Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Ag_2O Nanoparticle-Catalyzed Substrate-Controlled Regioselectivities: Direct Access to 3-Ylidenephthalides and Isocoumarins

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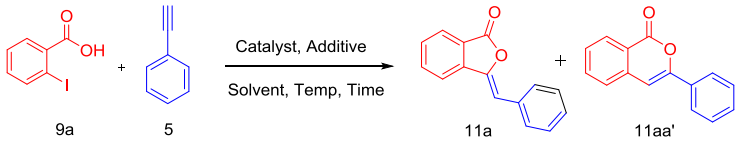
To be published on Web.

I. Table 1. Detailed Optimization study.



Entry.	Metal.	Additive.	Solvent.	Temp. (^{0}C).	Time (hr.)	Yield.(%)
1	CuI	--	DMF	80	3	10[b]
2	Ag_2O	--	DMF	80	3	45
3	Ag_2O	PivOH	DMF	80	3	75
4	AgOAc	PivOH	DMF	80	3	43
5	AgCl	PivOH	DMF	80	3	Nil
6	$AgNO_3$	PivOH	DMF	80	3	Nil
Screening of other metal oxides						
6a	ZnO	------	DMF	80	3	traces
6b	CuO	------	DMF	80	3	traces
6c	CdO	------	DMF	80	3	traces
6d	PbO	------	DMF	80	3	No reaction
6e	Al_2O_3	------	DMF	80	3	No reaction
6f	CrO_3	------	DMF	80	3	No reaction
6g	NiO	------	DMF	80	3	No reaction
6h	MnO_2	------	DMF	80	3	No reaction
6i	Fe_2O_3	------	DMF	80	3	No reaction
Optimization with Ag_2ONPs						
7	**Ag_2ONPs**	**PivOH**	**DMF**	**80**	**3**	**83**
8	Ag_2ONPs	AcOH	DMF	80	3	46
9	Ag_2ONPs	PivOH	DMF	80	24	59
10	Ag_2ONPs	PivOH	DMF	100	3	90
11	**Ag_2ONPs**	**PivOH**	**DMF**	**120**	**3**	**95**
12	Ag_2ONPs	PivOH	DMF	130	3	88
13	Ag_2ONPs	PivOH	DMF	120	1.5	88
14	Ag_2ONPs	PivOH	DMF	120	2	88
Screening of Solvents						
15.	Ag_2ONPs	PivOH	DMSO	80	3	55
16	Ag_2ONPs	PivOH	O-xylene	80	3	17
17.	Ag_2ONPs	PivOH	Toluene	80	3	25
18.	Ag_2ONPs	PivOH	DCE	80	3	30
19.	Ag_2ONPs	PivOH	1,4-Dioxane	80	3	27
20.	Ag_2ONPs	PivOH	PEG	80	3	No Reaction
21.	Ag_2ONPs	PivOH	H_2O	80	3	No Reaction
Screening of basic additives						
22.	Ag_2ONPs	Na_2CO_3	DMF	80	3	No reaction
23.	Ag_2ONPs	Cs_2CO_3	DMF	80	3	No reaction
24.	Ag_2ONPs	NaOH	DMF	80	3	No reaction
25.	Ag_2ONPs	1,10-phenanthroline	DMF	80	3	No reaction
Catalytic loading of Ag_2ONPs (in equiv.)						
26.	0.2	DMF	PivOH	80	3	8
27.	0.5	DMF	PivOH	80	3	20
28.	0.75	DMF	PivOH	80	3	56
29.	1	DMF	PivOH	80	3	83
30.	-------	**DMF**	**PivOH**	**80**	**3**	**No Reaction**

II. ^{1}H NMR and ^{13}C NMR Spectral Data of all synthesized compounds 11-21.

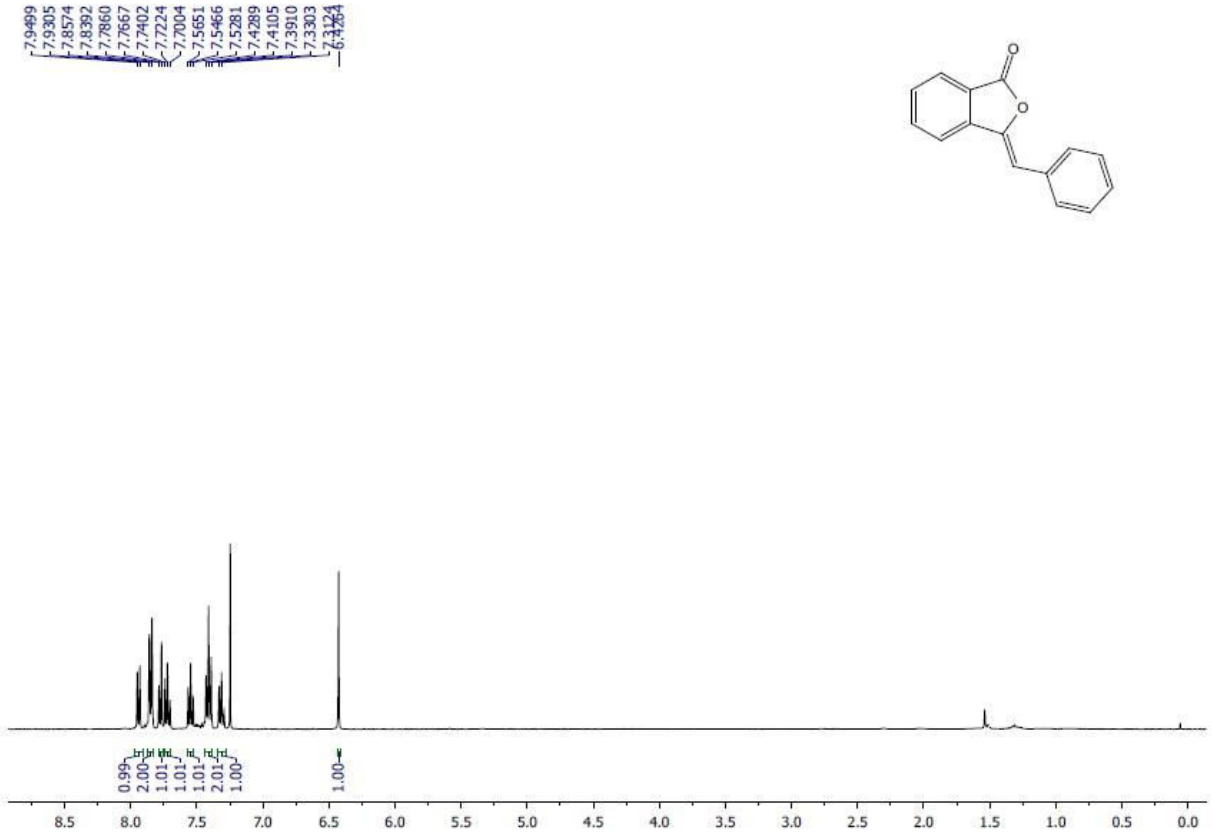


Figure 1: ^{1}H-NMR spectral data of **11a**.

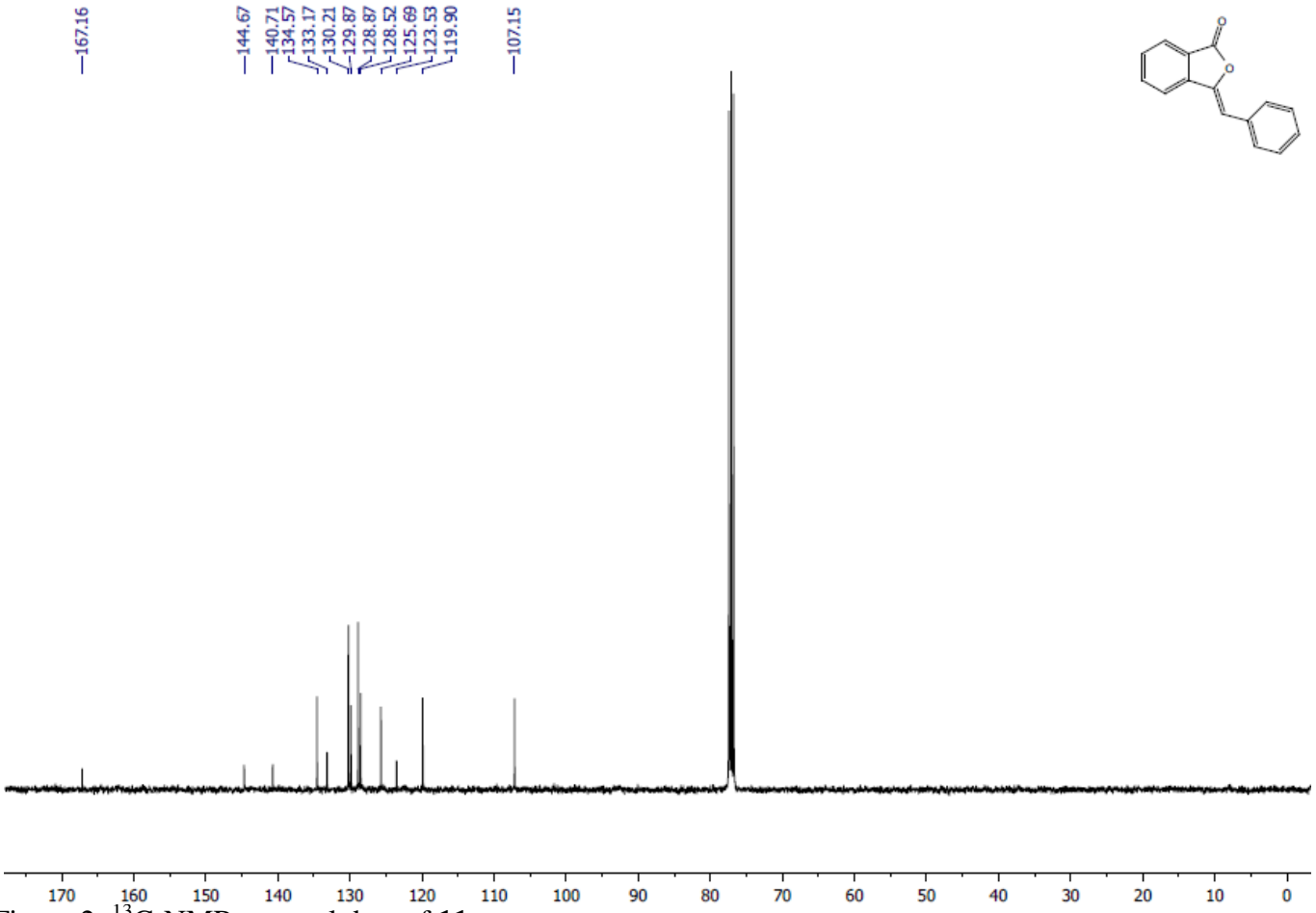


Figure 2: ^{13}C-NMR spectral data of **11a**.

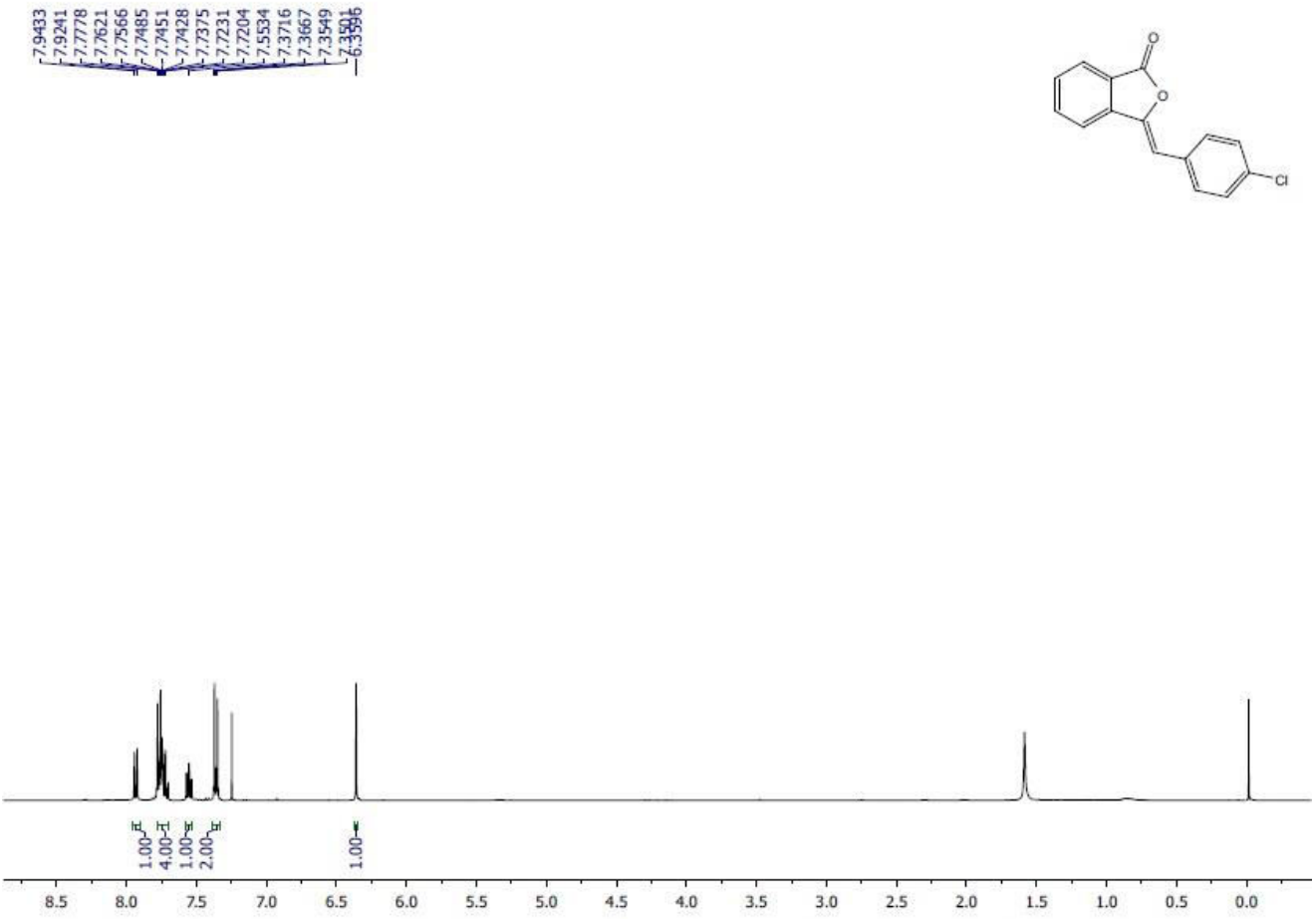


Figure 3: ^{1}H-NMR spectral data **11b**.

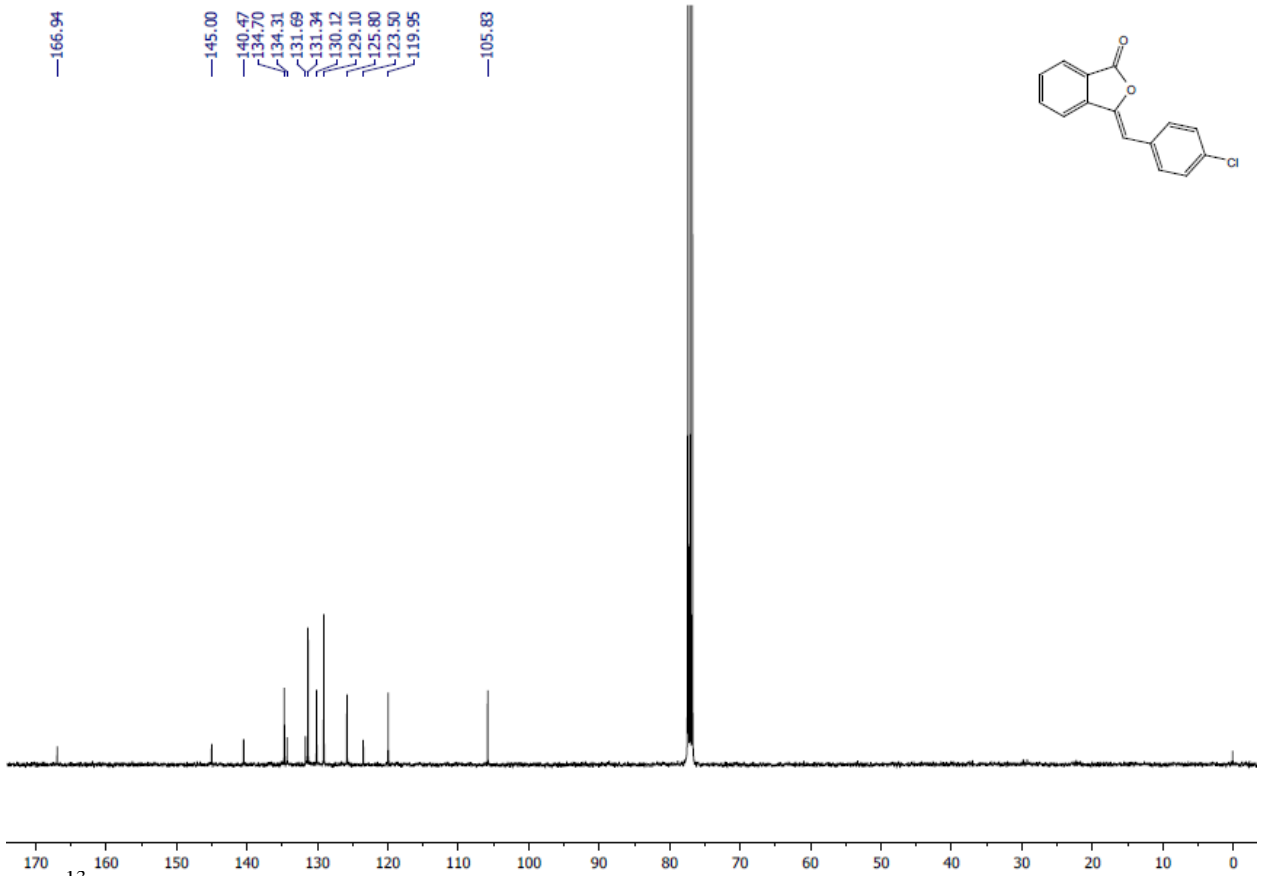


Figure 4: ^{13}C-NMRspectral data of **11b**.

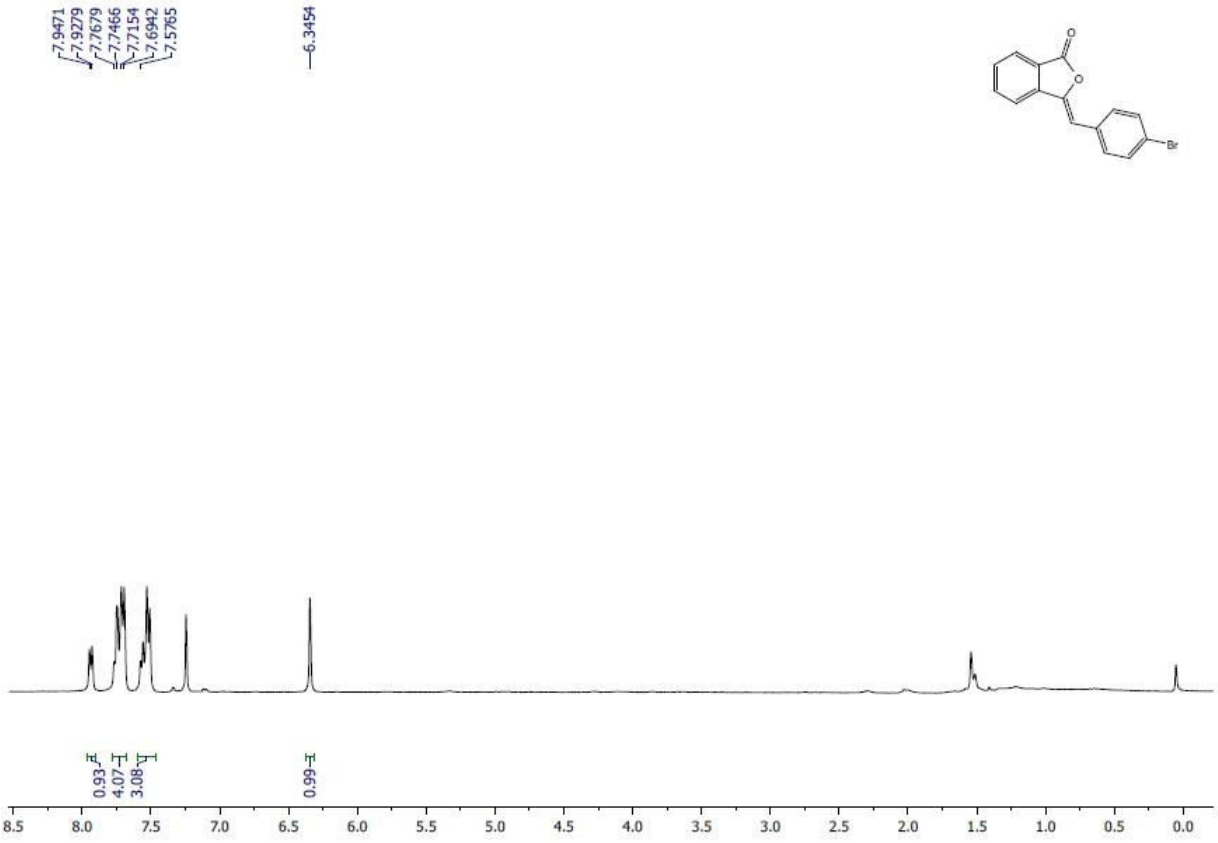


Figure 5: ^{1}H-NMR spectral data of **11c**.

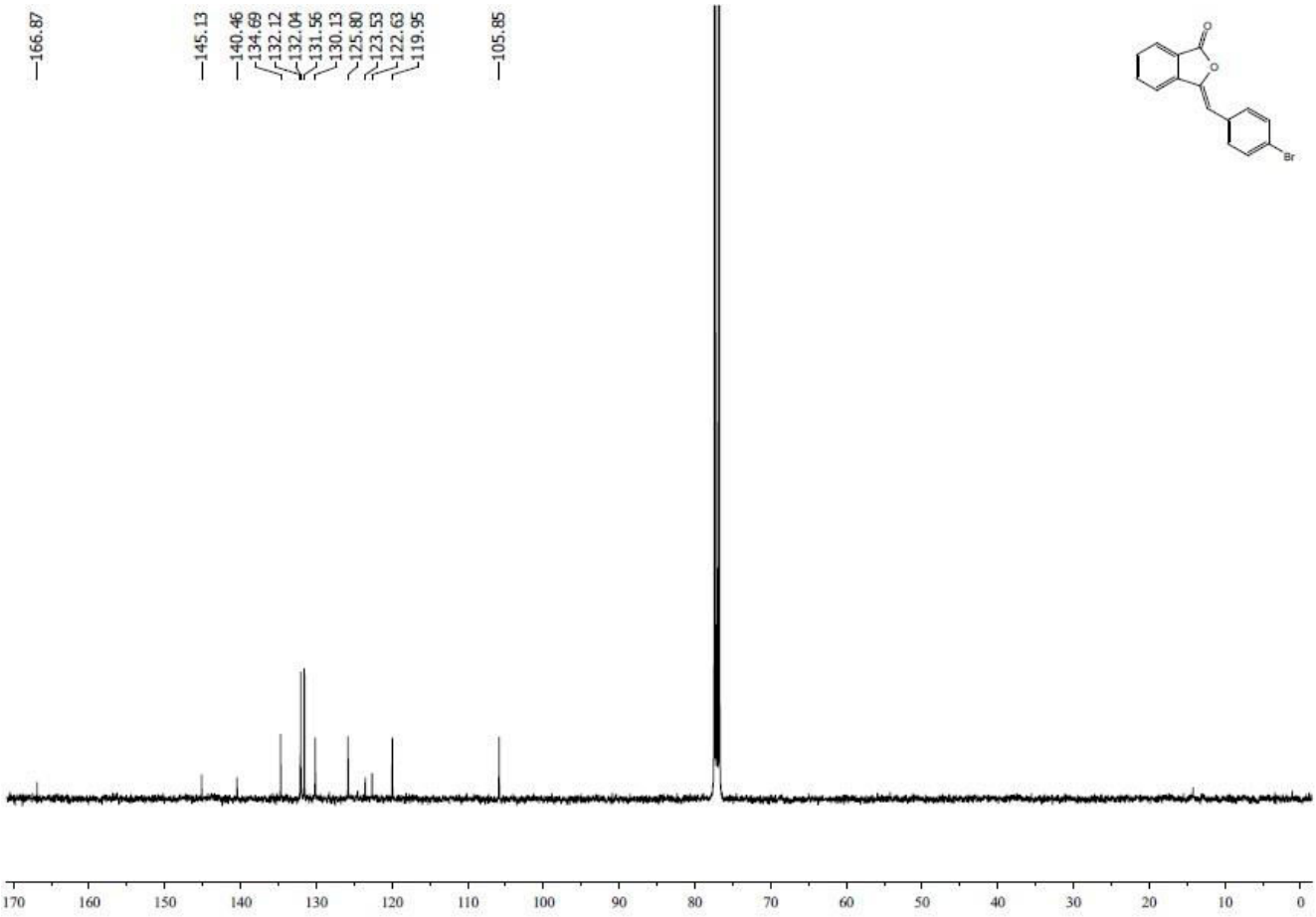


Figure 6: ^{13}C-NMR spectral data of **11c.**

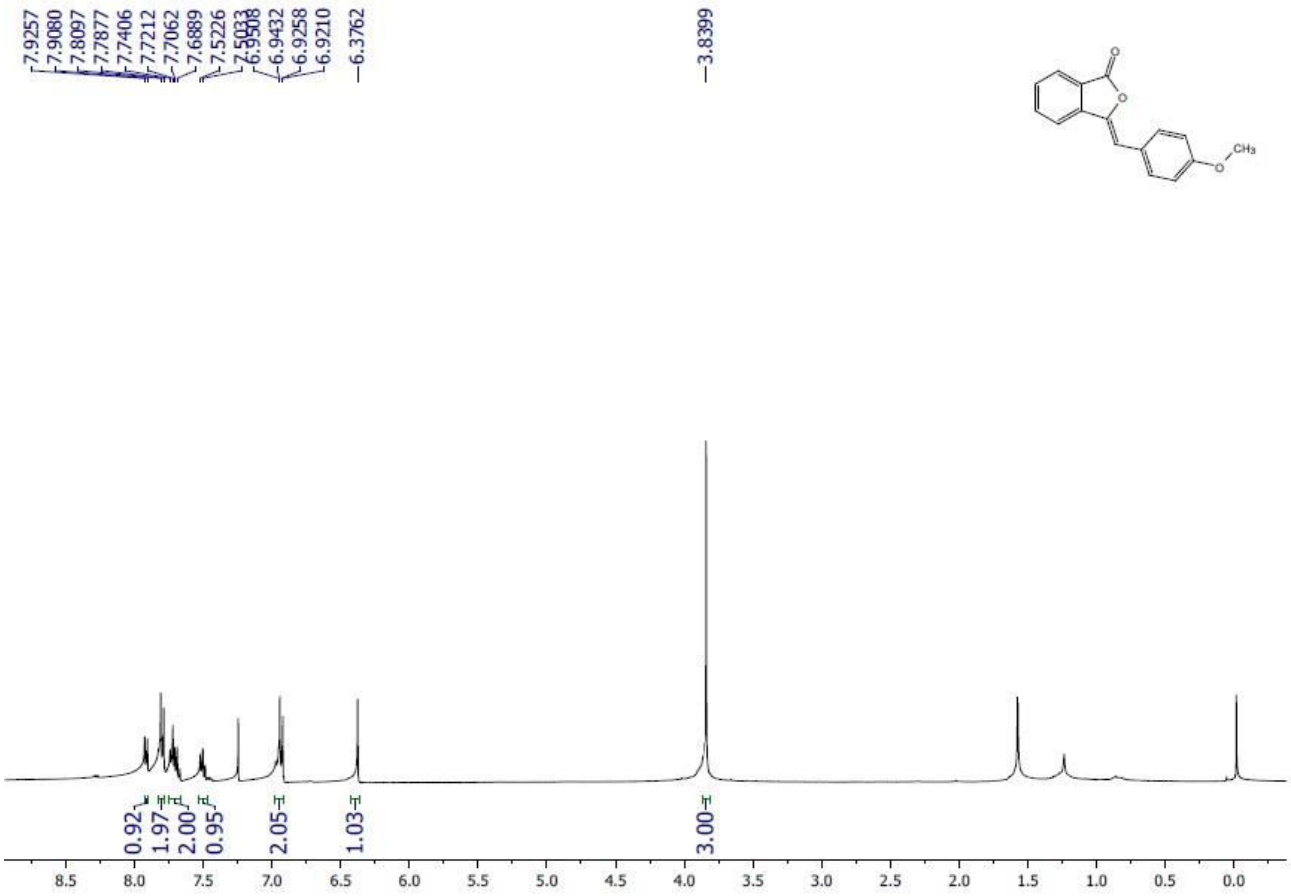


Figure 7: [1]H-NMR spectral data of **11d**.

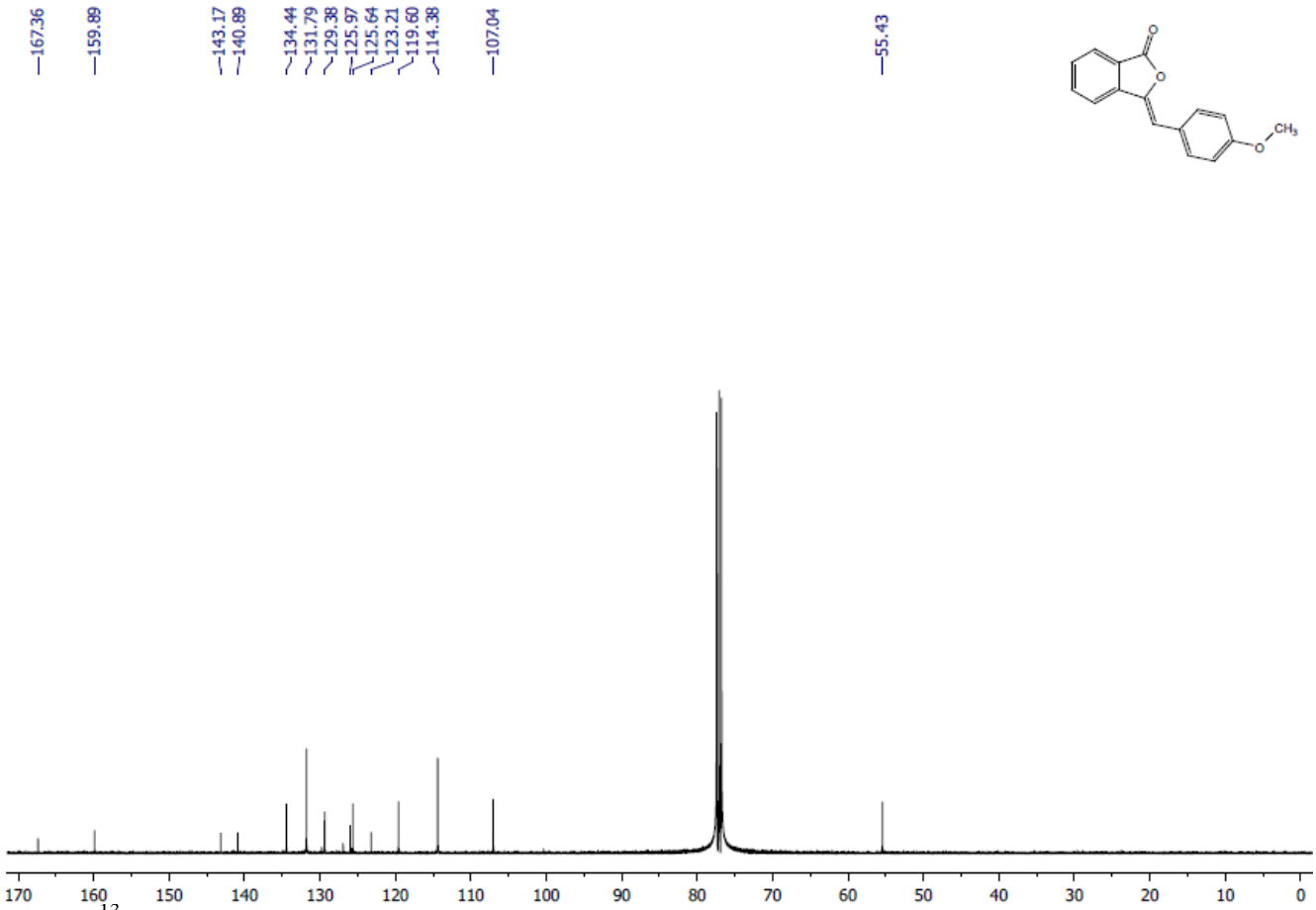


Figure 8: [13]C-NMR spectral data of **11d**.

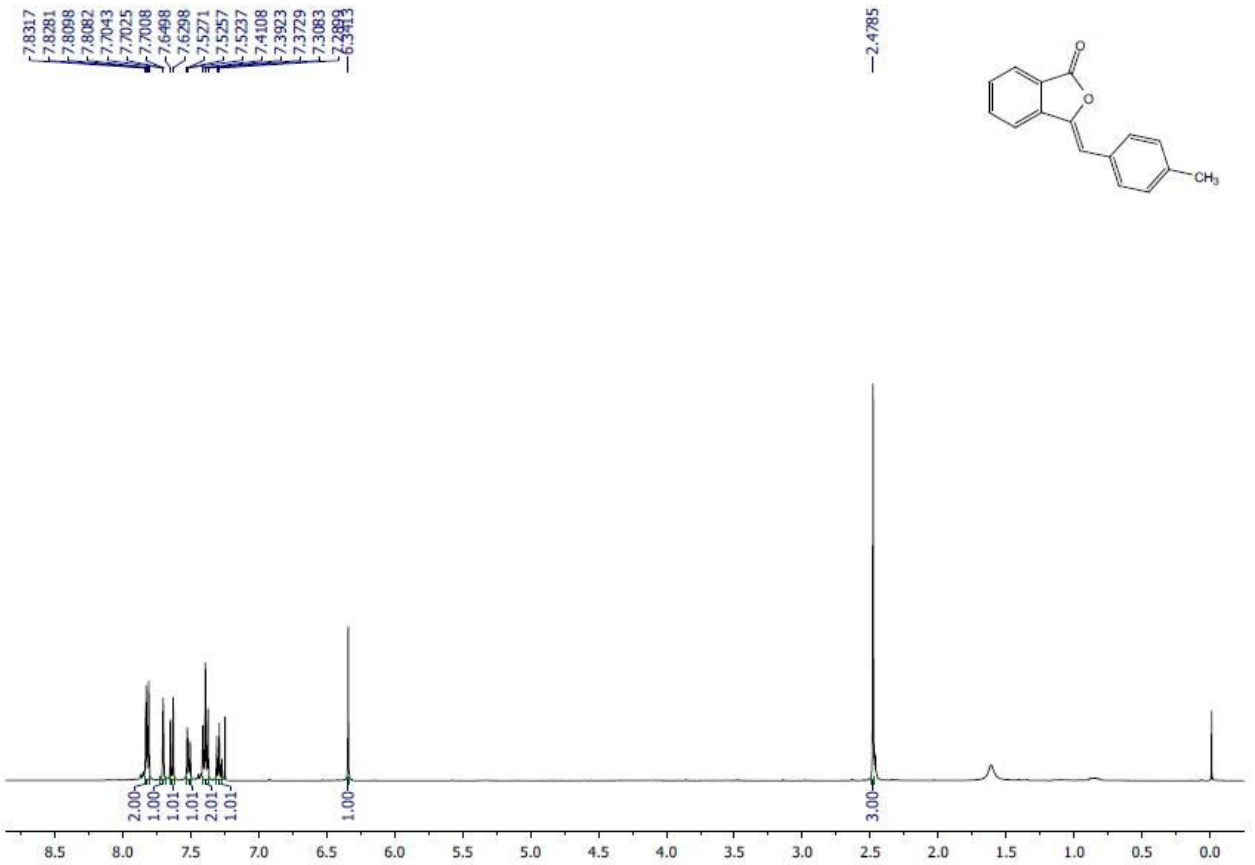


Figure 9: ^{1}H-NMR spectral data of **11e**.

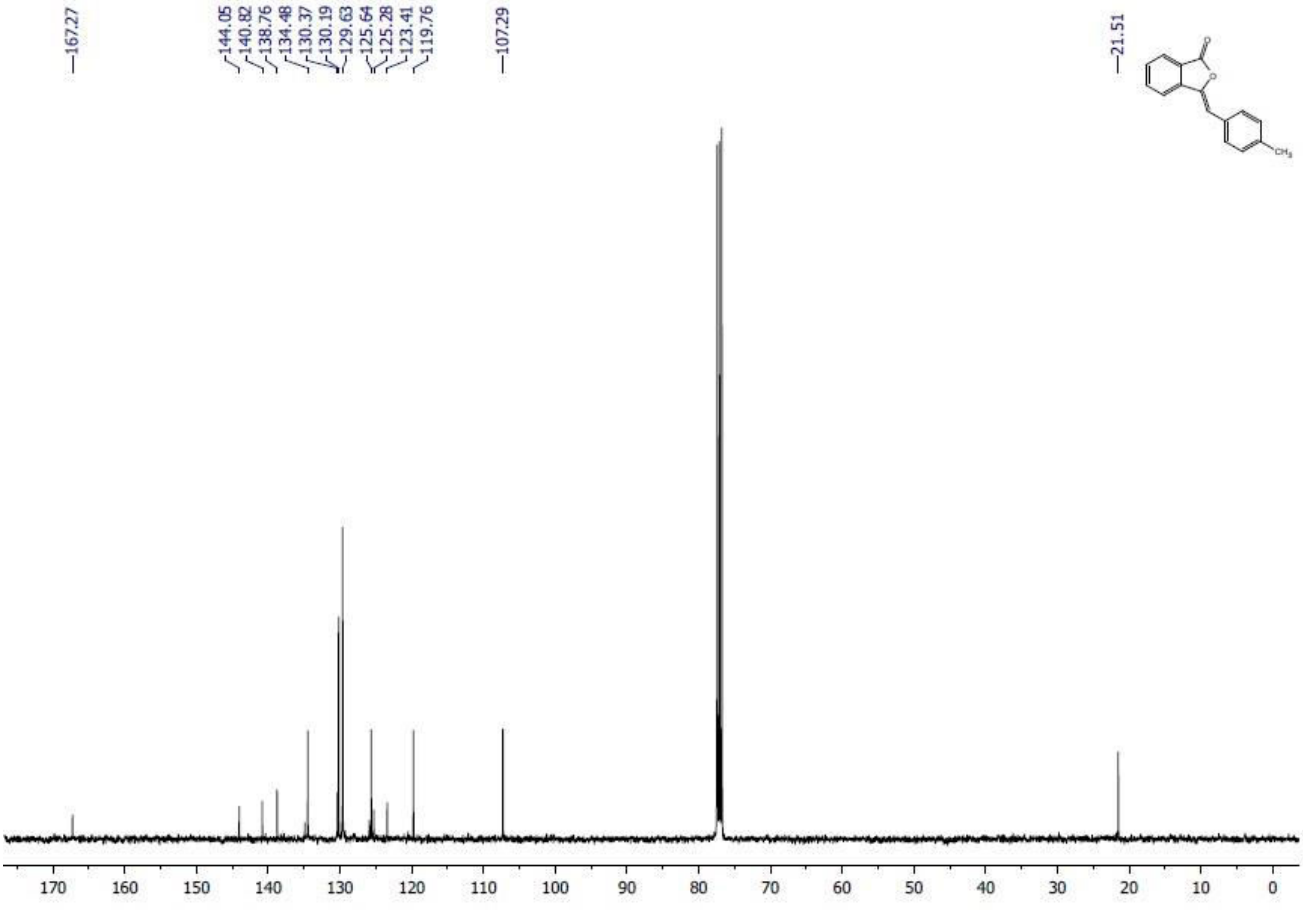


Figure 10: ^{13}C-NMR spectral data of **11e**.

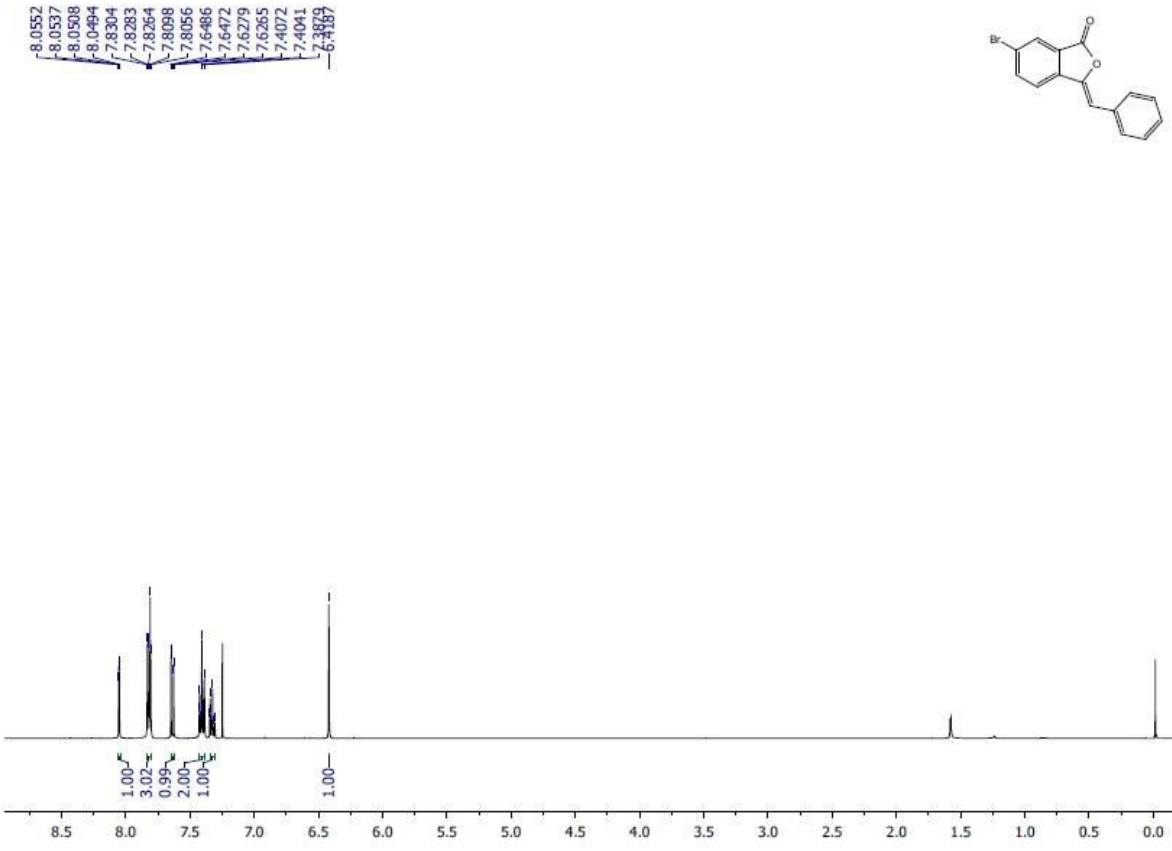


Figure 11: ^{1}H-NMR spectral data of **12a**.

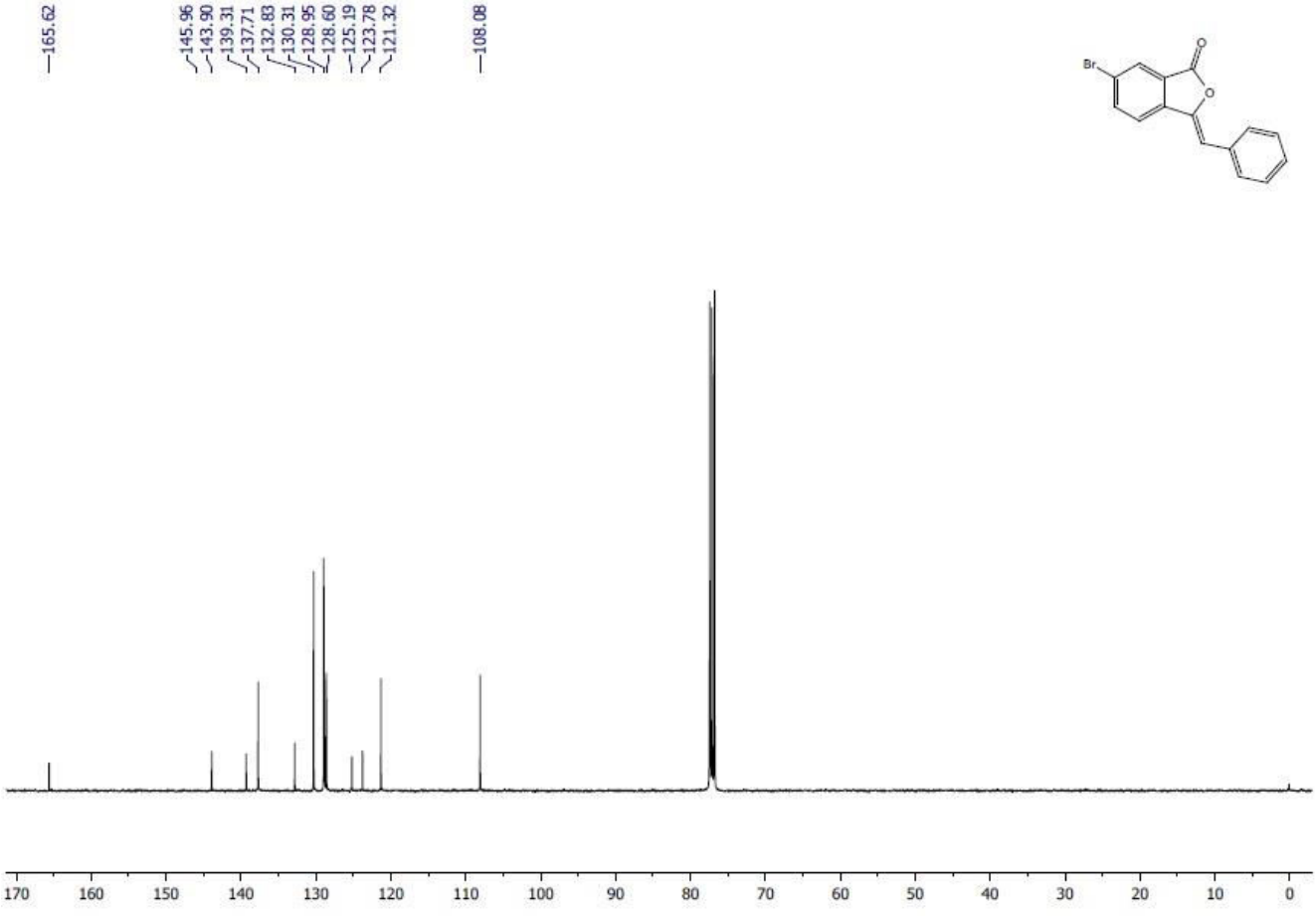


Figure 12: ^{13}C-NMR spectral data of **12a**.

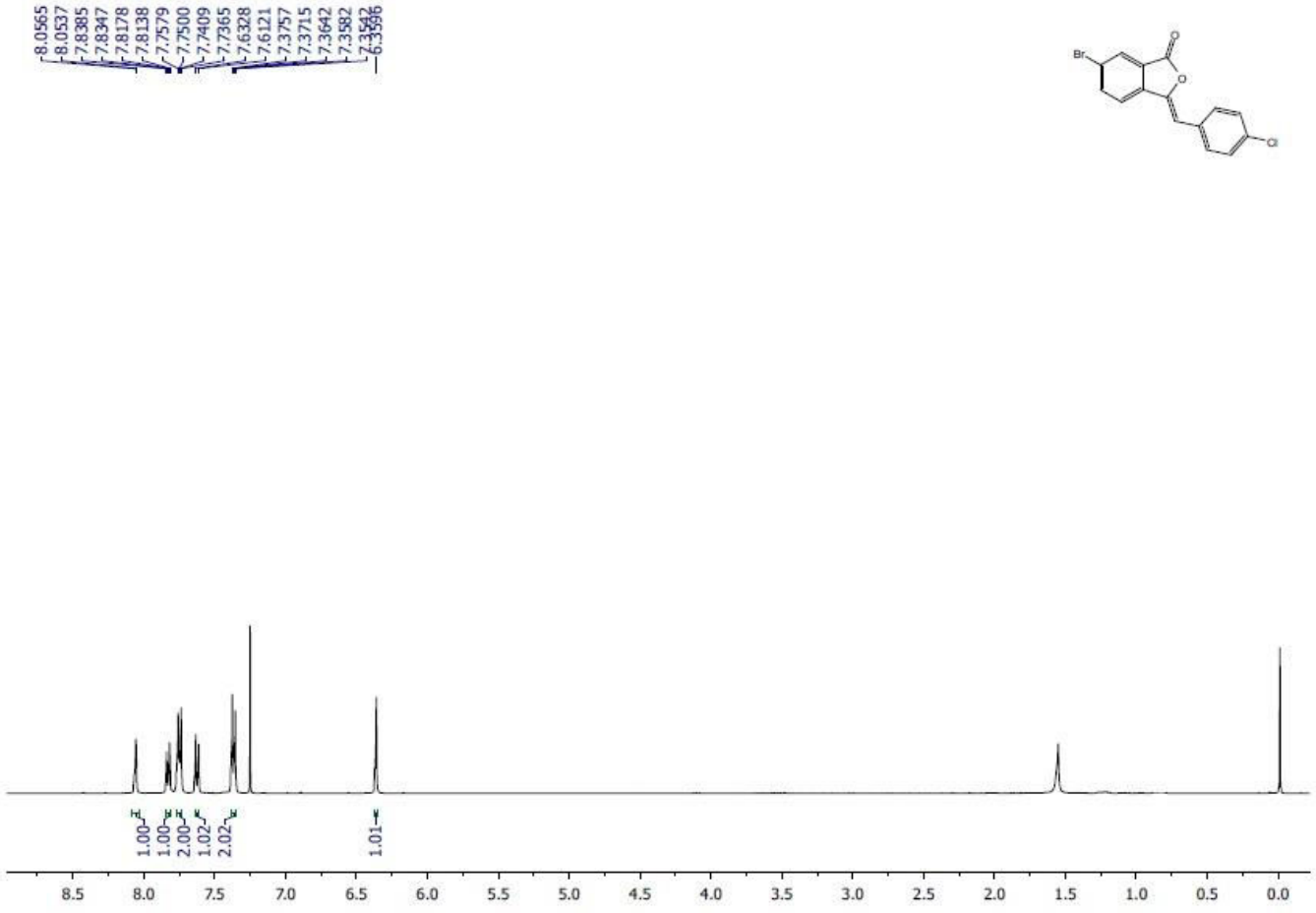


Figure 13: ^{1}H-NMR spectral data of **12b**.

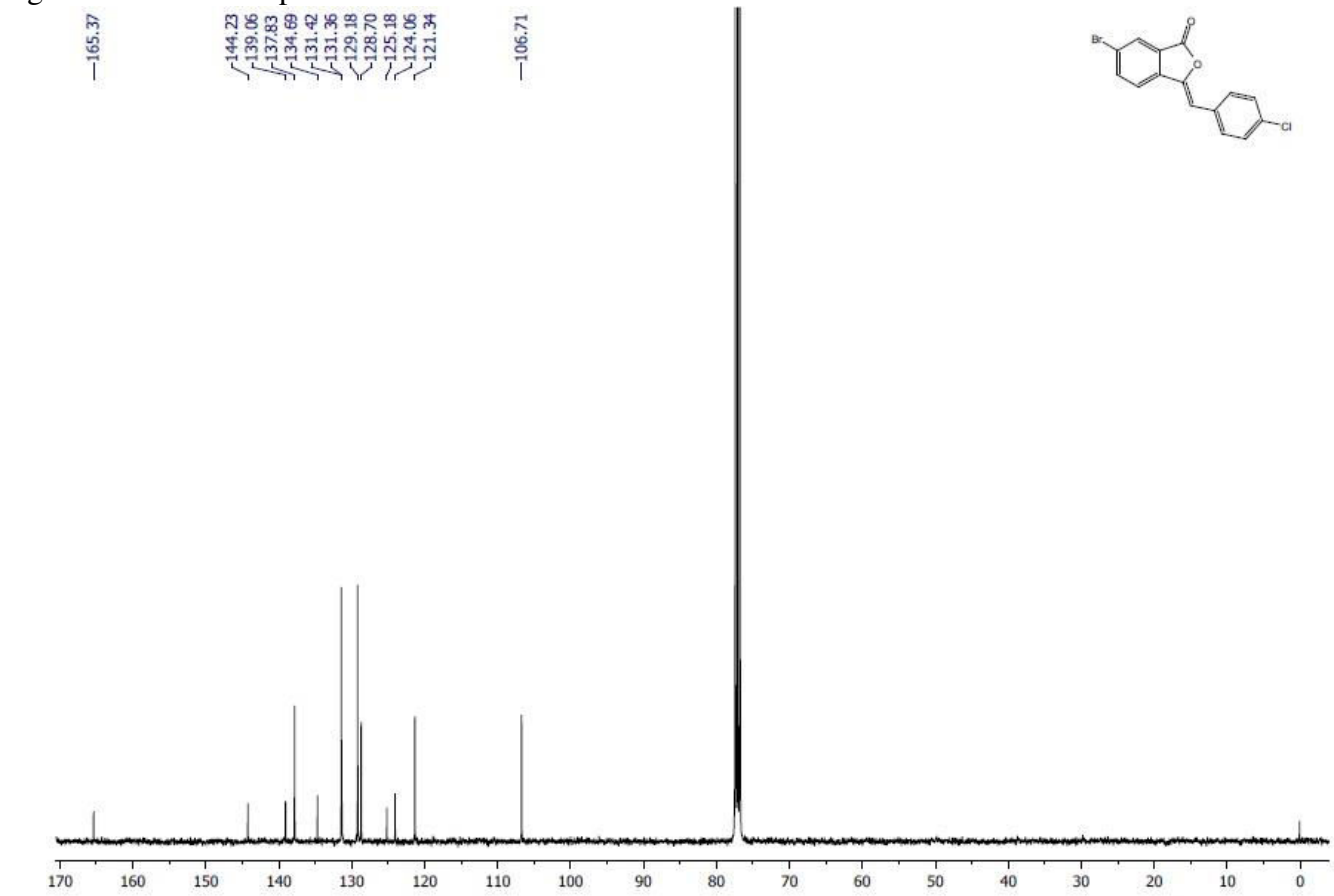


Figure 14: ^{13}C-NMR spectral data of **12b**.

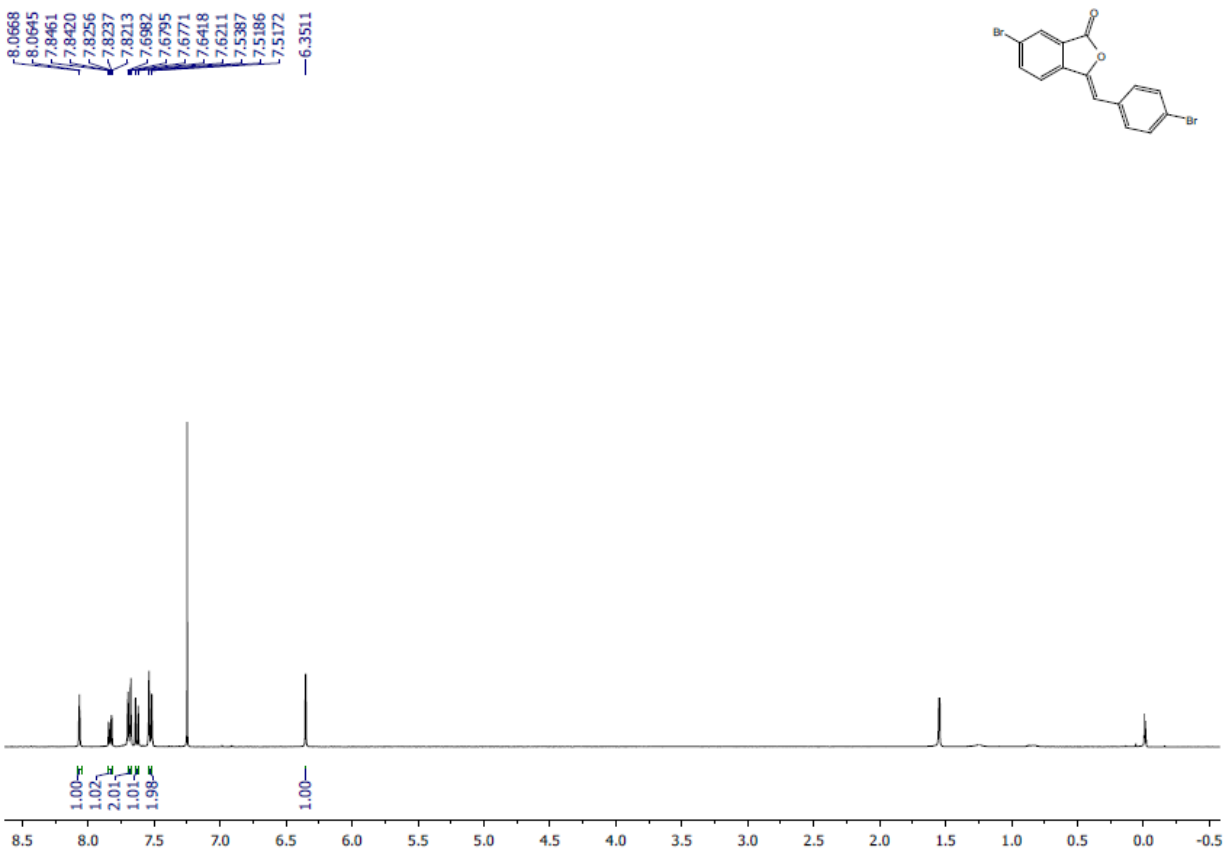


Figure 15: ^{1}H-NMR spectral data of **12c**.

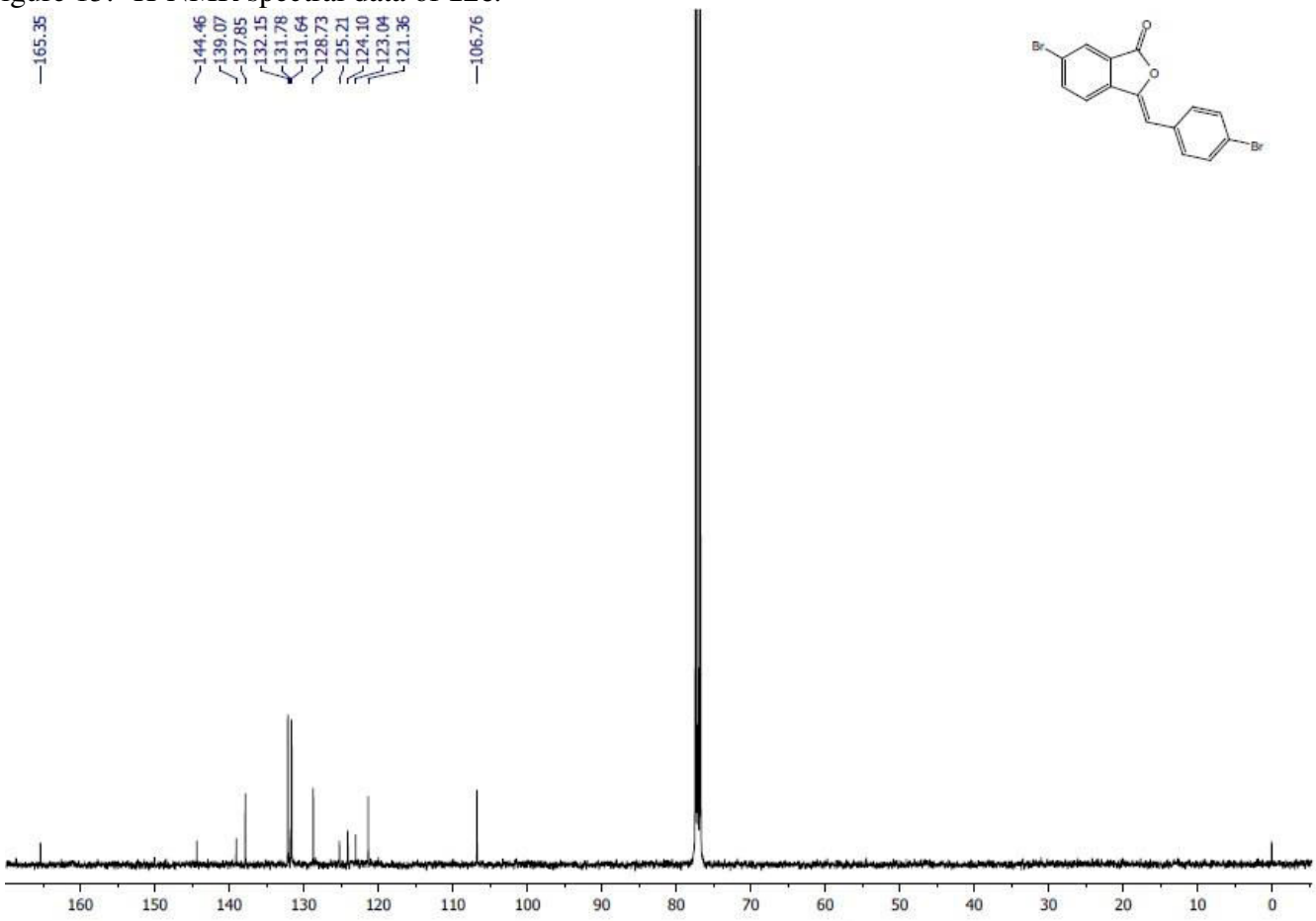


Figure 16: ^{13}C-NMR spectral data of **12c**.

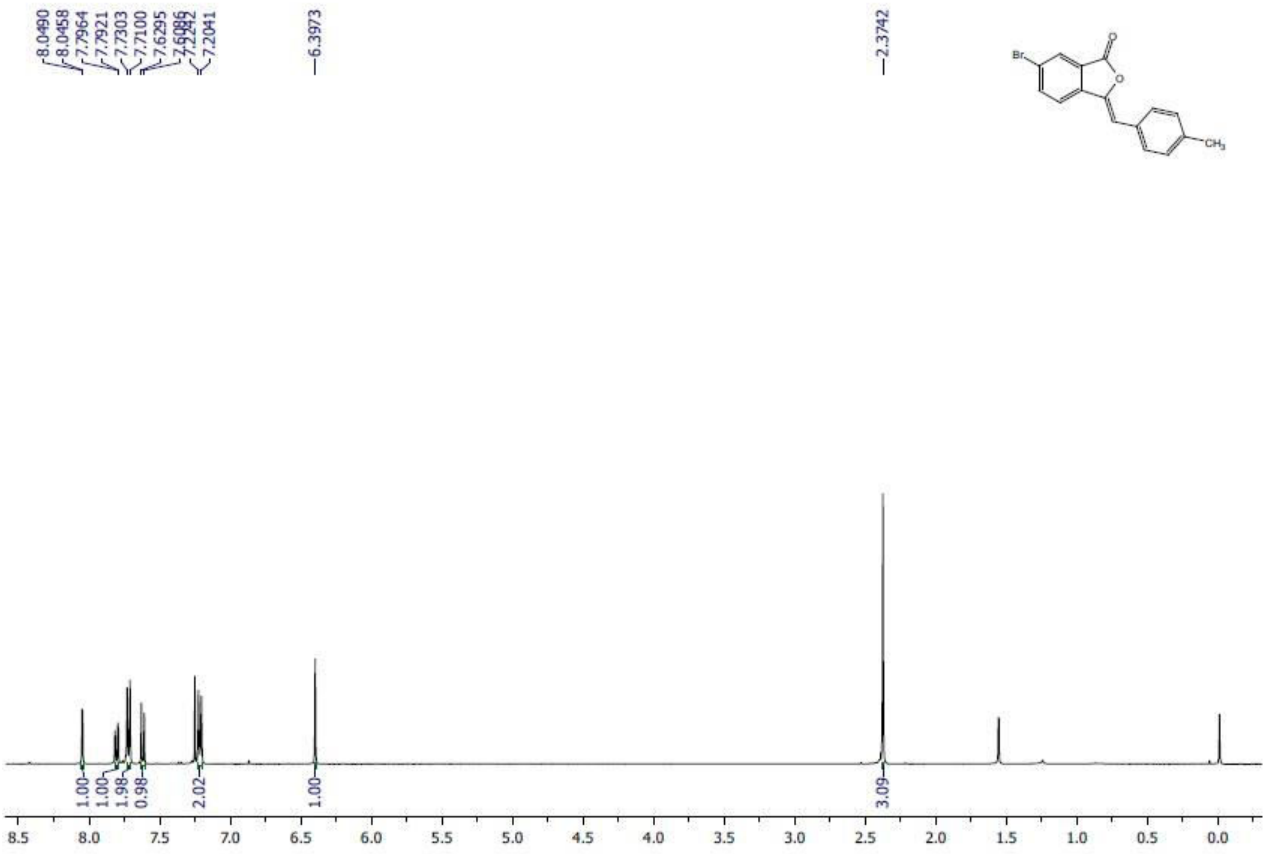


Figure 17: ^{1}H-NMR spectral data of **12d**.

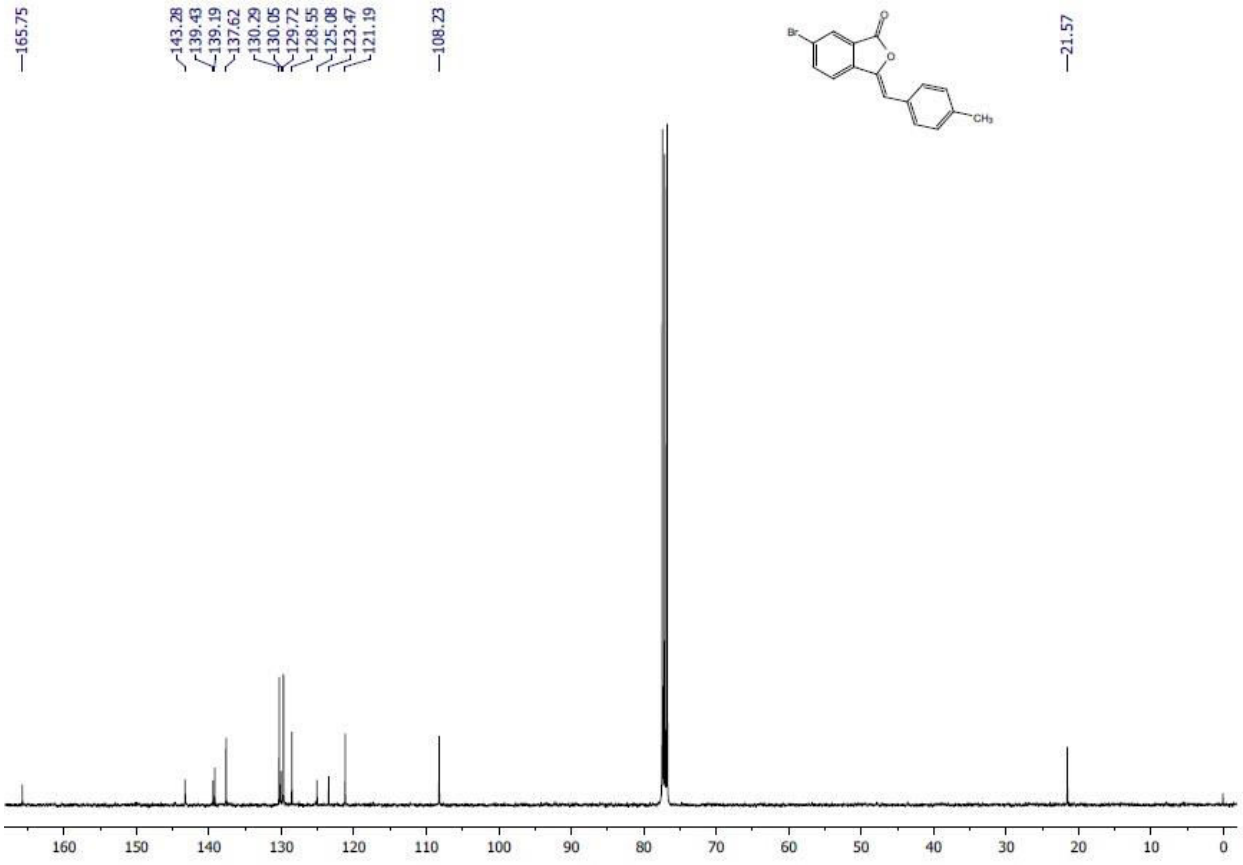


Figure 18: ^{13}C-NMR spectral data of **12d**.

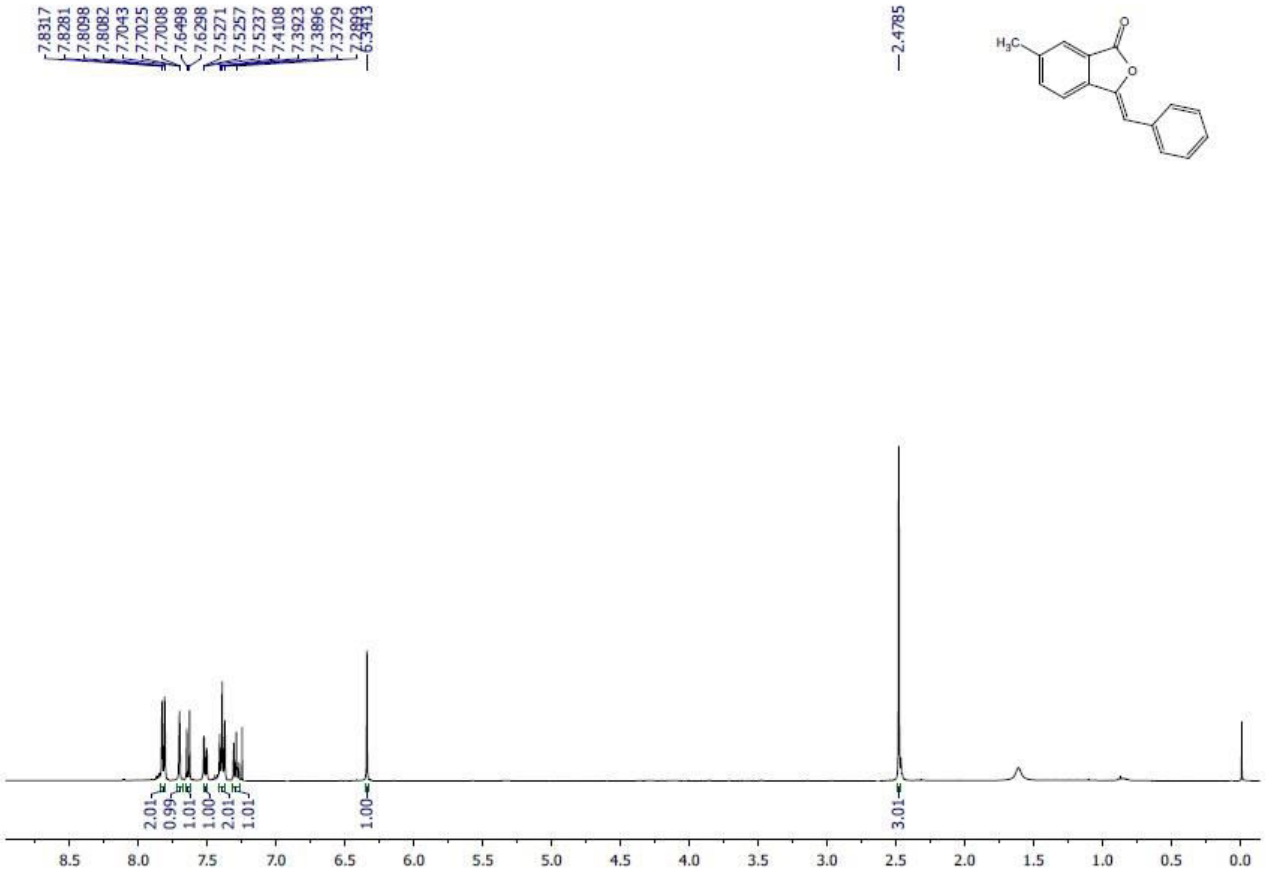


Figure 19: ^{1}H-NMR spectral data of **13a**.

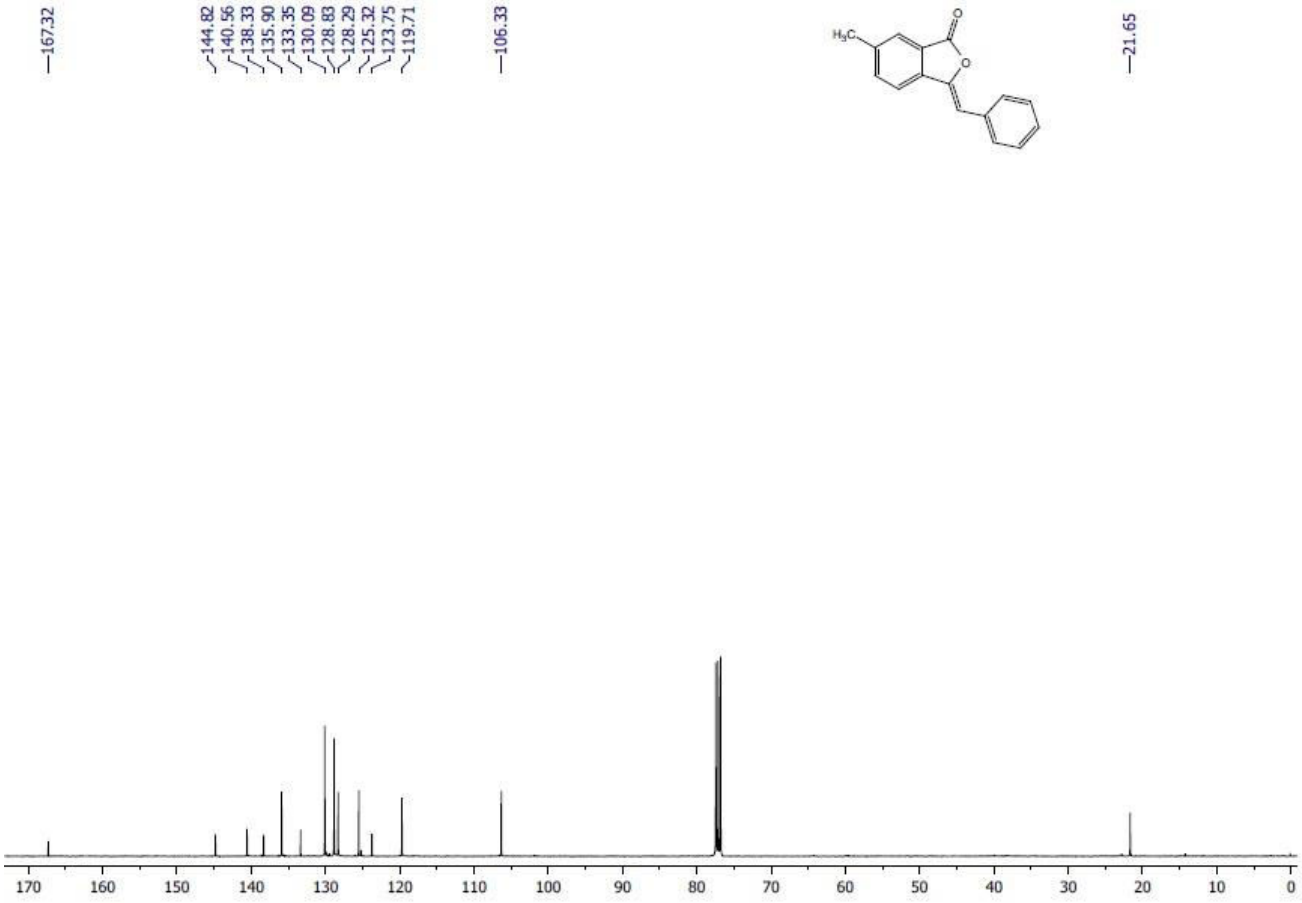


Figure 20: ^{13}C-NMR spectral data of **13a**.

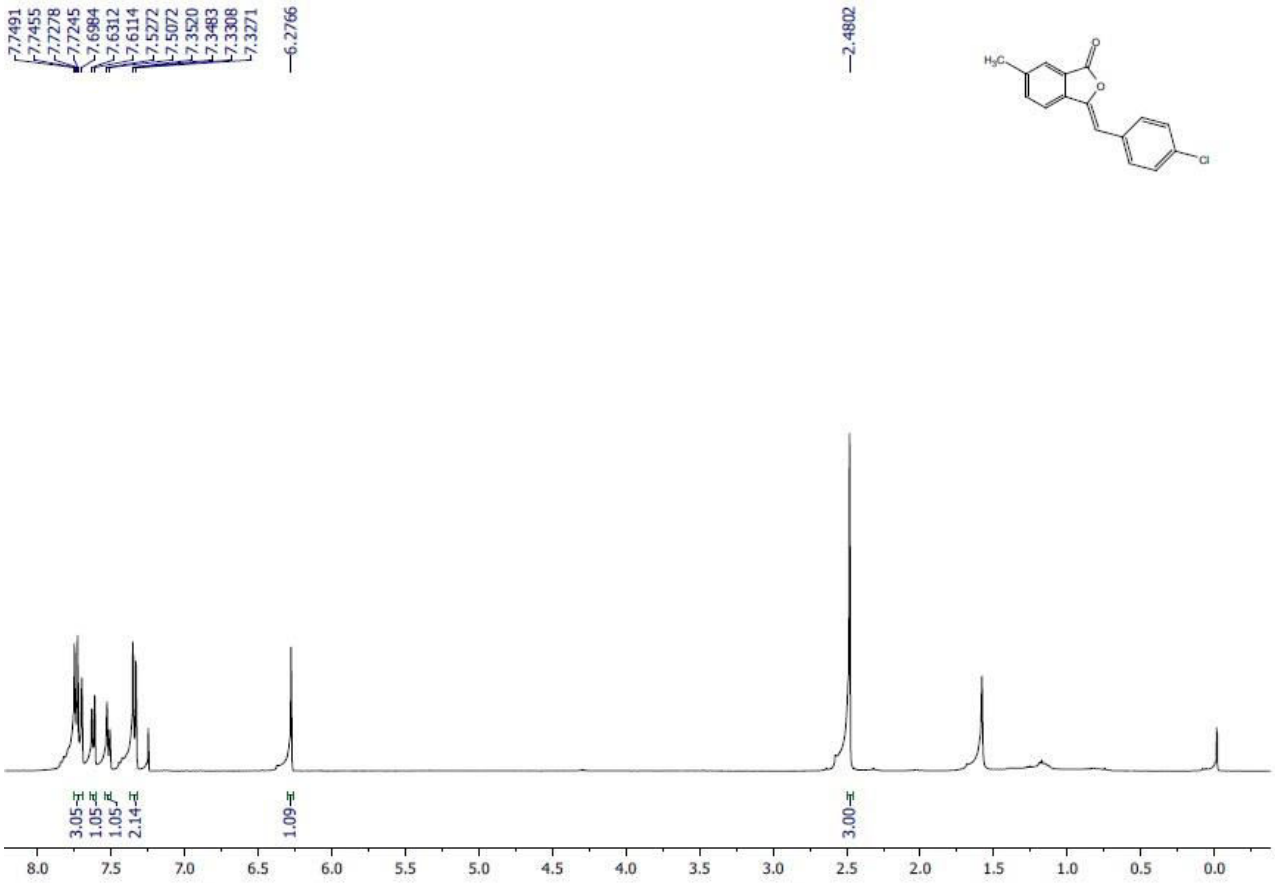


Figure 21: [1]H-NMR spectral data of **13b**.

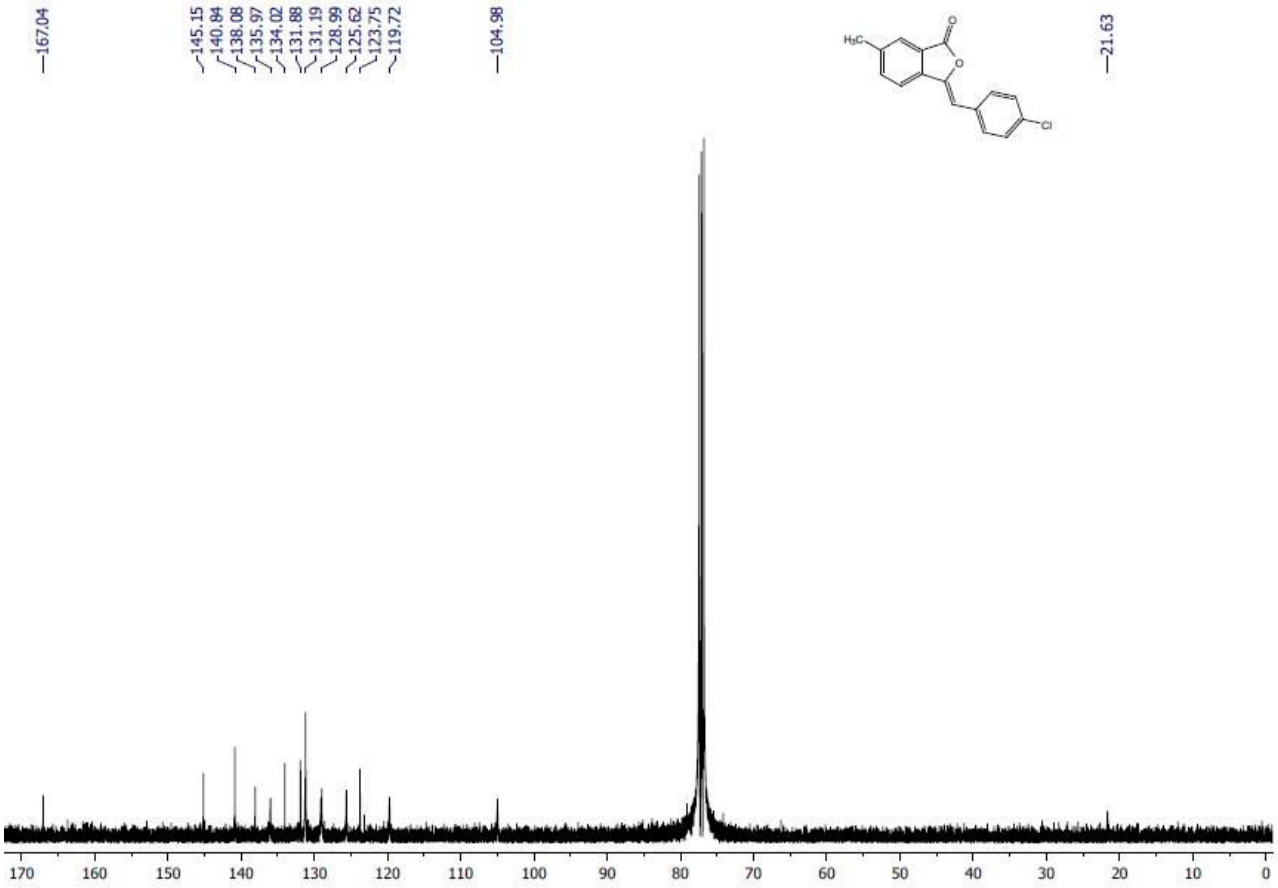
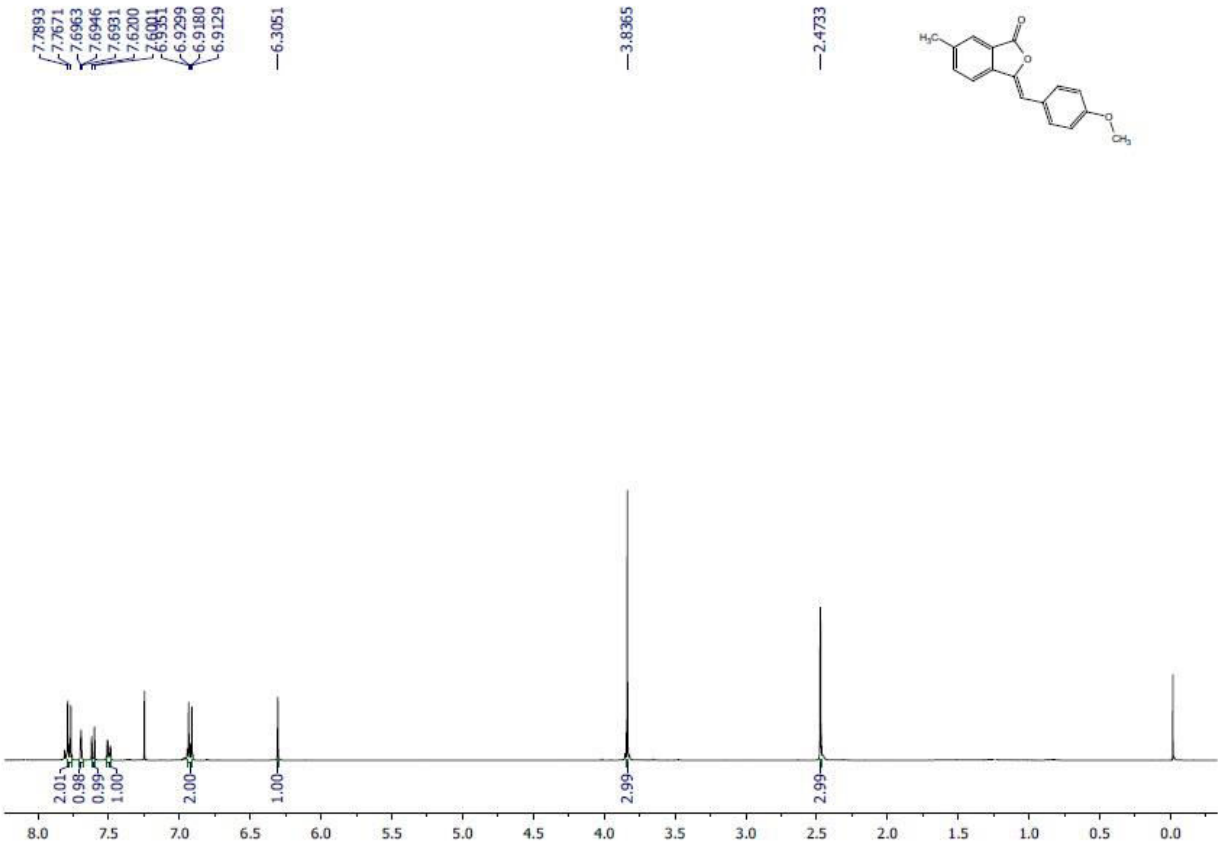


Figure 22: [13]C-NMR spectral data of **13b**.



.Figure 23: ^{1}H-NMR spectral data of **13c**.

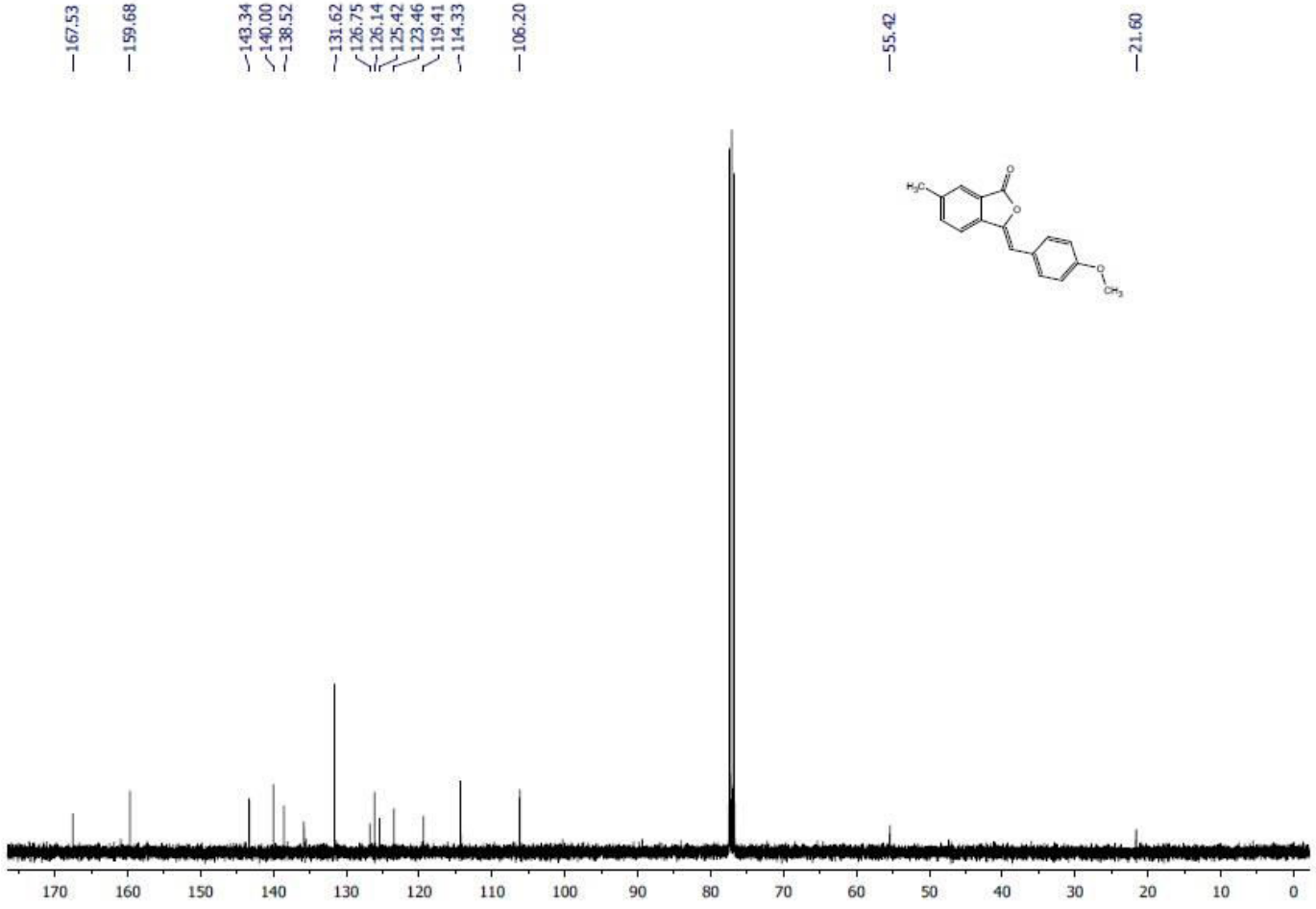


Figure 24: ^{13}C-NMR spectral data of **13c**.

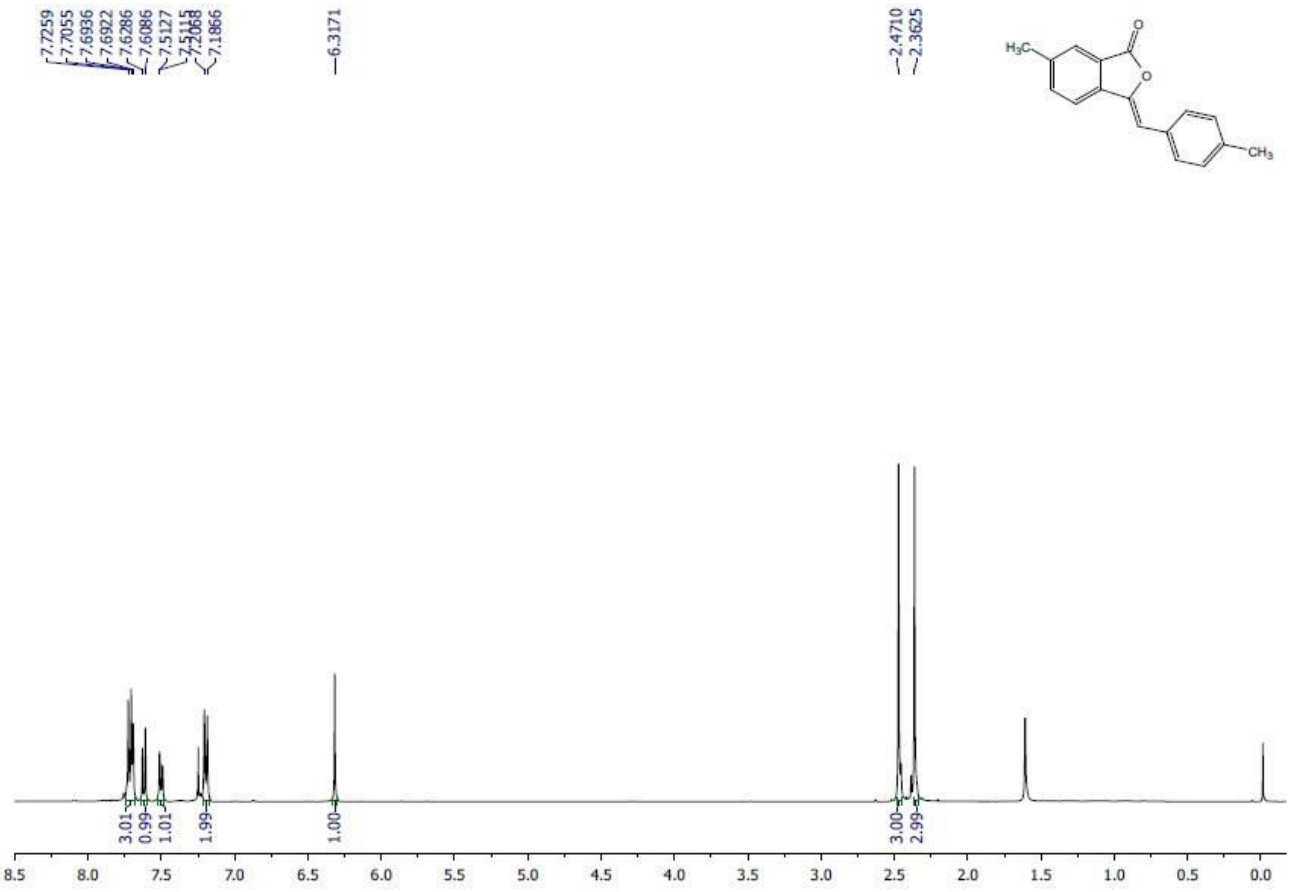


Figure 25: ^{1}H-NMR spectral data of **13d**.

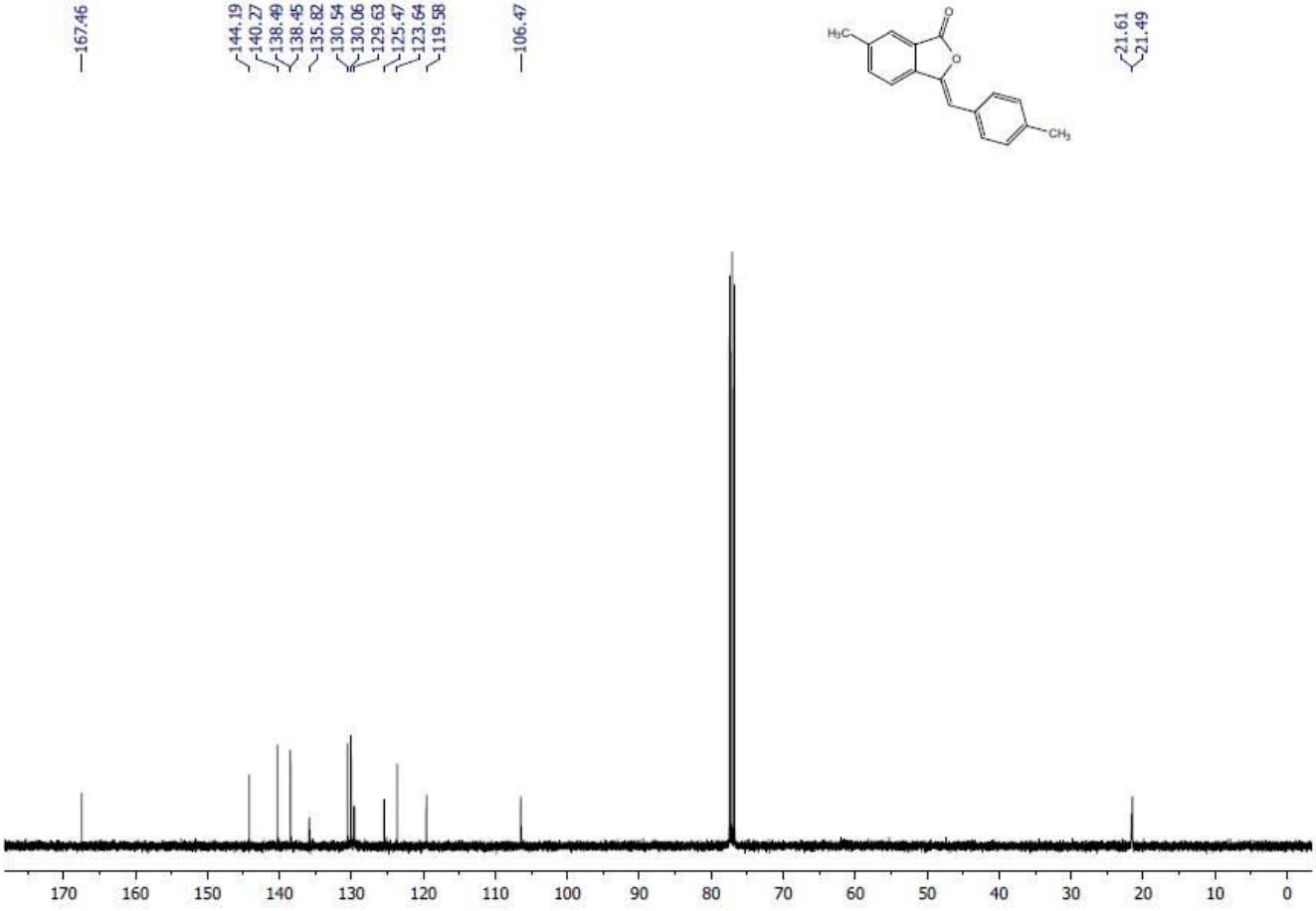


Figure 26: ^{13}C-NMR spectral data of **13d**.

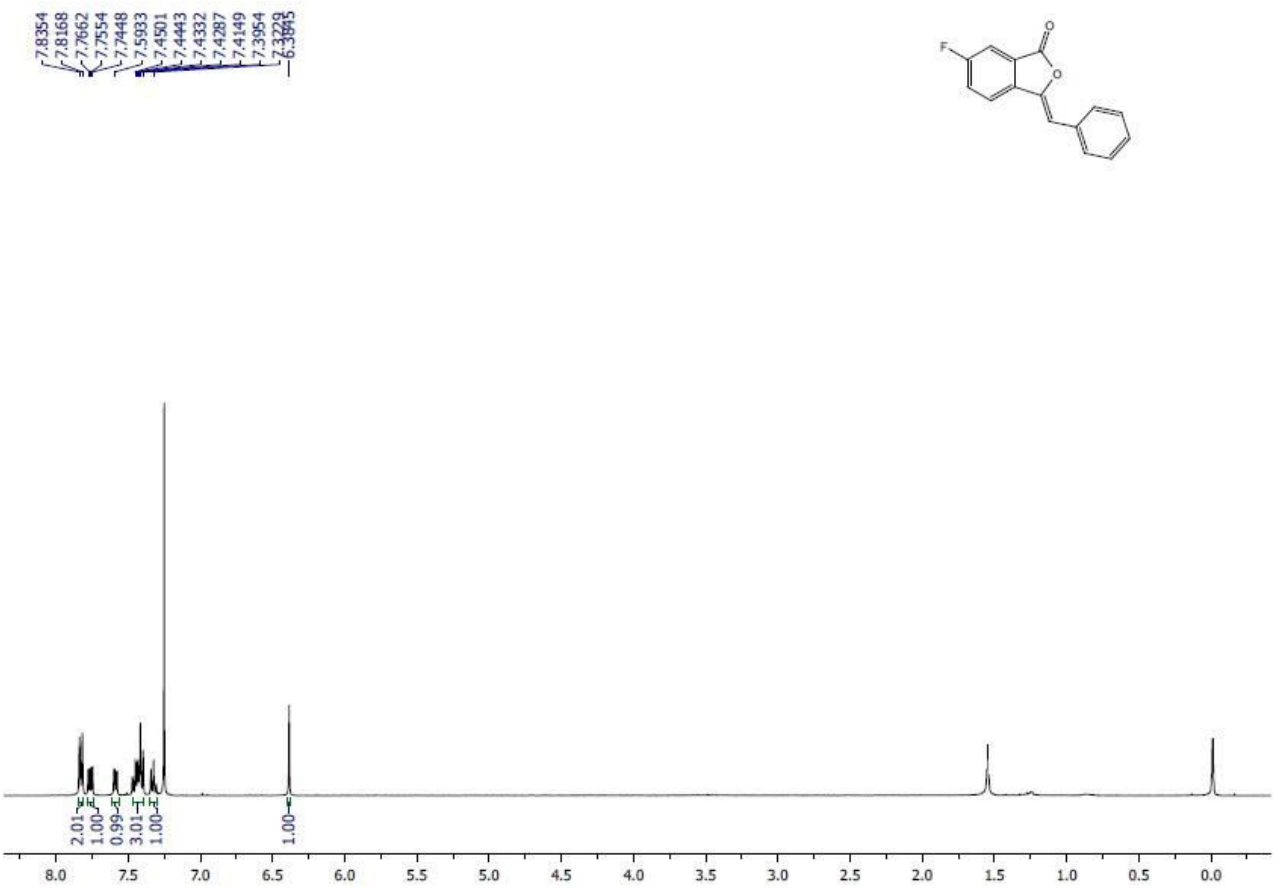


Figure 27: ^{1}H-NMR spectral data of **14a**.

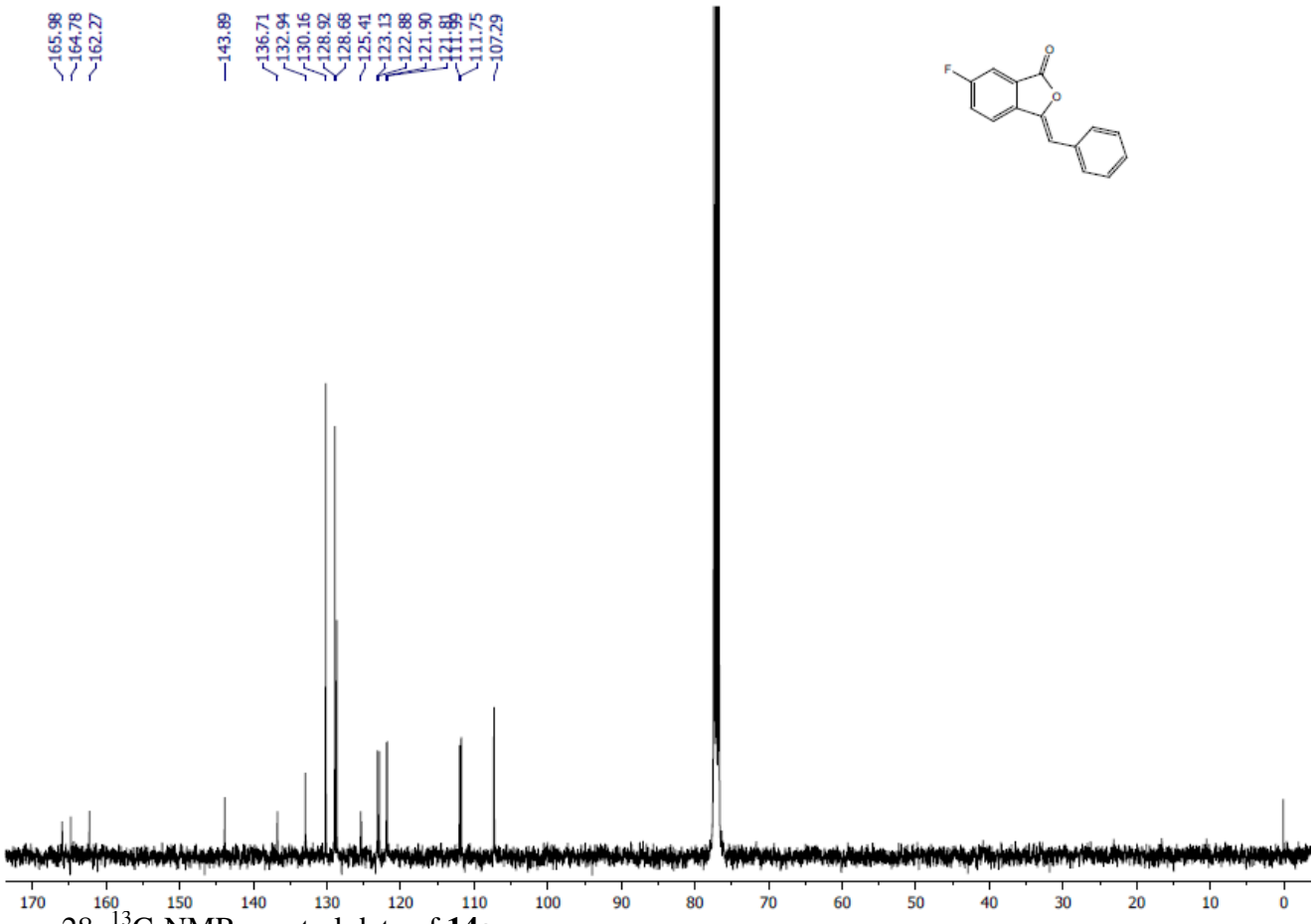


Figure 28: ^{13}C-NMR spectral data of **14a**.

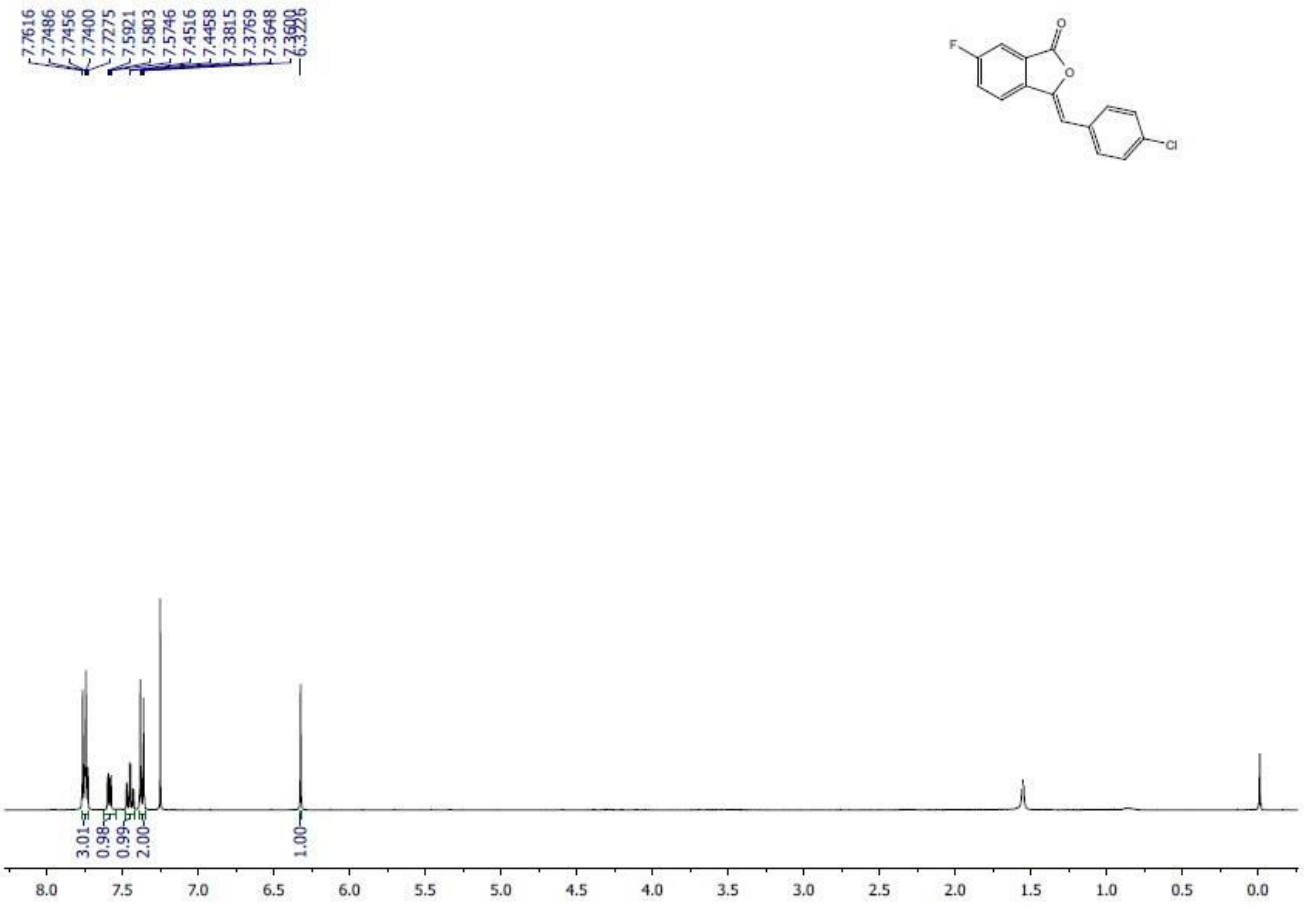


Figure 29: ^{1}H-NMR spectral data of **14b**.

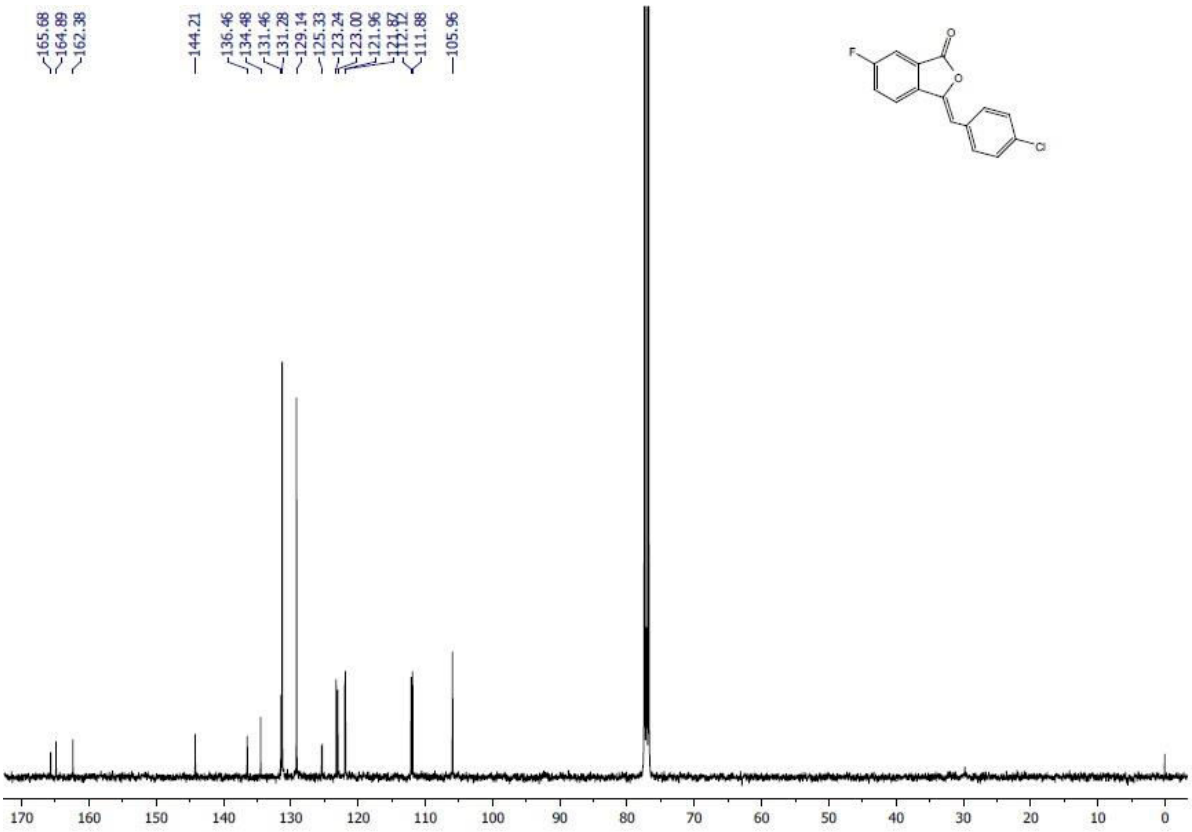


Figure 30: ^{13}C-NMR spectral data of **14b**.

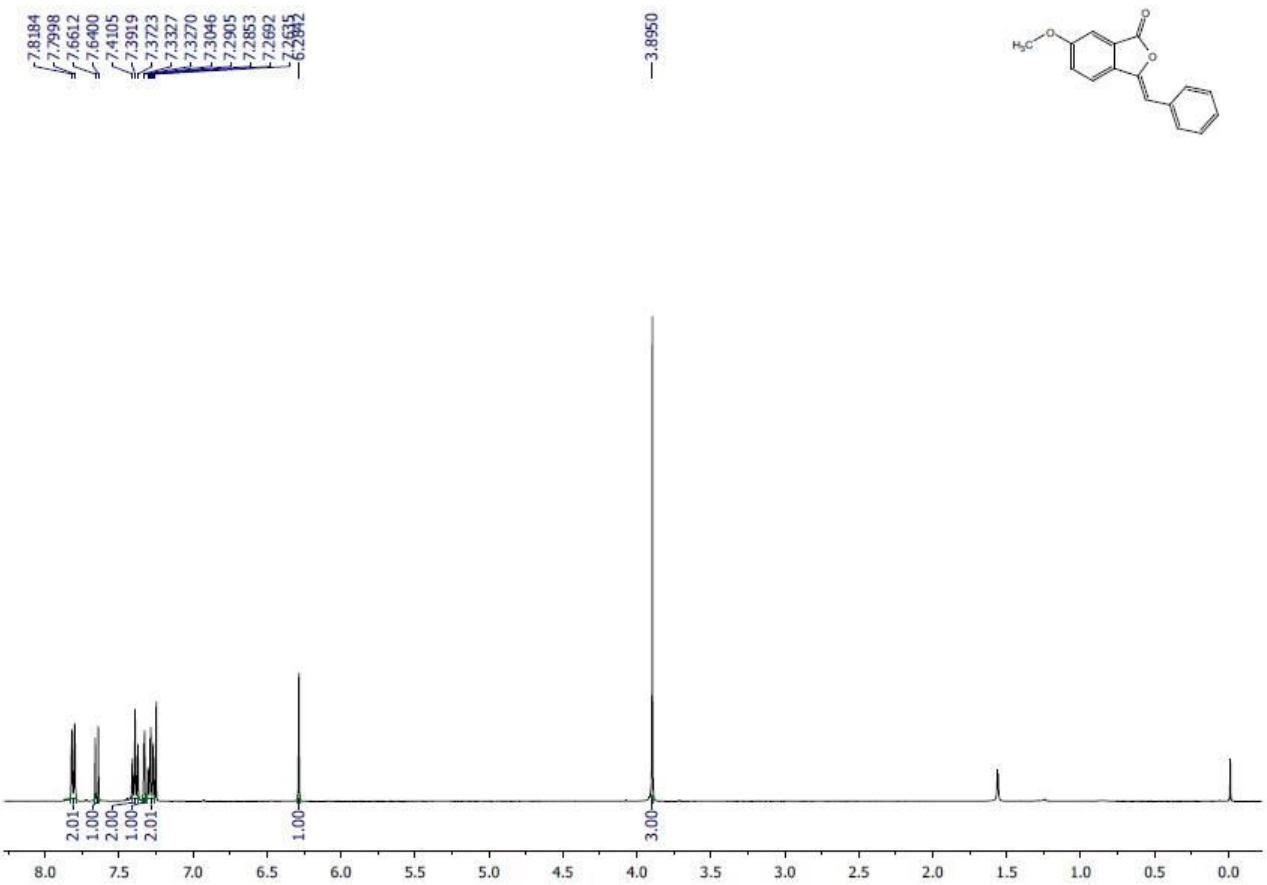


Figure 31: ^{1}H-NMR spectral data of **15a**.

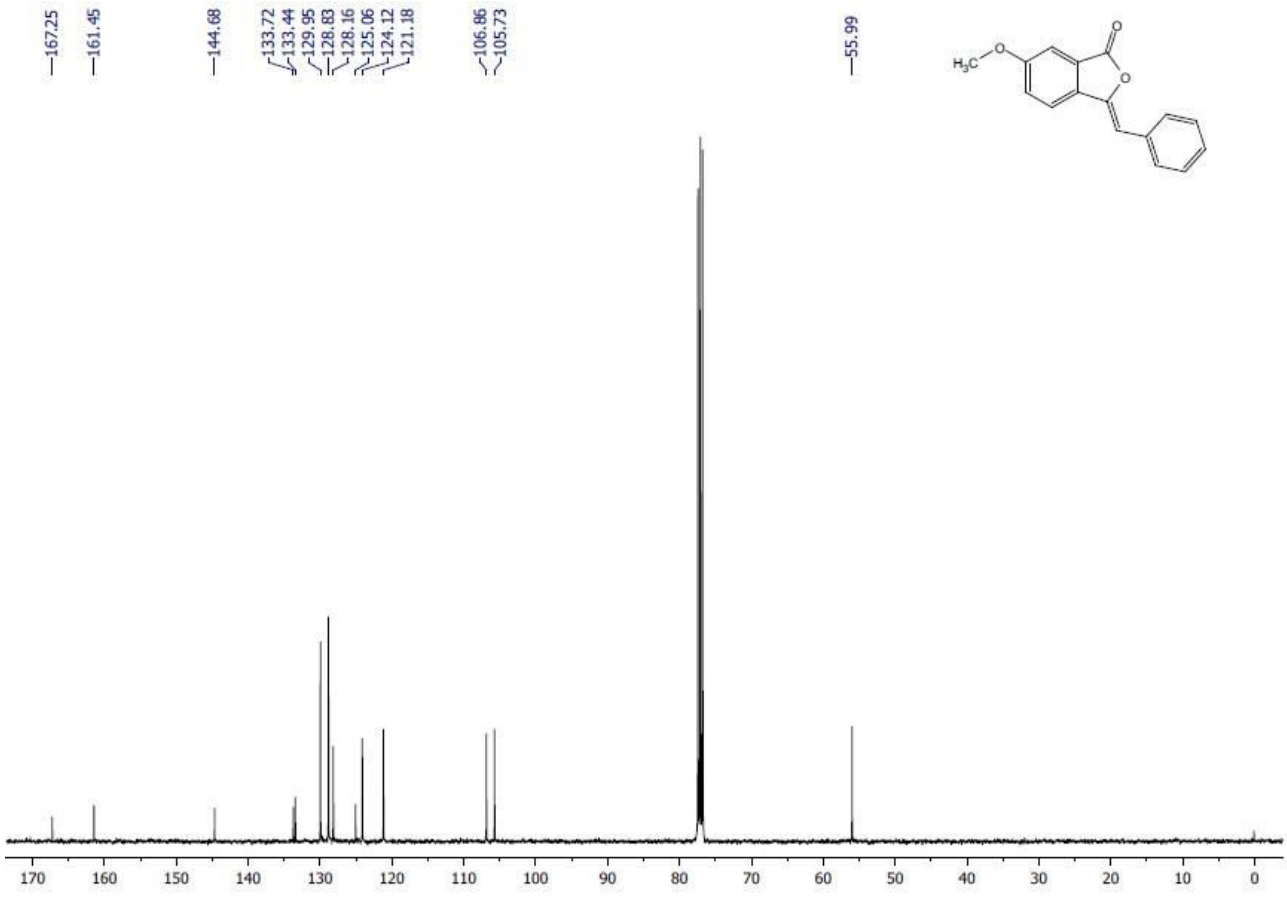


Figure 32: ^{13}C-NMR spectral data of **15a**.

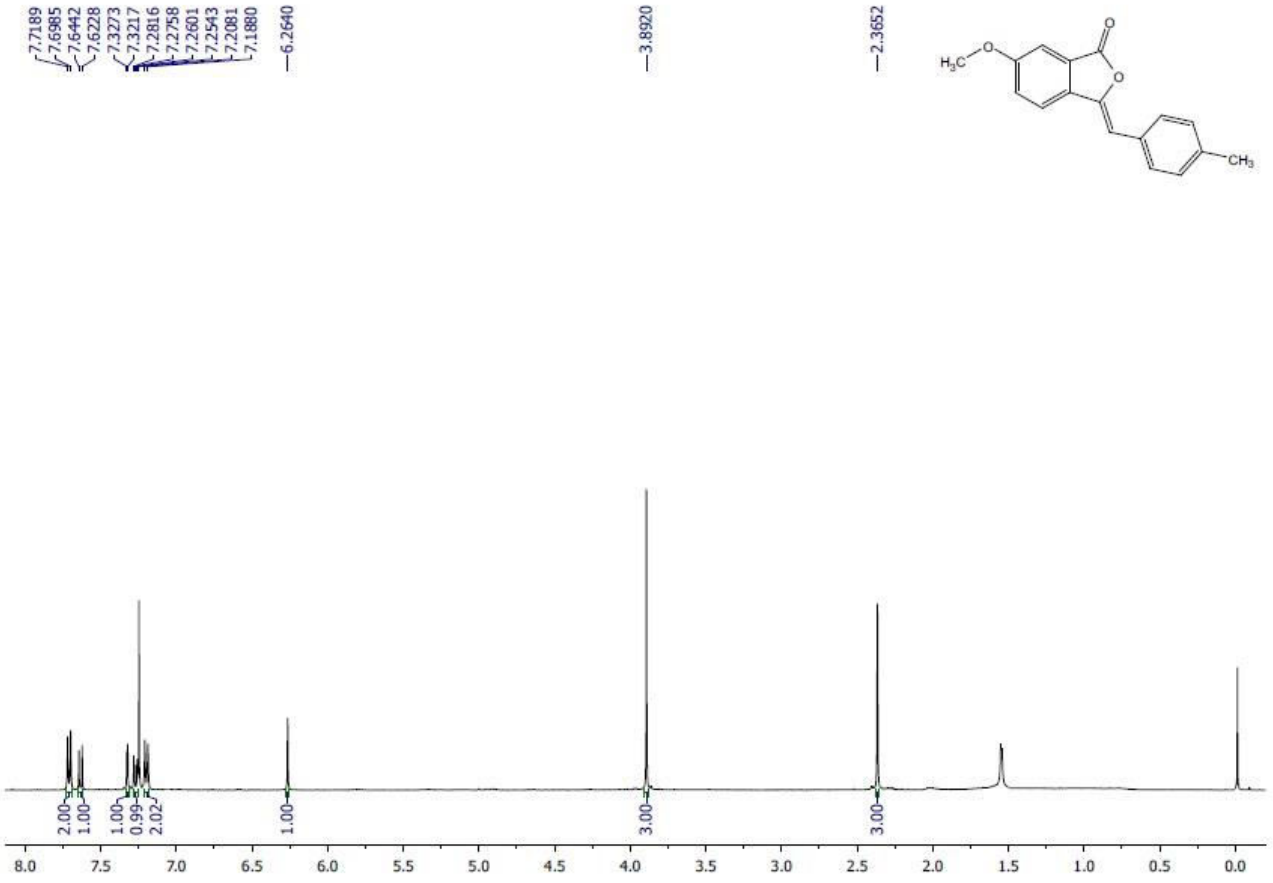


Figure 33: [1]H-NMR spectral data of **15b**.

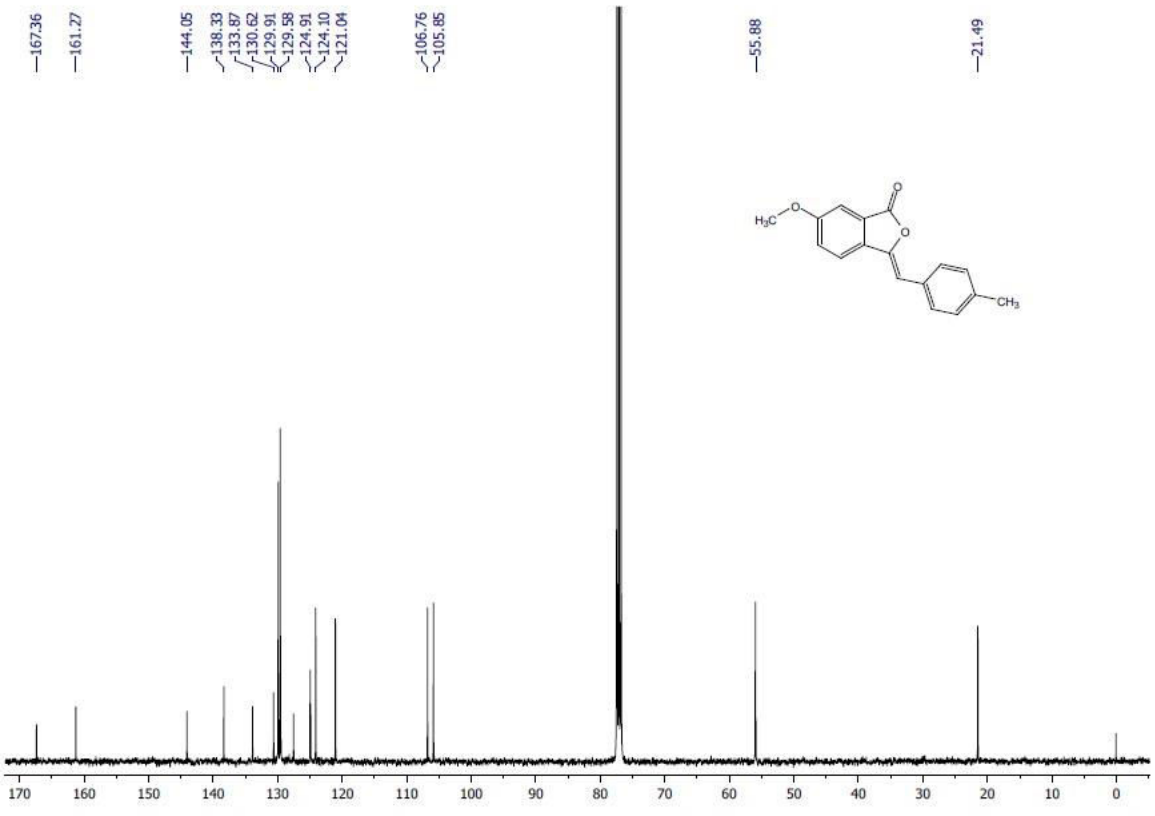


Figure 34: [13]C-NMR spectral data of **15b**.

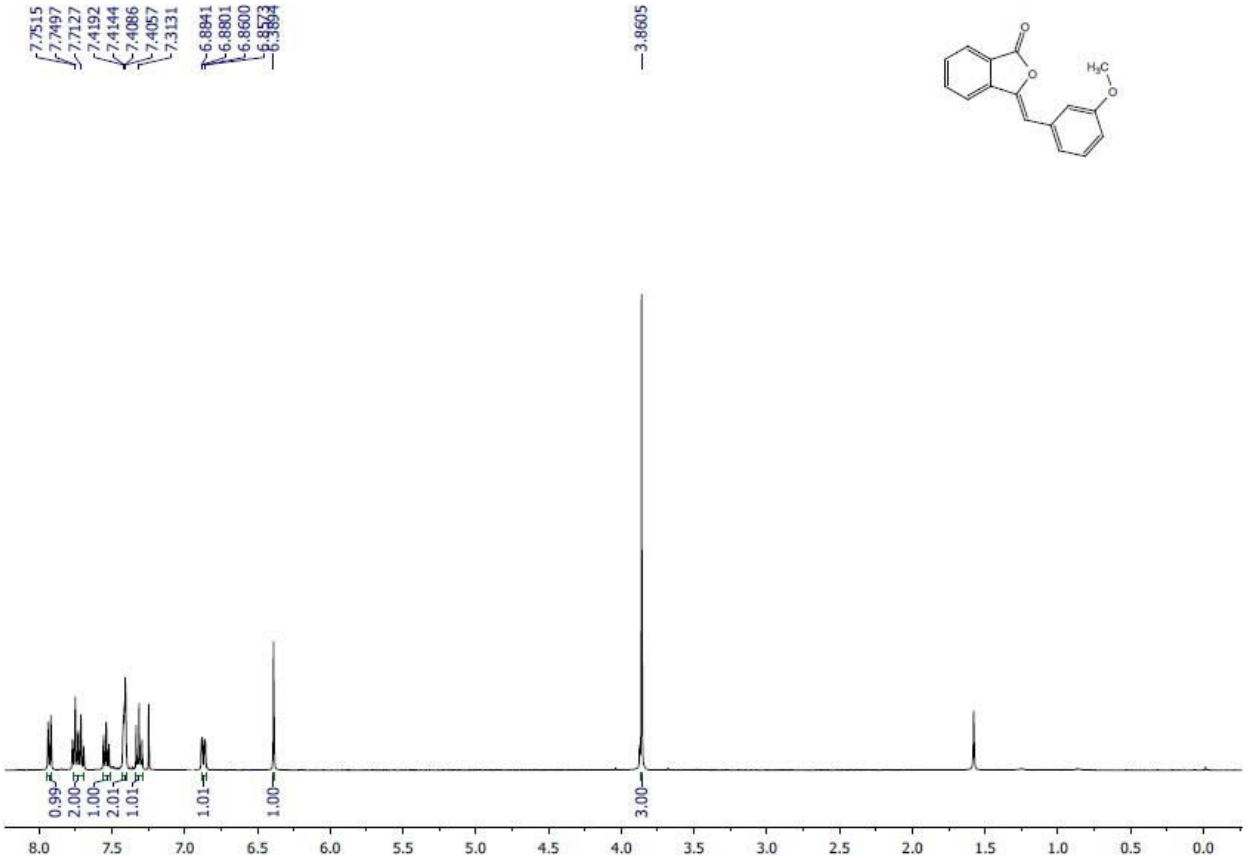


Figure 35: ^{1}H-NMR spectral data of **16a**.

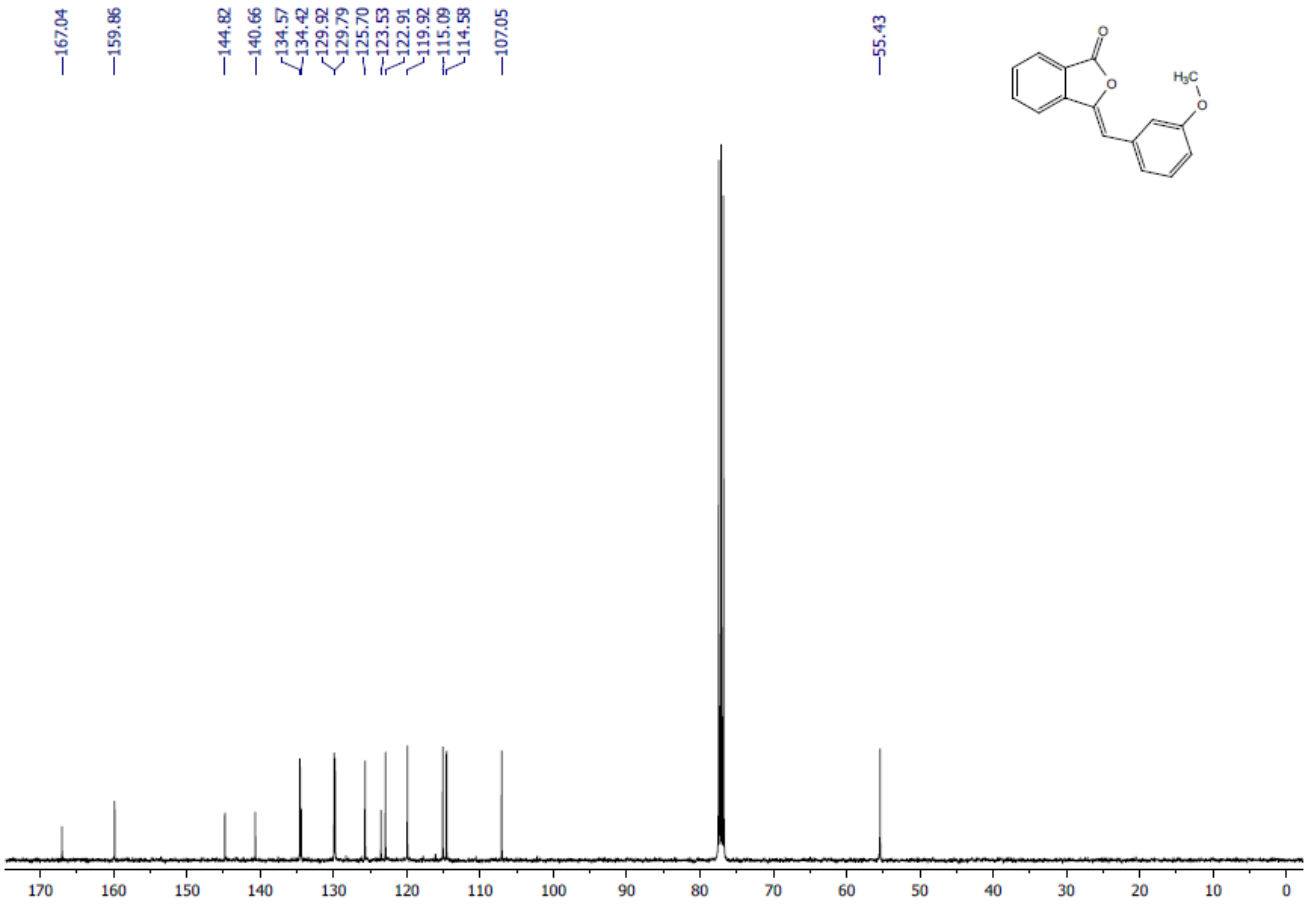


Figure 36: ^{13}C-NMR spectral data of **16a**.

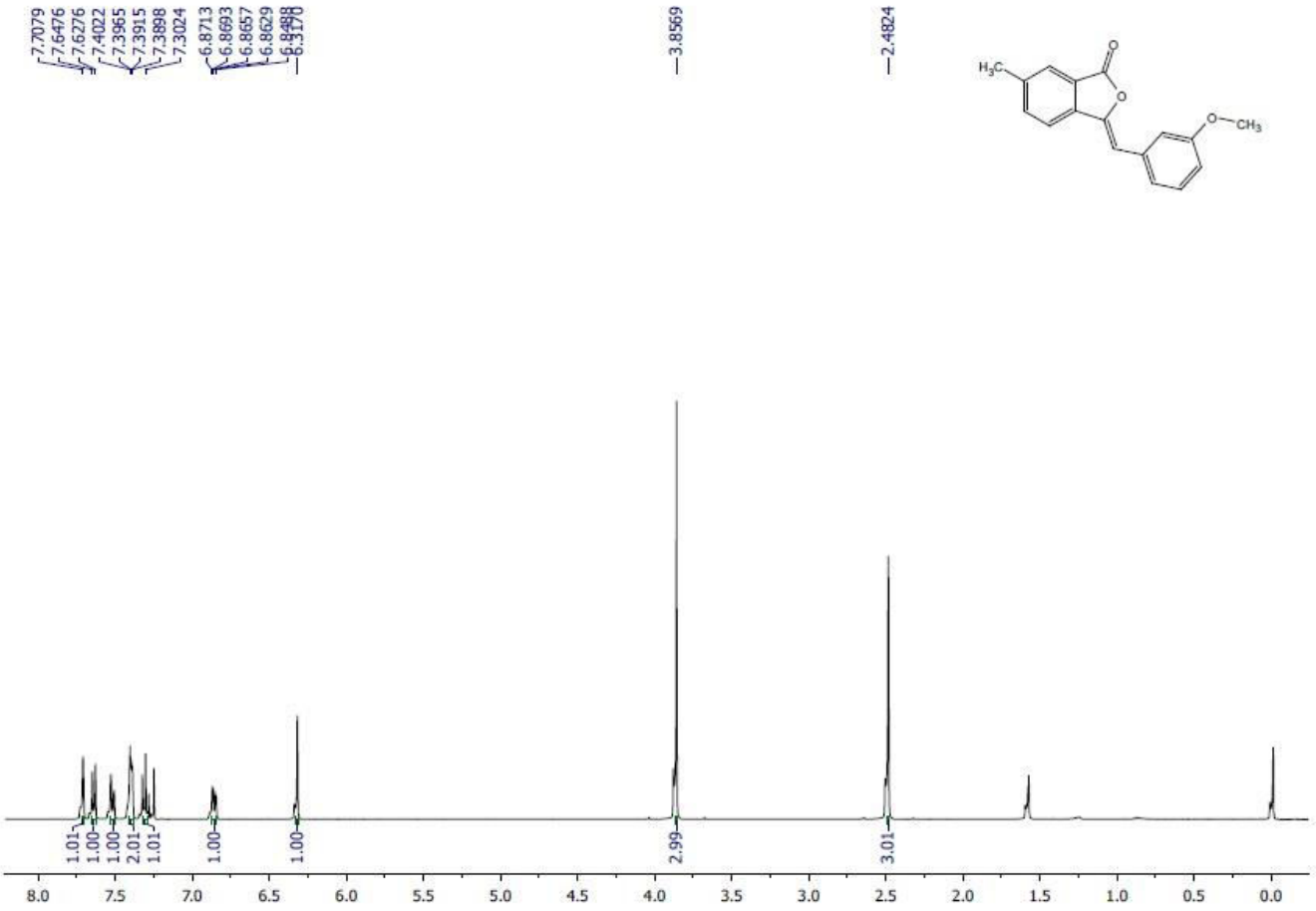


Figure 37: ^{1}H-NMR spectral data of **16b**.

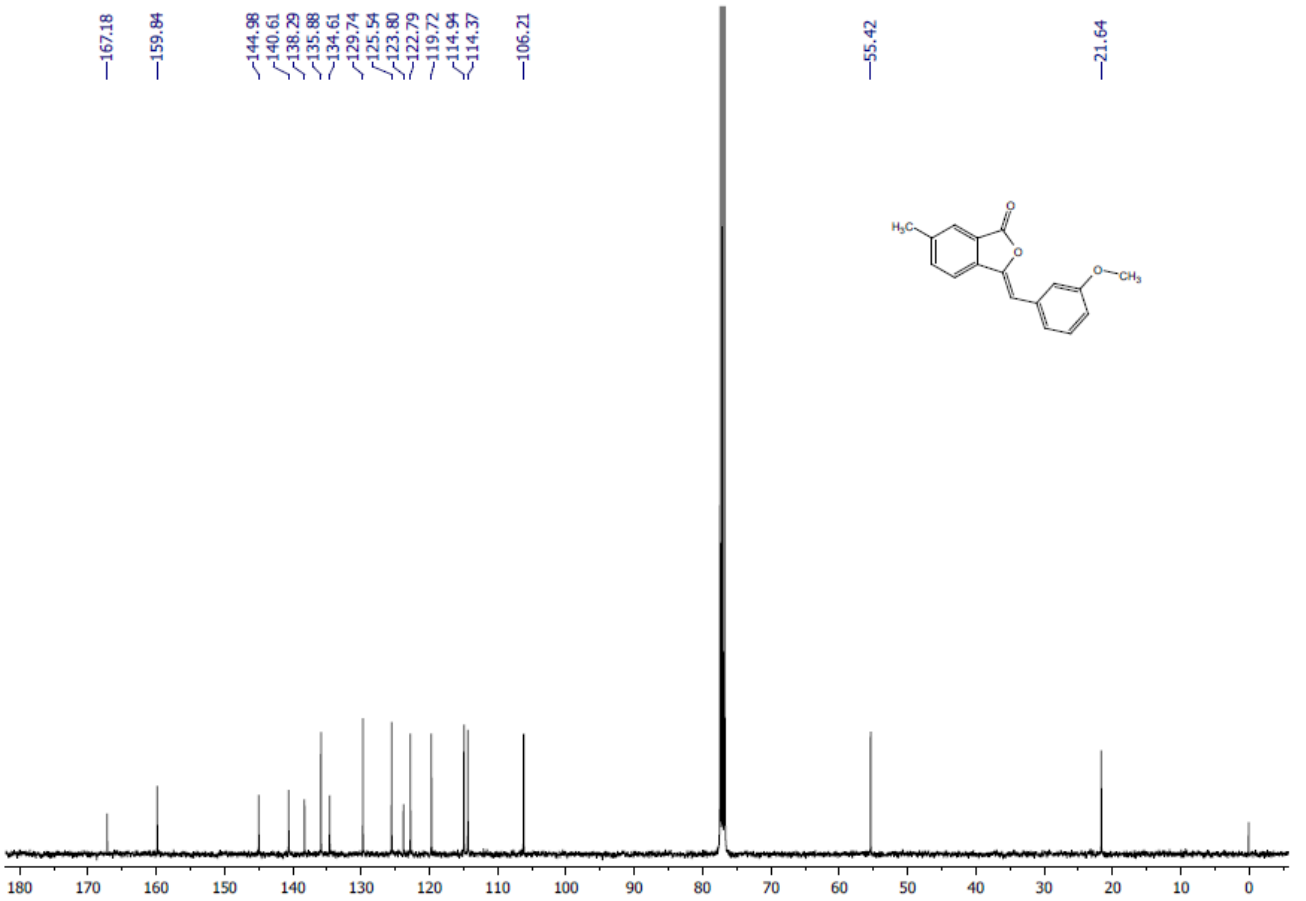


Figure 38: ^{13}C-NMR spectral data of **16b**.

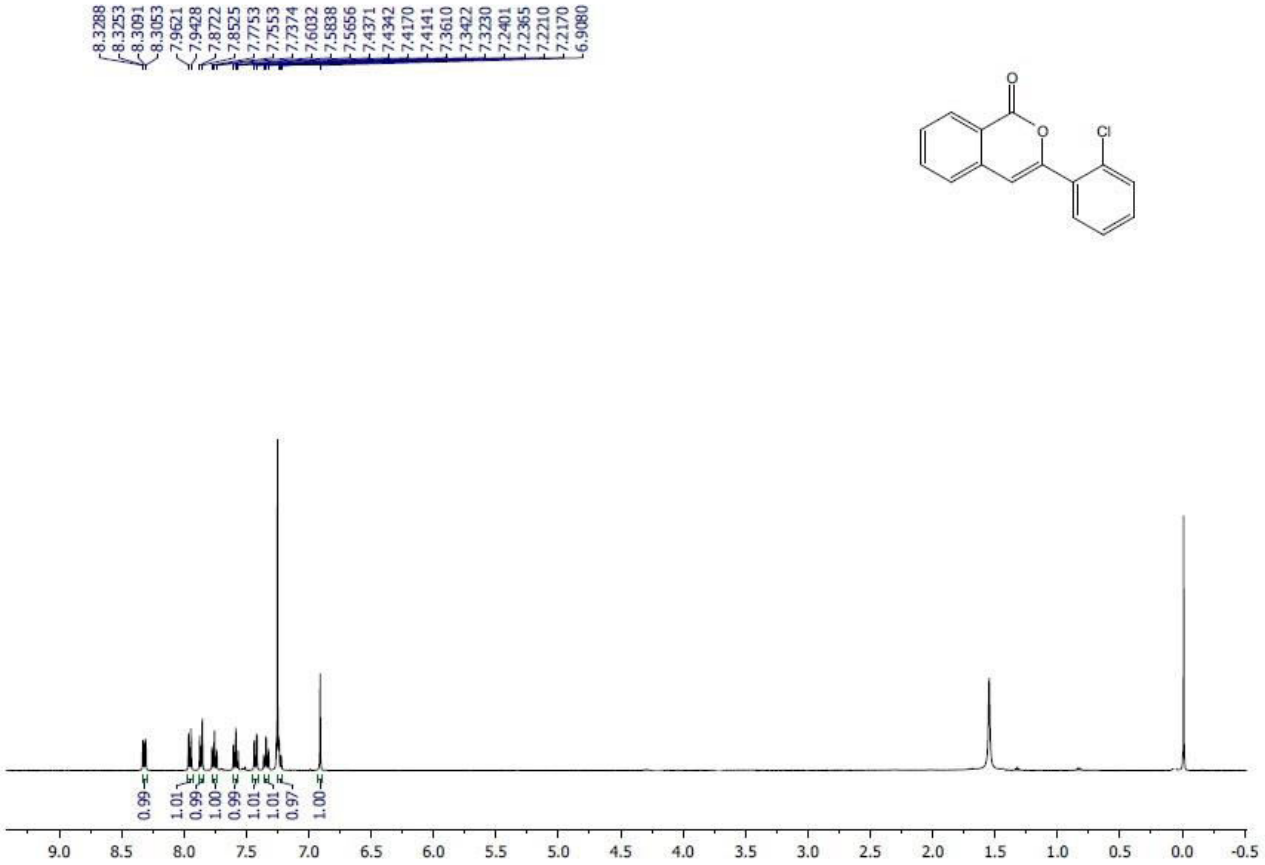


Figure 39: ^{1}H-NMR spectral data of **17a**.

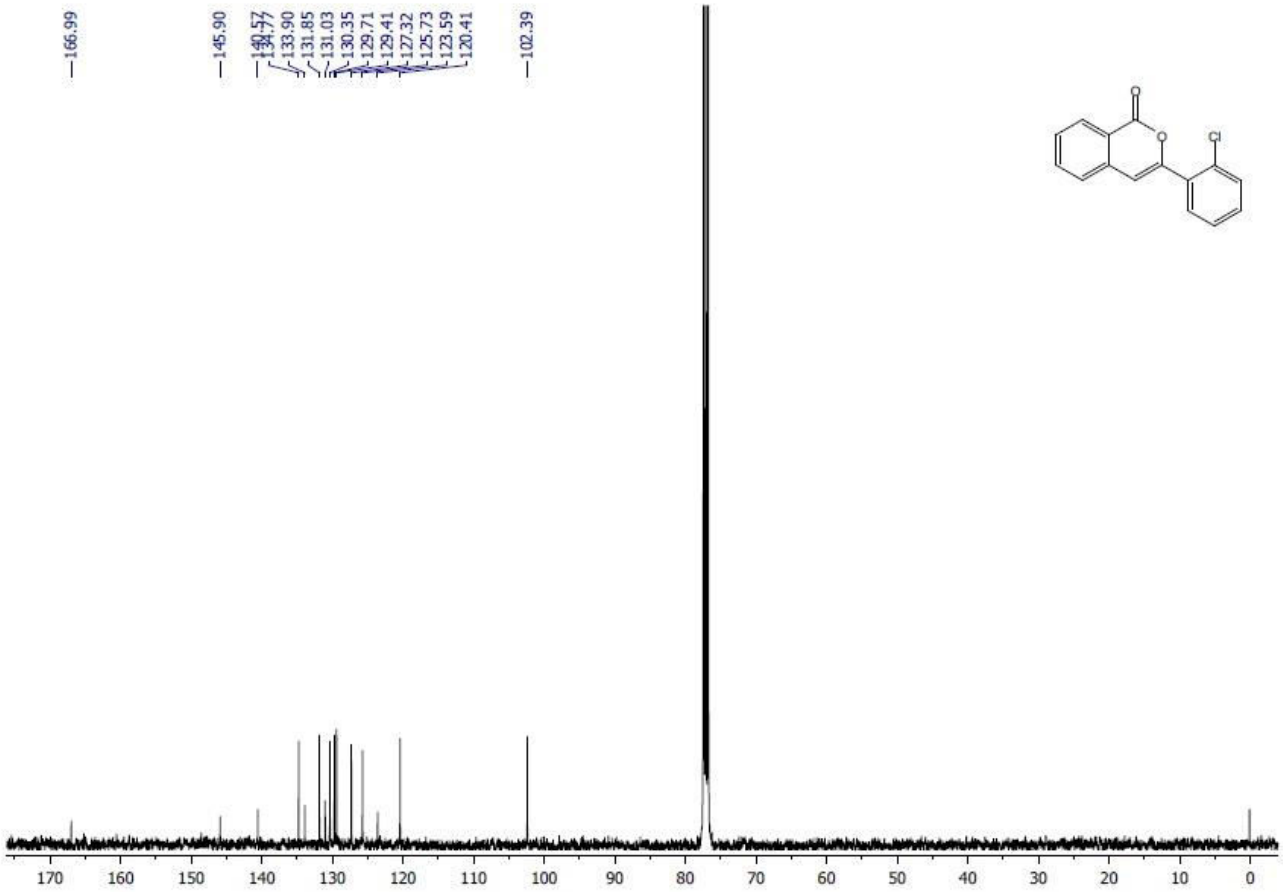


Figure 40: ^{13}C-NMR spectral data of **17a**.

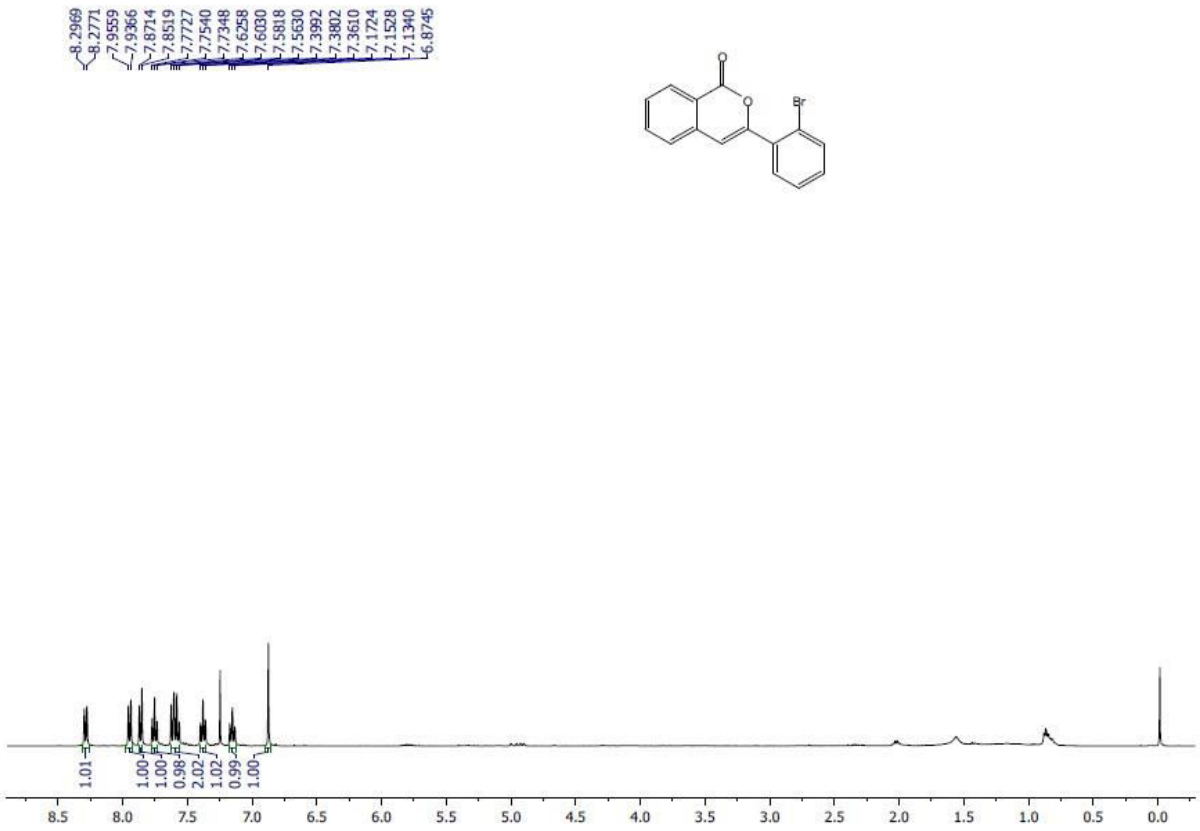


Figure 41: ^{1}H-NMR spectral data of **17b**.

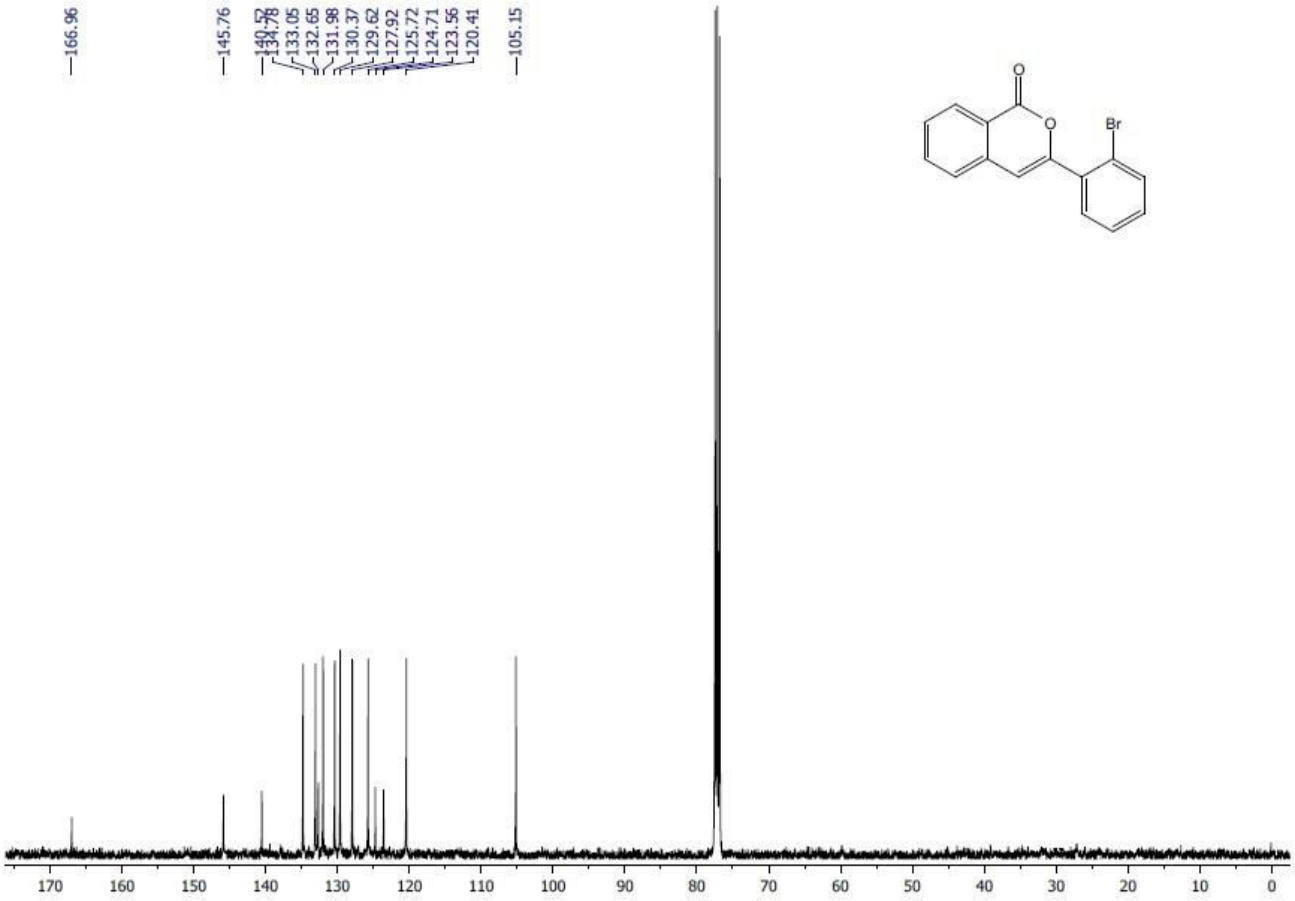


Figure 42: ^{13}C-NMR spectral data of **17b**.

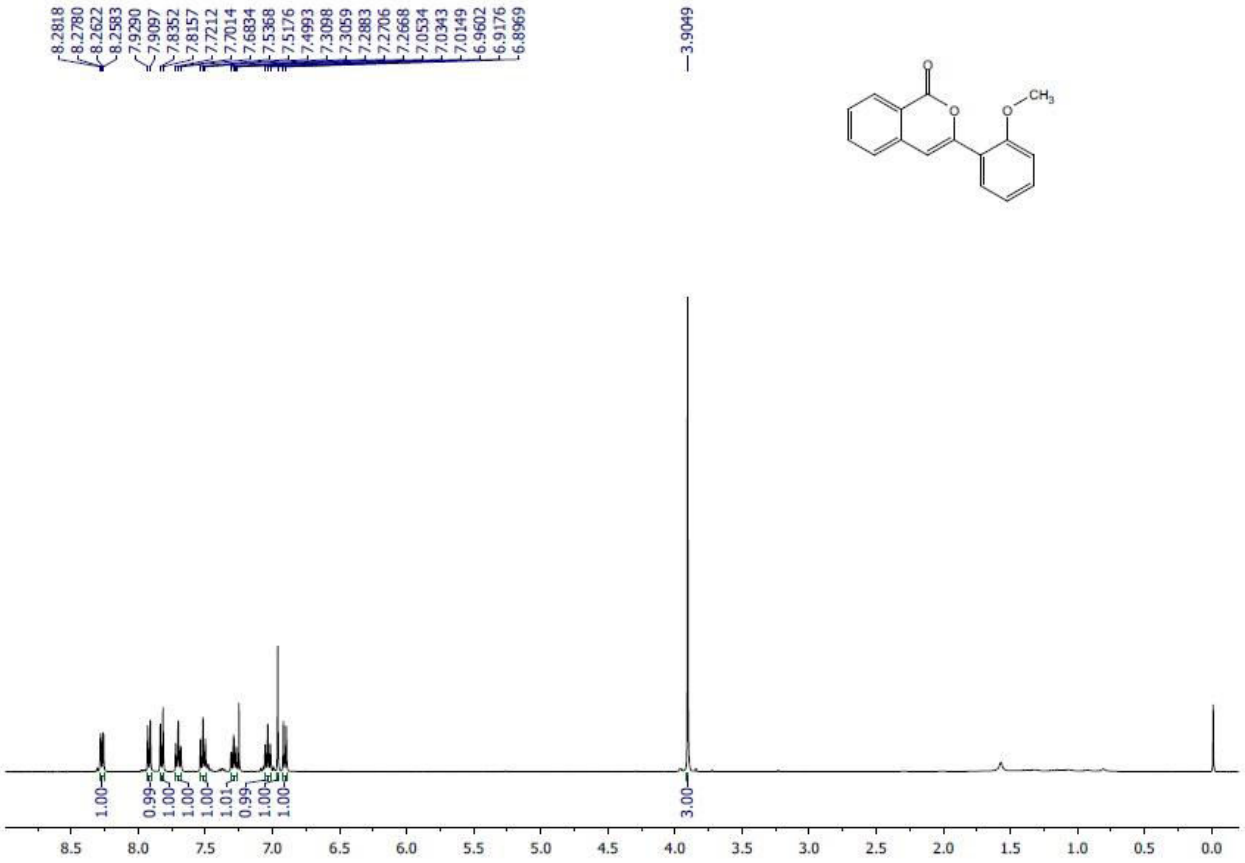


Figure 43: ^{1}H-NMR spectral data of **17c**.

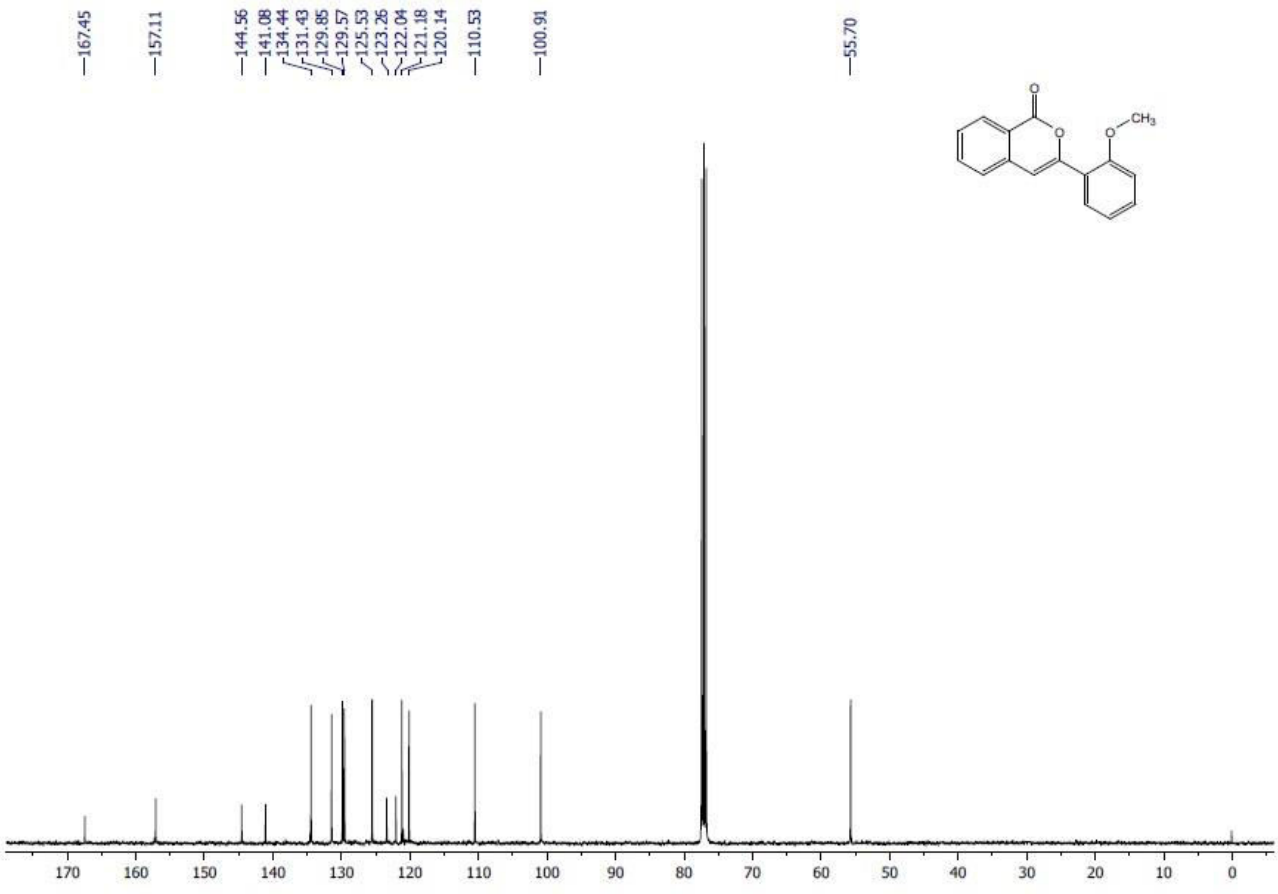


Figure 44: ^{13}C-NMR spectral data of **17c**.

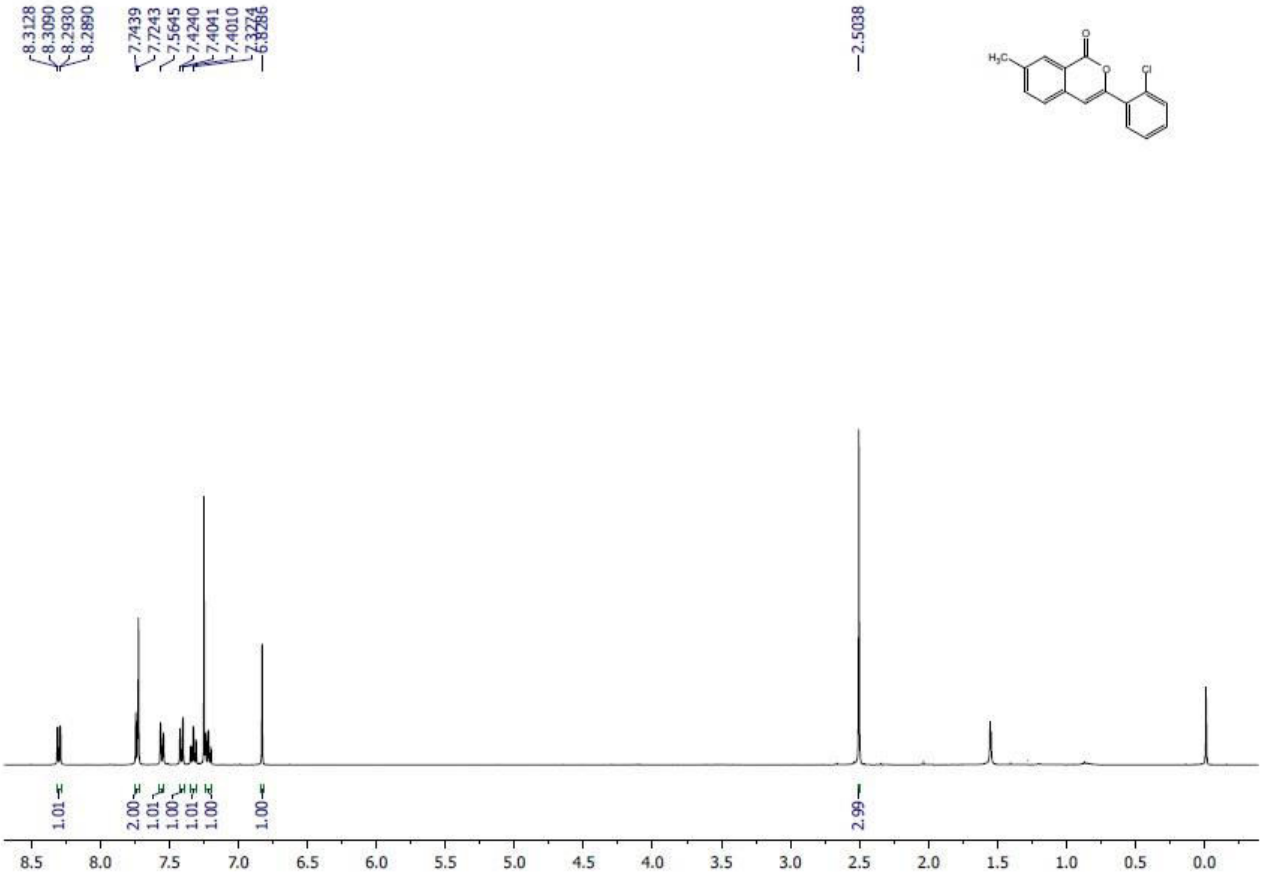


Figure 45: ^{1}H-NMR spectral data of **18a**.

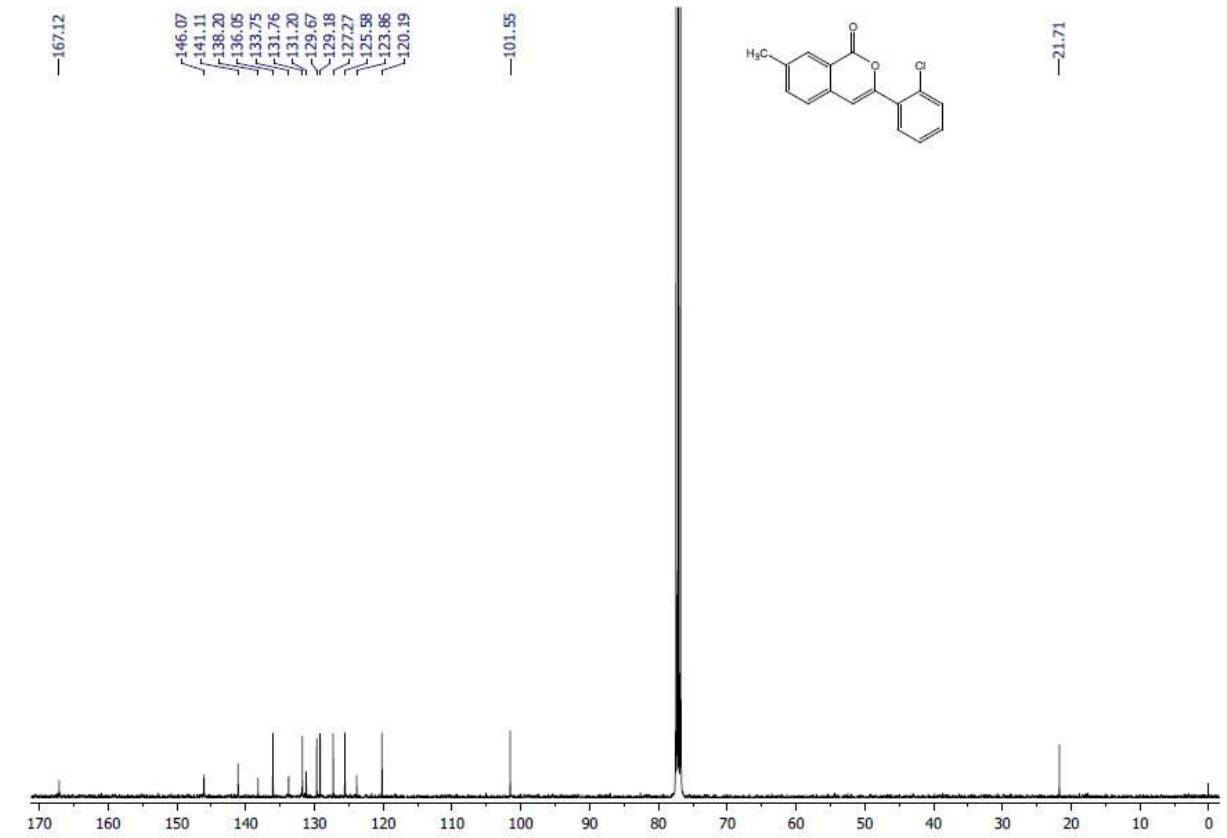


Figure 46: ^{13}C-NMR spectral data of **18a**.

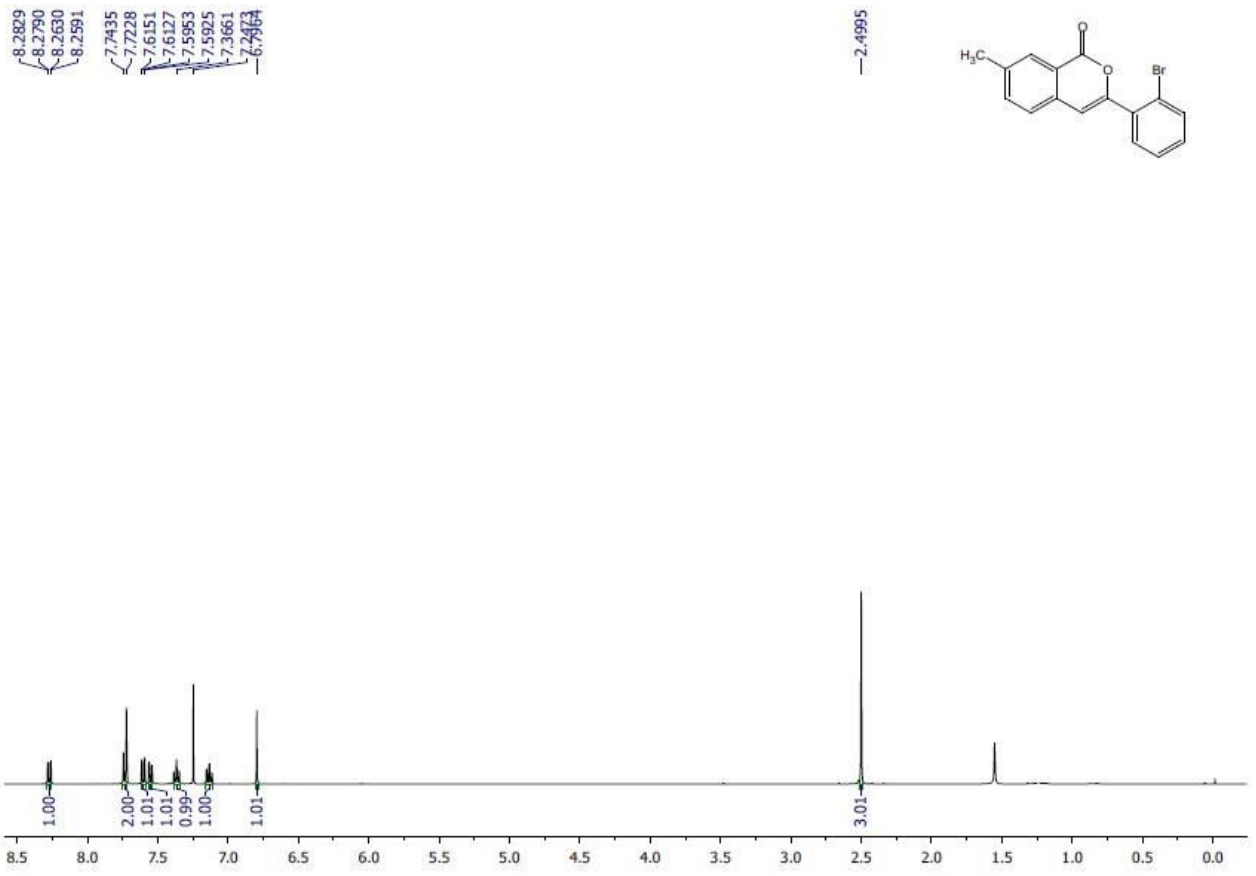


Figure 47: ^{1}H-NMR spectral data of **18b**.

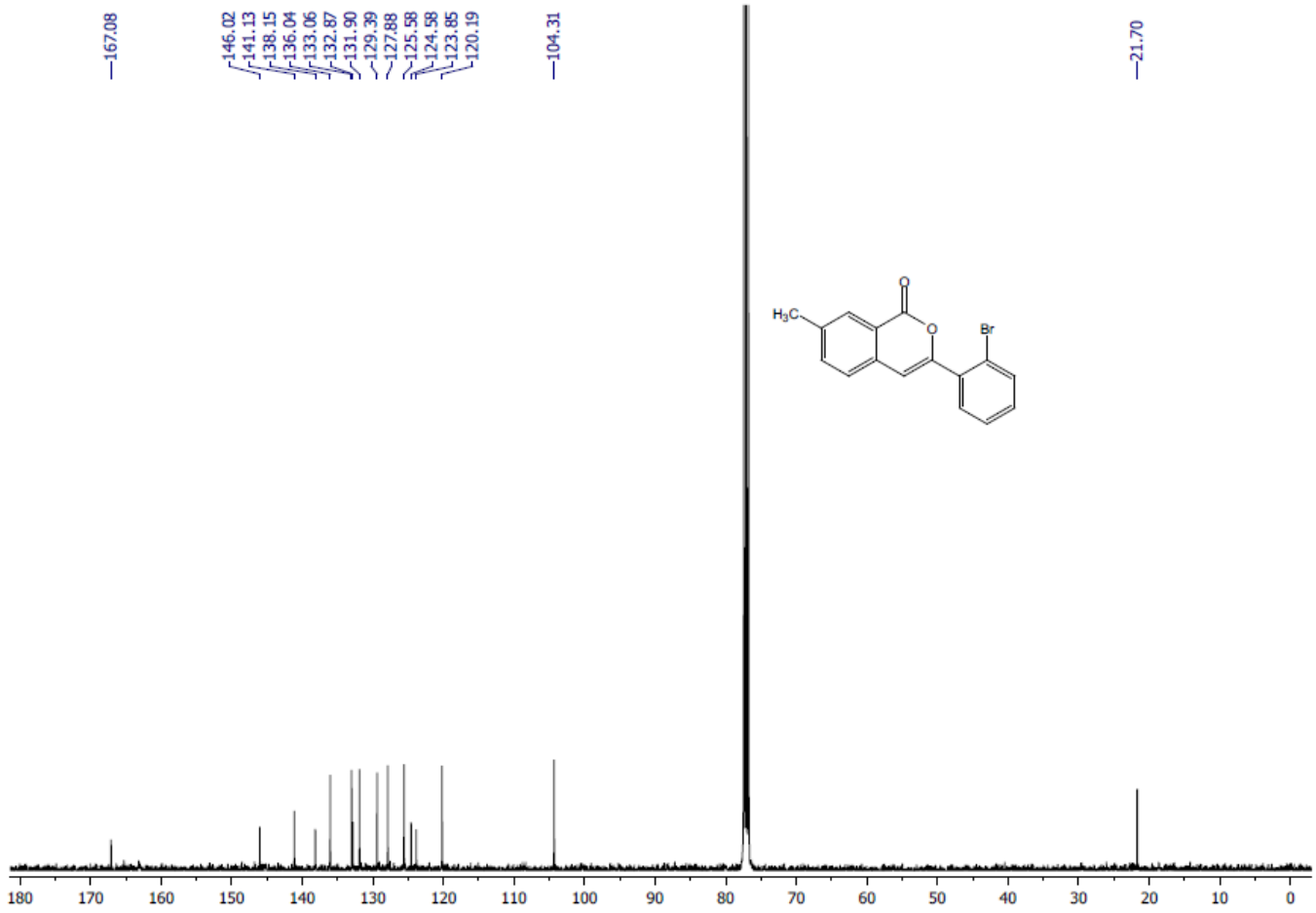


Figure 48: ^{13}C-NMR spectral data of **18b**.

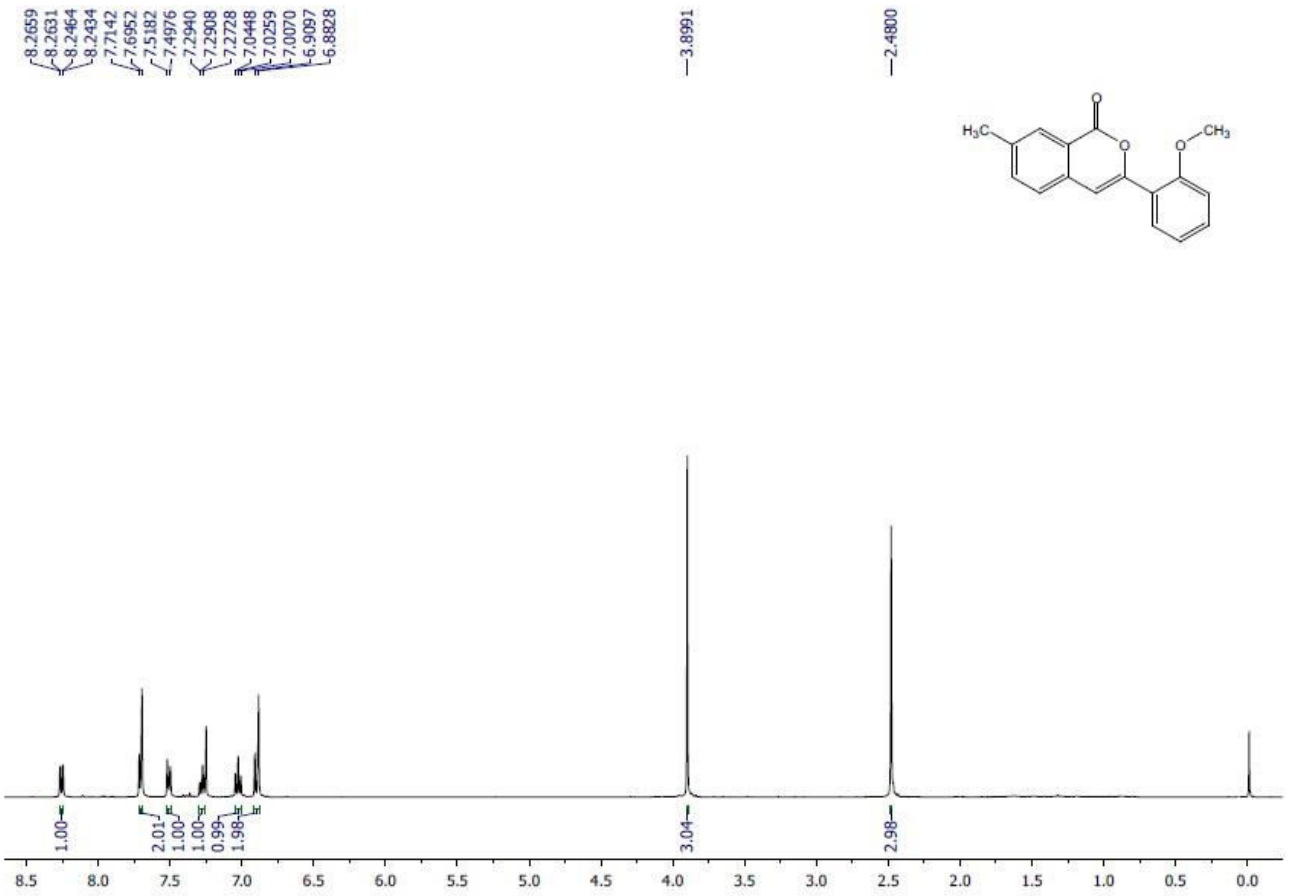


Figure 49: ^{1}H-NMR spectral data of **18c**.

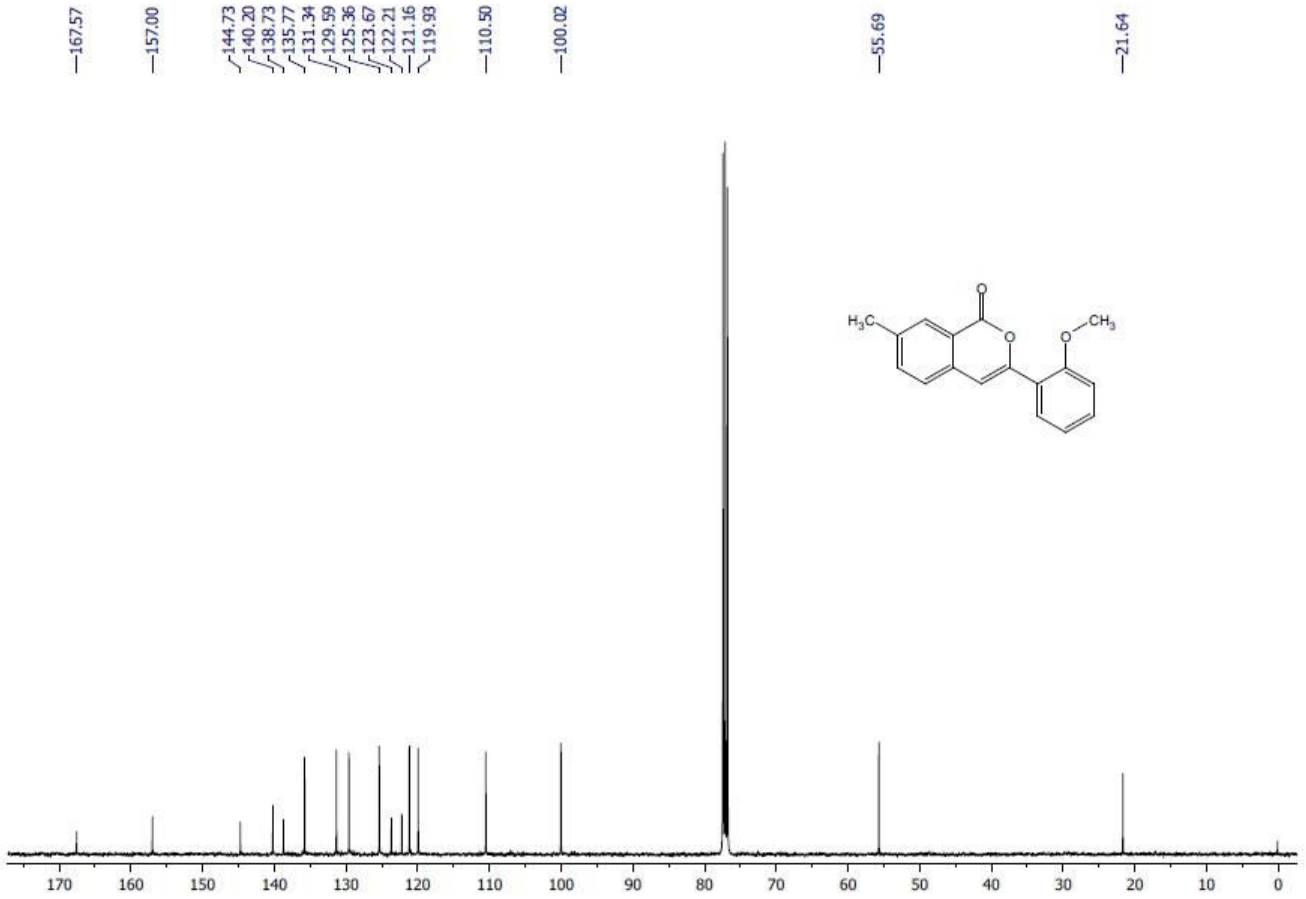


Figure 50: ^{13}C-NMR spectral data of **18c**.

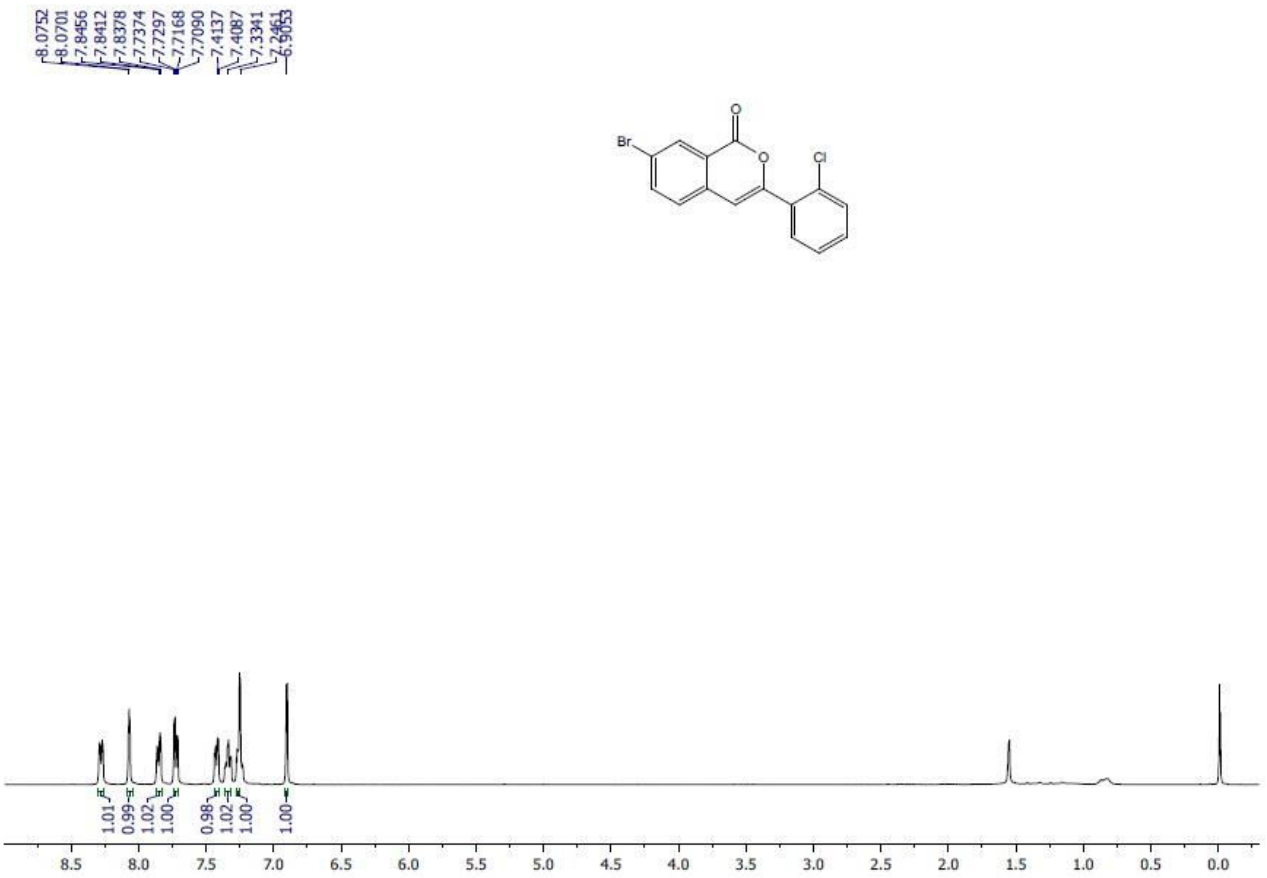


Figure 51: ^{1}H-NMR spectral data of **19a**.

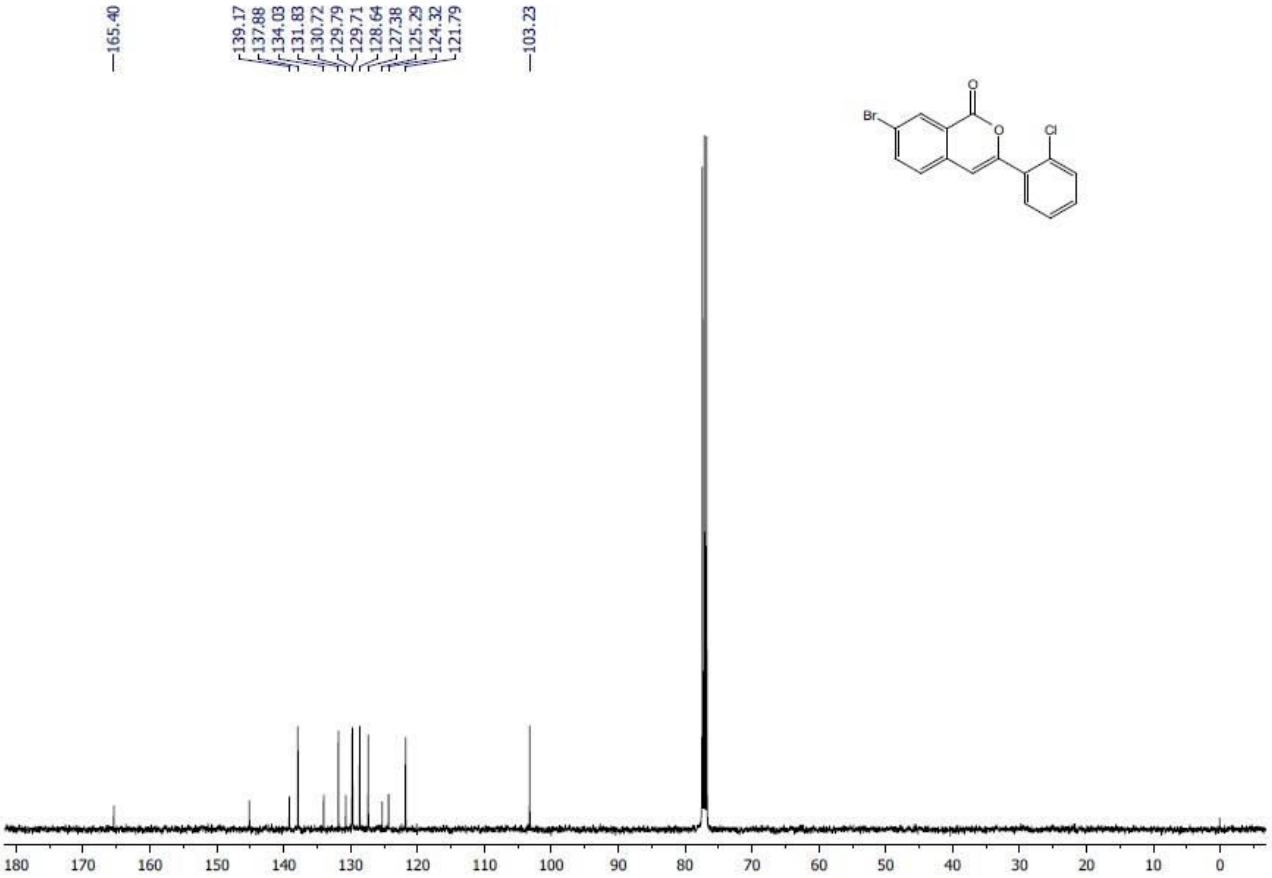


Figure 52: ^{13}C-NMR spectral data of **19a**.

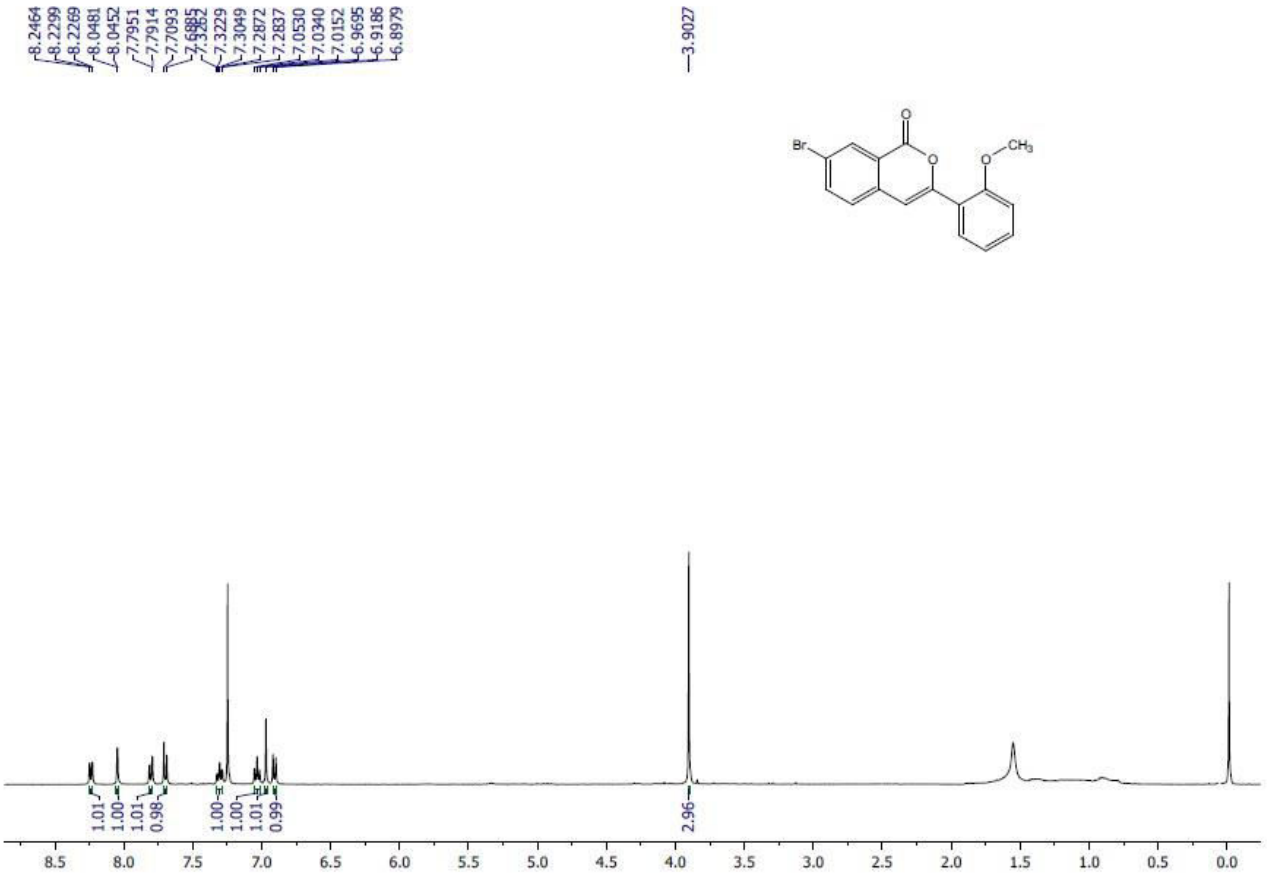


Figure 53: ^{1}H-NMR spectral data of **19b**.

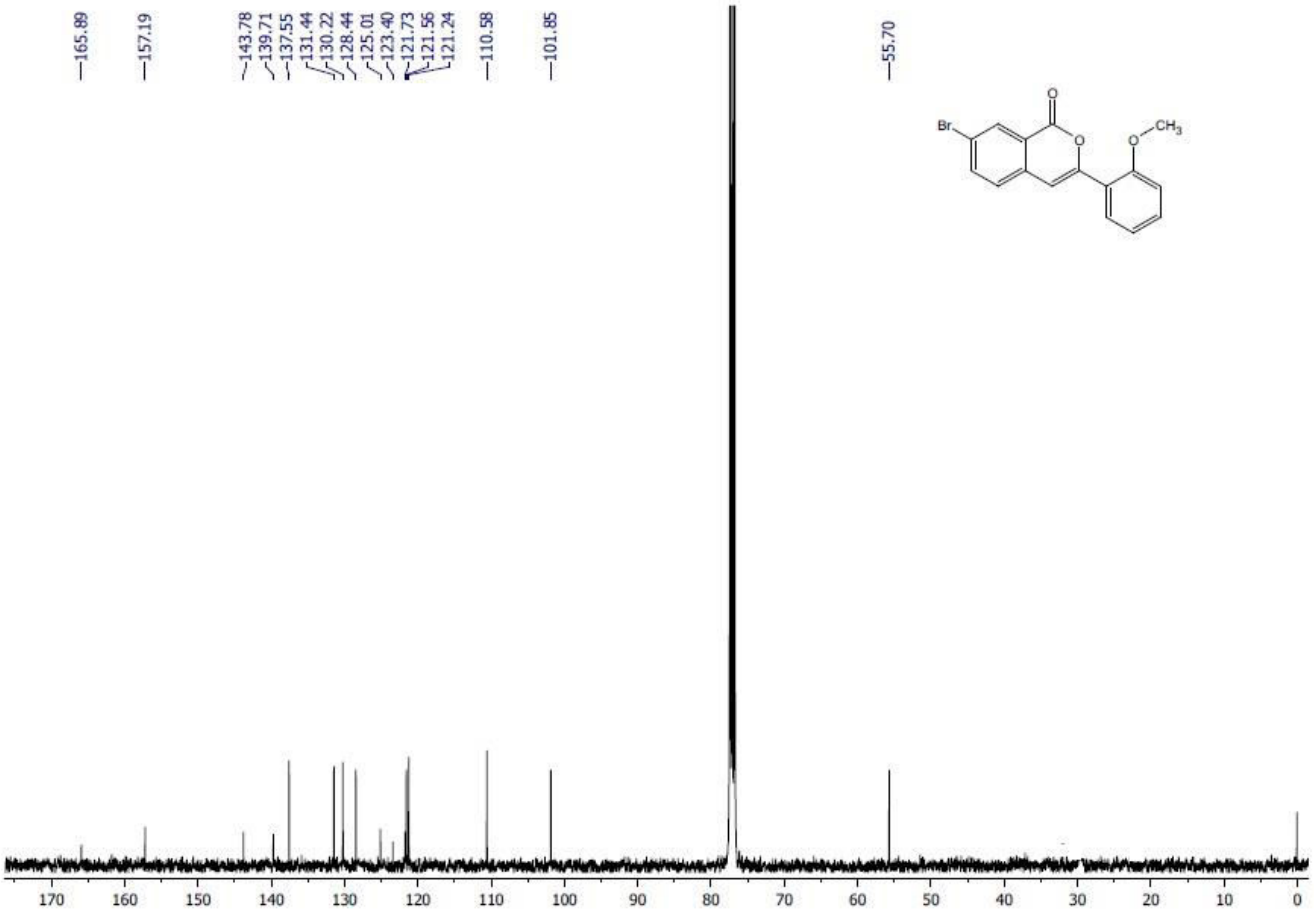


Figure 54: ^{13}C-NMR spectral data of **19b**.

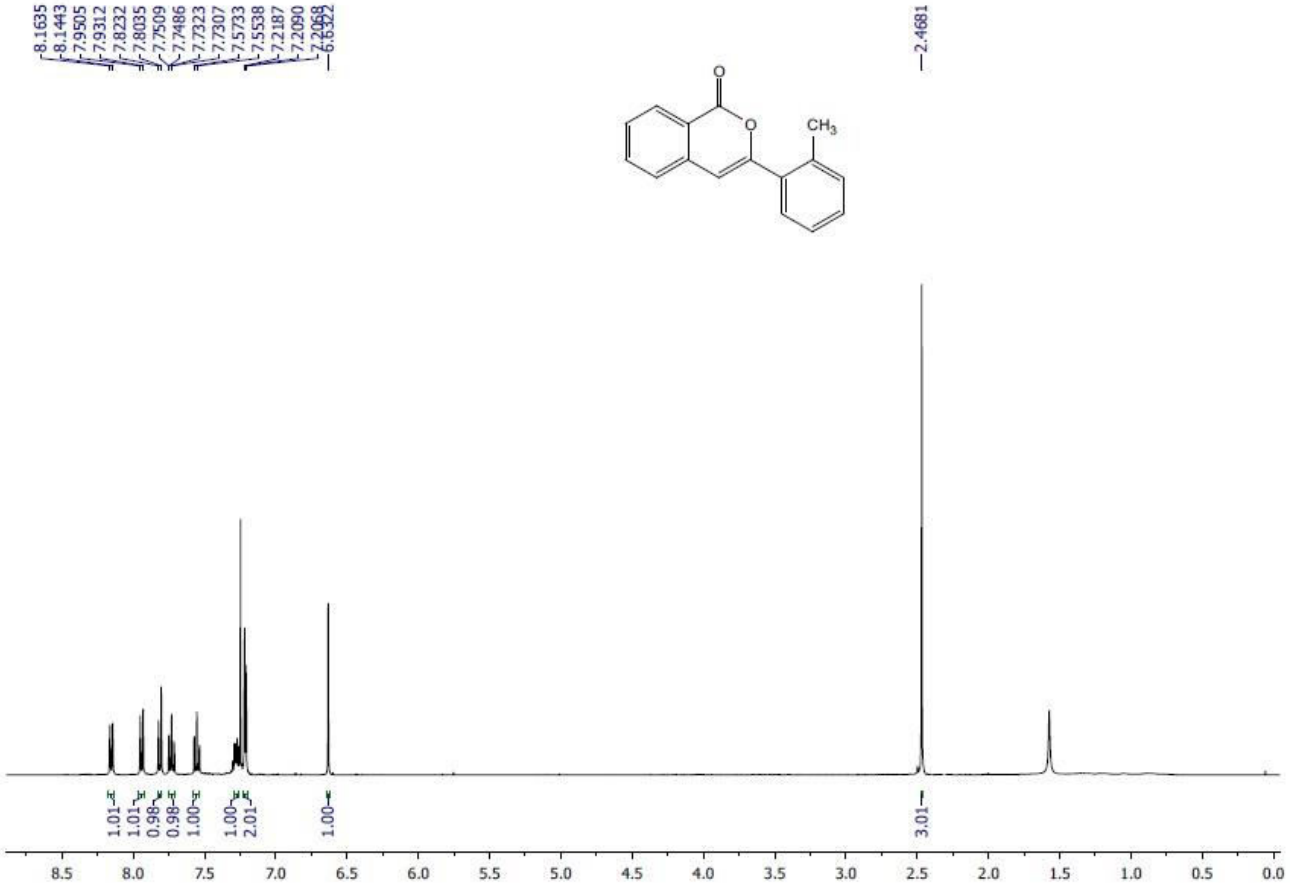


Figure 55: ^{1}H-NMR spectral data of **20a**.

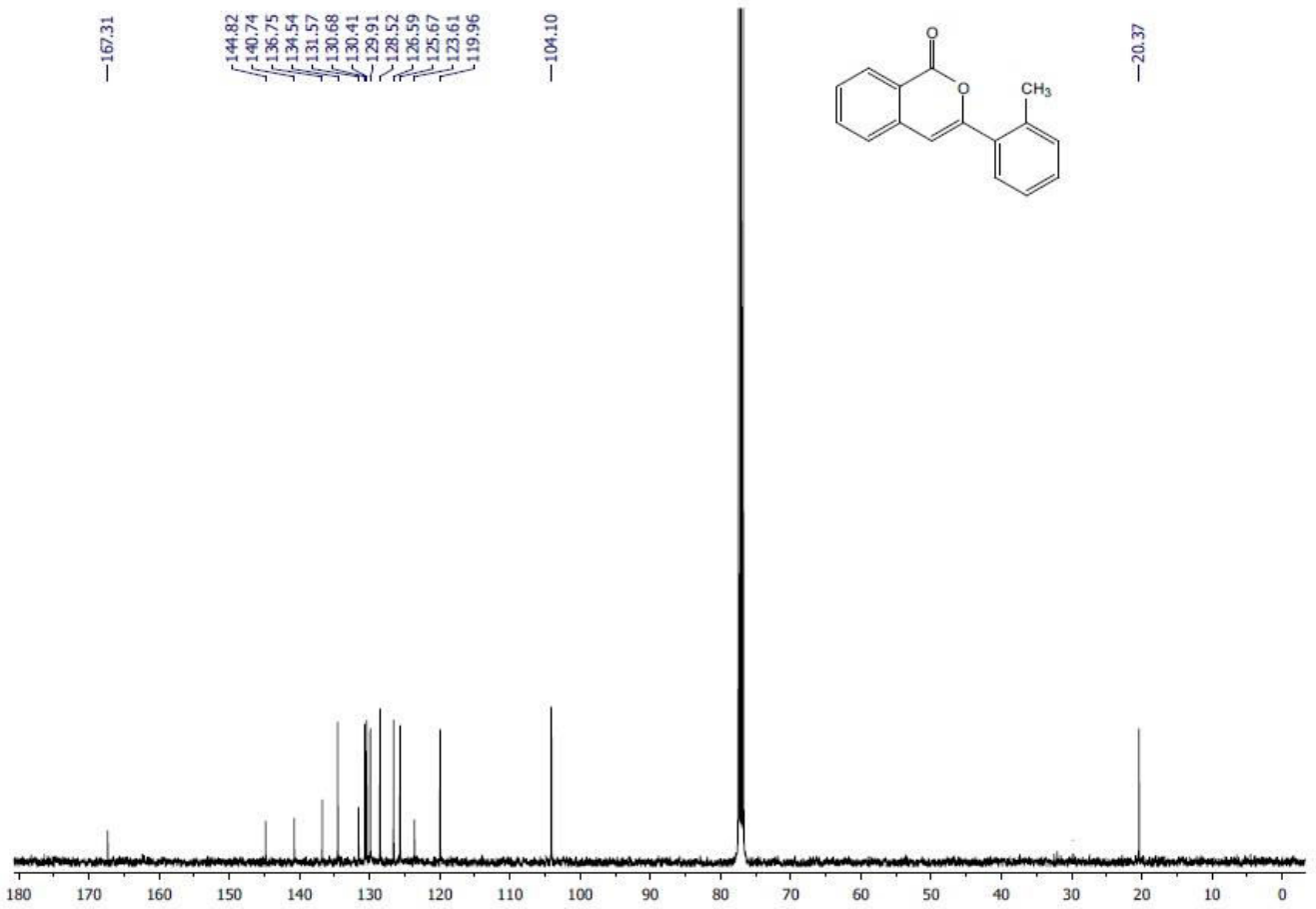


Figure 56: ^{13}C-NMR spectral data of **20a**.

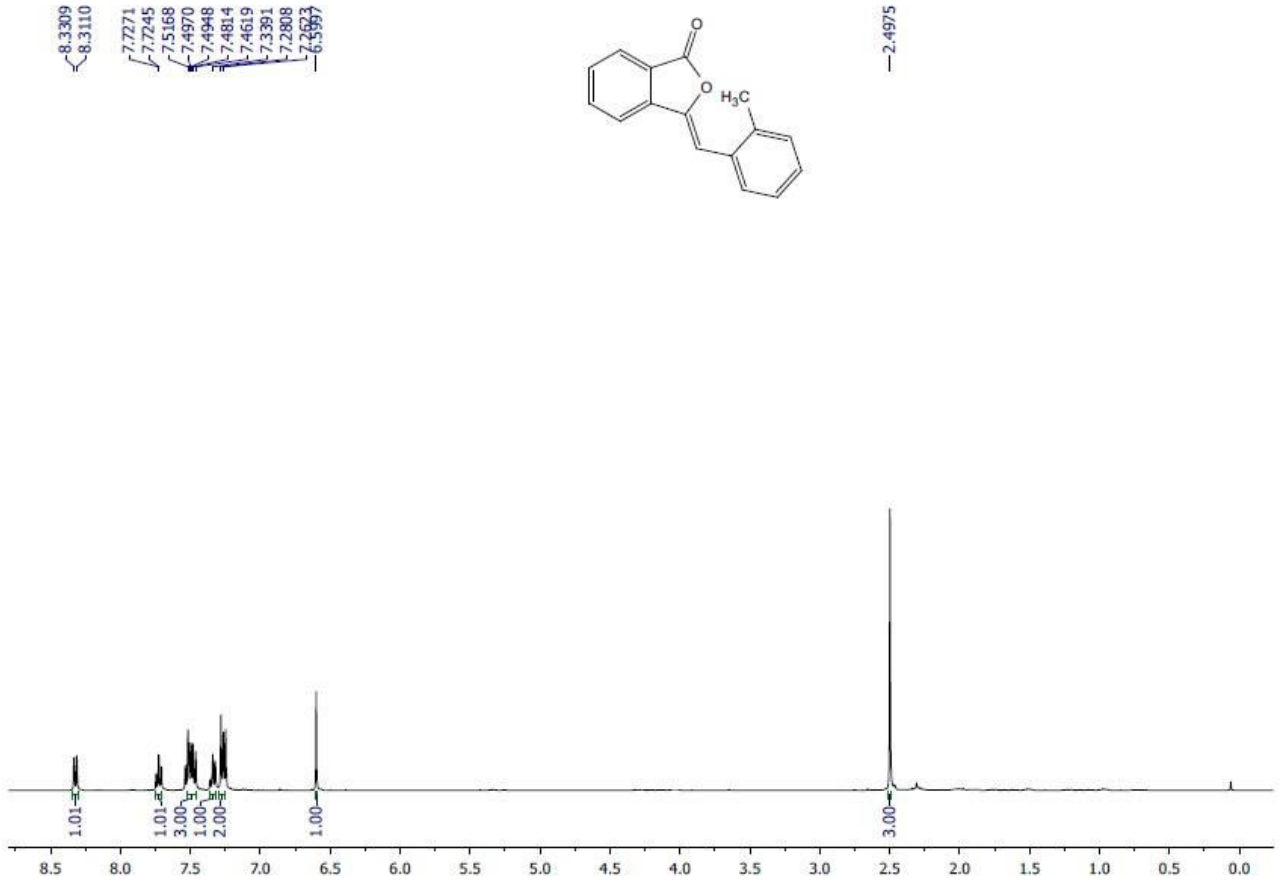


Figure 57: [1]H-NMR spectral data of **20b**.

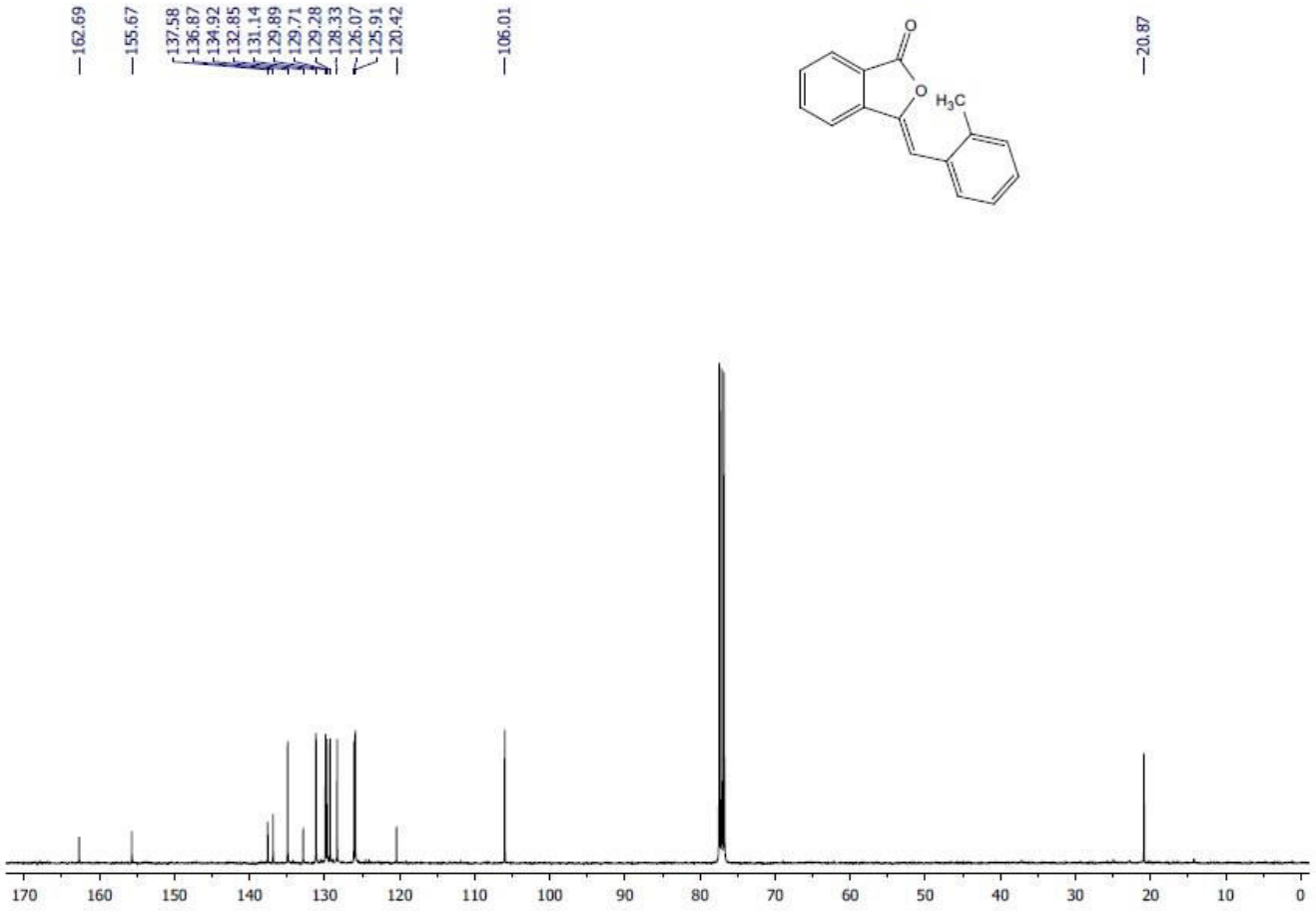


Figure 58: [13]C-NMR spectral data of **20b**.

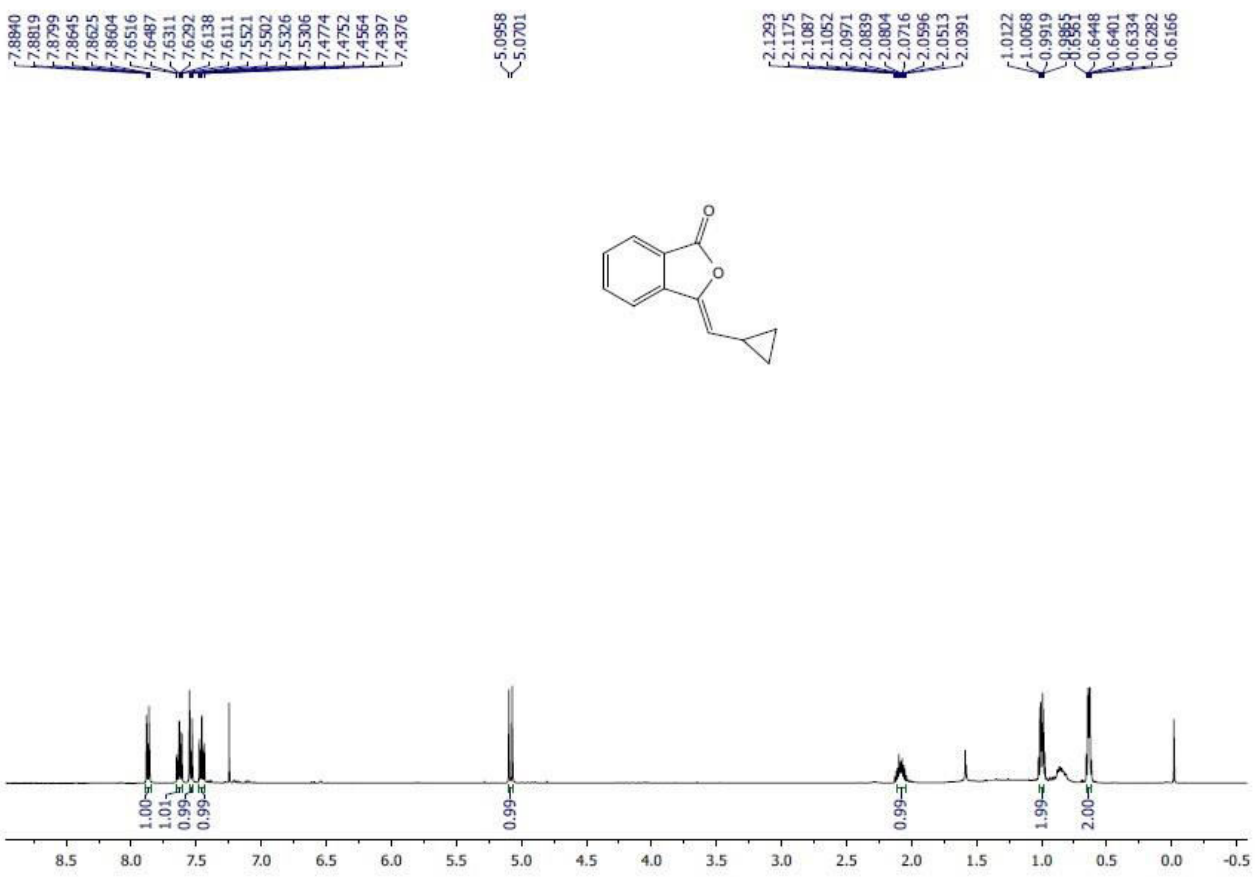


Figure 59: ^{1}H-NMR spectral data of **21a**.

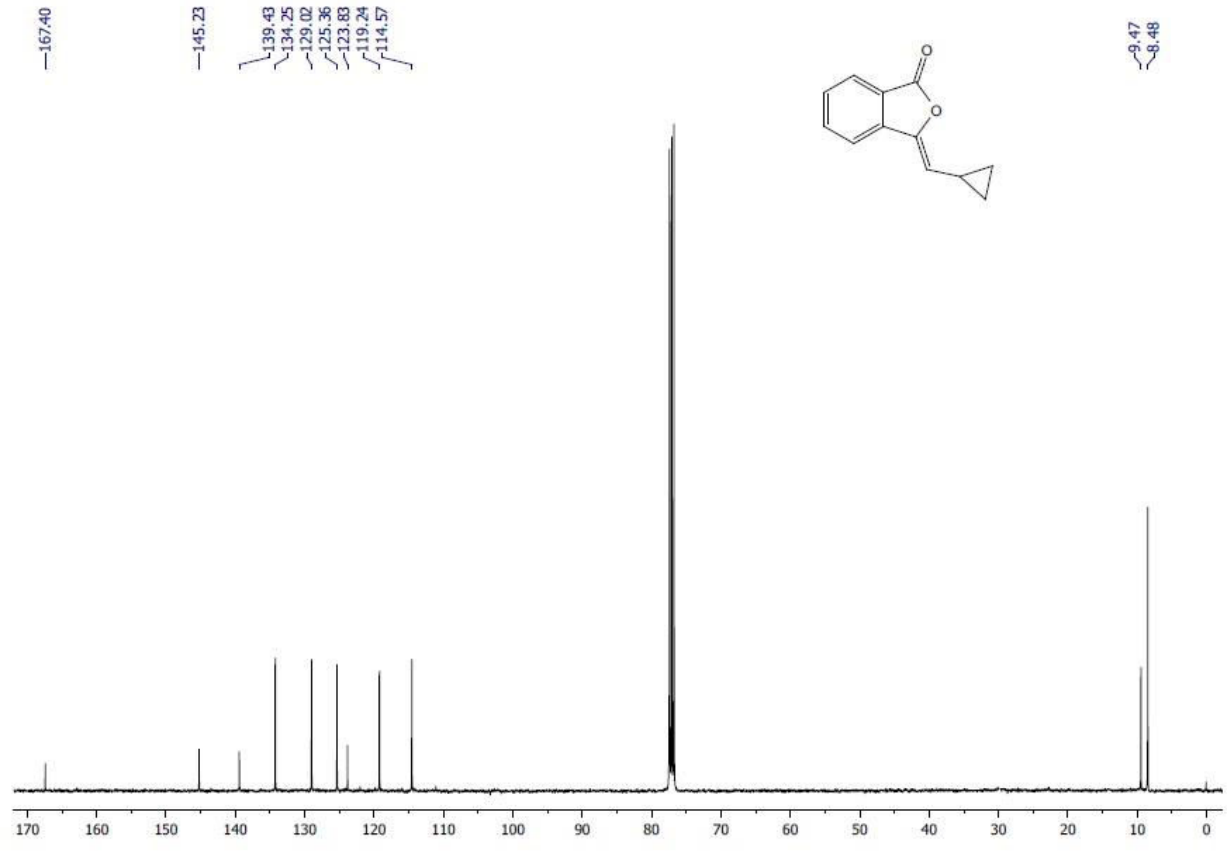


Figure 60: ^{13}C-NMR spectral data of **21a**.

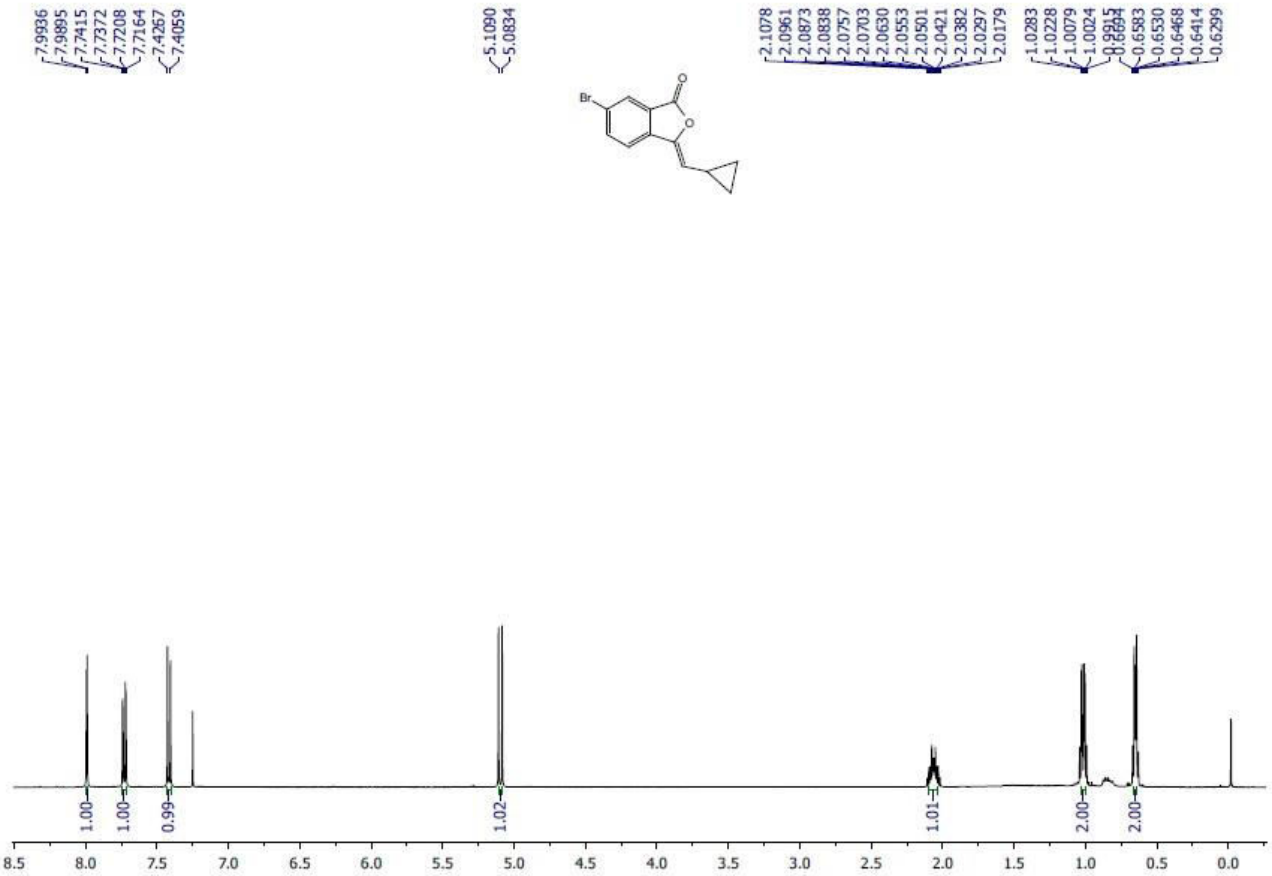


Figure 61: ^{1}H-NMR spectral data of **21b**.

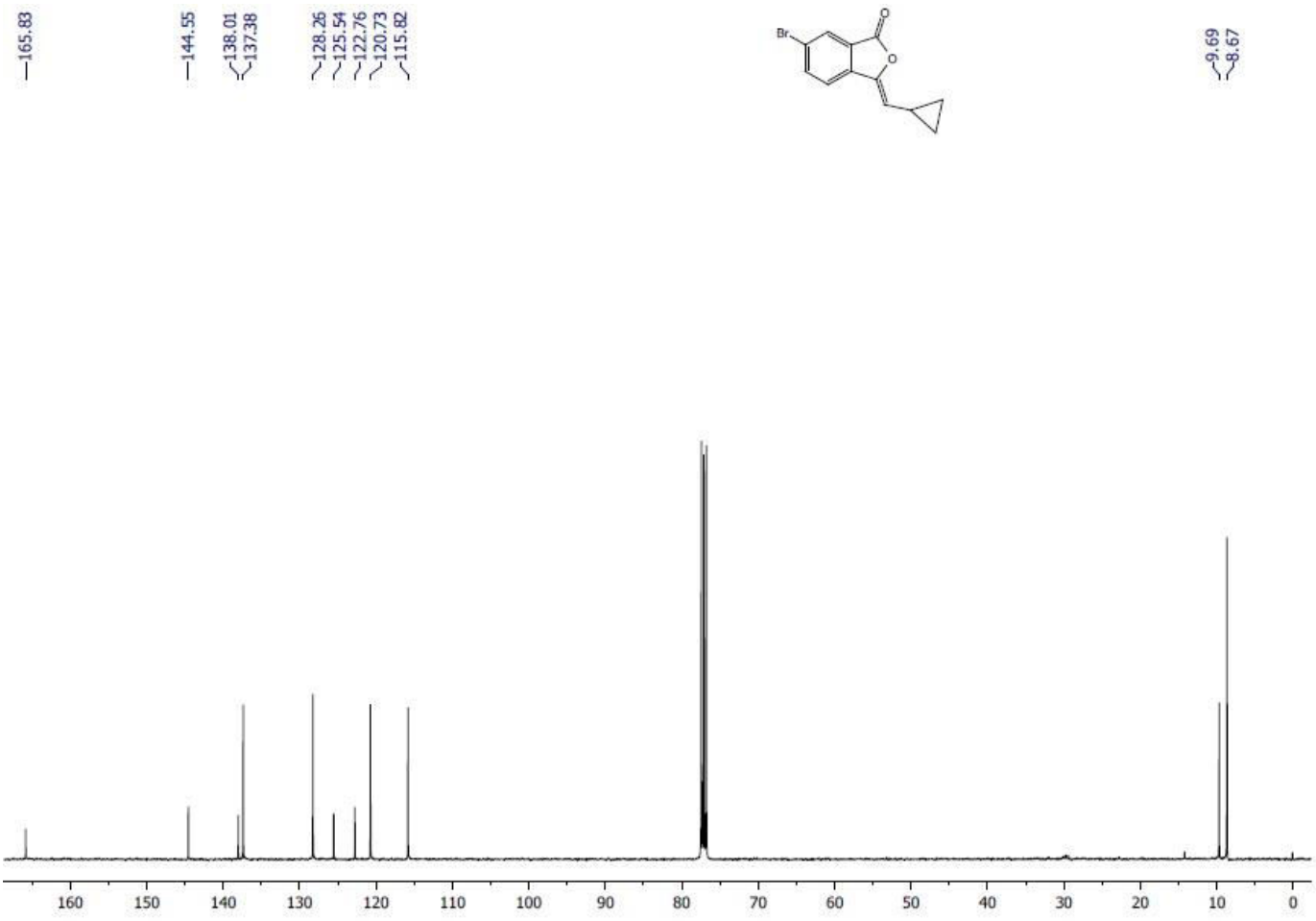


Figure 62: ^{13}C-NMR spectral data of **21b**.

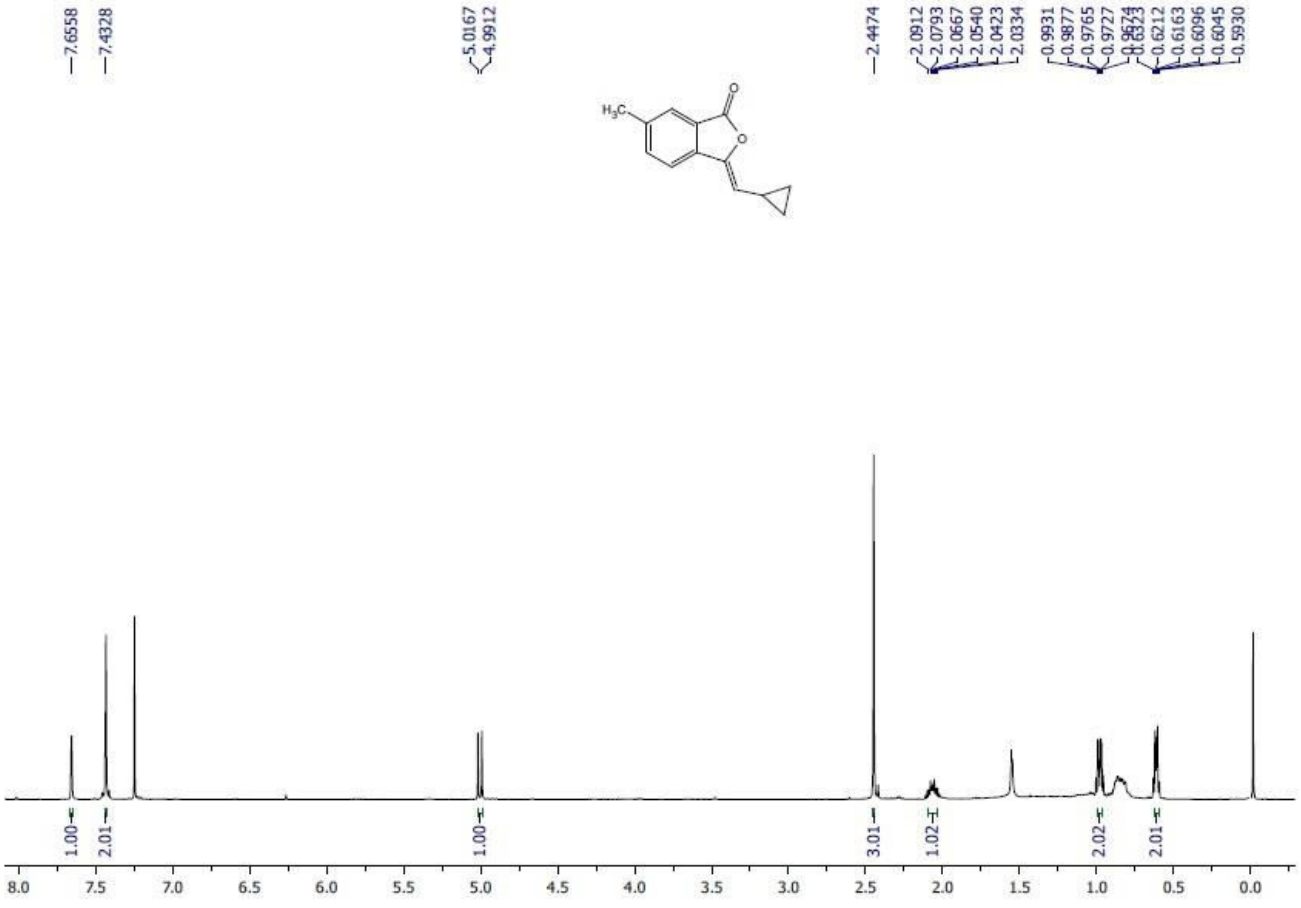


Figure 63: [1]H-NMR spectral data of **21c**.

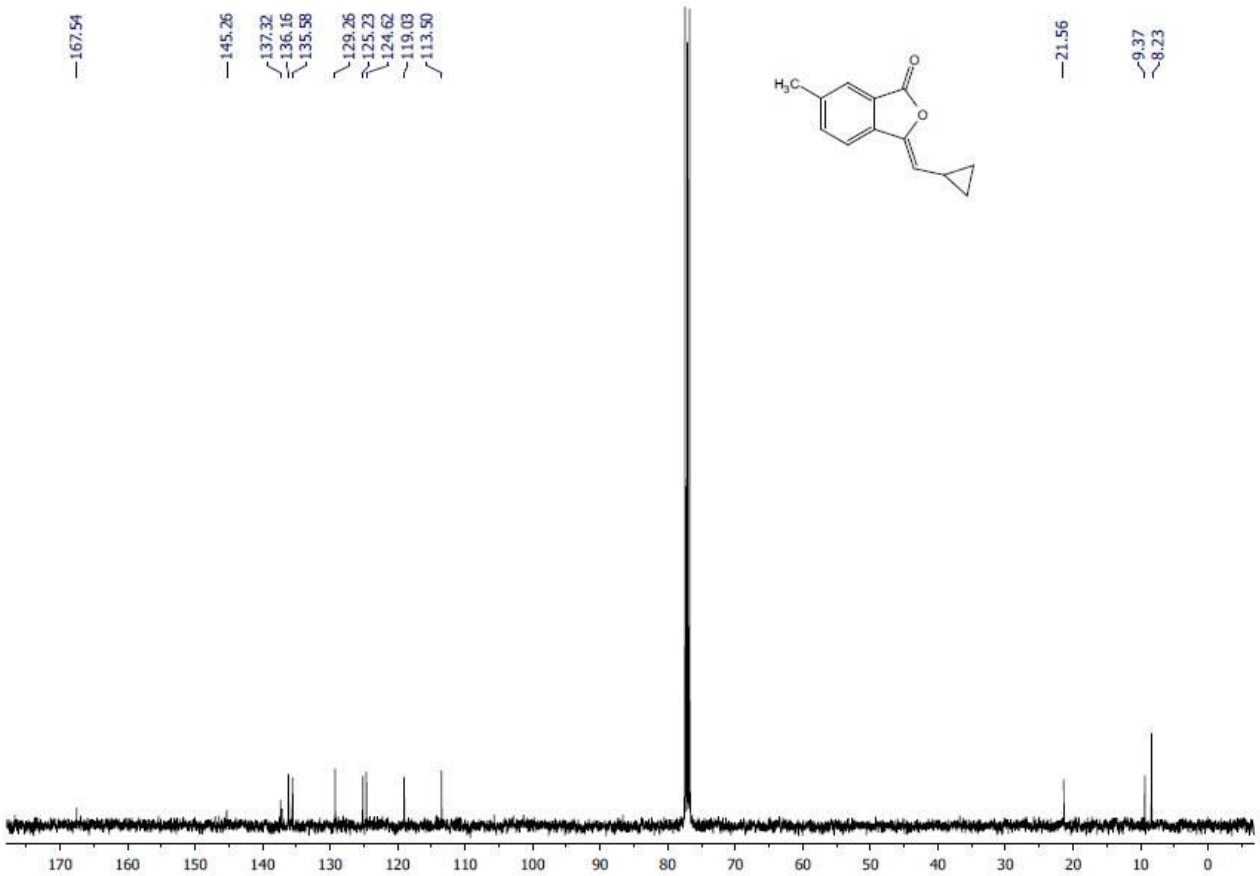


Figure 64: [13]C-NMR spectral data of **21c**.