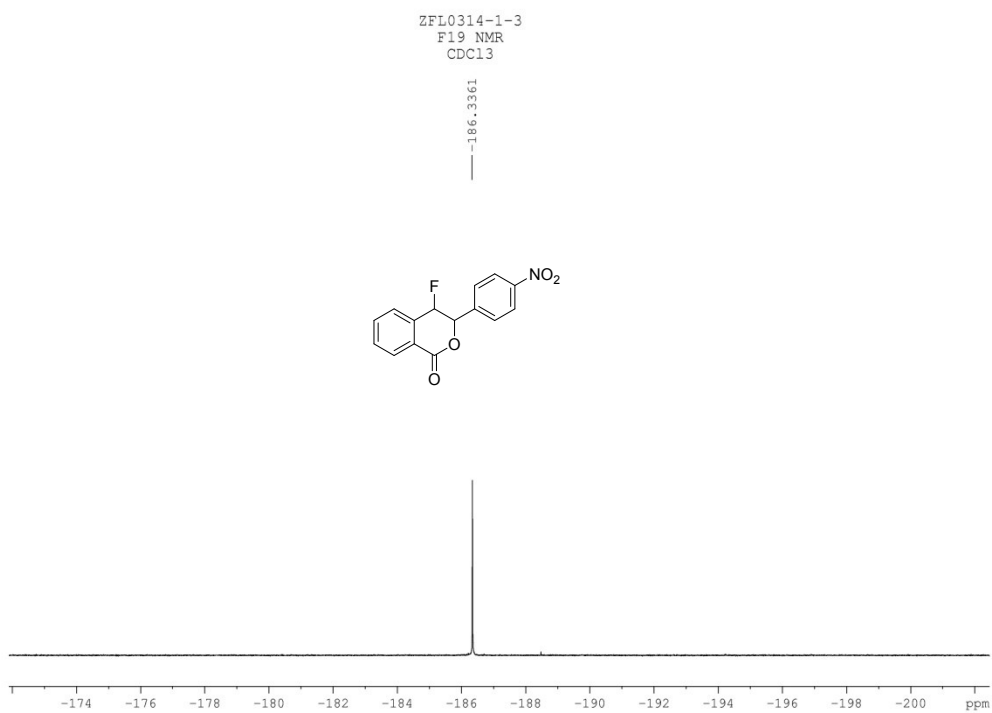


Fig. 24 ¹⁹F NMR spectrum of compound **3h**

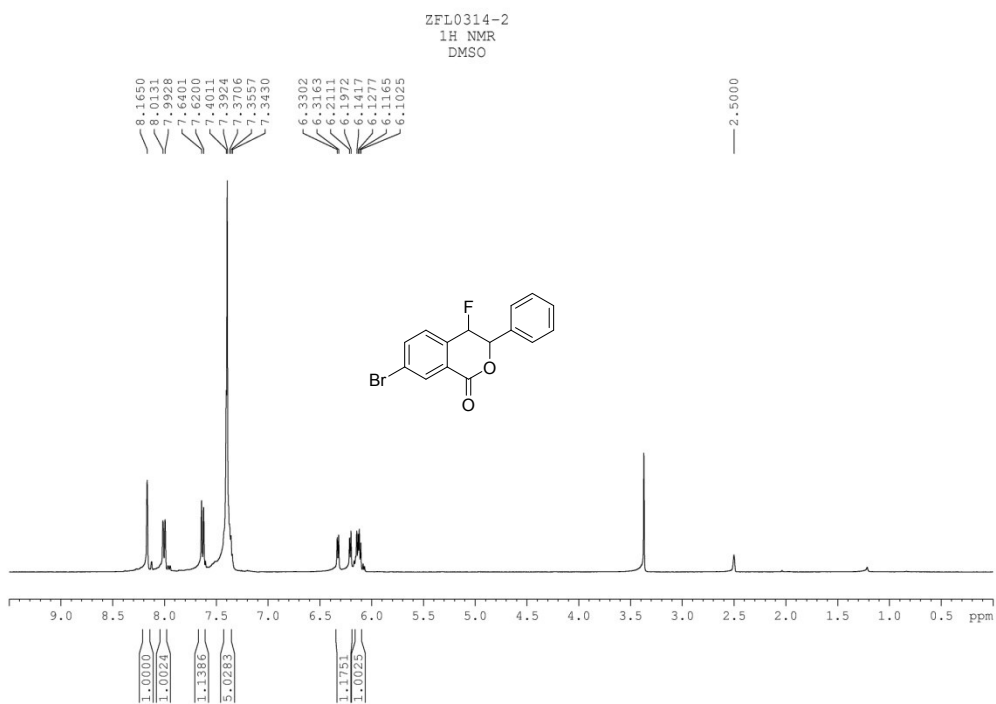


Fig. 25 ¹H NMR spectrum of compound 3i

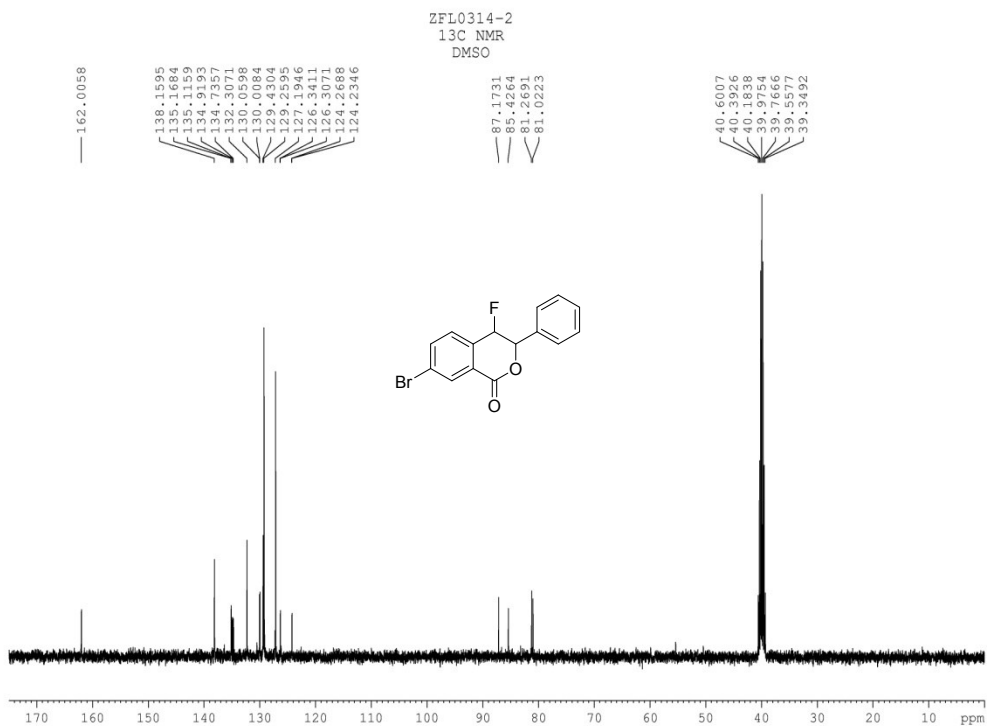


Fig. 26 ¹³C NMR spectrum of compound 3i

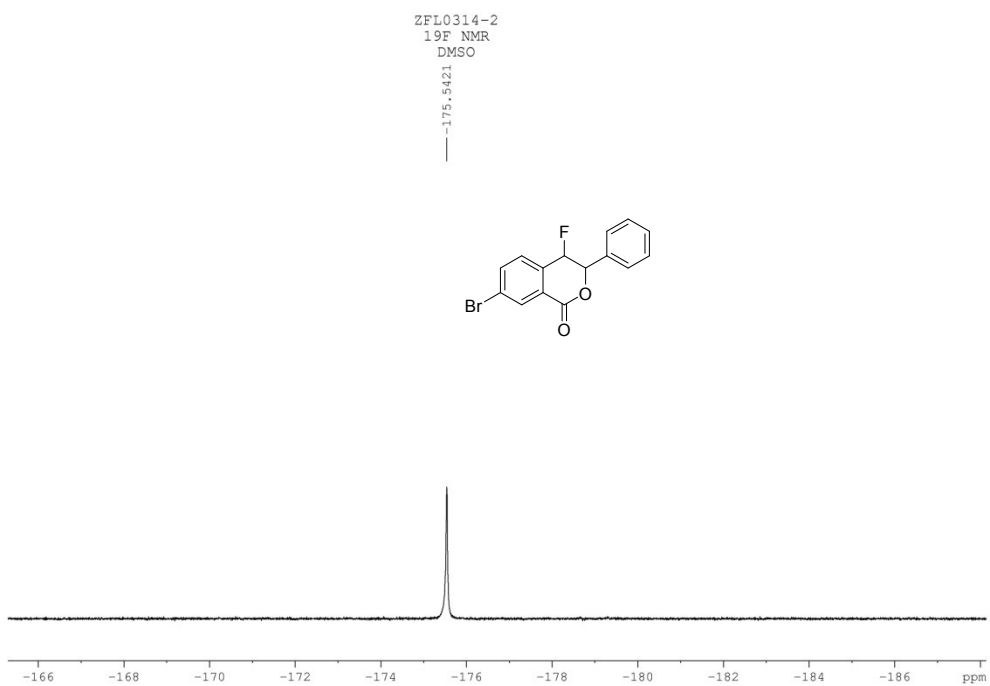


Fig. 27 ¹⁹F NMR spectrum of compound **3i**

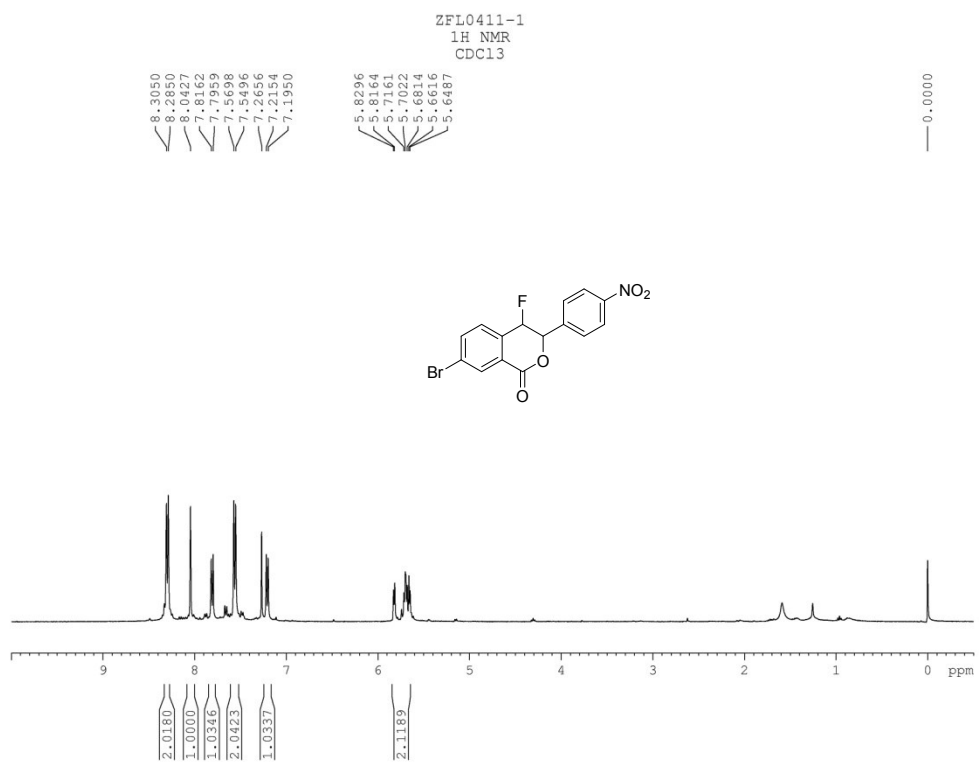


Fig. 28 ¹H NMR spectrum of compound **3j**

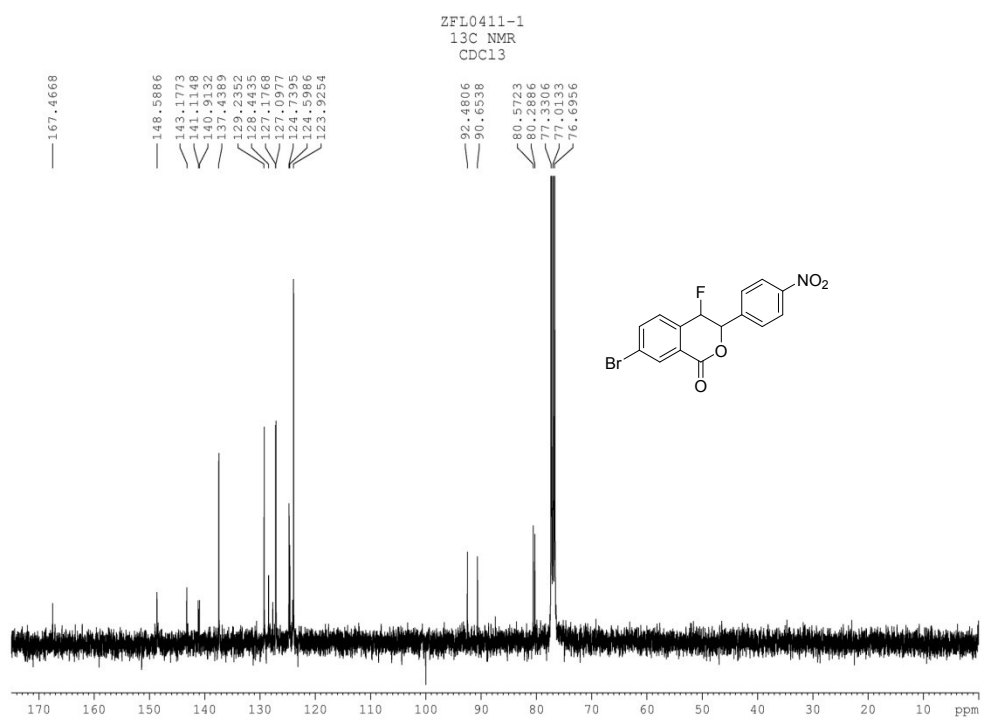


Fig. 29 ¹³C NMR spectrum of compound **3j**

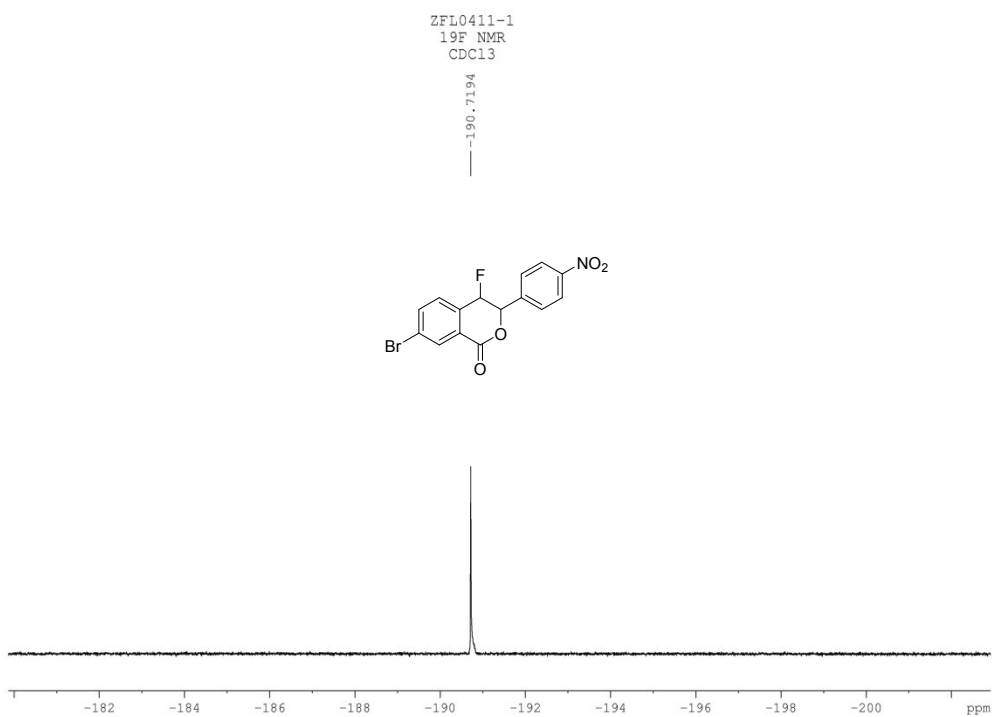


Fig. 30 ¹⁹F NMR spectrum of compound **3j**

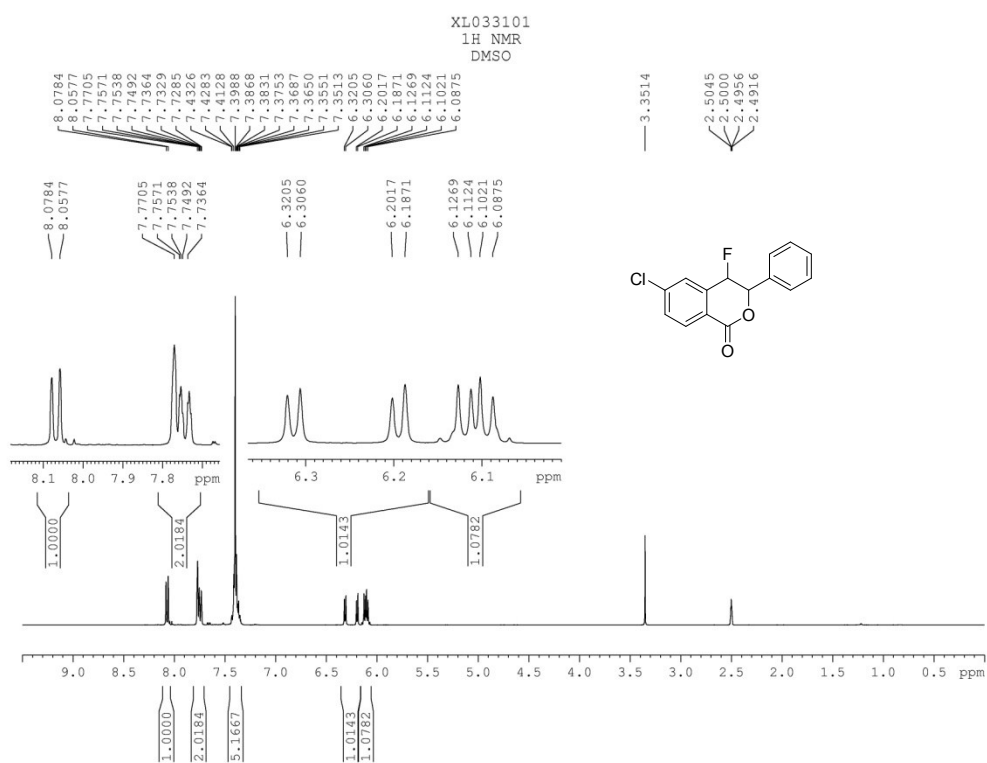


Fig. 31 ¹H NMR spectrum of compound 3k

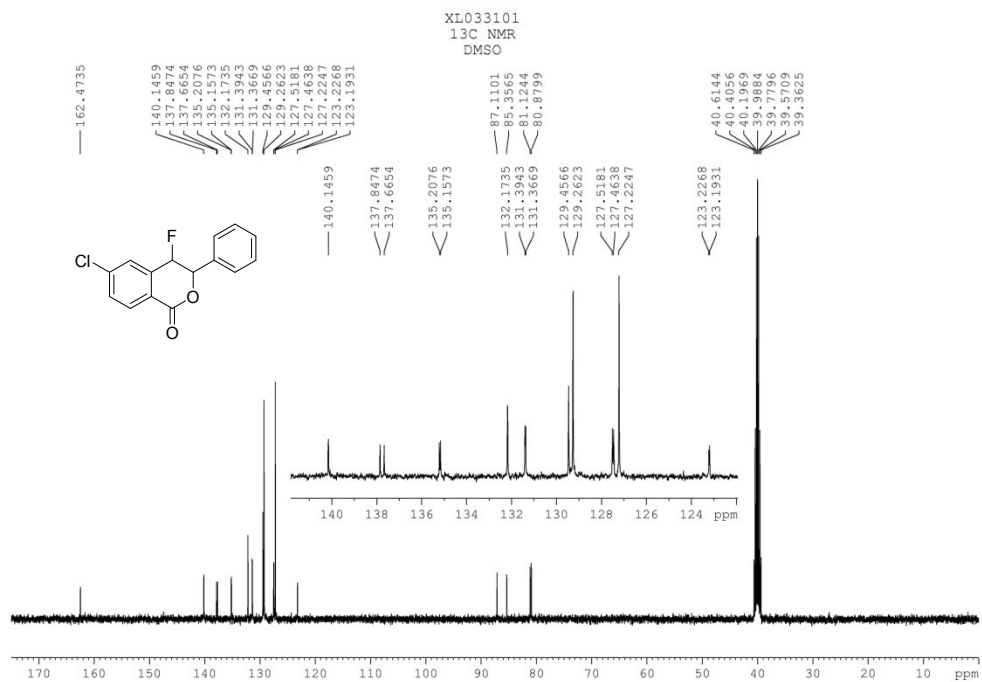


Fig. 32 ¹³C NMR spectrum of compound 3k

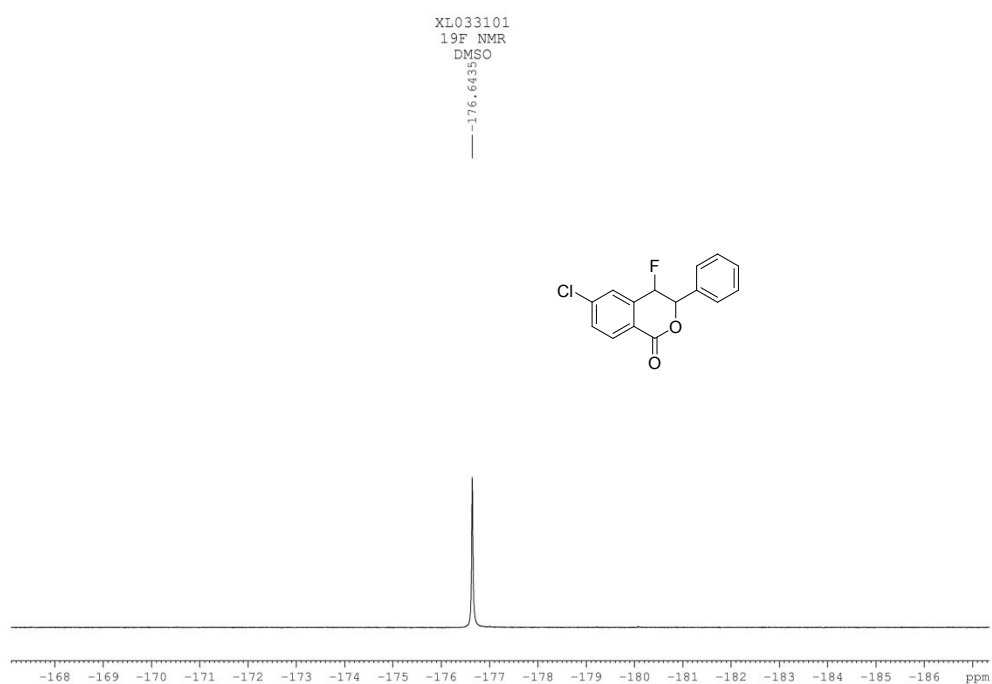


Fig. 33 ^{19}F NMR spectrum of compound **3k**

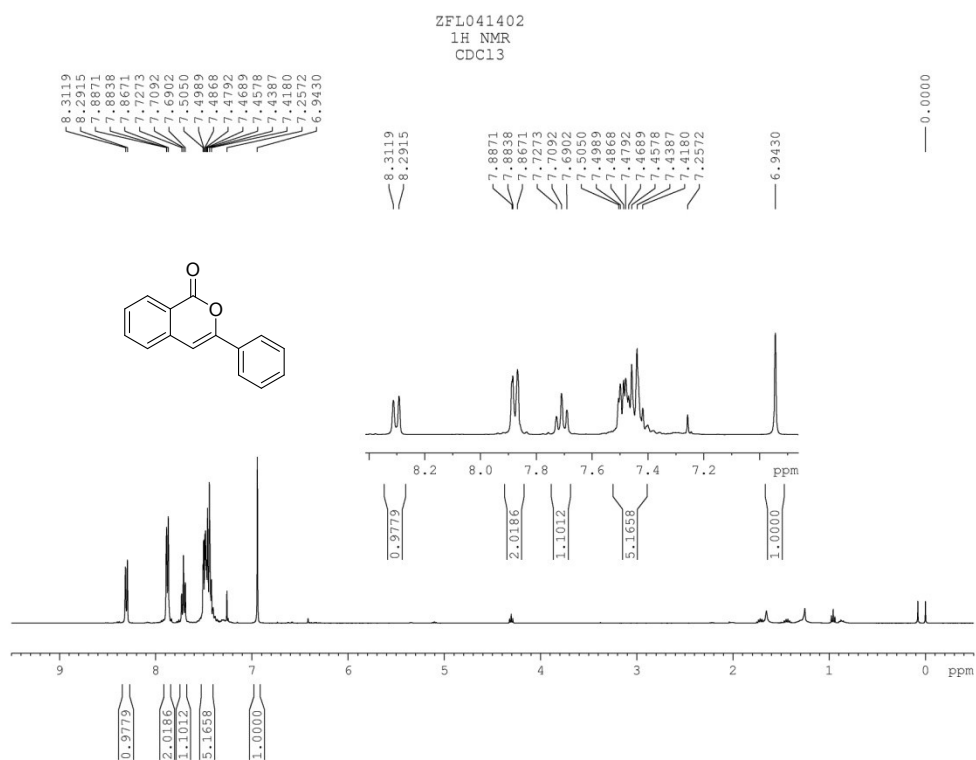


Fig. 34 ^1H NMR spectrum of compound **4a**

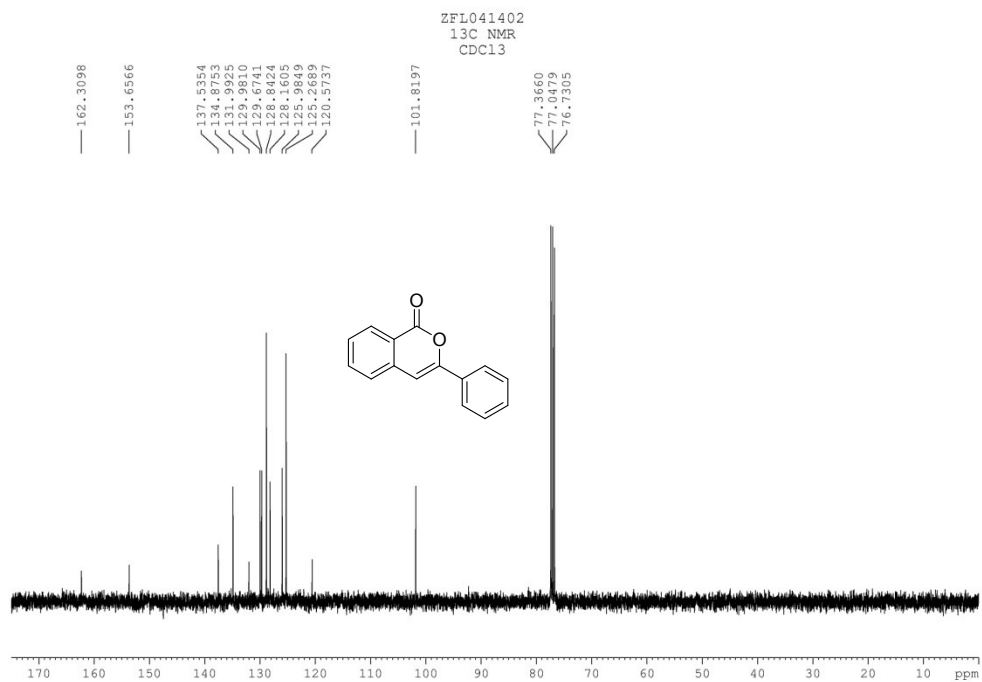


Fig. 35 ¹³C NMR spectrum of compound 4a

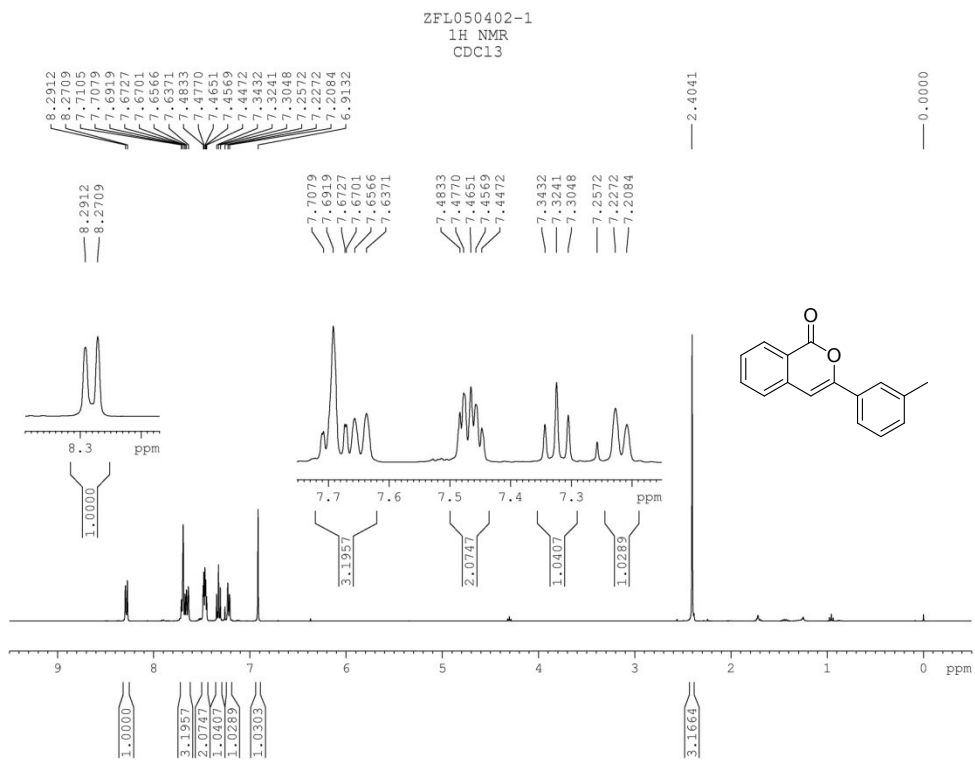


Fig. 36 ¹H NMR spectrum of compound 4b

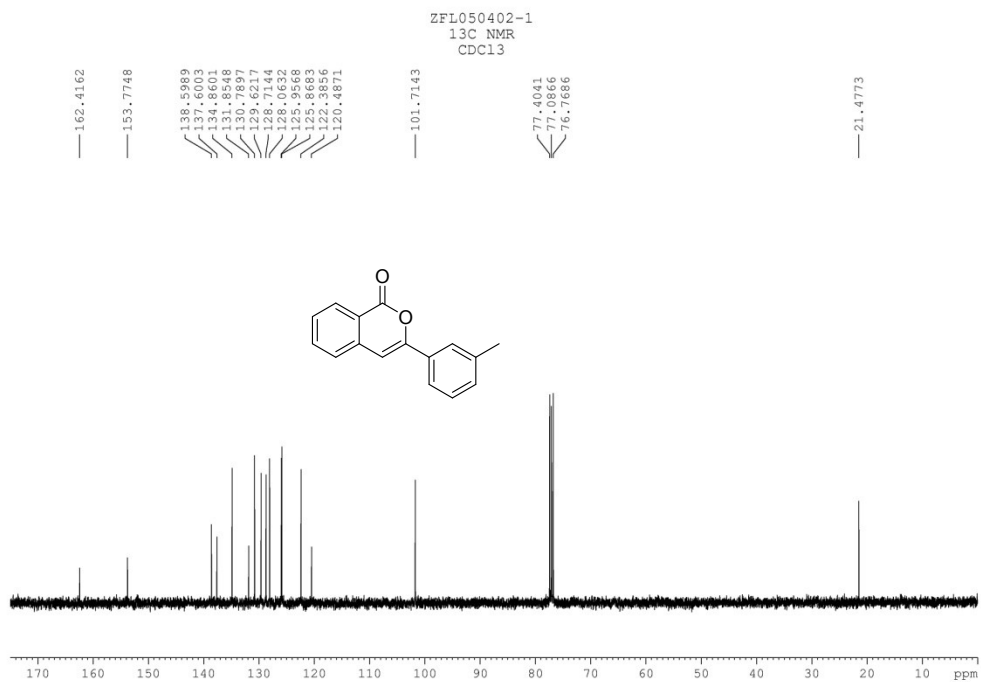


Fig. 37 ¹³C NMR spectrum of compound 4b

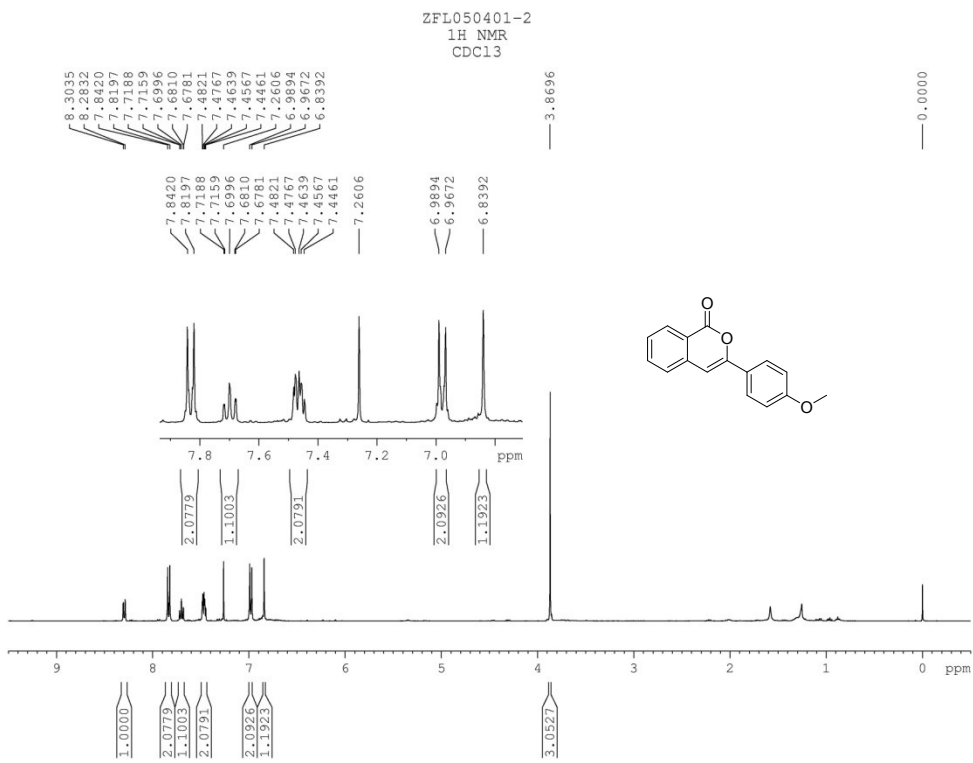


Fig. 38 ¹H NMR spectrum of compound 4c

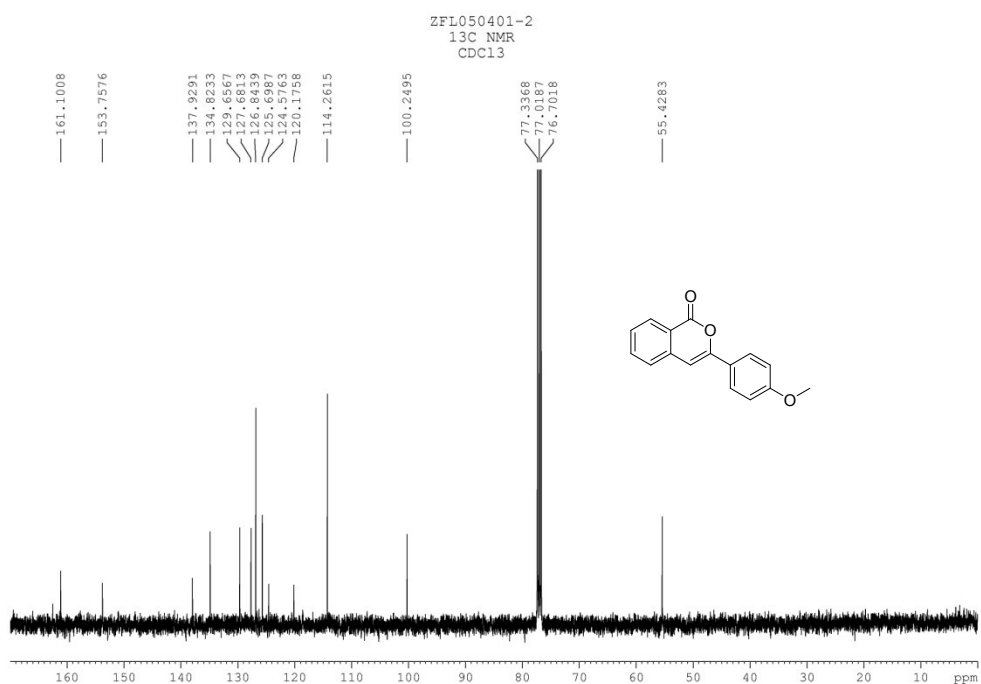


Fig. 39 ¹³C NMR spectrum of compound 4c

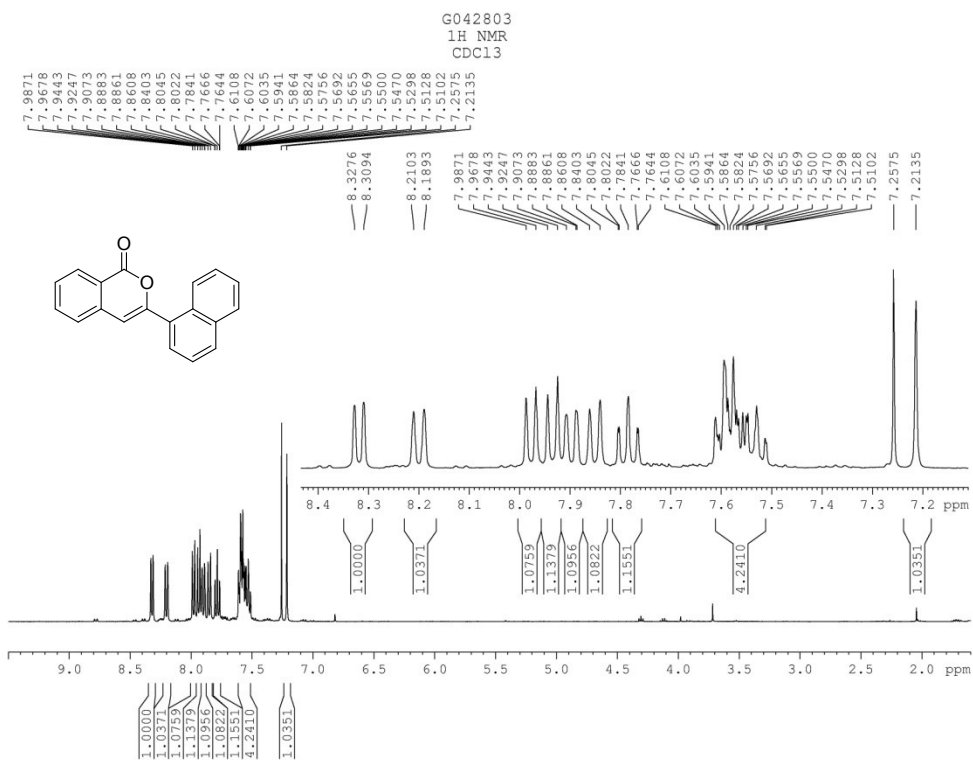


Fig. 40 ¹H NMR spectrum of compound 4d

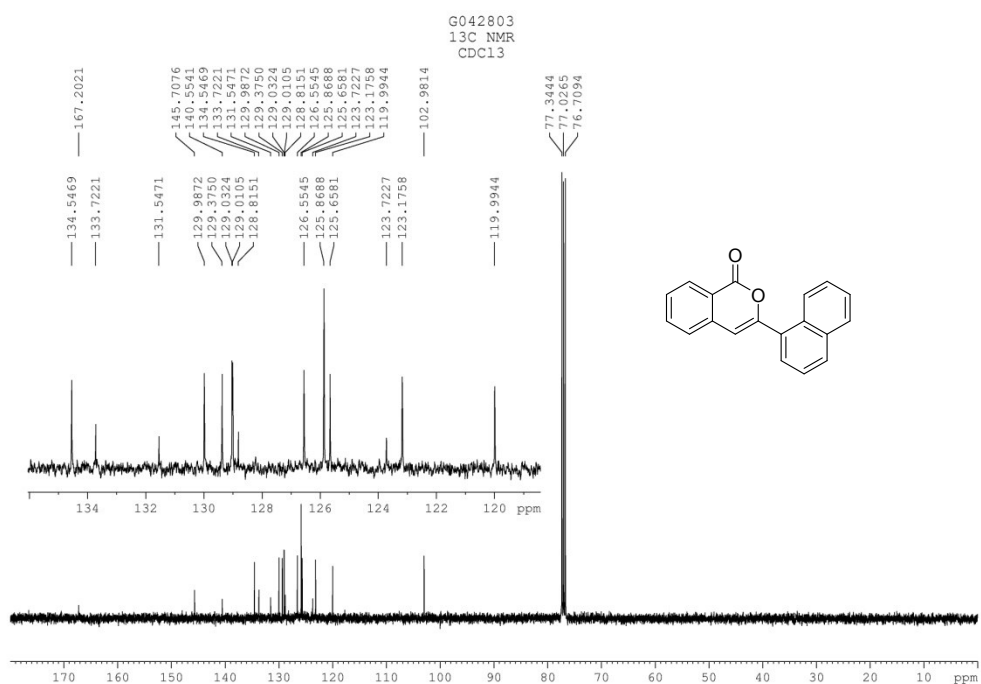


Fig. 41 ¹³C NMR spectrum of compound 4d

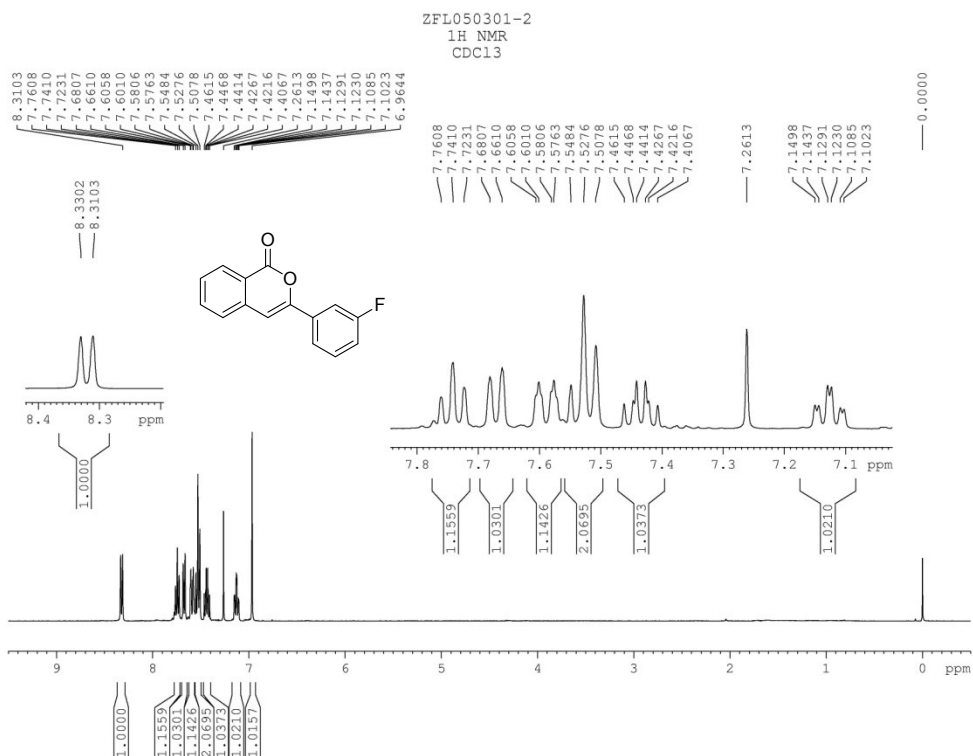


Fig. 42 ¹H NMR spectrum of compound 4e

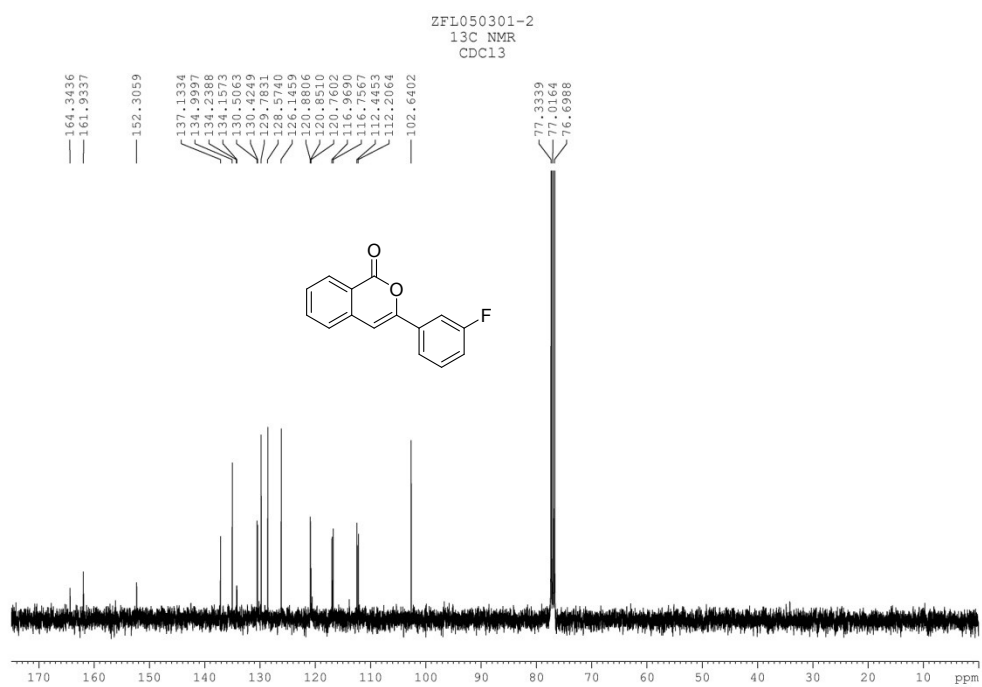


Fig. 43 ¹³C NMR spectrum of compound **4e**

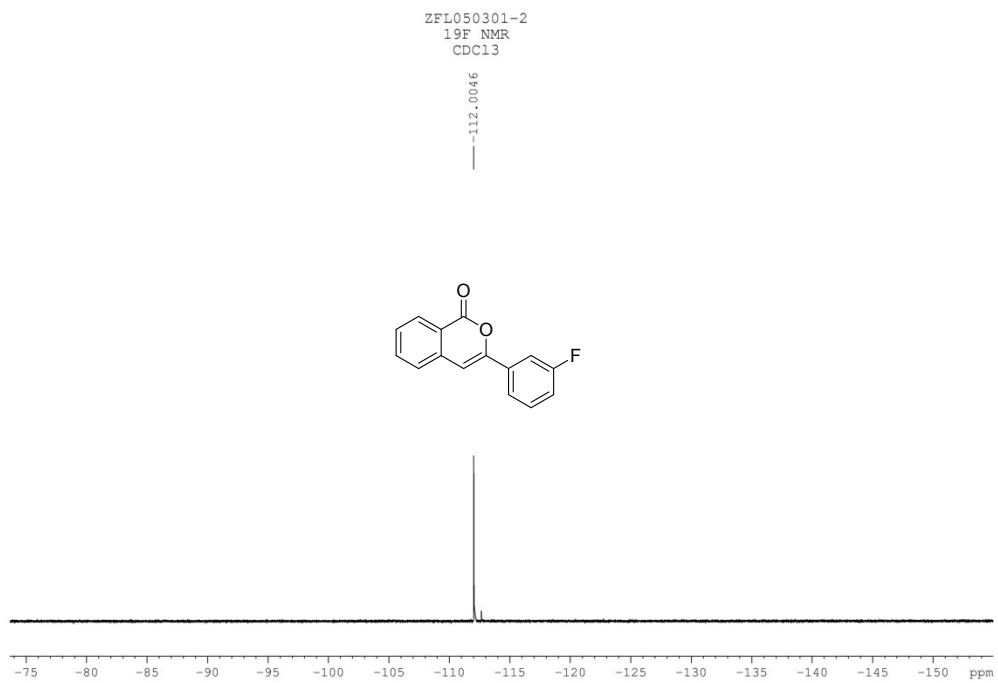


Fig. 44 ¹⁹F NMR spectrum of compound **4e**

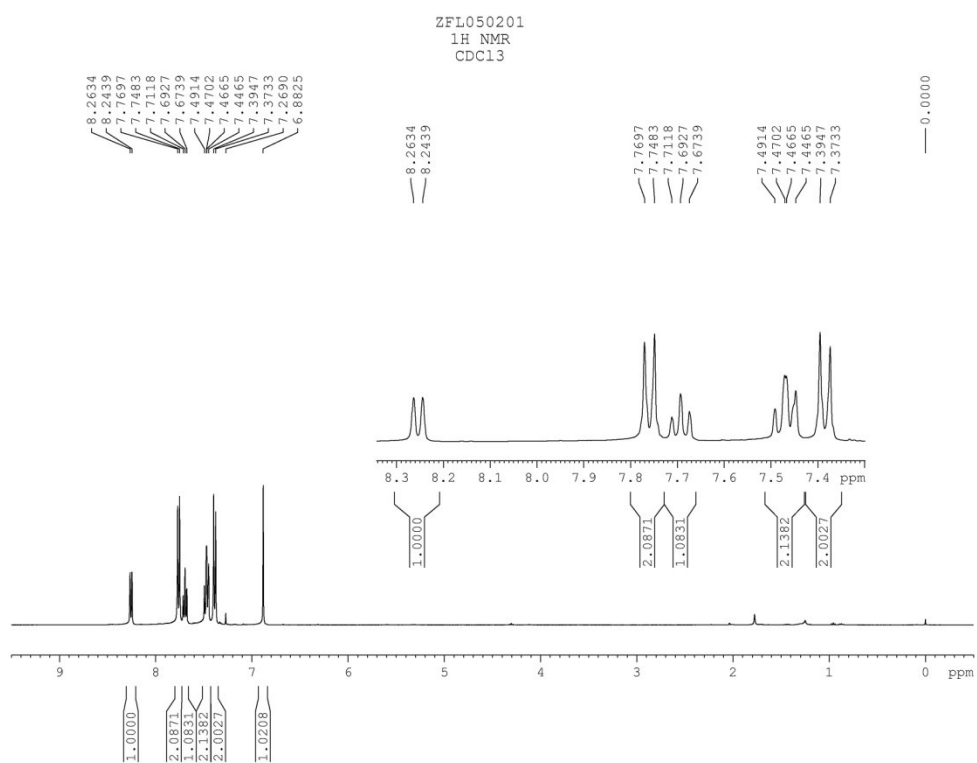


Fig. 45 ^1H NMR spectrum of compound 4f

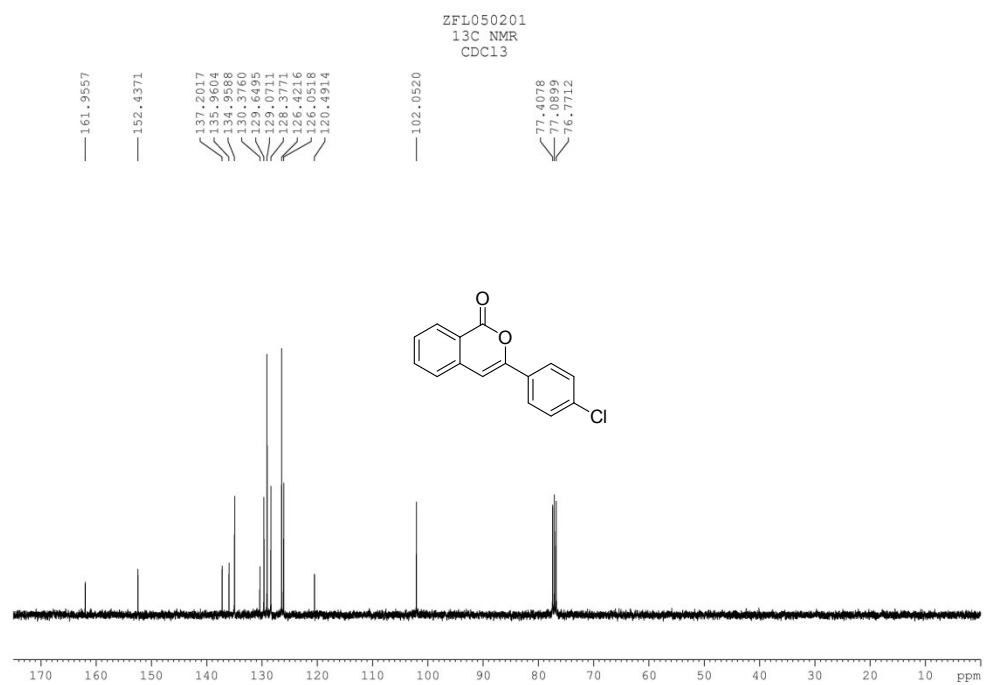


Fig. 46 ^{13}C NMR spectrum of compound 4f

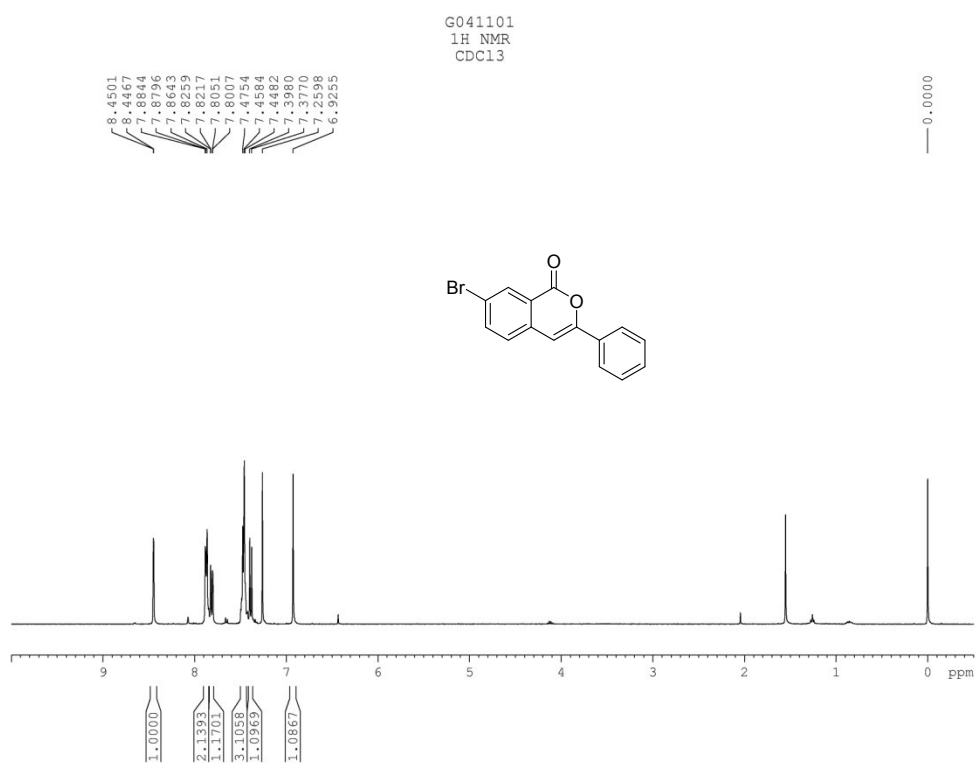


Fig. 47 ^1H NMR spectrum of compound **4g**

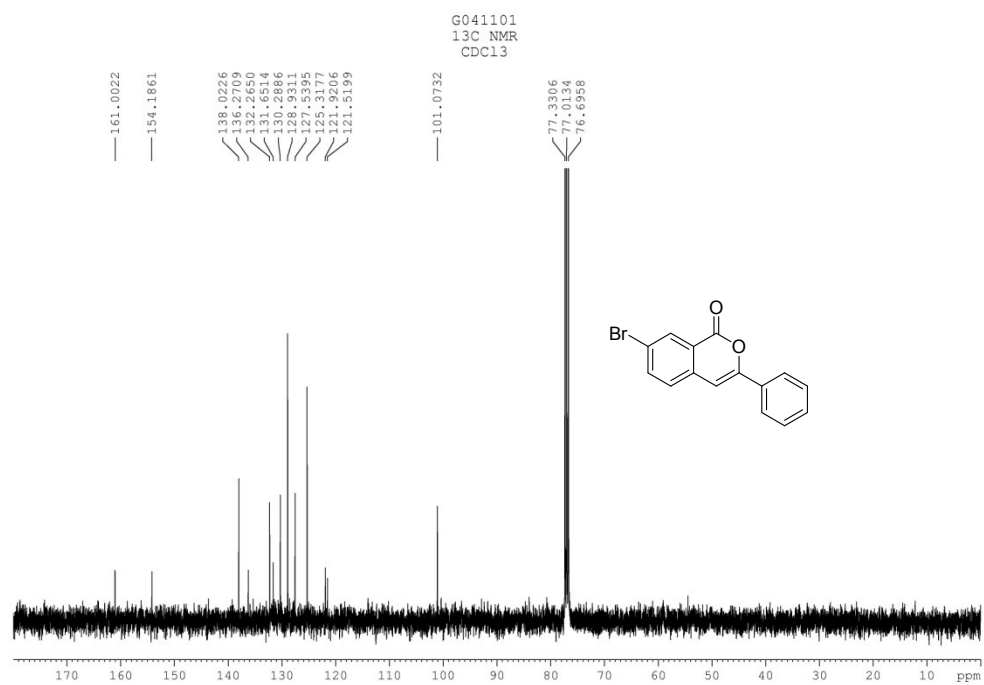


Fig. 48 ^{13}C NMR spectrum of compound **4g**