

Synthesis of methyl 2-cyano-3,12-dioxo-18 β -olean-1,9(11)-dien-30-oate analogues to determine the active groups of inhibiting cell growth and inducing apoptosis in leukemia cells

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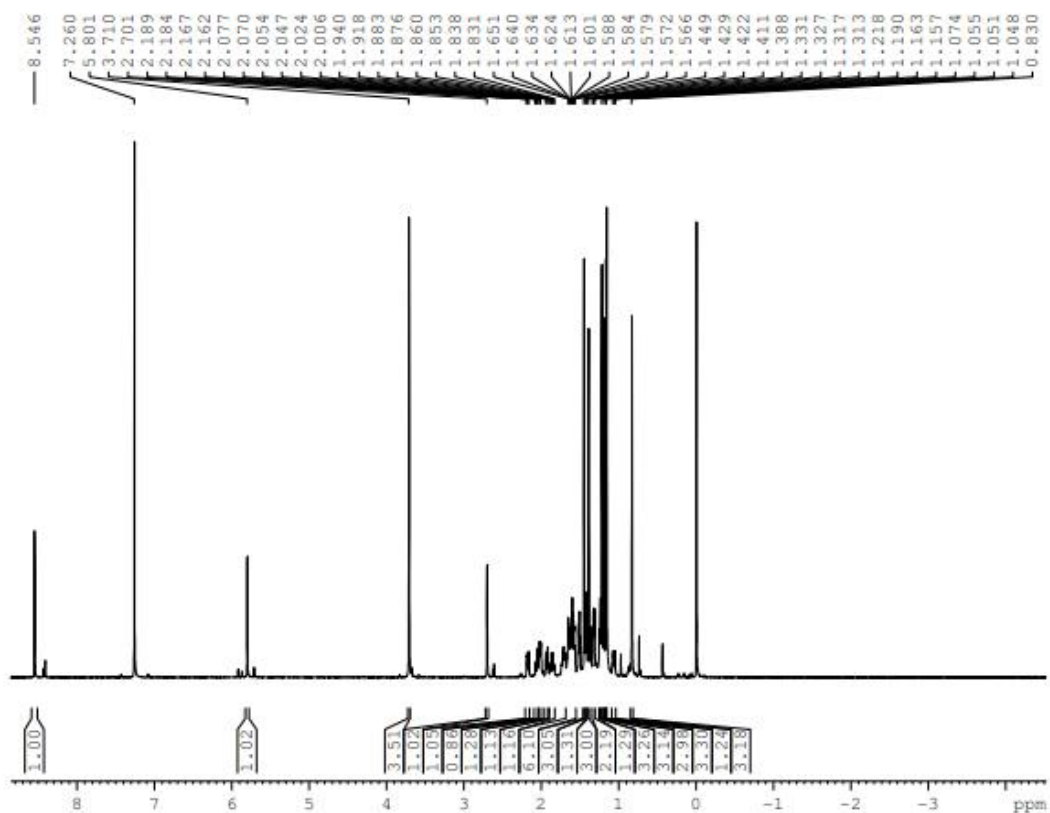
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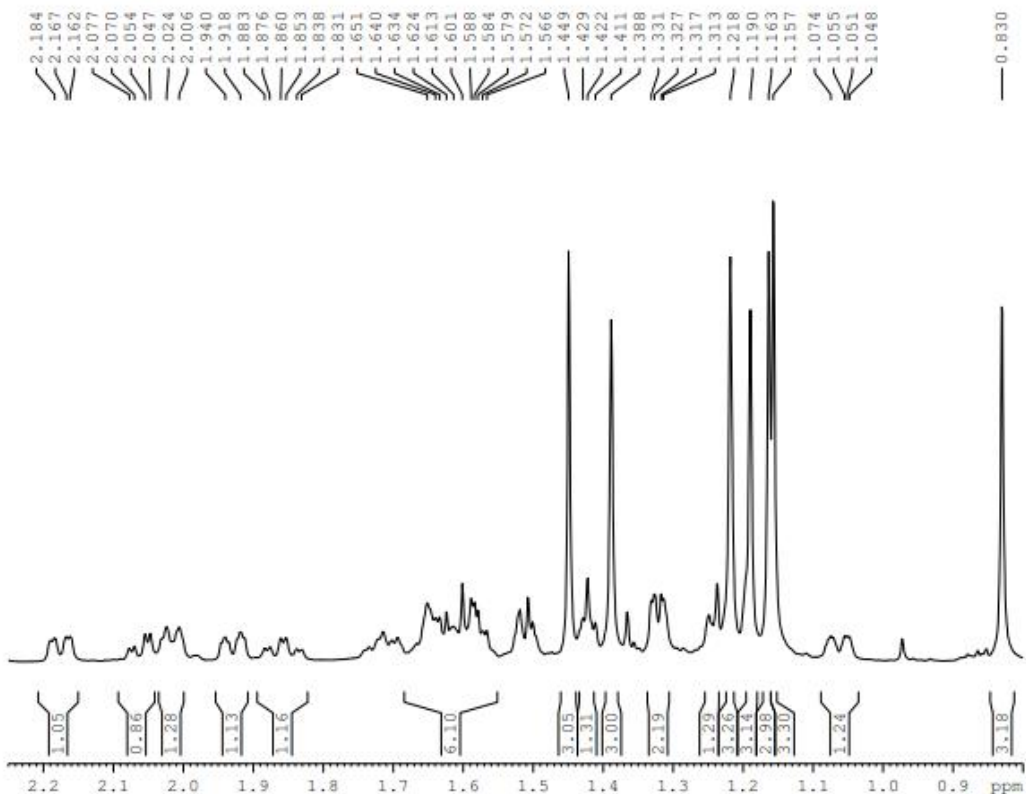
The NMR spectra data of target compounds

Compound 10a.....	2
Compound 10b.....	4
Compound 10c.....	6
Compound 10d.....	8
Compound 10e.....	10
Compound 11a.....	14
Compound 11c.....	16
Compound 11d.....	18
Compound 12.....	20
Compound 13.....	22
Compound 9a.....	24
Compound 9b.....	25
Compound 9c.....	26
Compound 9d.....	27
Compound 5e.....	28
Compound 7c.....	28
Compound 7e.....	29
Compound 8c.....	30
Compound 8e.....	31

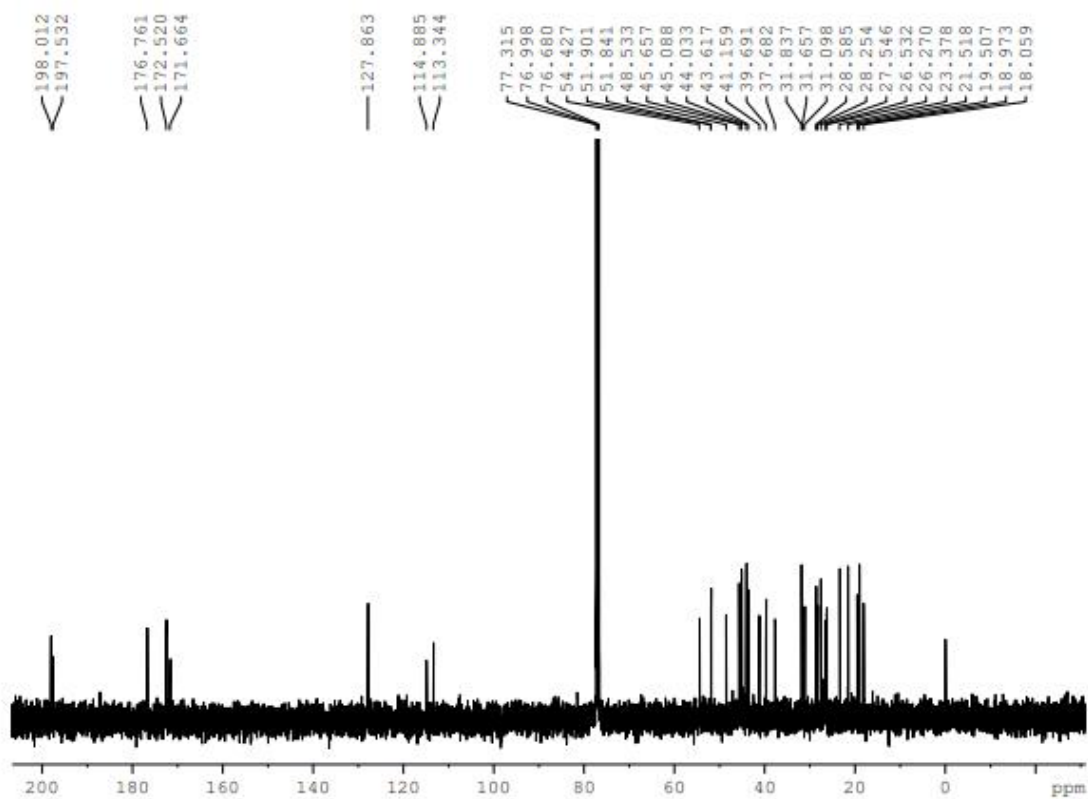
Compound 10a



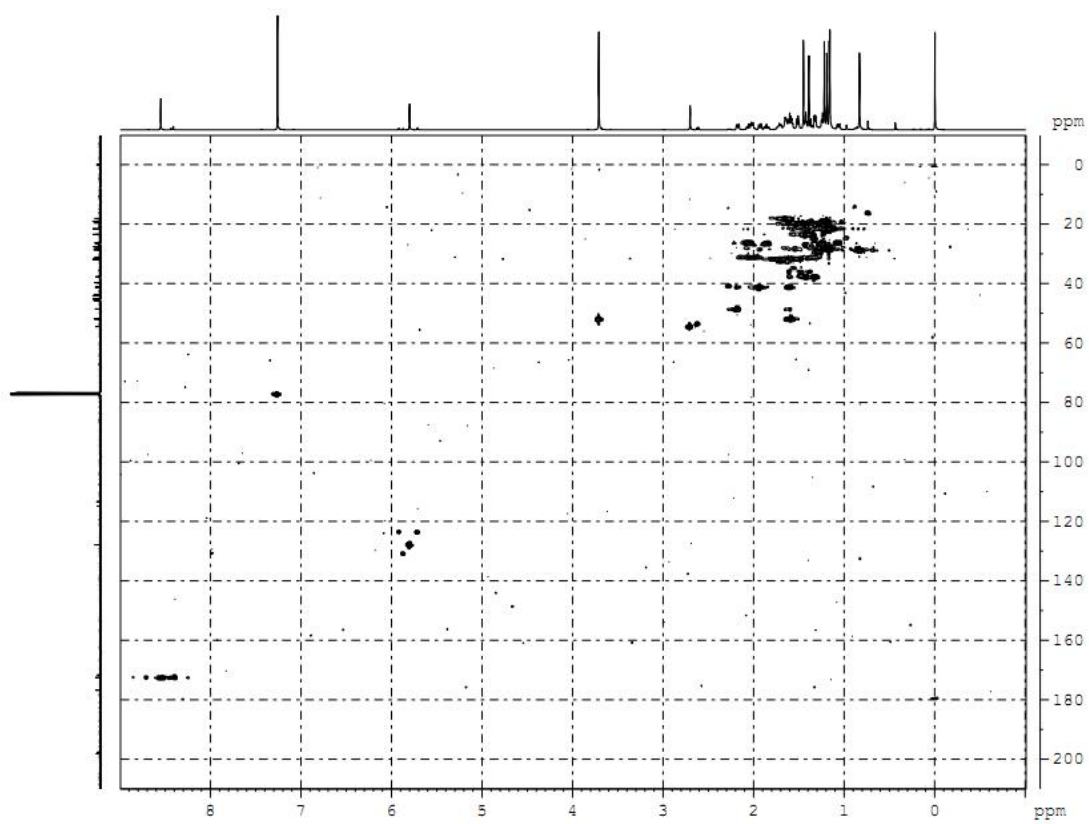
¹H NMR spectra of compound 10a



¹H NMR spectra of compound 10a

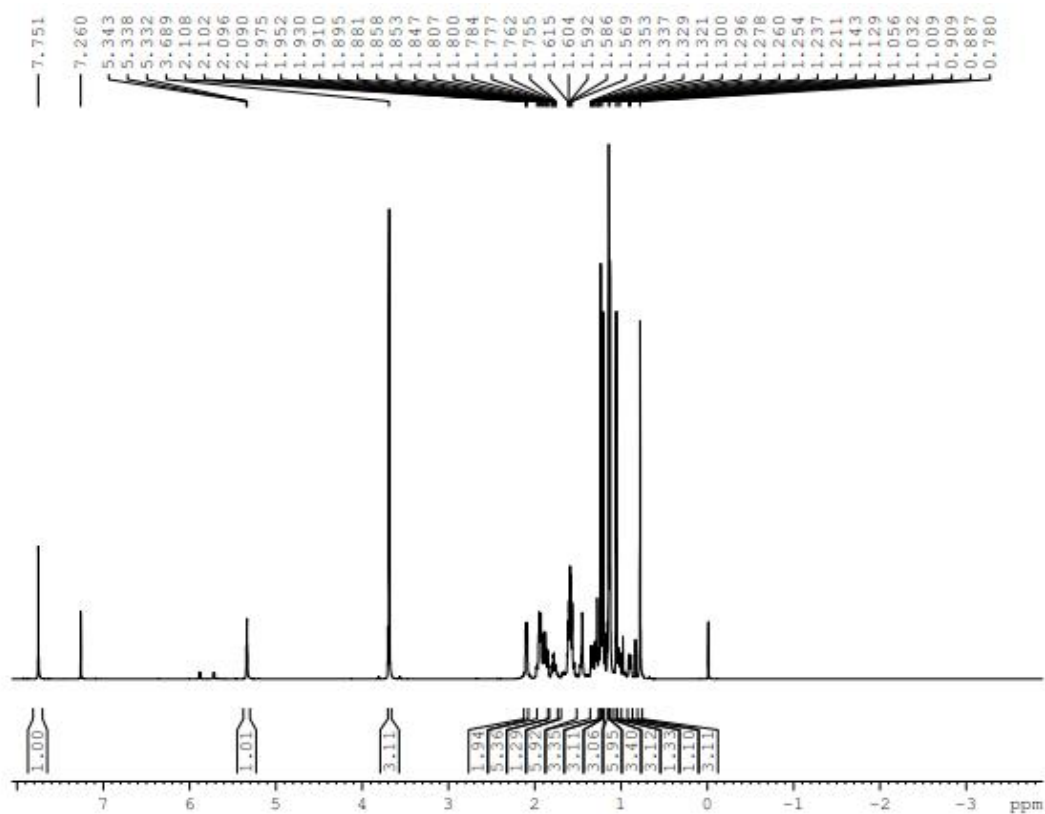


^{13}C NMR spectra of compound **10a**

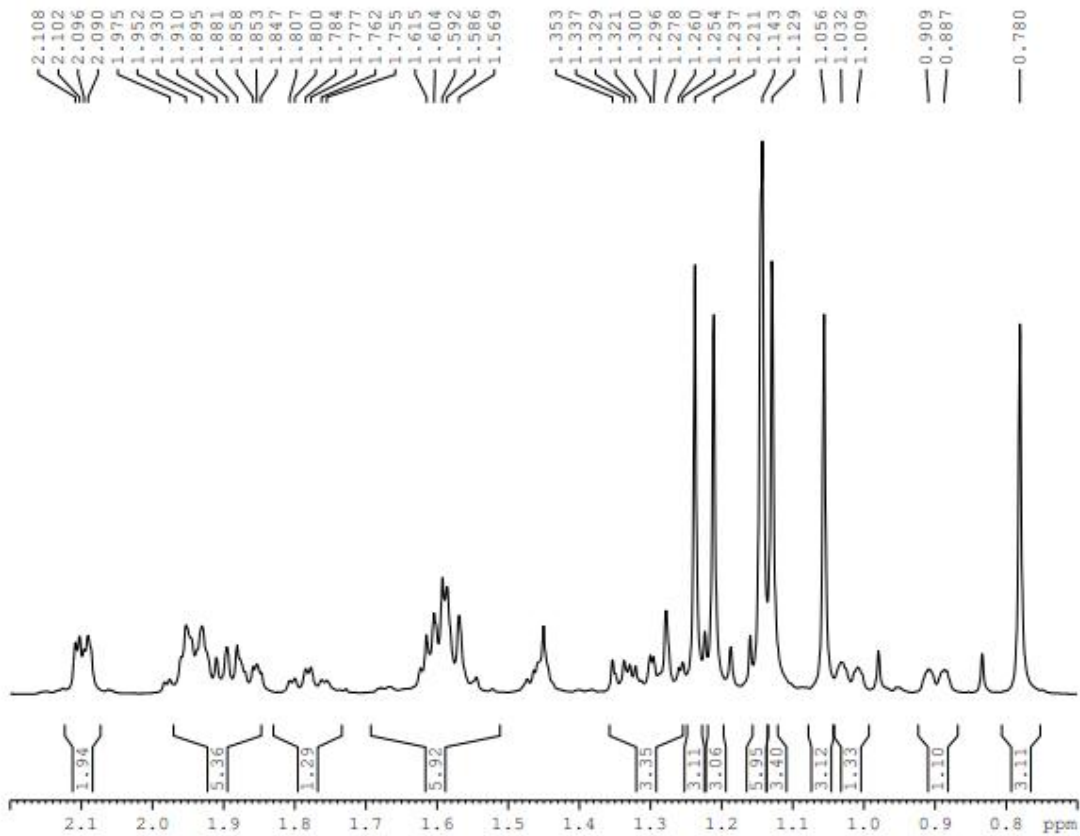


HSQC spectra of compound **10a**

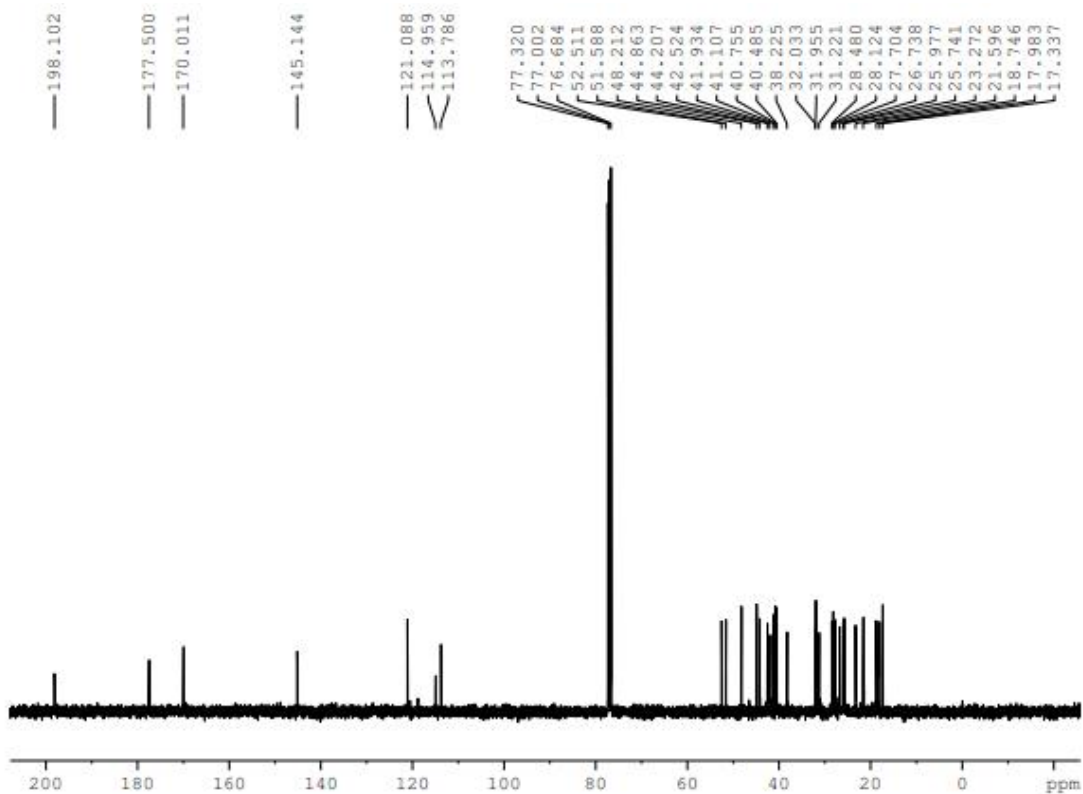
Compound 10b



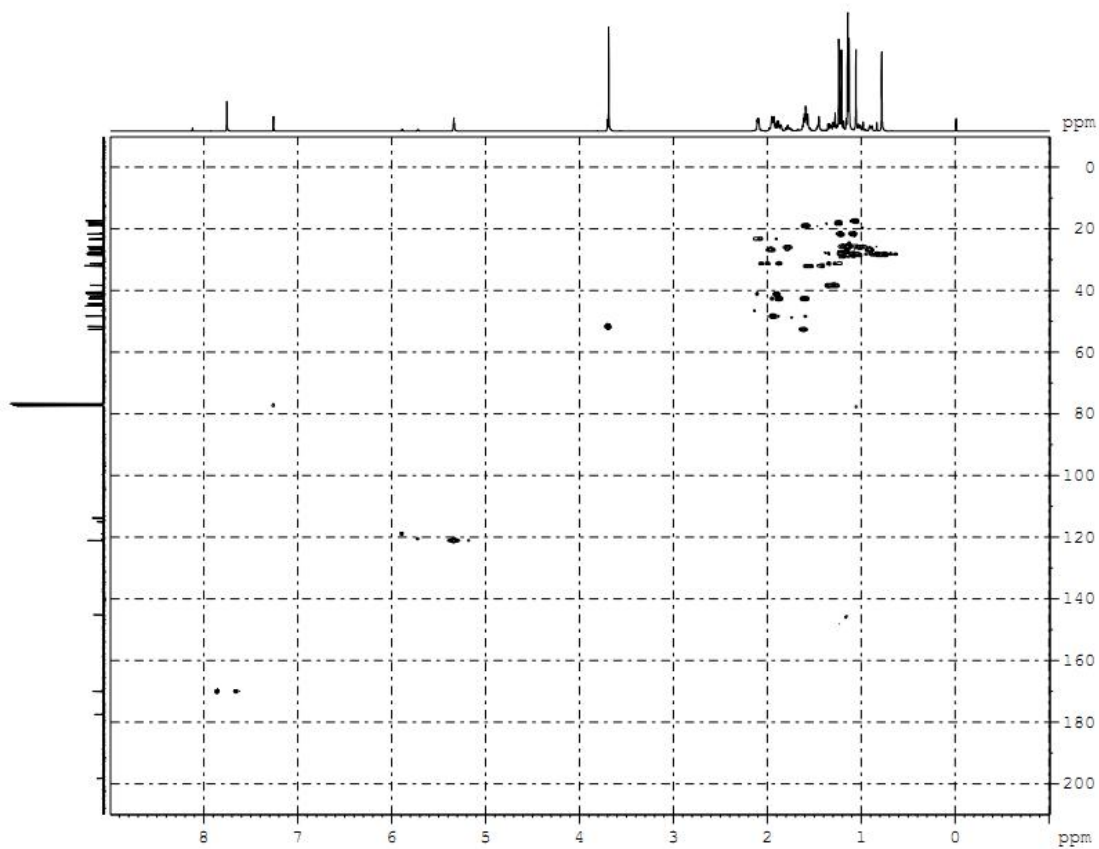
¹H NMR spectra of compound 10b



¹H NMR spectra of compound 10b

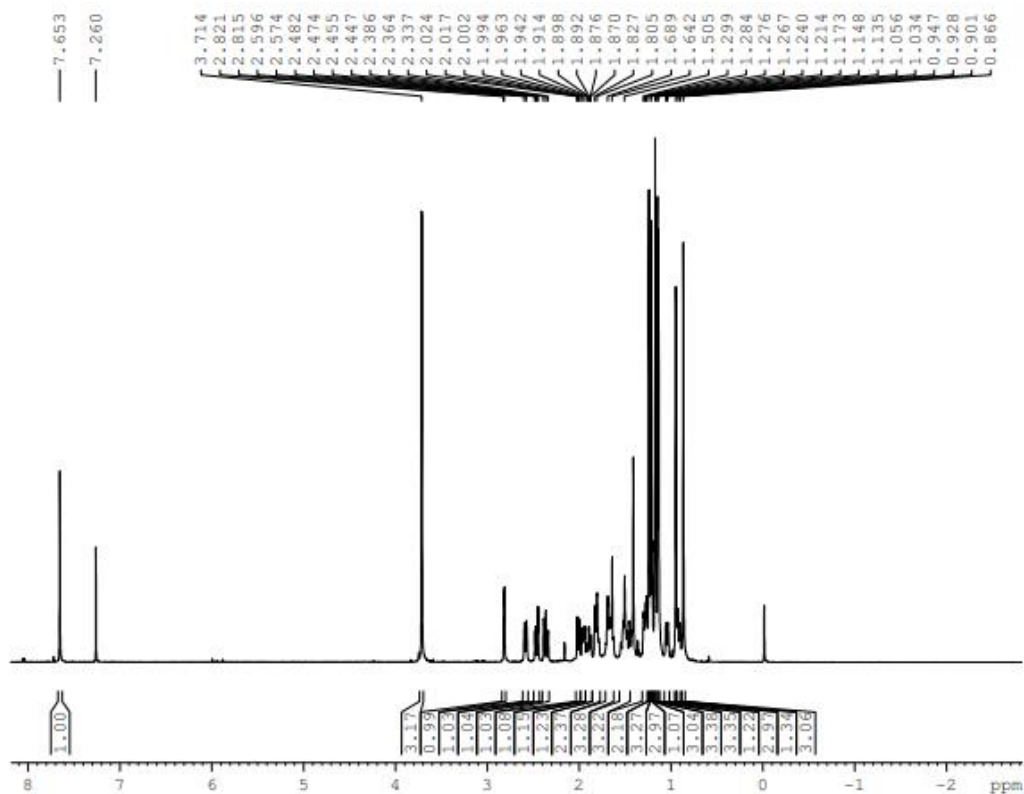


^{13}C NMR spectra of compound **10b**

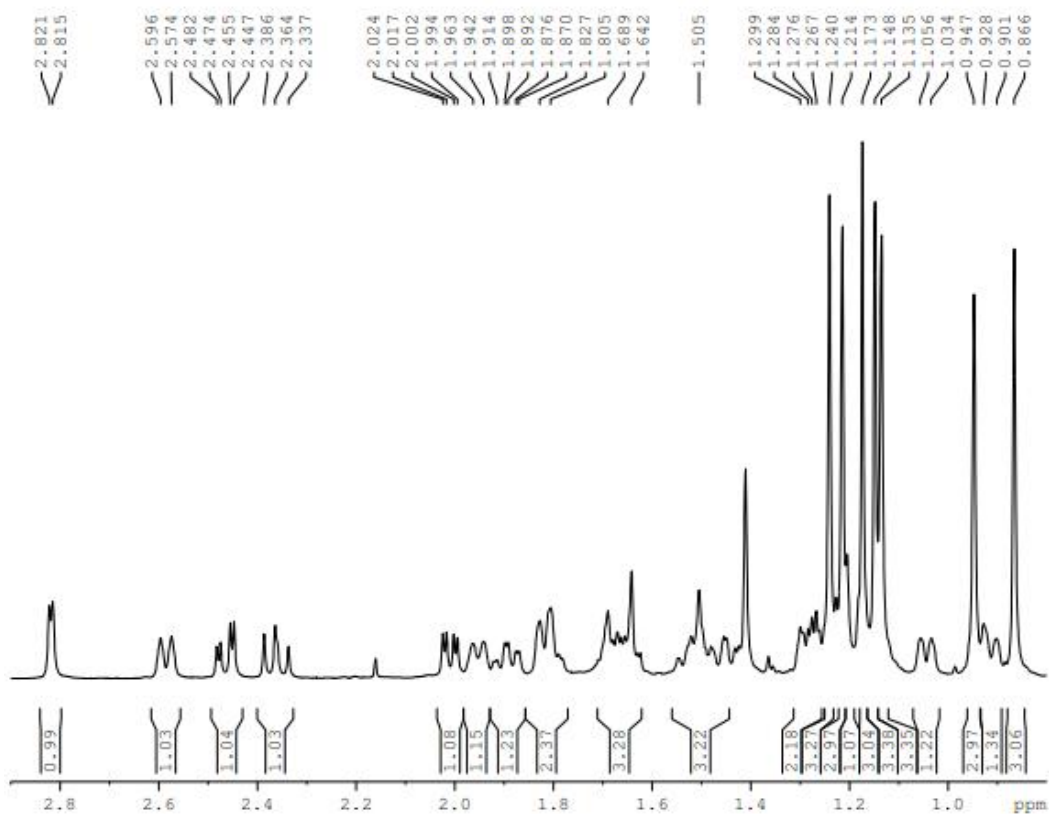


HSQC spectra of compound **10b**

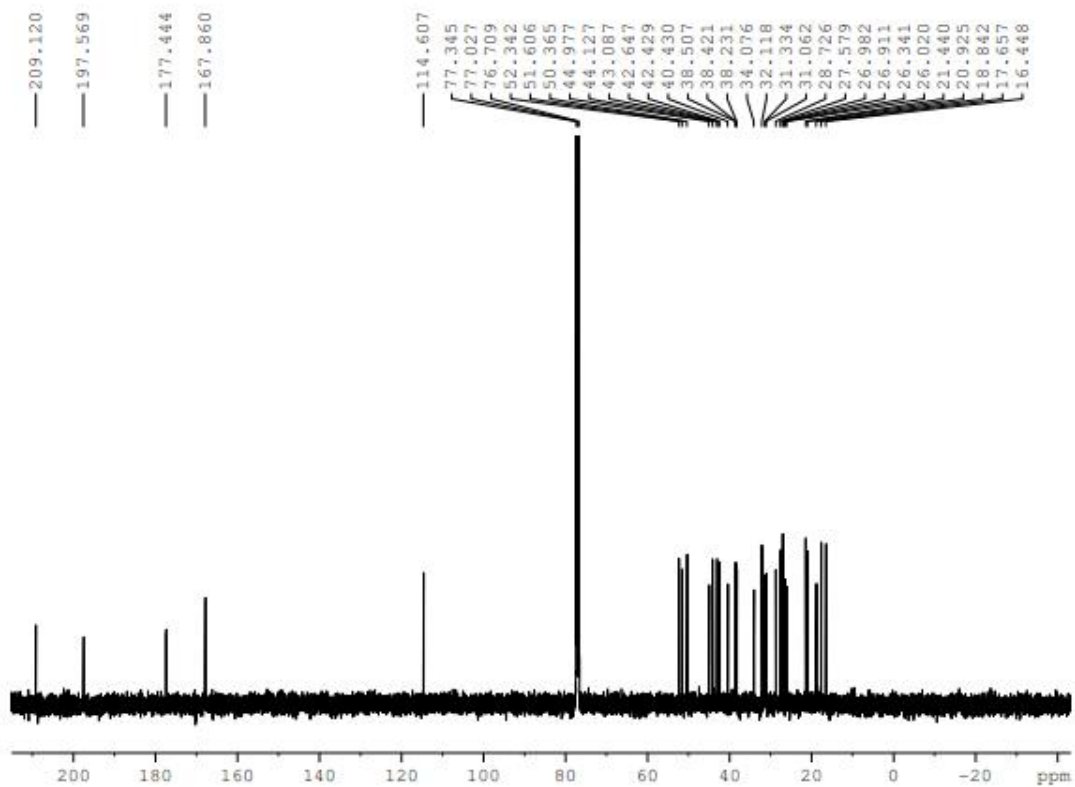
Compound 10c



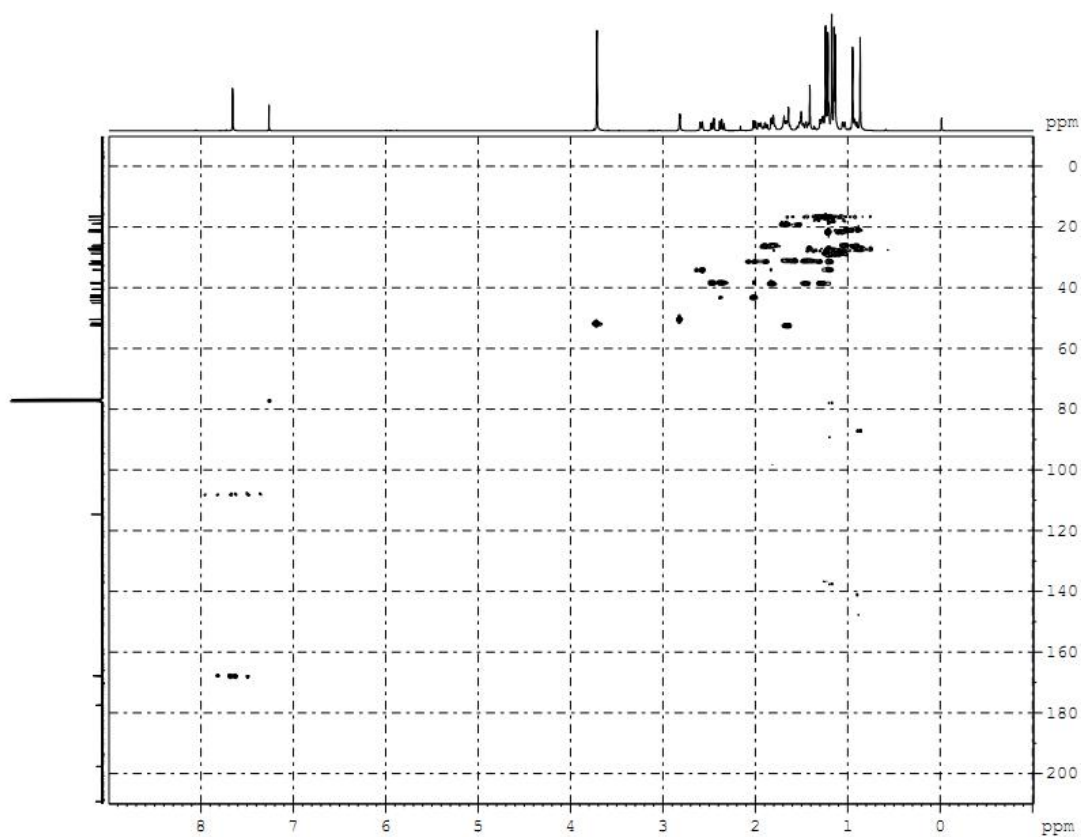
¹H NMR spectra of compound 10c



¹H NMR spectra of compound 10c

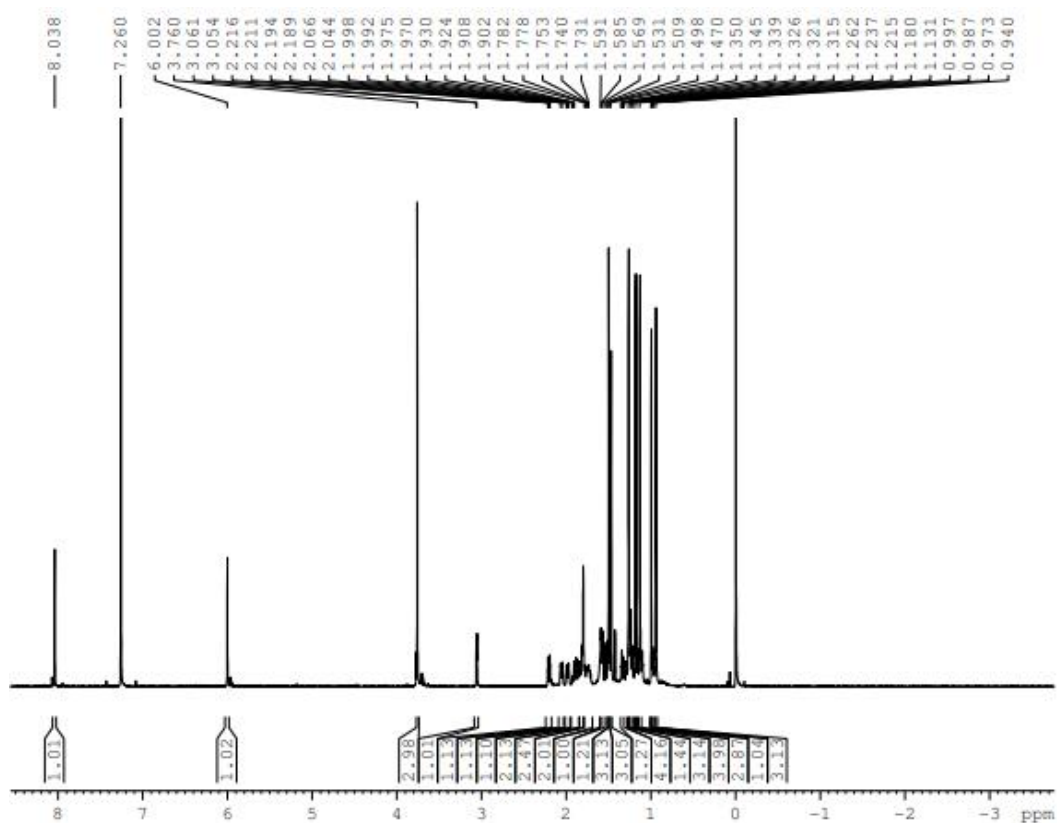


¹³C NMR spectra of compound 10c

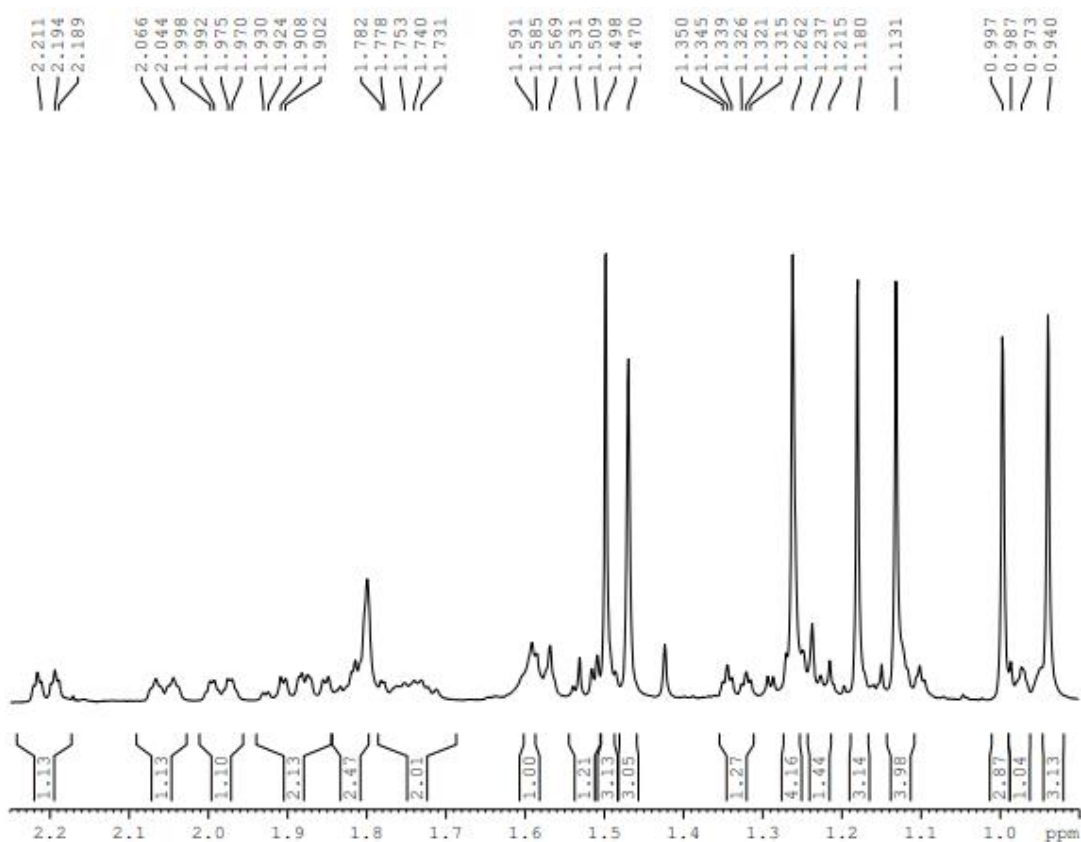


HSQC spectra of compound 10c

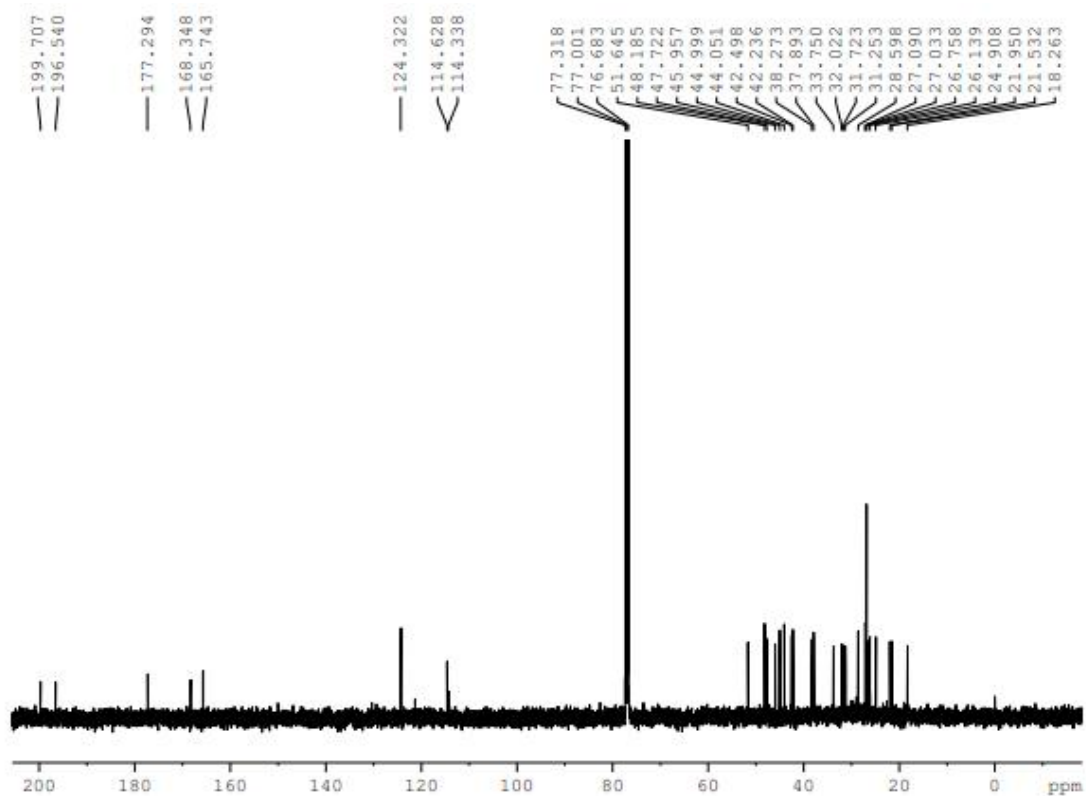
Compound 10d



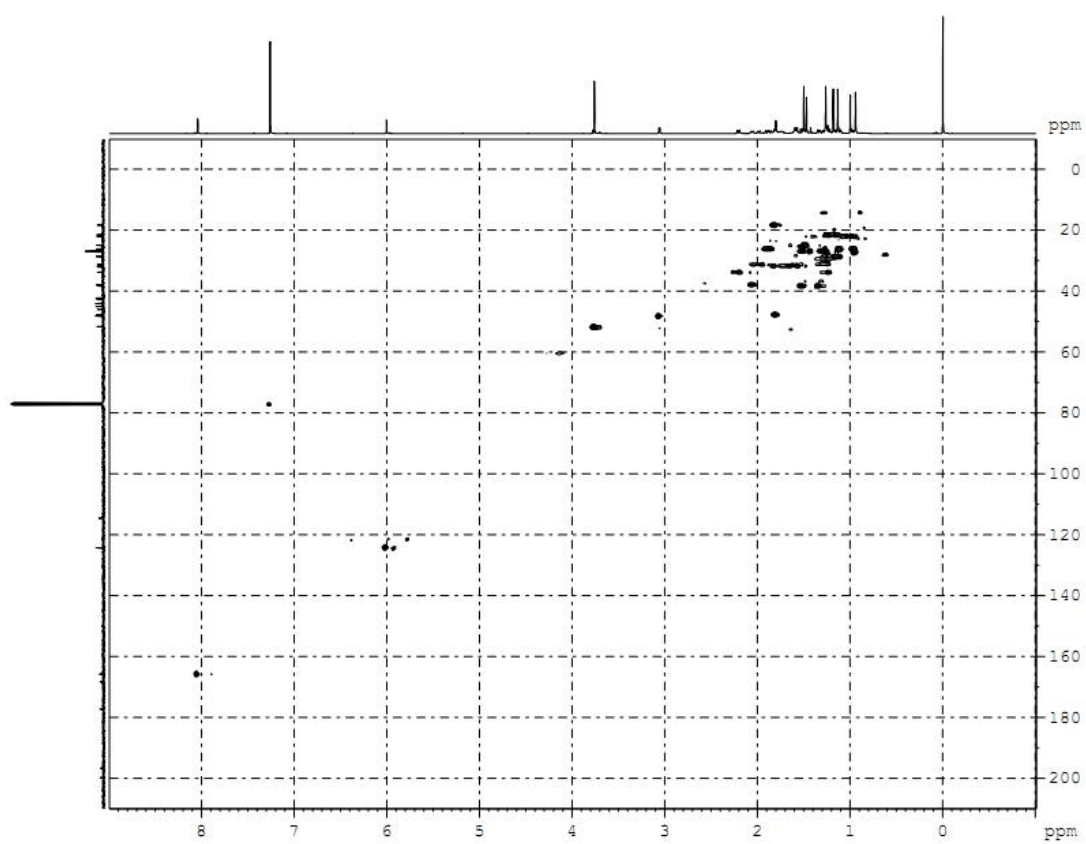
¹H NMR spectra of compound 10d



¹H NMR spectra of compound 10d

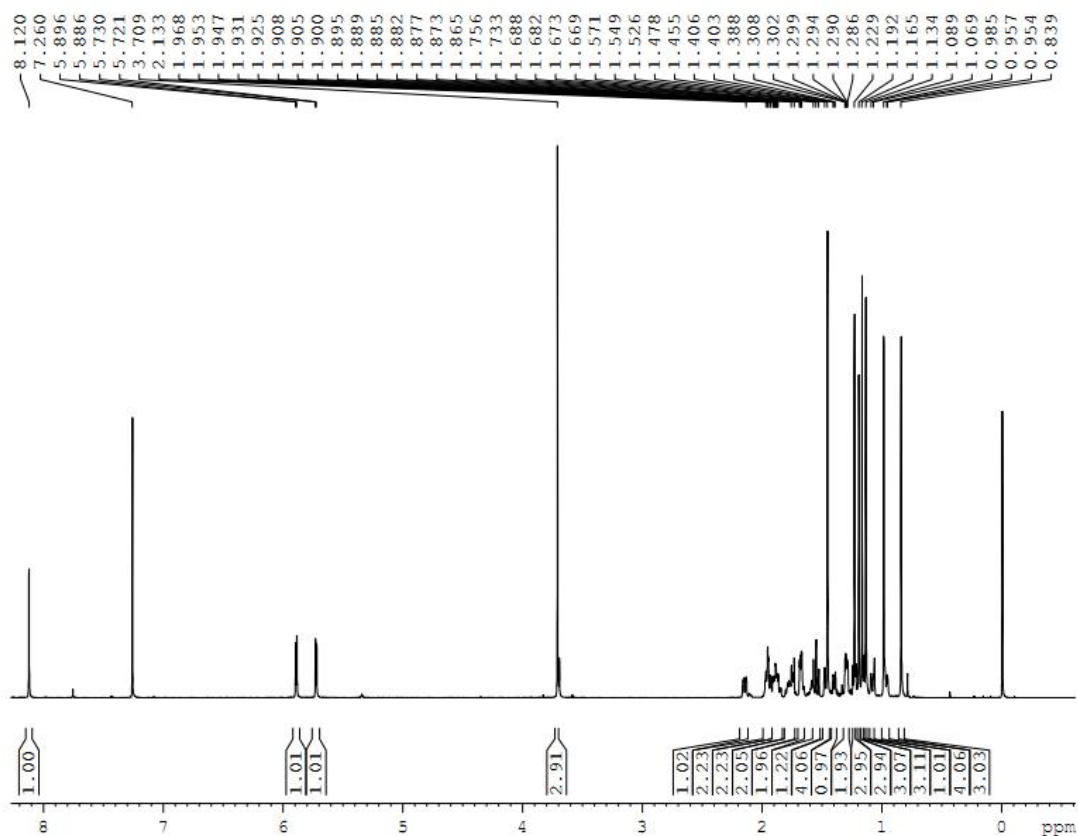


^{13}C NMR spectra of compound **10d**

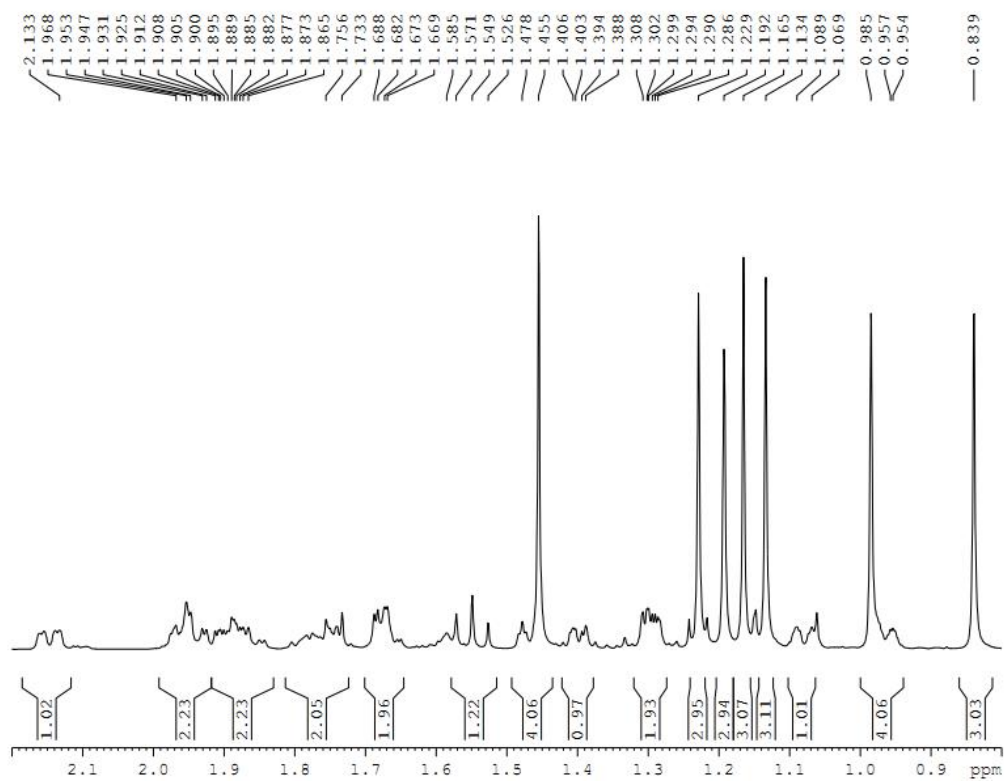


HSQC spectra of compound **10d**

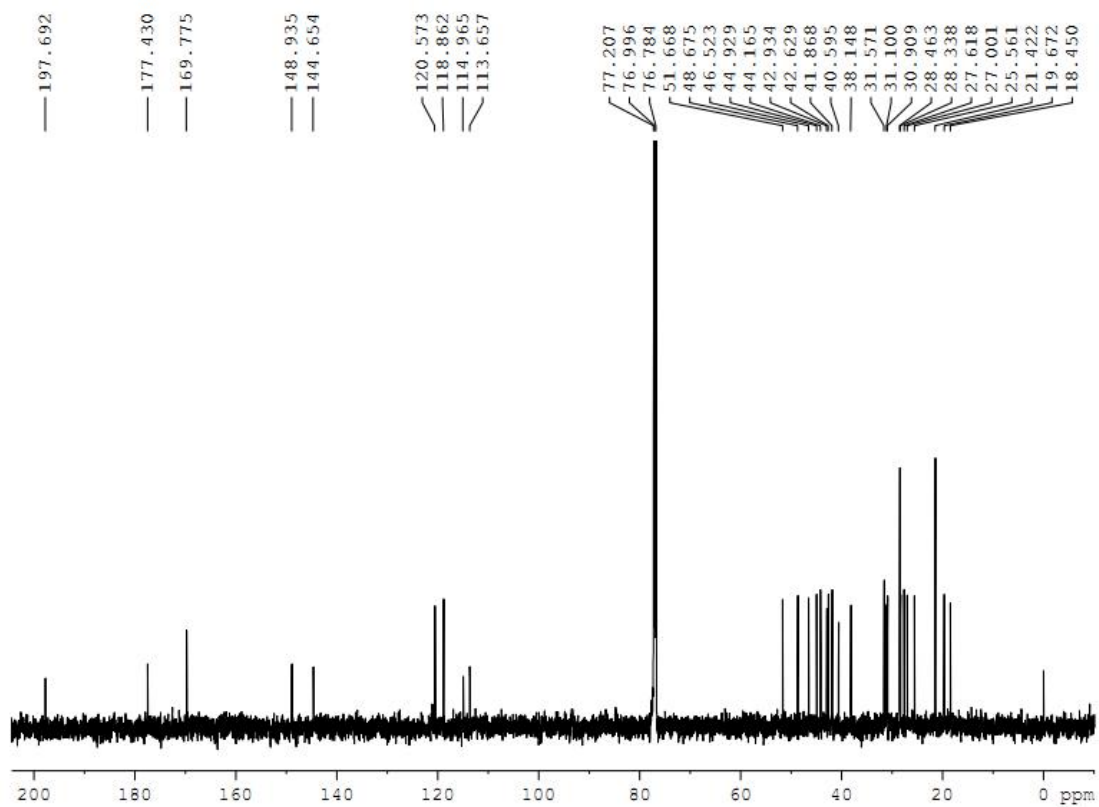
Compound 10e



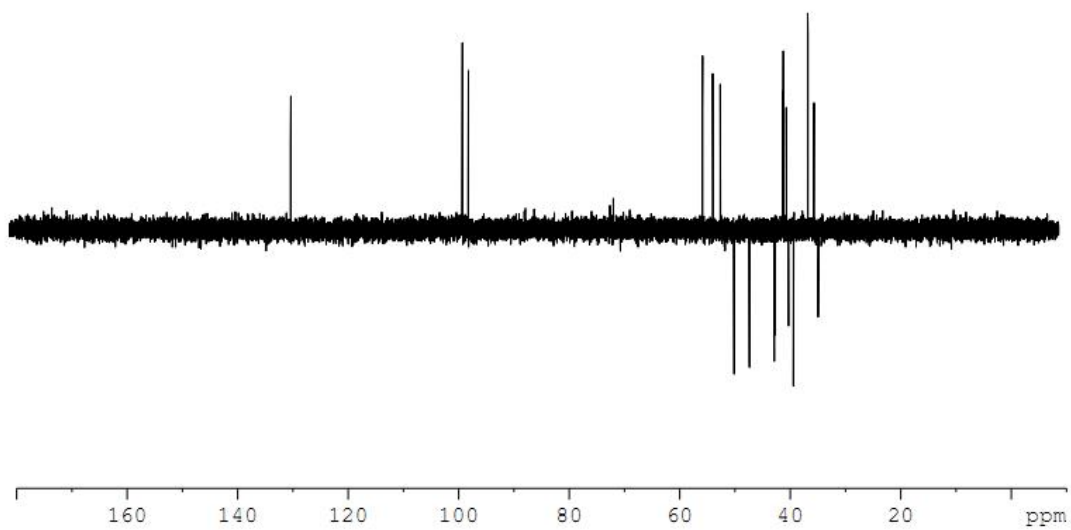
¹H NMR spectra of compound 10e



¹H NMR spectra of compound 10e

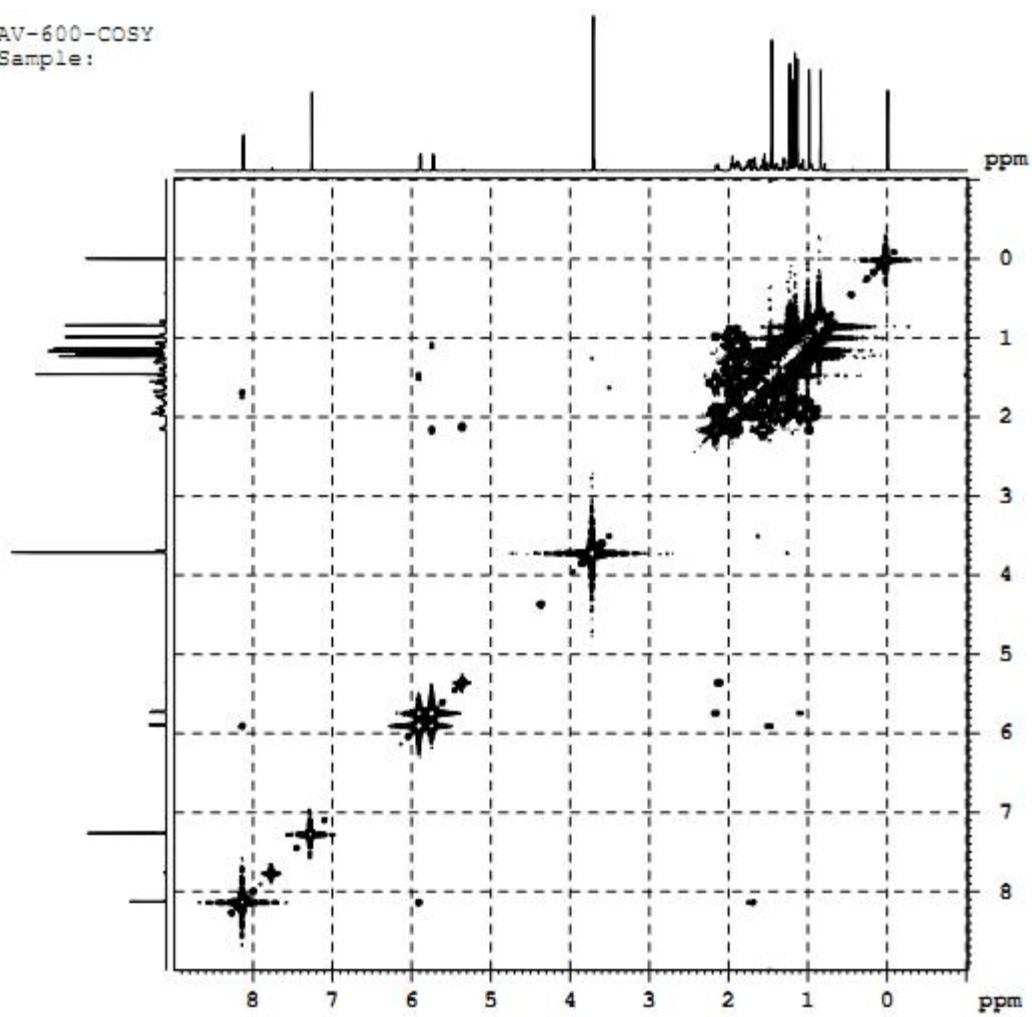


¹³C NMR spectra of compound 10e

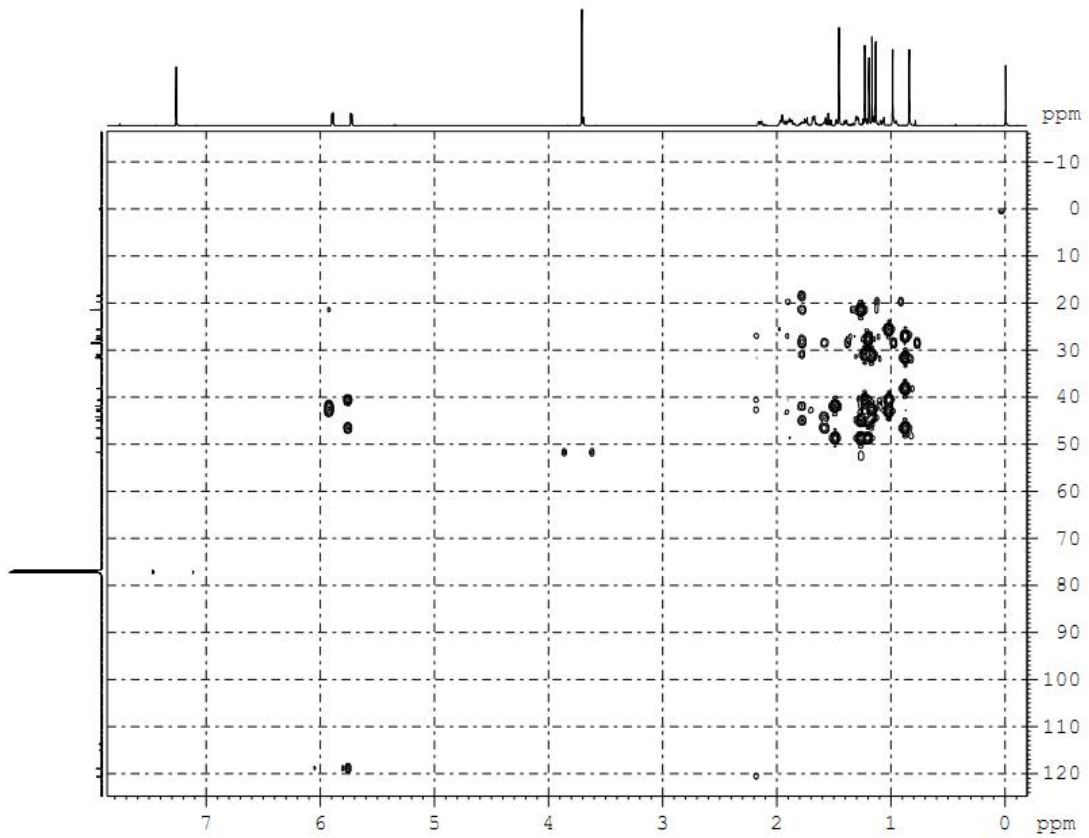


DEPT135 spectra of compound 10e

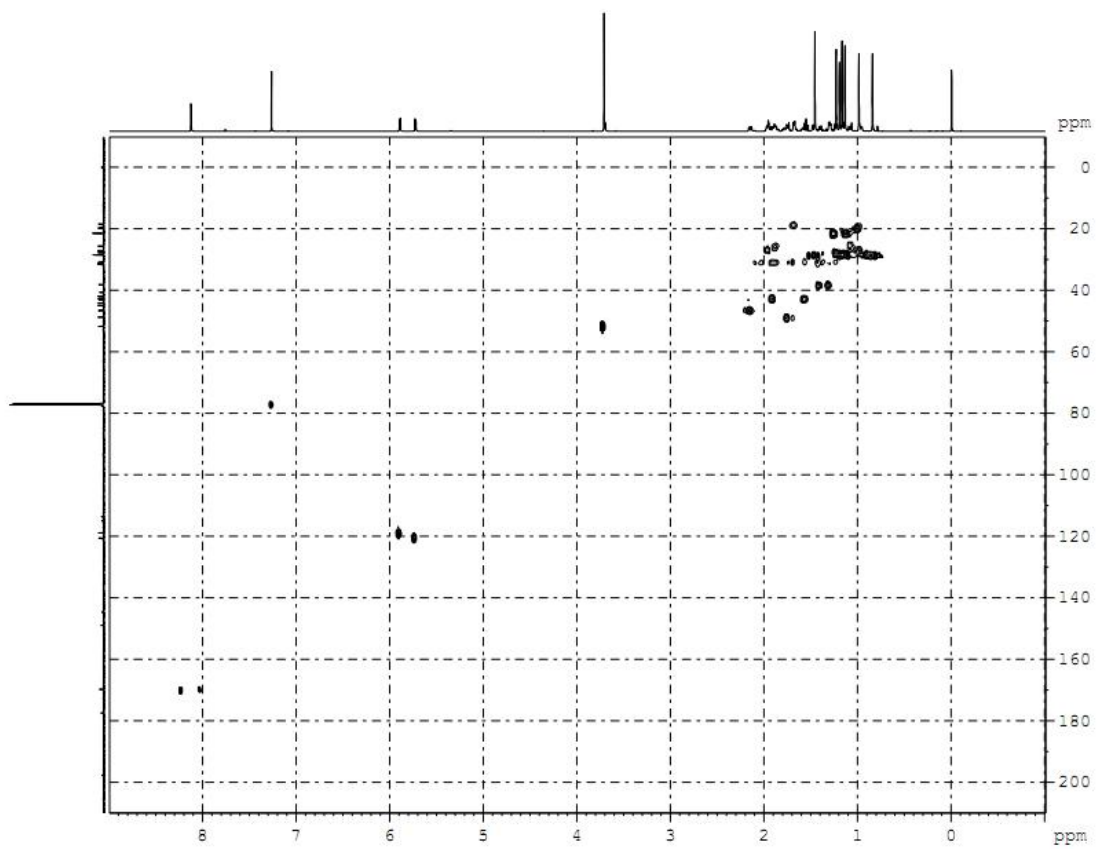
AV-600-COSY
Sample:



H-H COSY spectra of compound **10e**

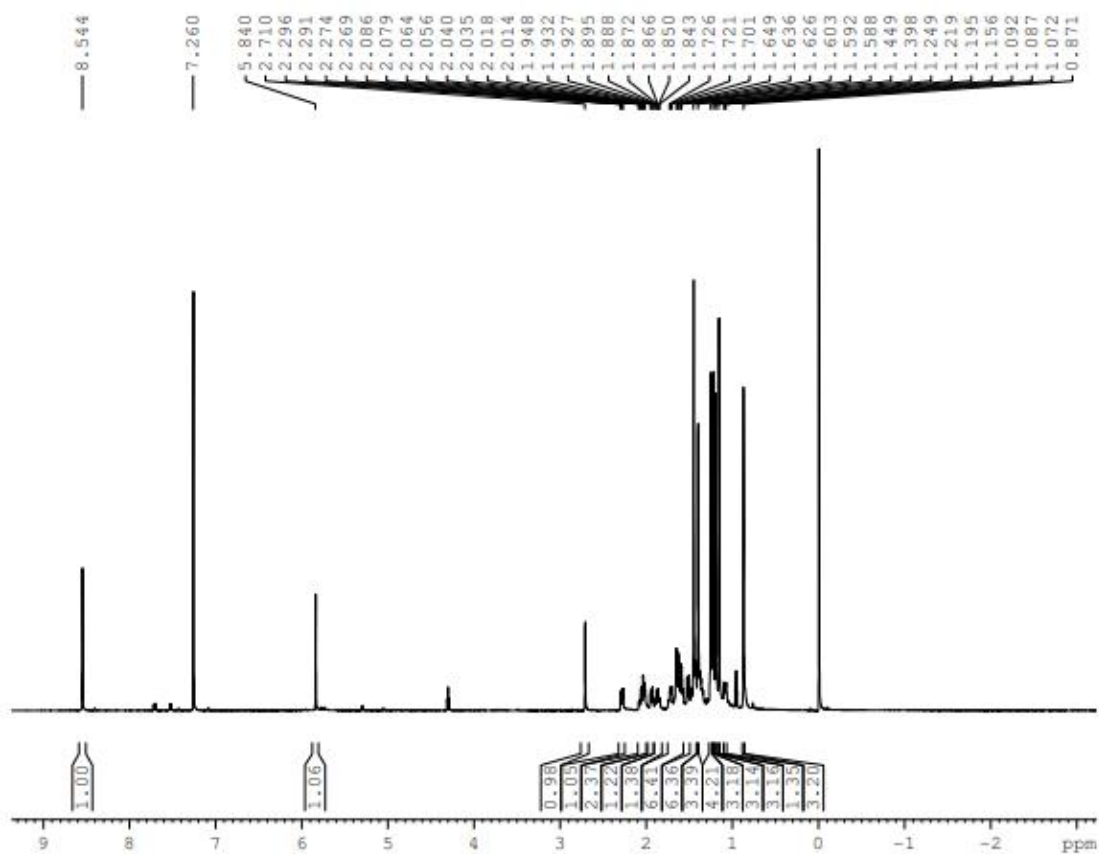


HMBC spectra of compound **10e**

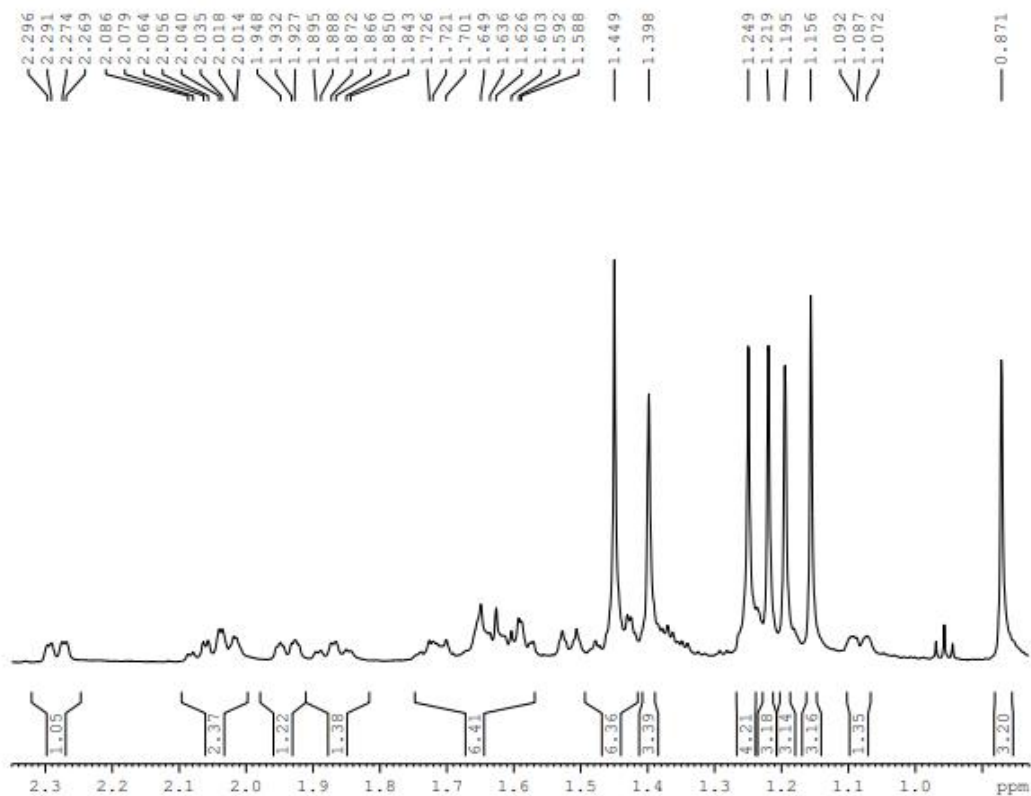


HSQC spectra of compound **10e**

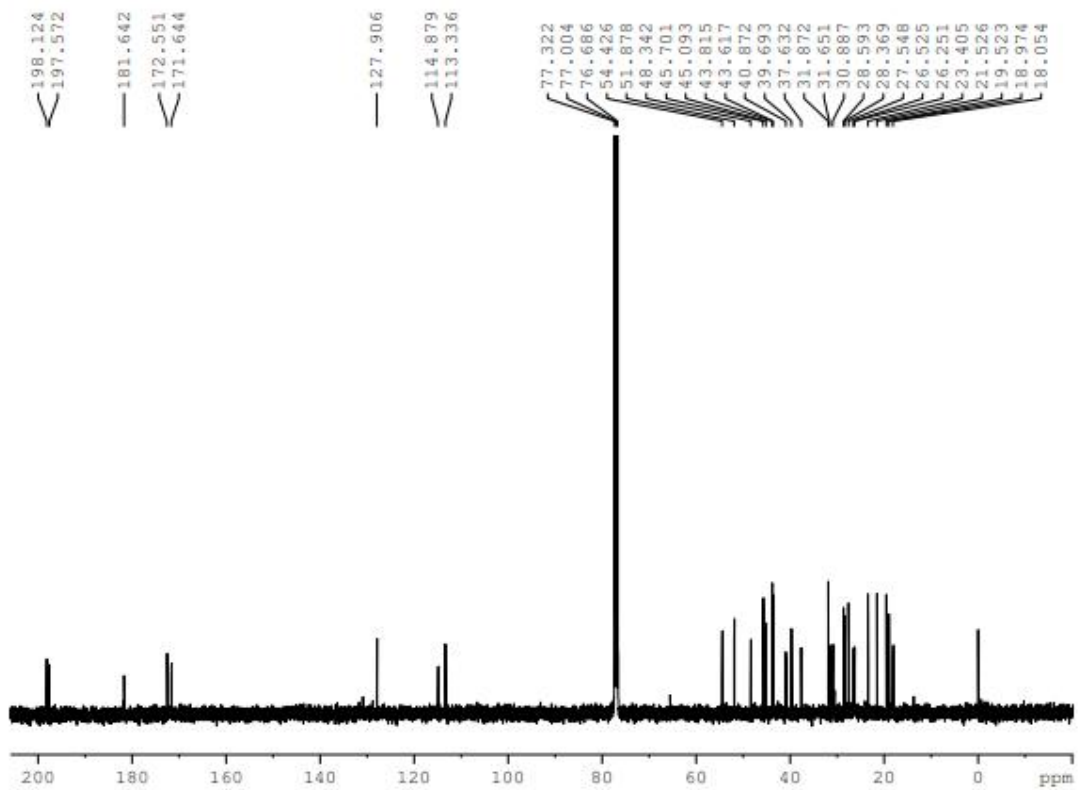
Compound 11a



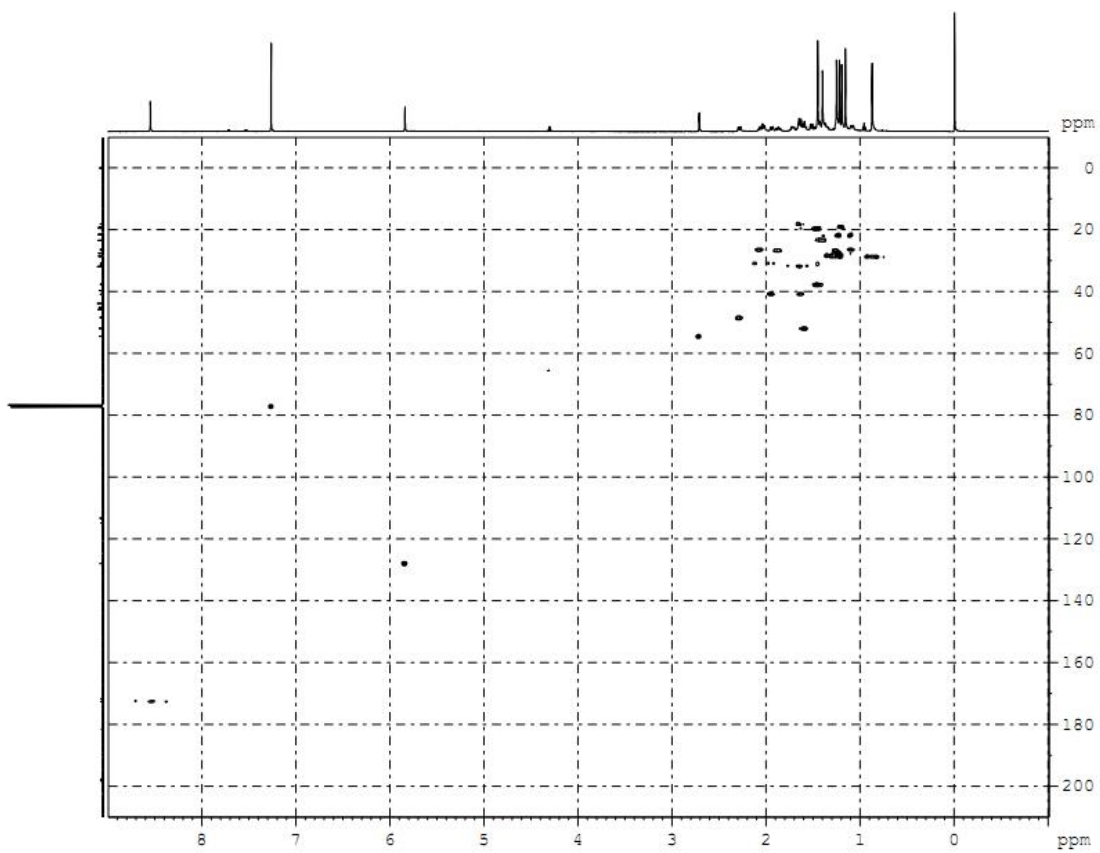
¹H NMR spectra of compound 11a



¹H NMR spectra of compound 11a

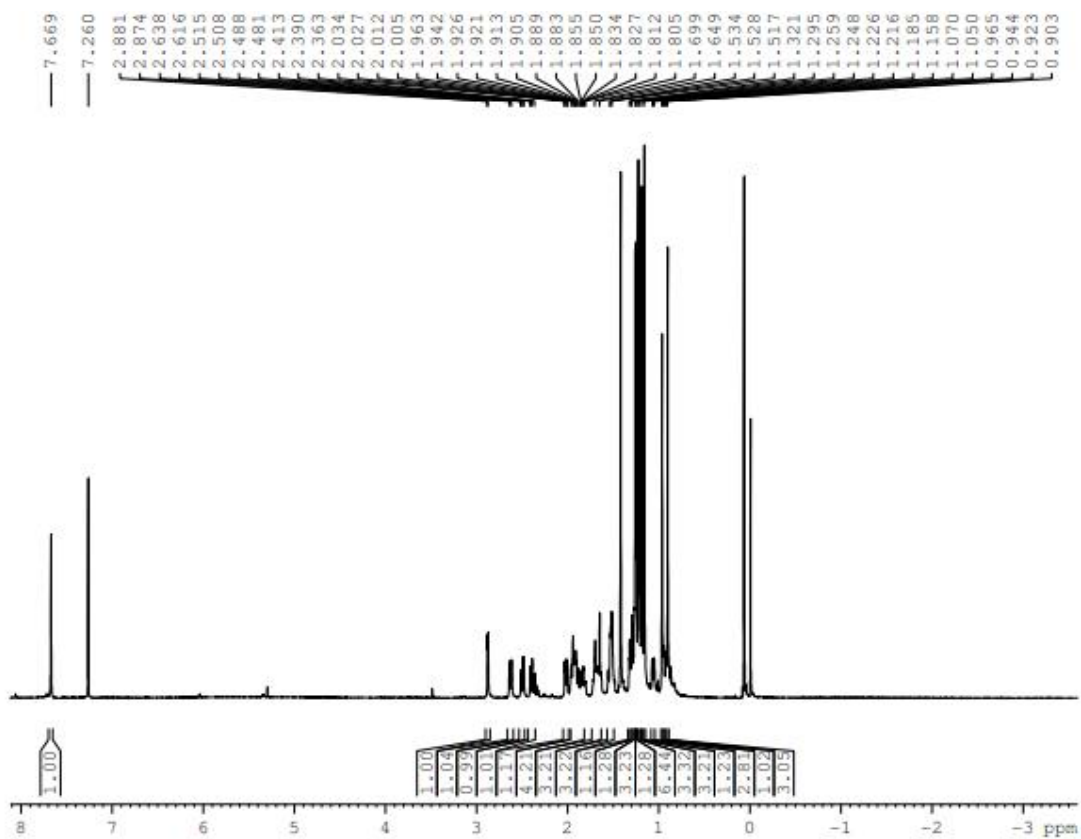


^{13}C NMR spectra of compound 11a

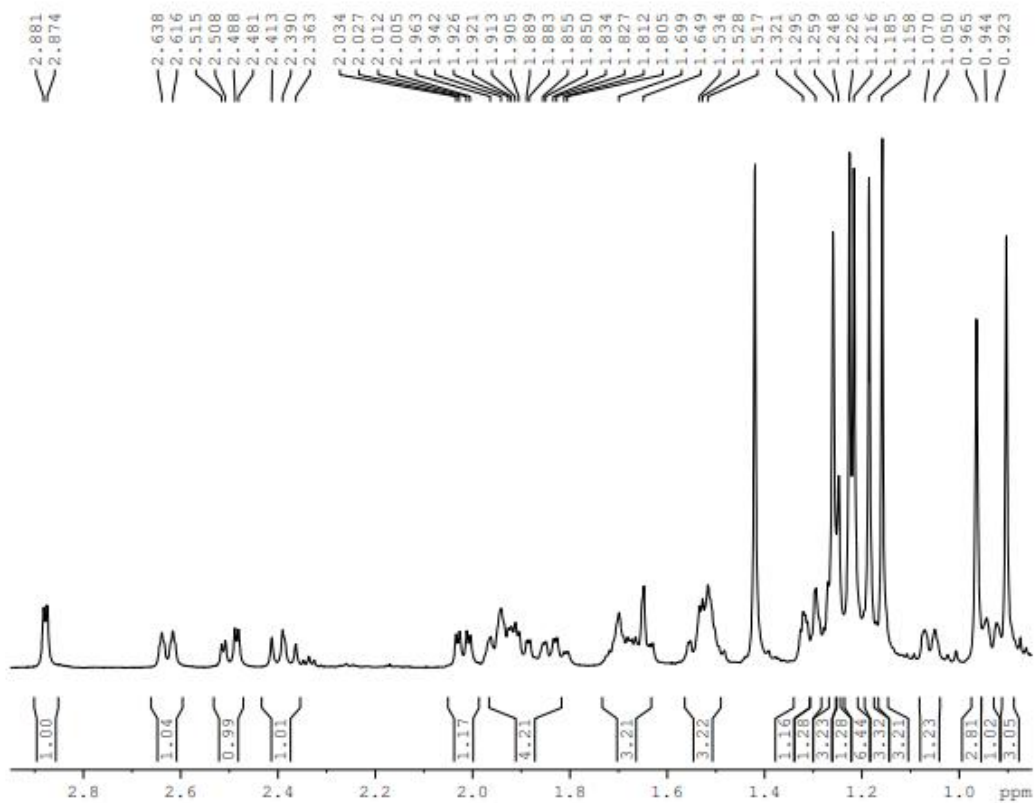


HSQC spectra of compound 11a

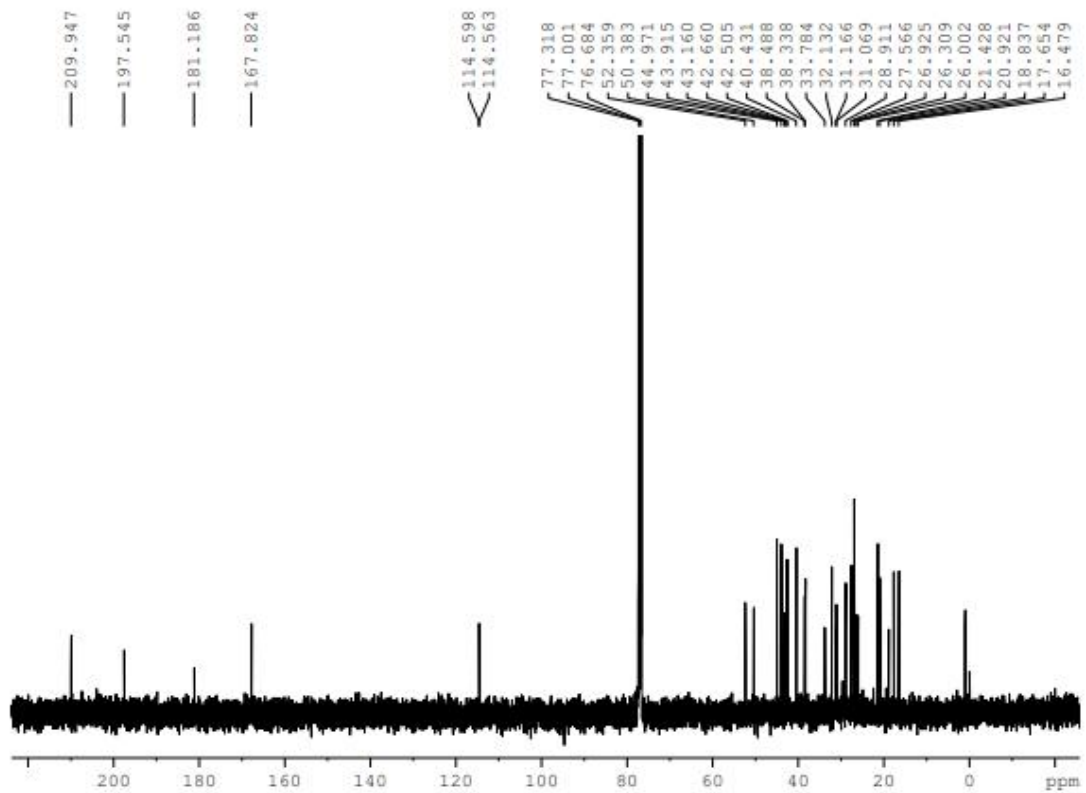
Compound 11c



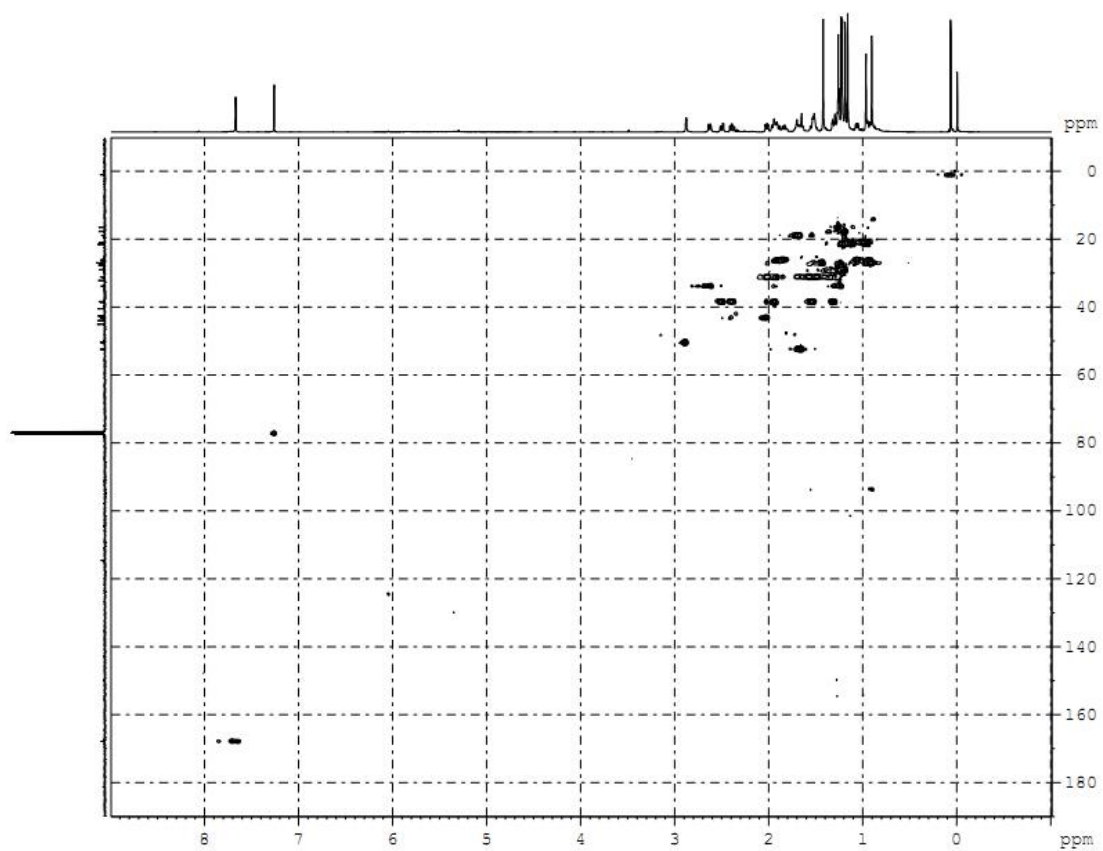
¹H NMR spectra of compound 11c



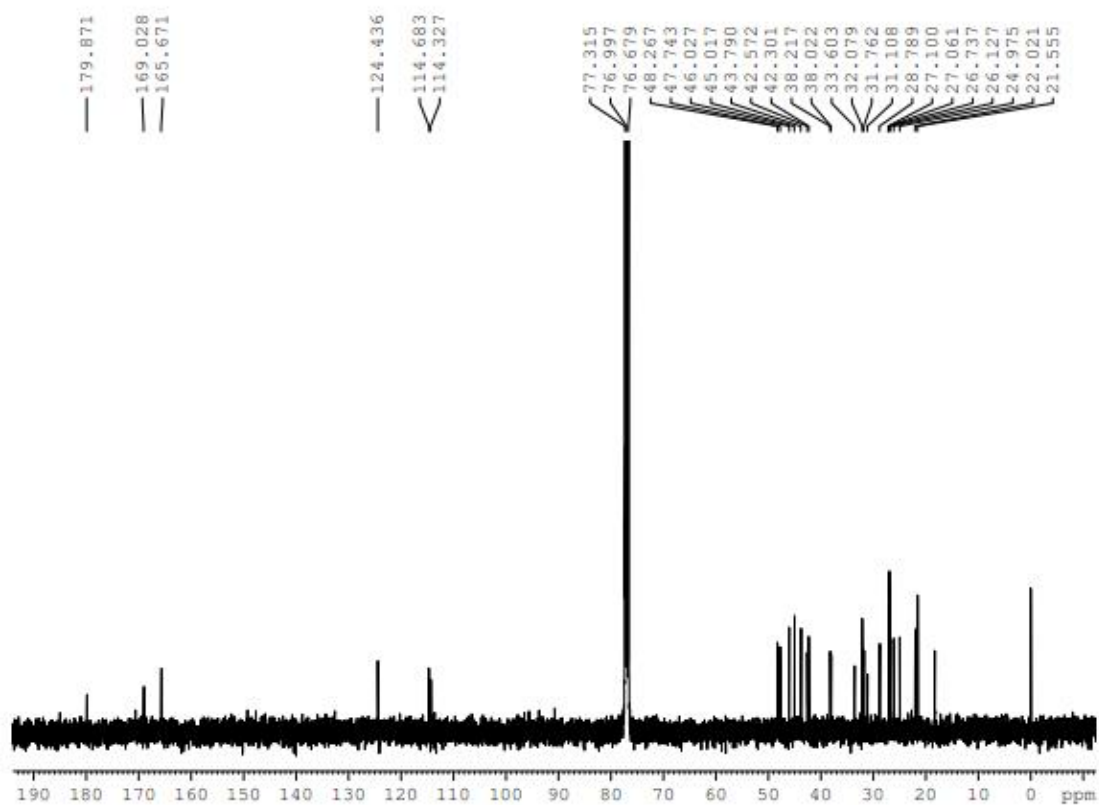
¹H NMR spectra of compound 11c



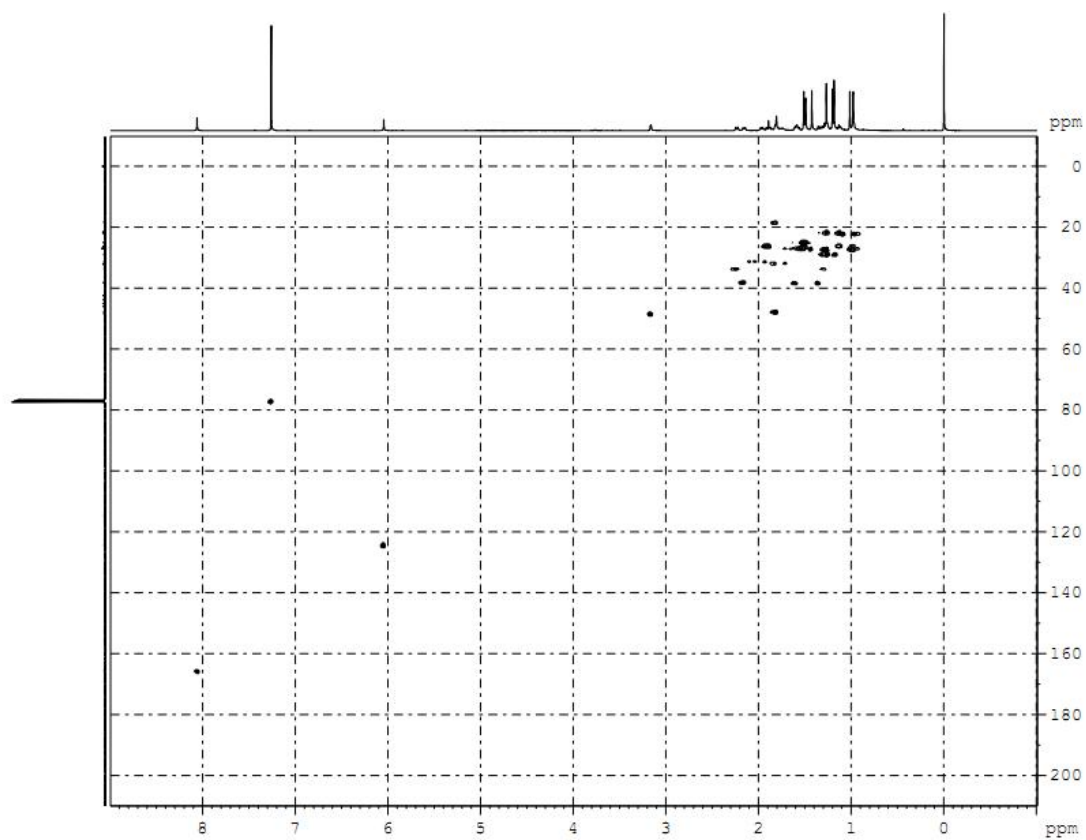
^{13}C NMR spectra of compound **11c**



HSQC spectra of compound **11c**

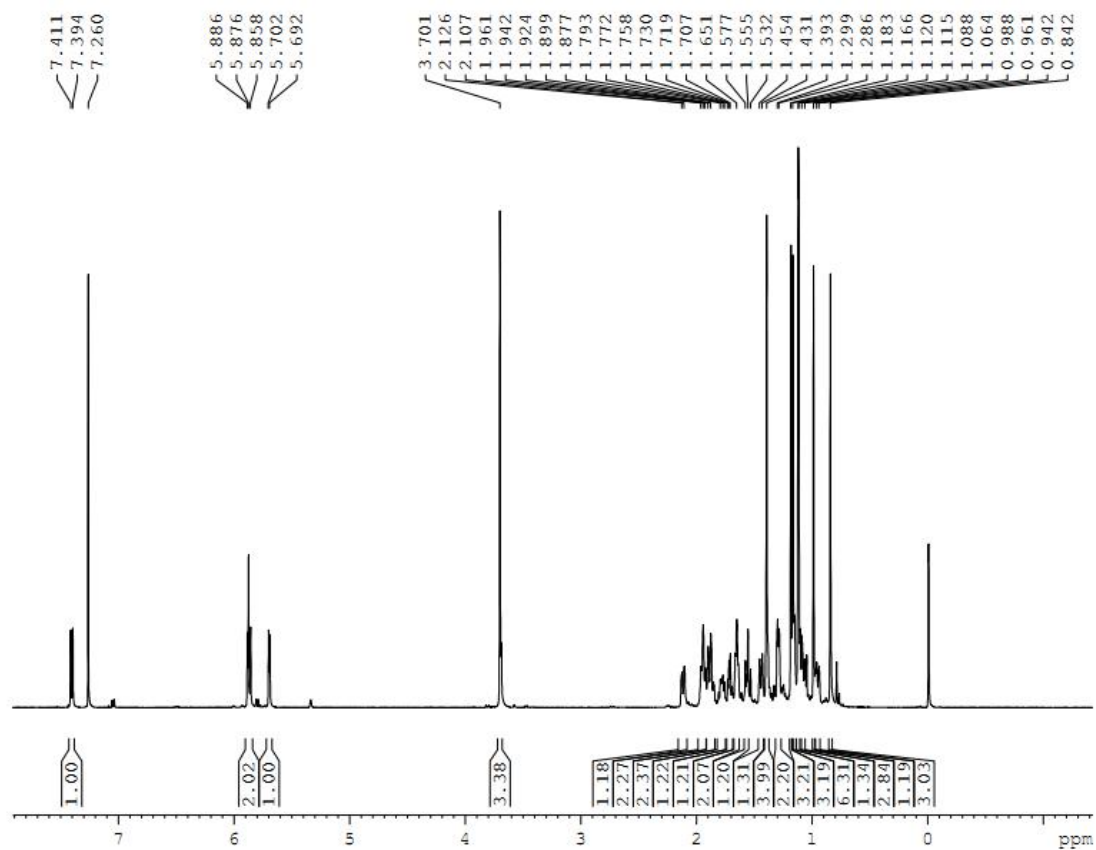


^{13}C NMR spectra of compound **11d**

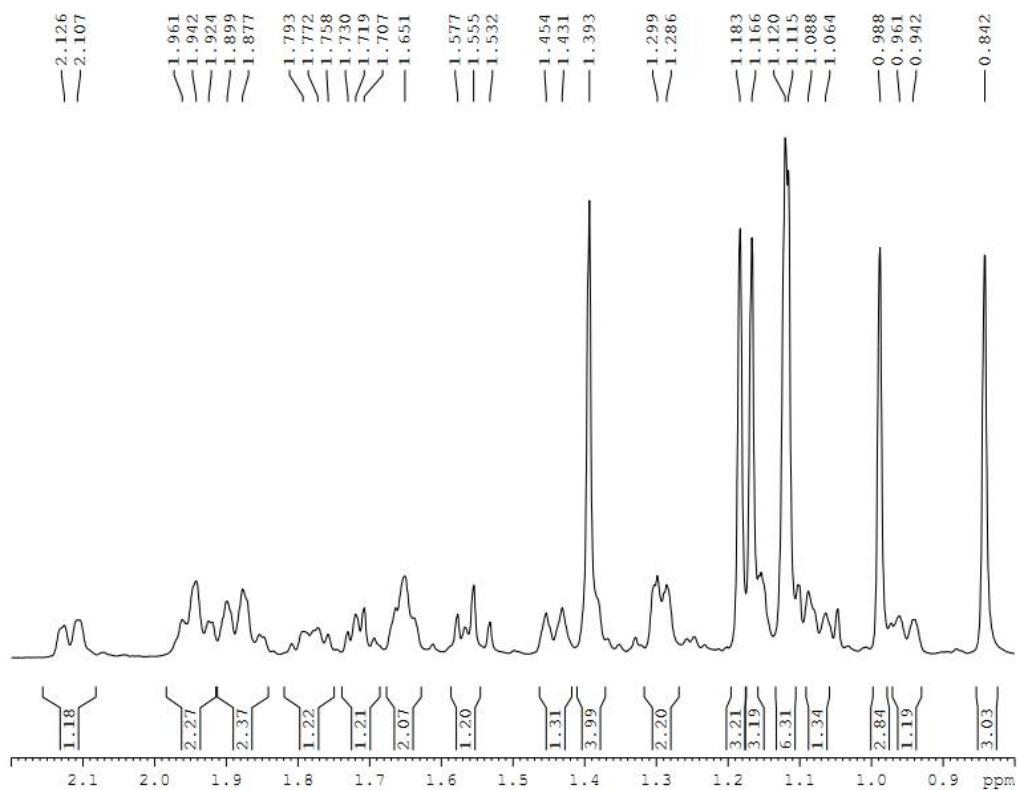


HSQC spectra of compound **11d**

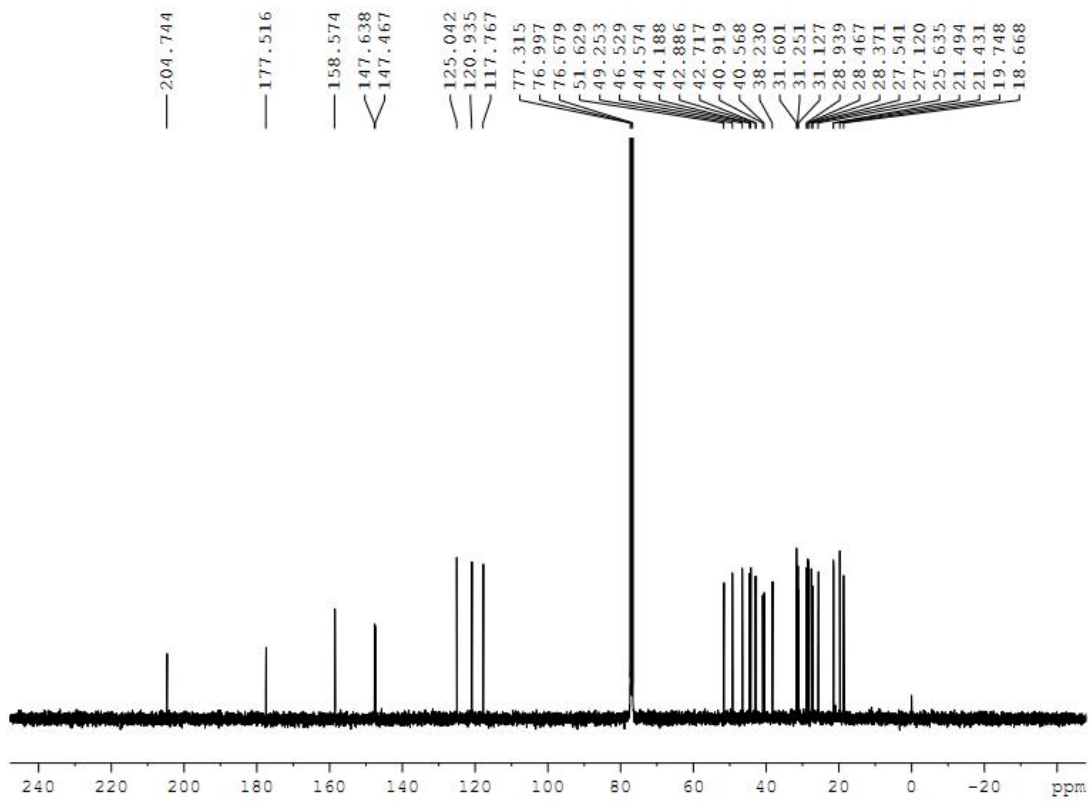
Compound 12



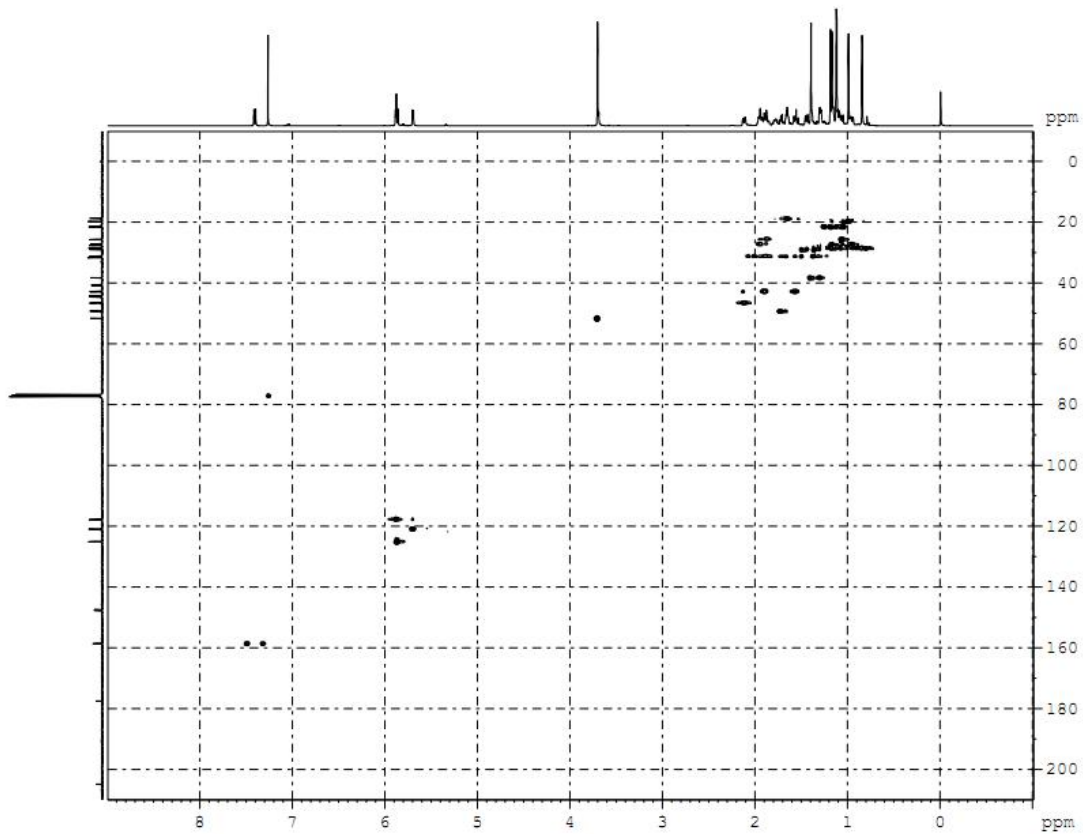
¹H NMR spectra of compound 12



¹H NMR spectra of compound 12

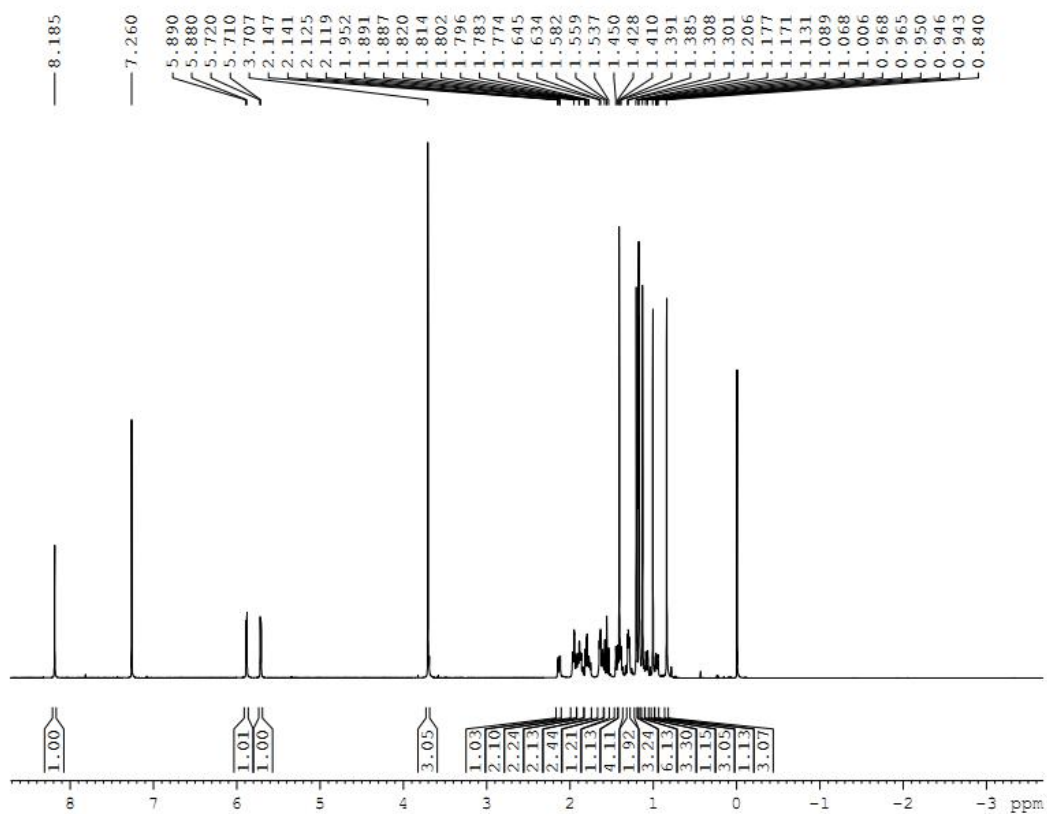


^{13}C NMR spectra of compound 12

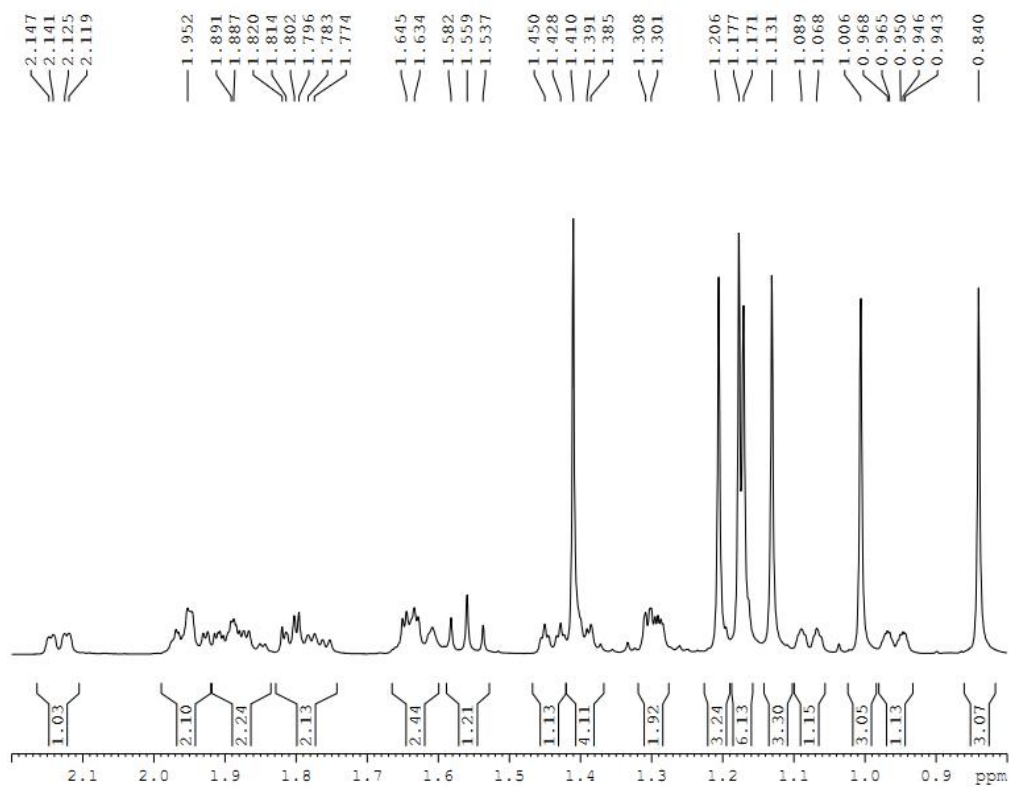


HSQC spectra of compound 12

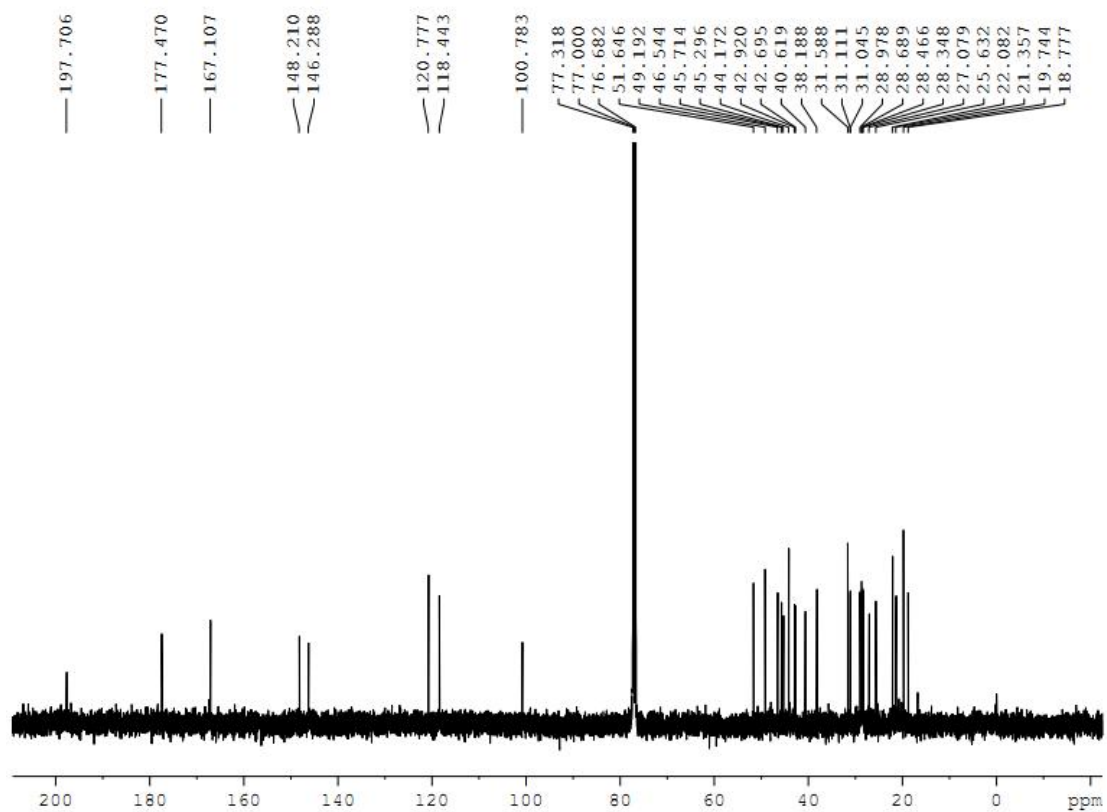
Compound 13



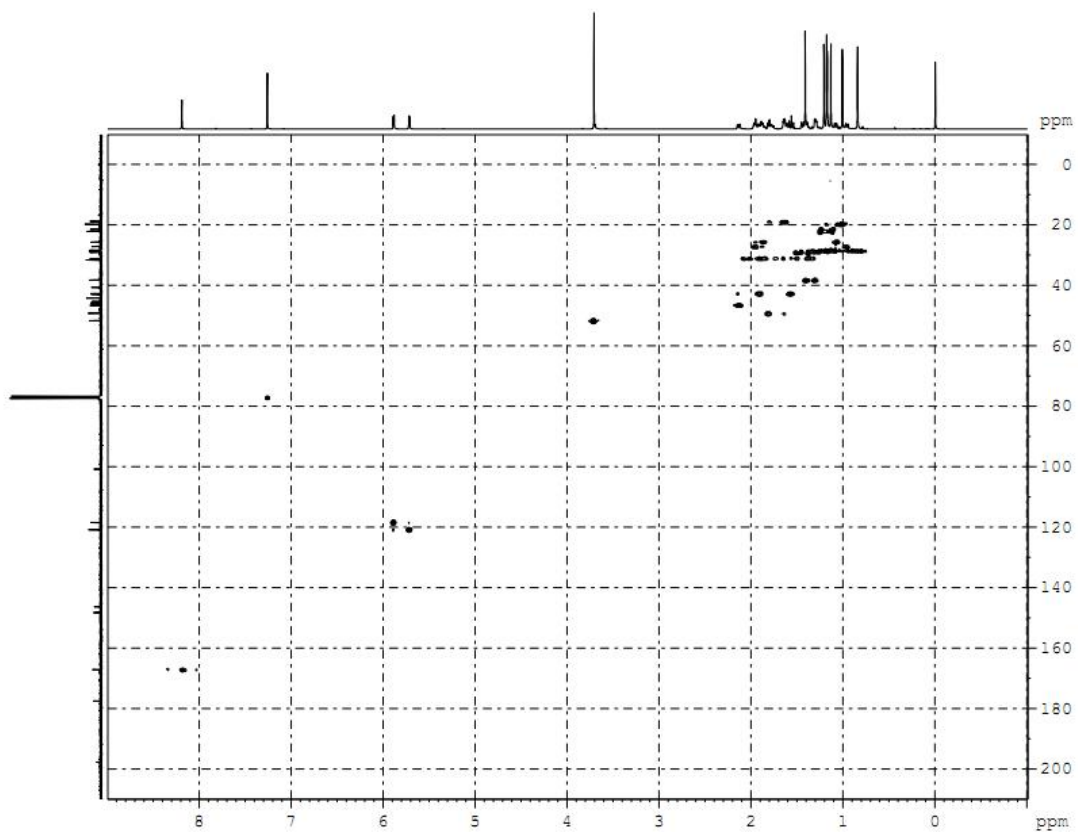
¹H NMR spectra of compound 13



¹H NMR spectra of compound 13

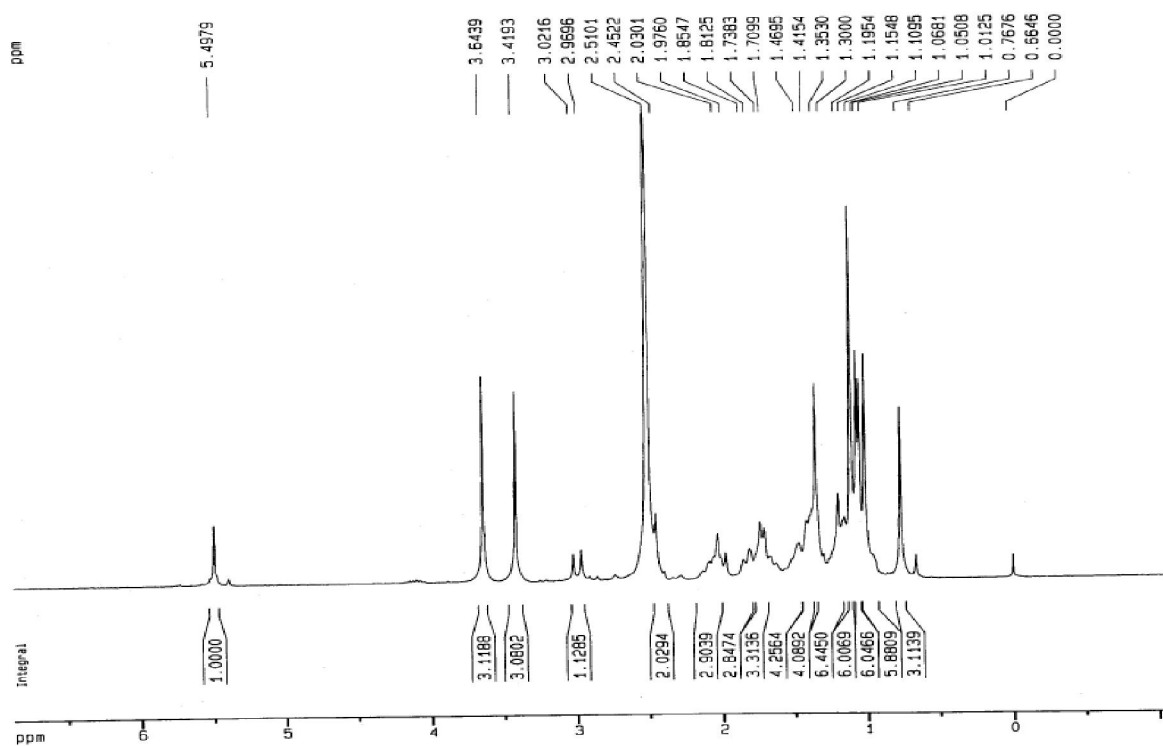


^{13}C NMR spectra of compound 13

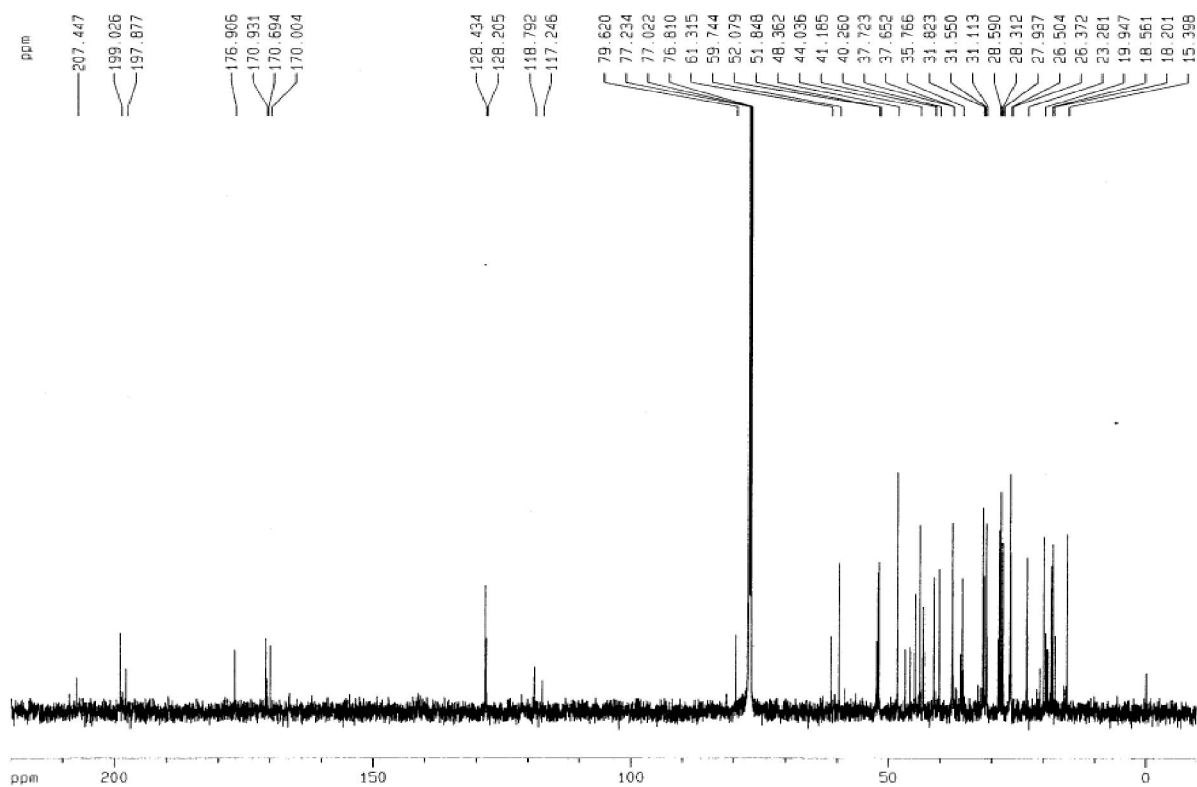


HSQC spectra of compound 13

Compound 9a

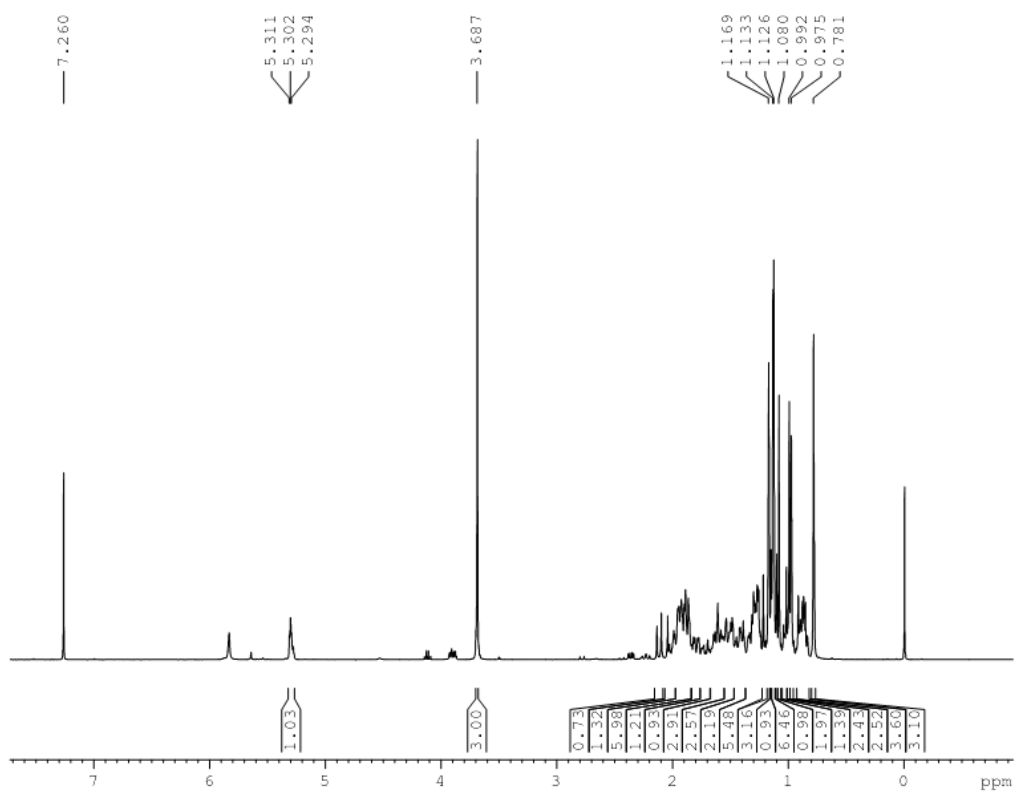


¹H-NMR spectra of compound 9a

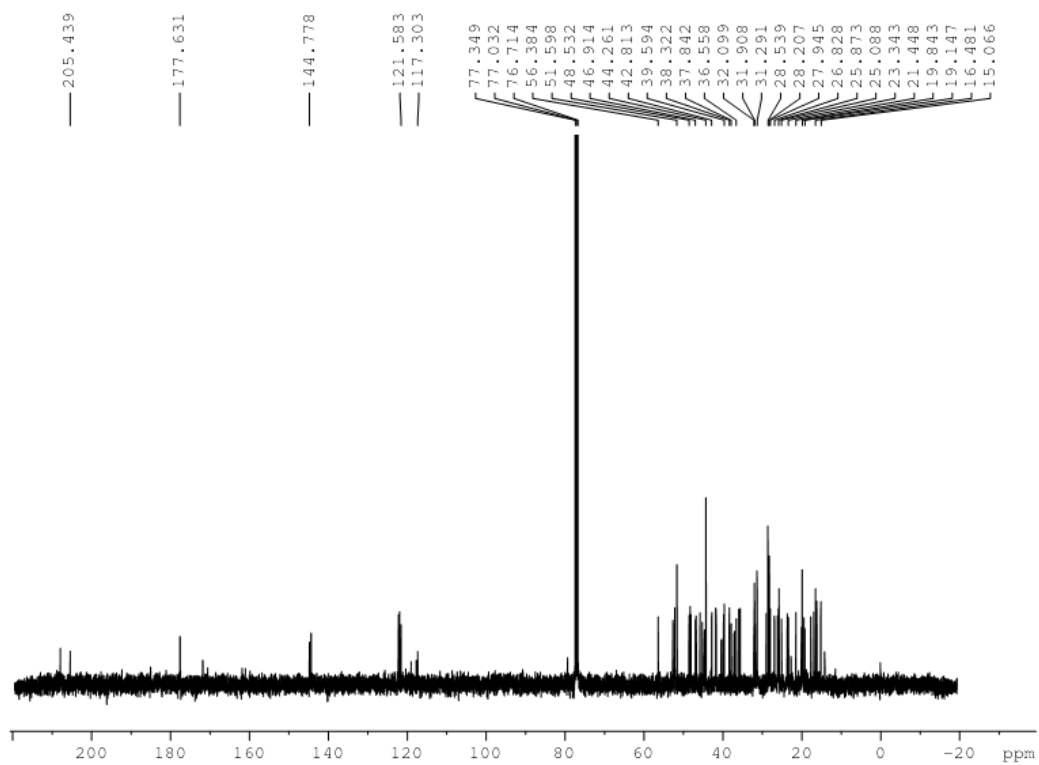


¹³C-NMR spectra of compound 9a

Compound 9b

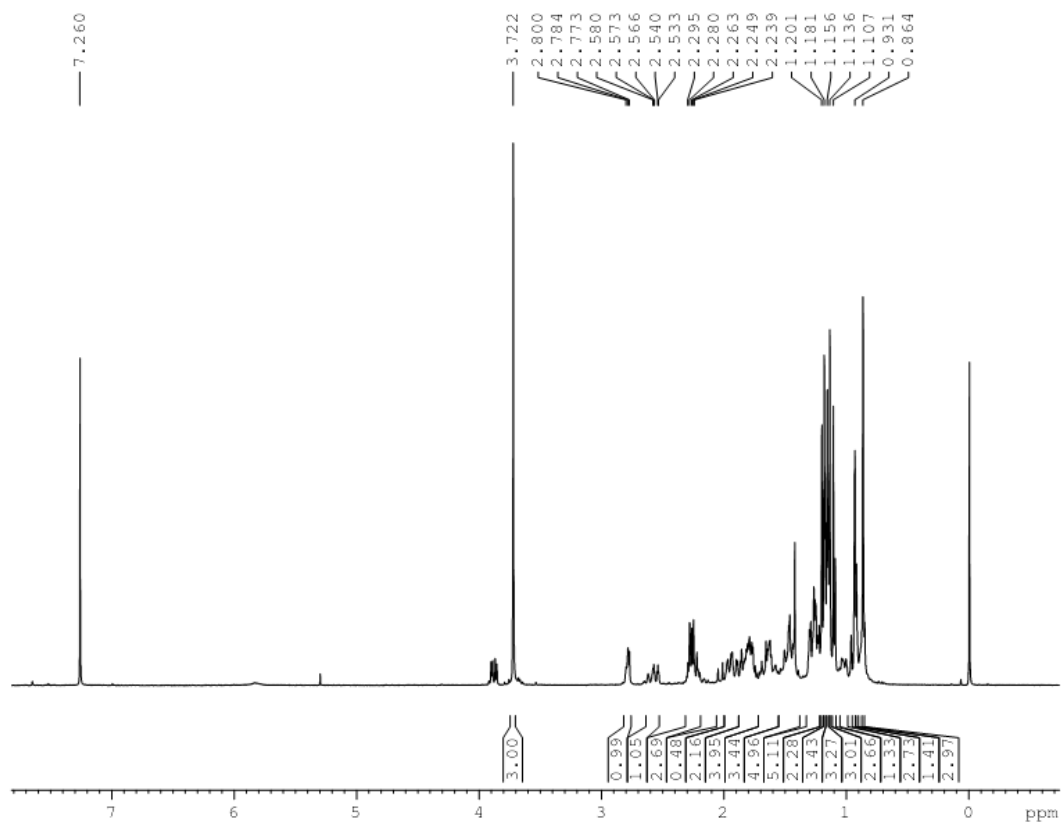


¹H-NMR spectra of compound 9b

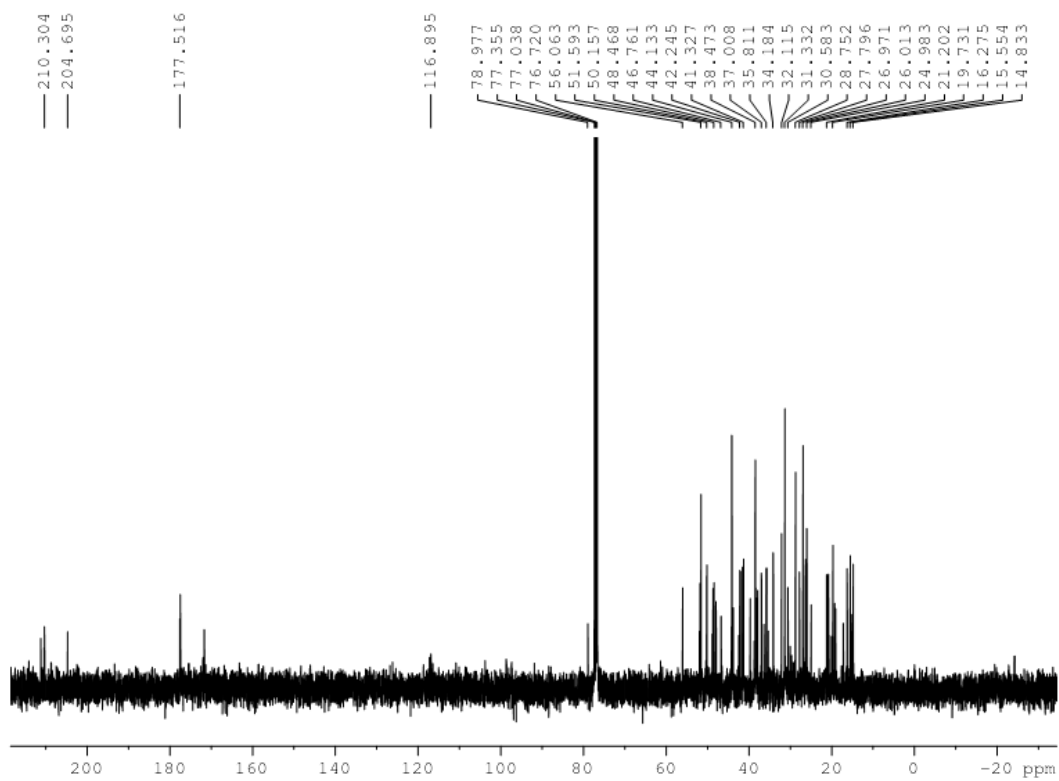


¹³C-NMR spectra of compound 9b

Compound 9c

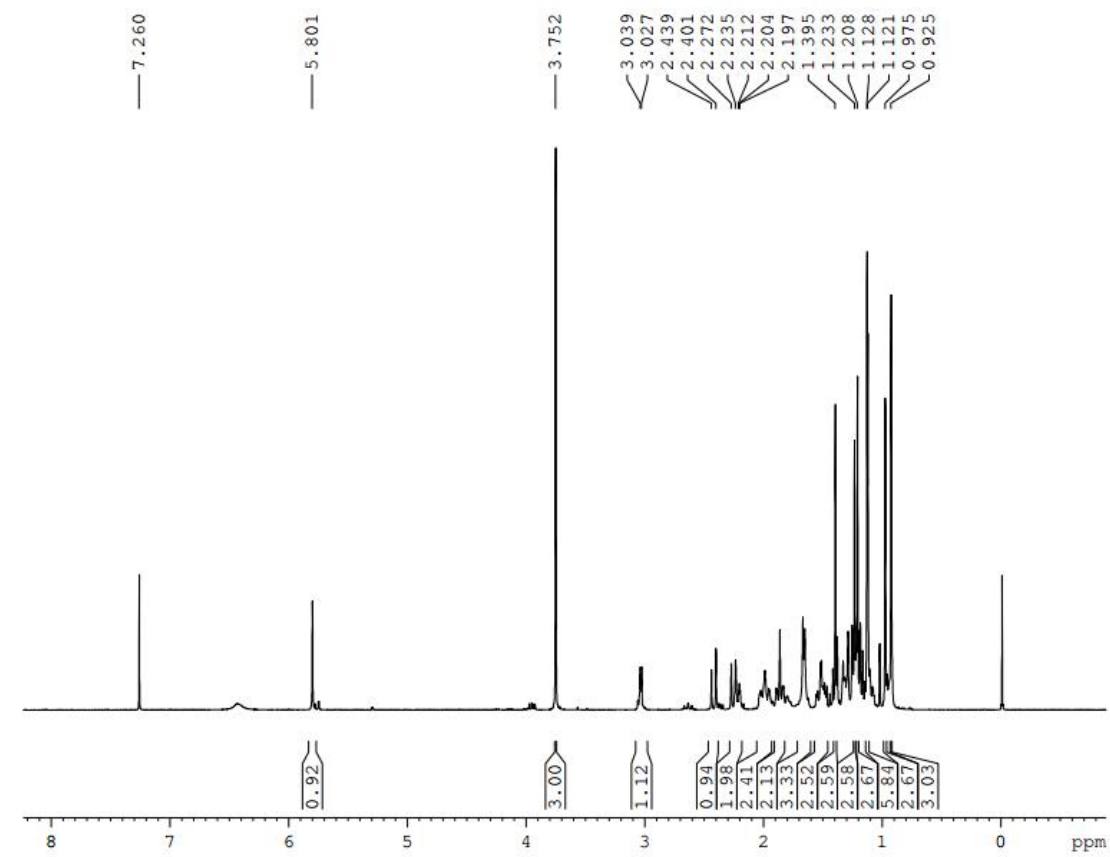


$^1\text{H-NMR}$ spectra of compound 9c

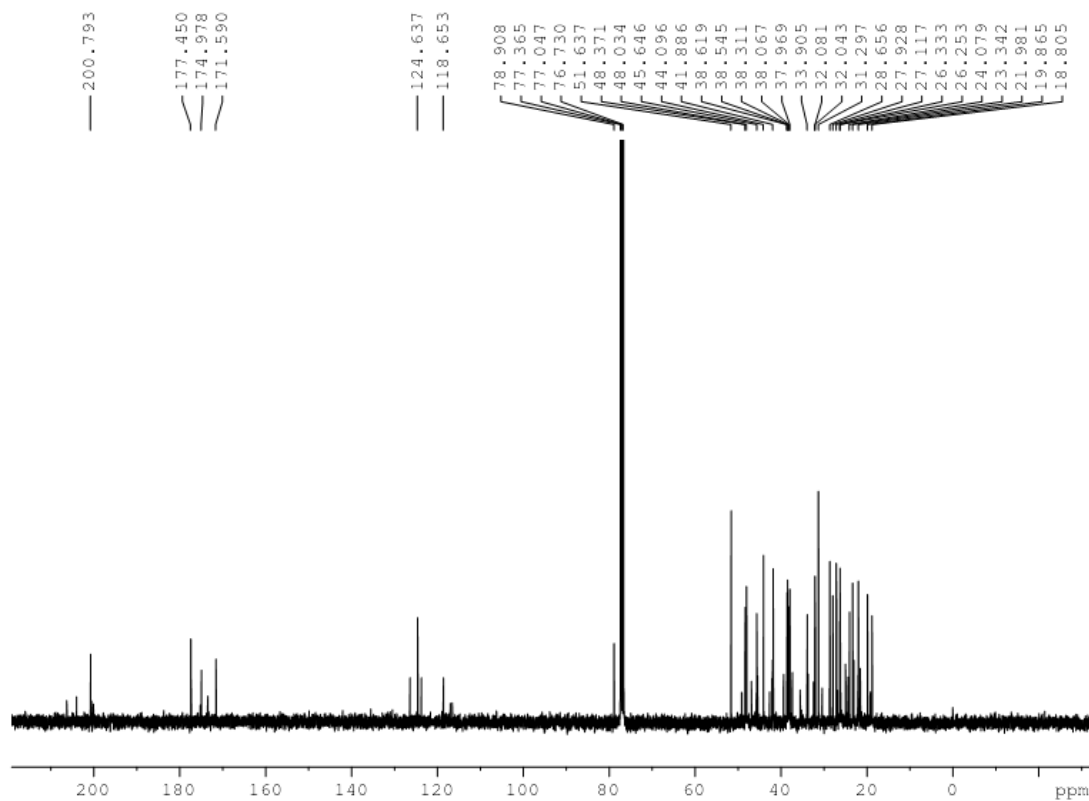


$^{13}\text{C-NMR}$ spectra of compound 9c

Compound 9d

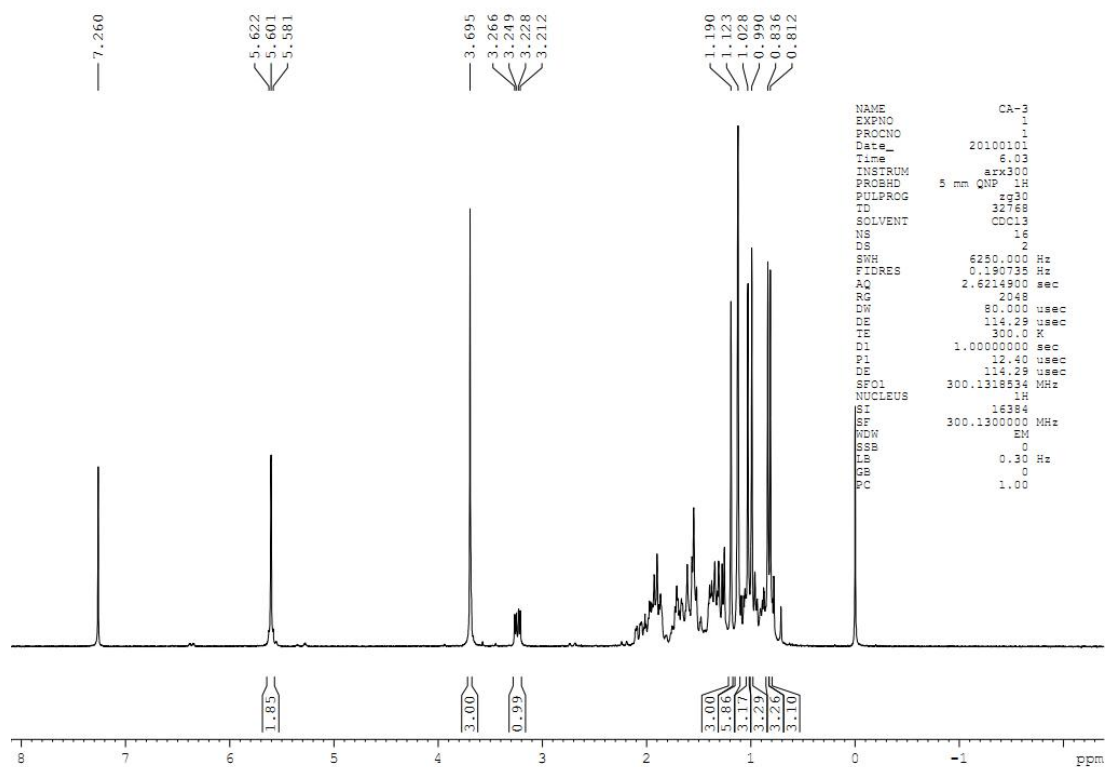


¹H-NMR spectra of compound 9d



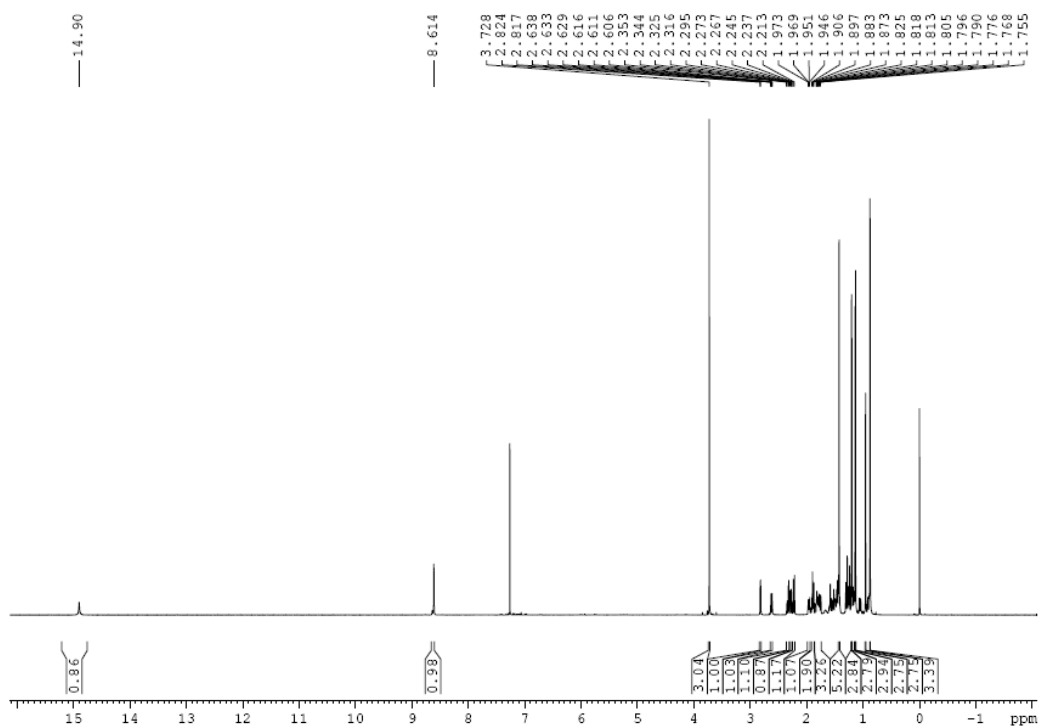
¹³C-NMR spectra of compound 9d

Compound 5e

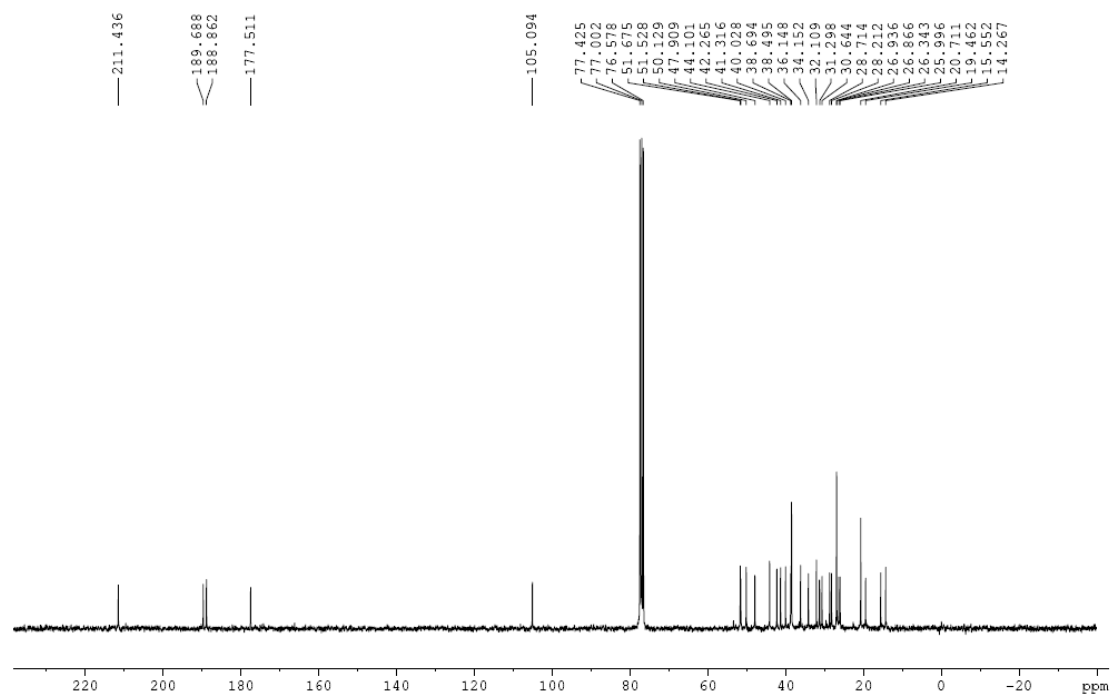


¹H NMR spectra of compound 5e

Compound 7c

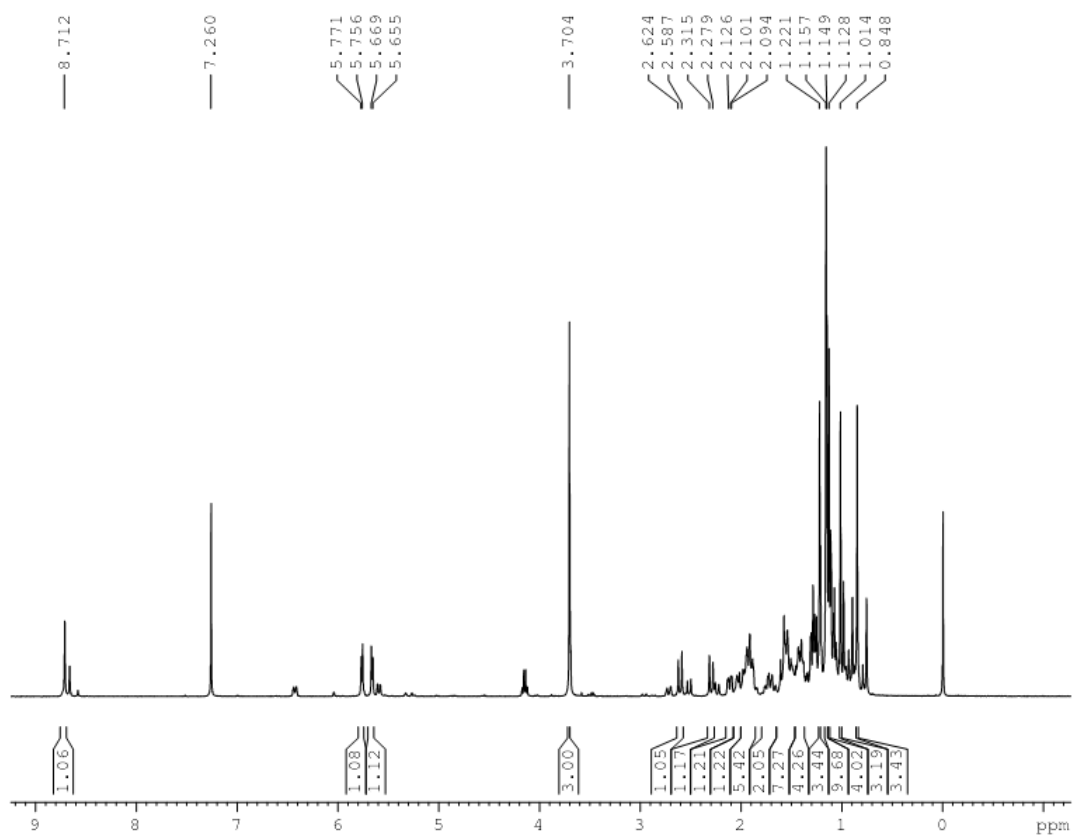


¹H NMR spectra of compound 7c

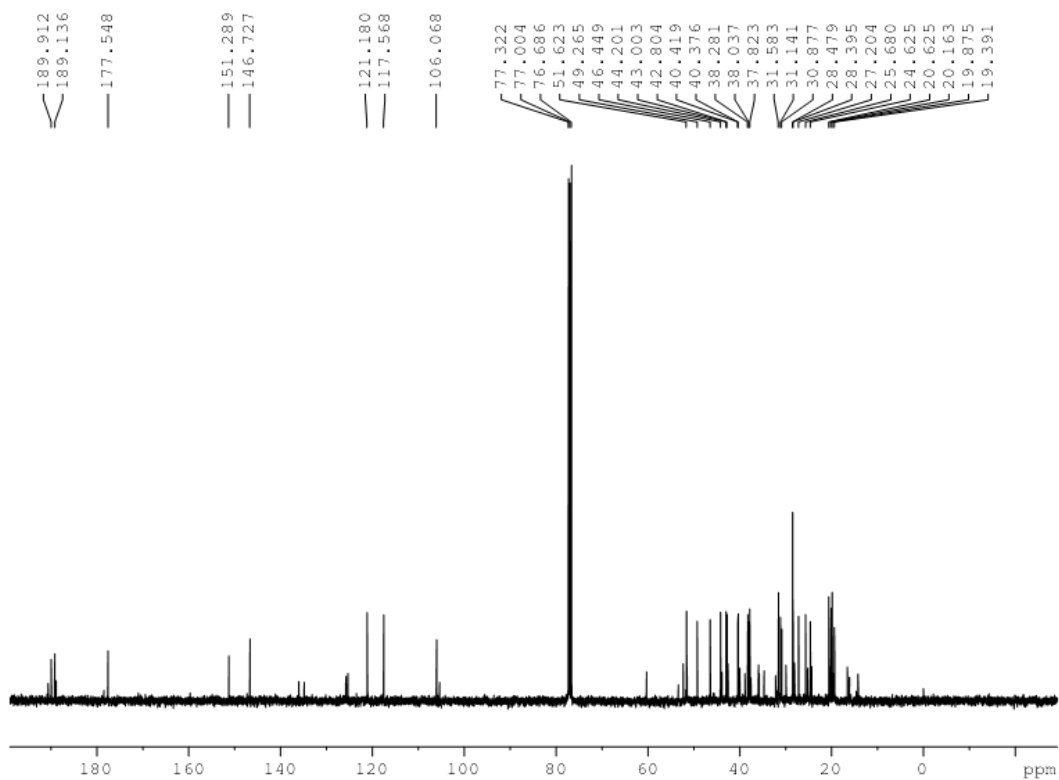


^{13}C NMR spectra of compound **7c**

Compound **7e**

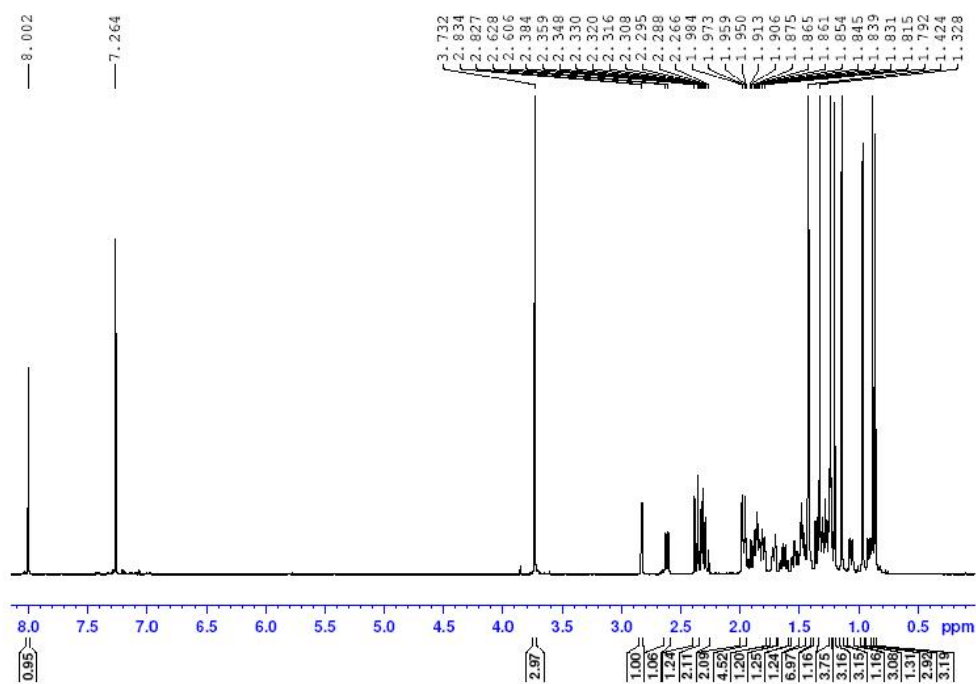


^1H NMR spectra of compound **7e**

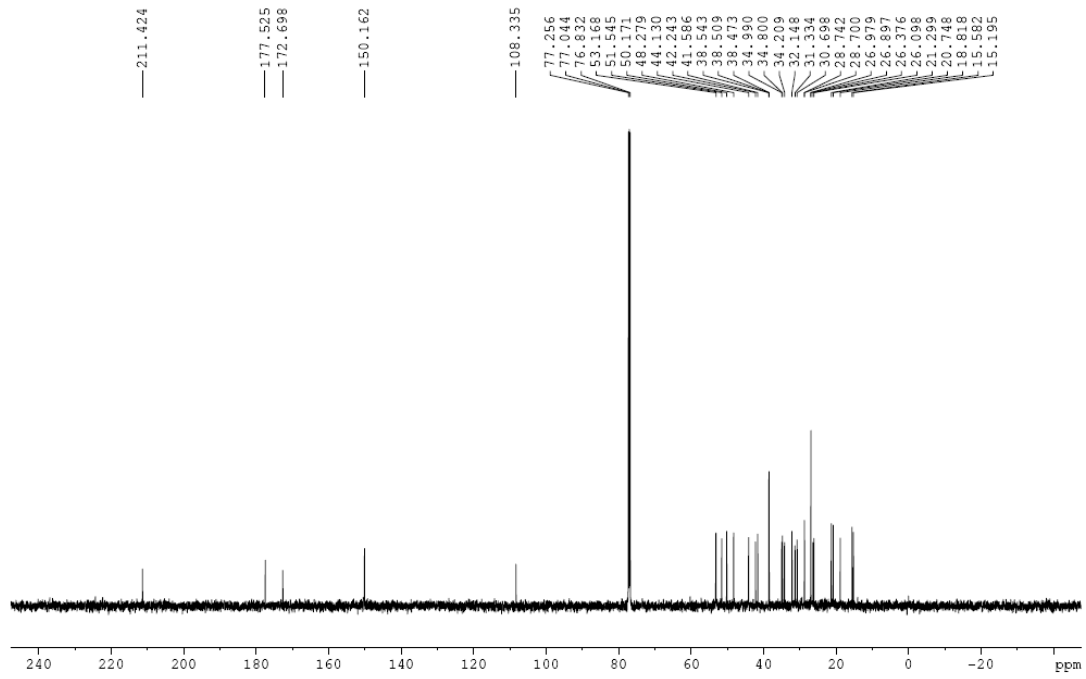


^{13}C NMR spectra of compound **7e**

Compound **8c**

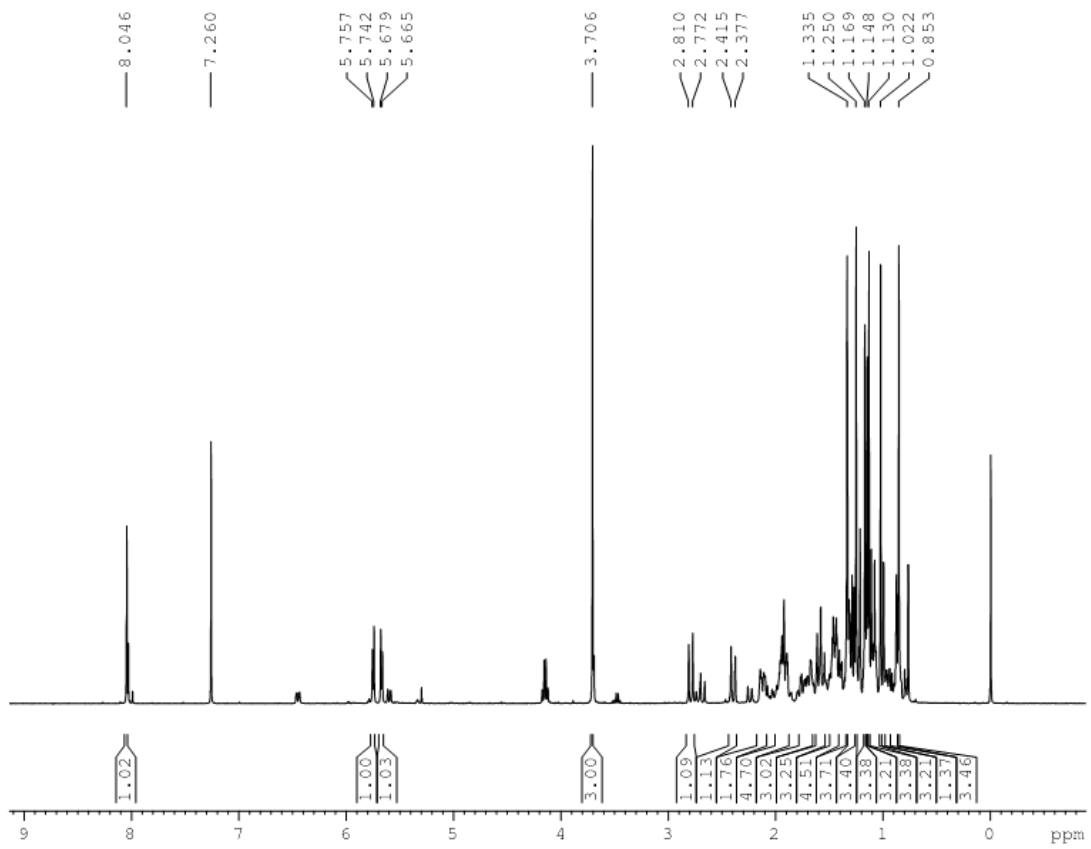


^1H NMR spectra of compound **8c**

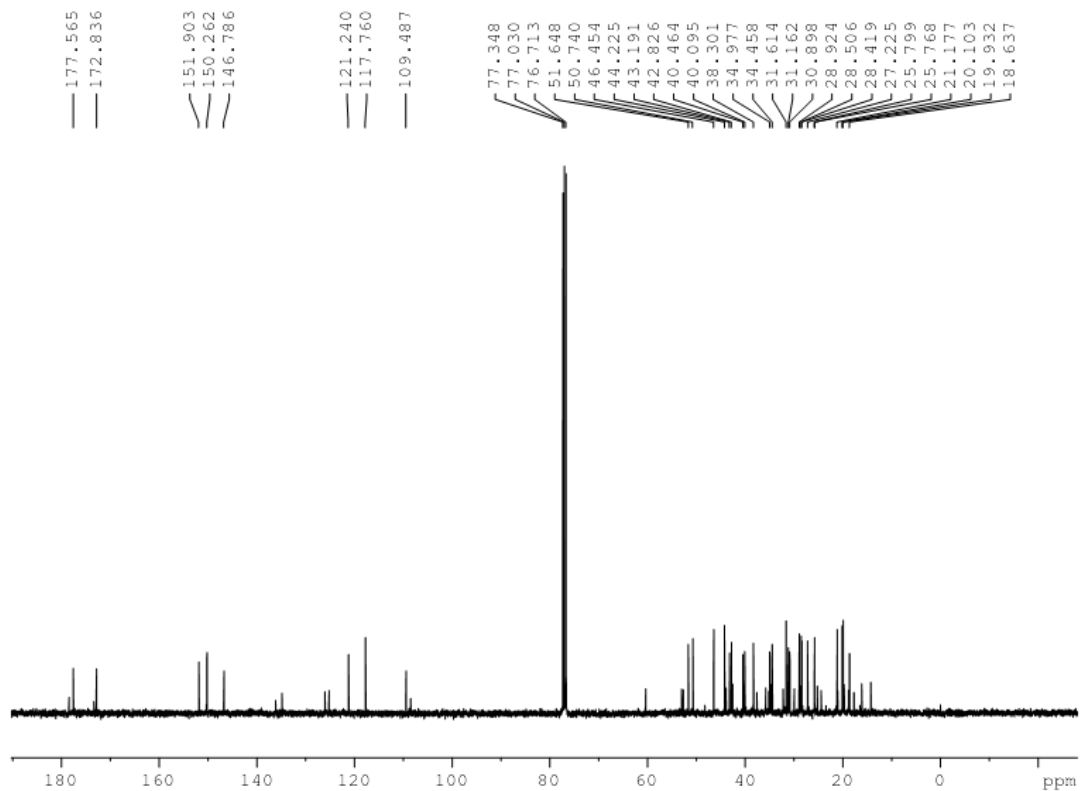


^{13}C NMR spectra of compound **8c**

Compound **8e**



^1H NMR spectra of compound **8e**



^{13}C NMR spectra of compound **8e**