Electronic Supplementary Material (ESI) for Organic Chemistry Frontiers.

Supporting Information

Copper-catalyzed direct C-3 oxidative amidation of quinoxalin-2(1*H*)-ones with amidates under microwave irradiation

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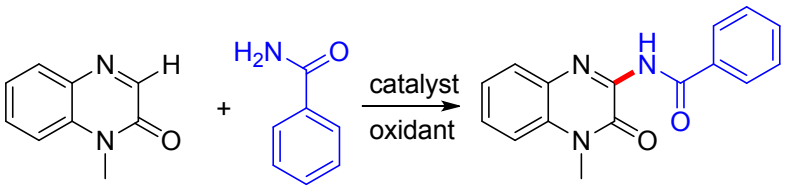
1. Optimization of reaction conditions



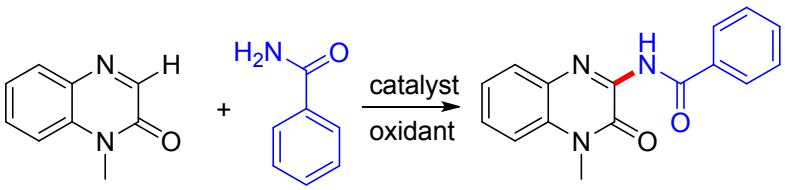
1a **2a** **3aa**

Table S1 Screening the loading amount of **1a** and **2a**[a]

Entry	The molar ratio of **1a** and **2a** (equiv.)	Yields (%)[b]
1	2:1	35
2	1:1	63
3	1:1.5	68
4	1:2	73
5	**1:2.5**	**75**

[a] Reaction conditions: 1-methylquinoxalin-2(1*H*)-one **1a** (0.2 mmol, 32.0 mg), benzamide **2a**, CuBr (0.04 mmol, 5.7 mg), $K_2S_2O_8$ (0.6 mmol, 162 mg) in CH_3CN (2.0 mL) at 100 °C for 0.5 h under microwave irradiation.

[b] Isolated yield.



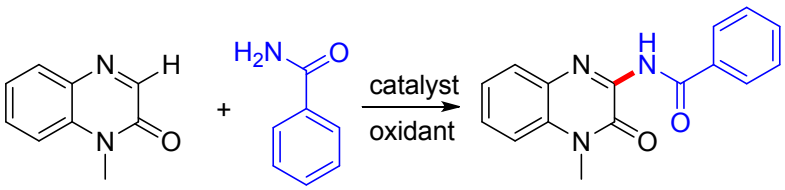
1a **2a** **3aa**

Table S2 Screening the reaction tempearature[a]

Entry	Temperature (°C)	Yields (%)[b]
1	20	0
2	60	58
3	70	65
4	**80**	**78**
5	90	78
6	100	78

[a] Reaction conditions: 1-methylquinoxalin-2(1*H*)-one **1a** (0.2 mmol, 32.0 mg), benzamide **2a** (0.5 mmol, 60.5 mg), CuBr (0.04 mmol, 5.7 mg), $K_2S_2O_8$ (0.6 mmol, 162 mg) in CH_3CN (2.0 mL) for 0.5 h under microwave irradiation.

[b] Isolated yield.



1a **2a** **3aa**

Table S3 Screening the reaction times[a]

Entry	Times (min)	Yields (%)[b]
1	10	63
2	20	70
3	30	78
4	40	76

[a] Reaction conditions: 1-methylquinoxalin-2(1*H*)-one **1a** (0.2 mmol, 32.0 mg), benzamide **2a** (0.5 mmol, 60.5 mg), CuBr (0.04 mmol, 5.7 mg), $K_2S_2O_8$ (0.6 mmol, 162 mg) in CH_3CN (2.0 mL) under microwave irradiation.

[b] Isolated yield.

2. Copies of spectra of products

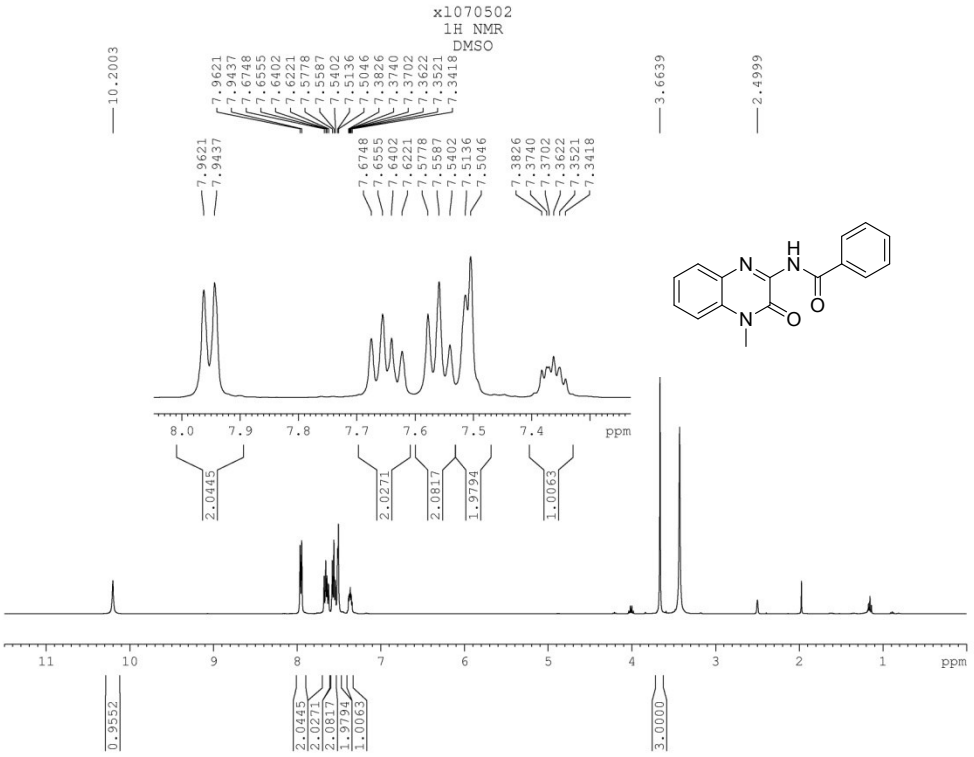


Fig. 1 ^{1}H NMR spectrum of compound **3aa**

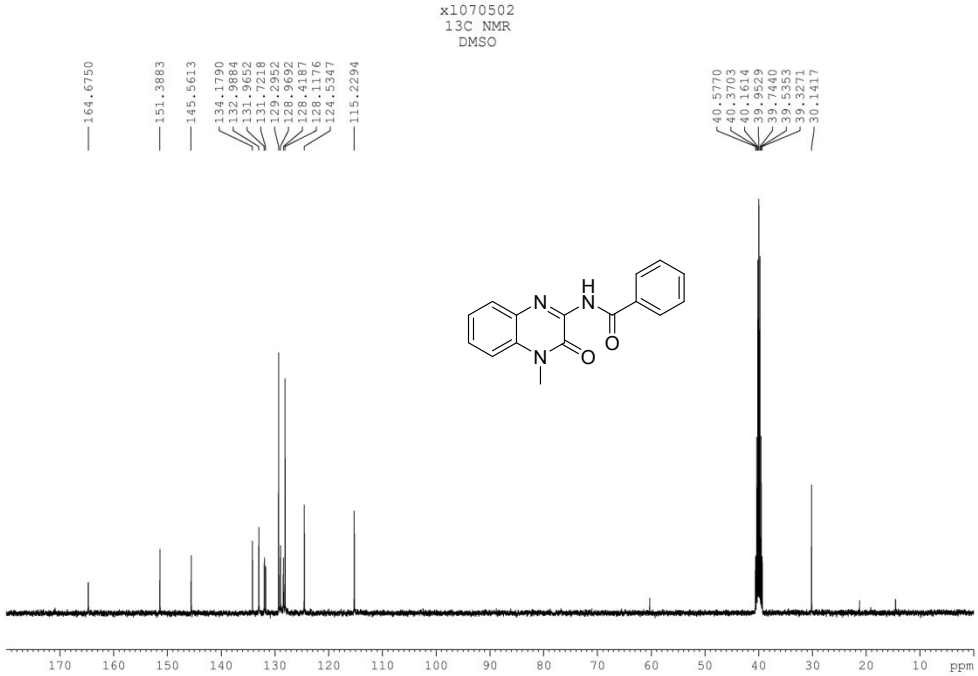


Fig. 2 ^{13}C NMR spectrum of compound **3aa**

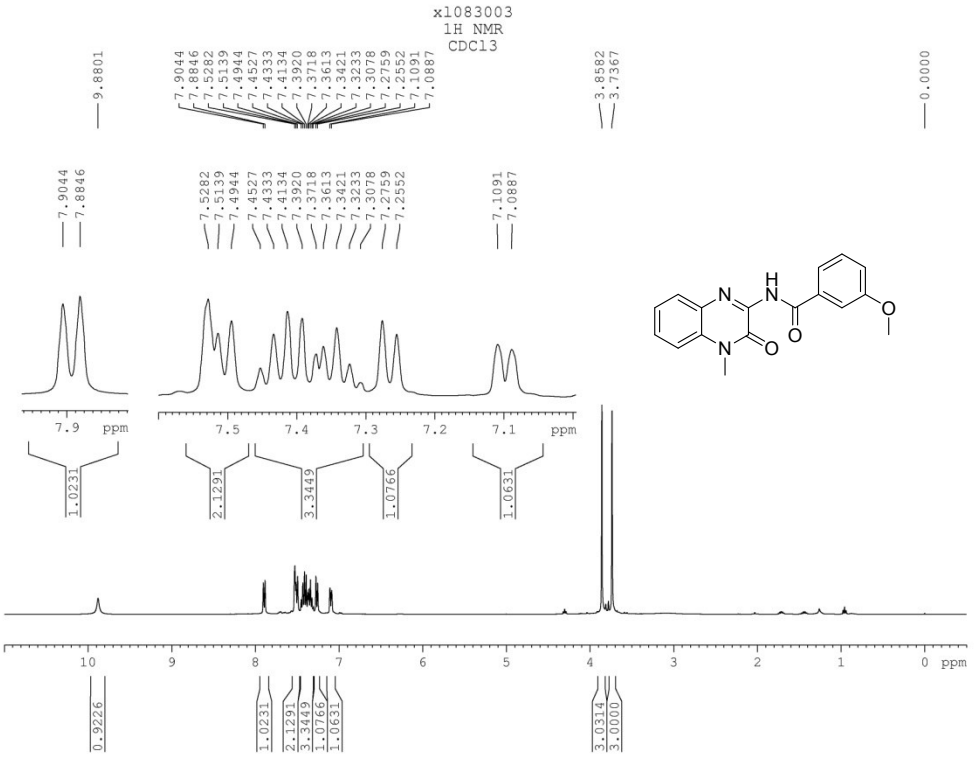


Fig. 3 ^{1}H NMR spectrum of compound **3ab**

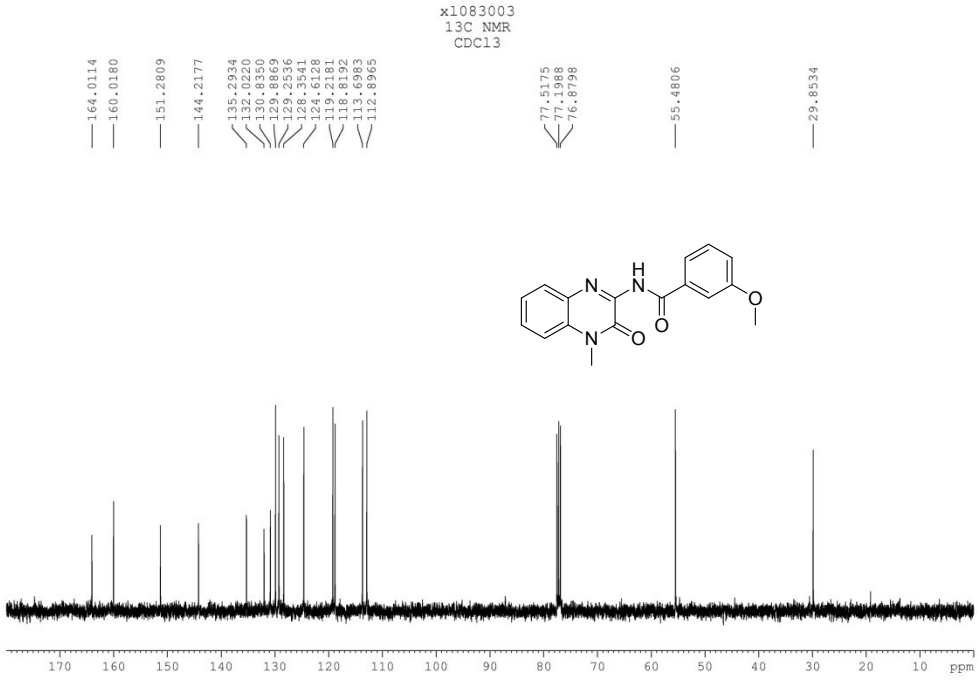


Fig. 4 ^{13}C NMR spectrum of compound **3ab**

Fig. 5 ^{1}H NMR spectrum of compound **3ac**

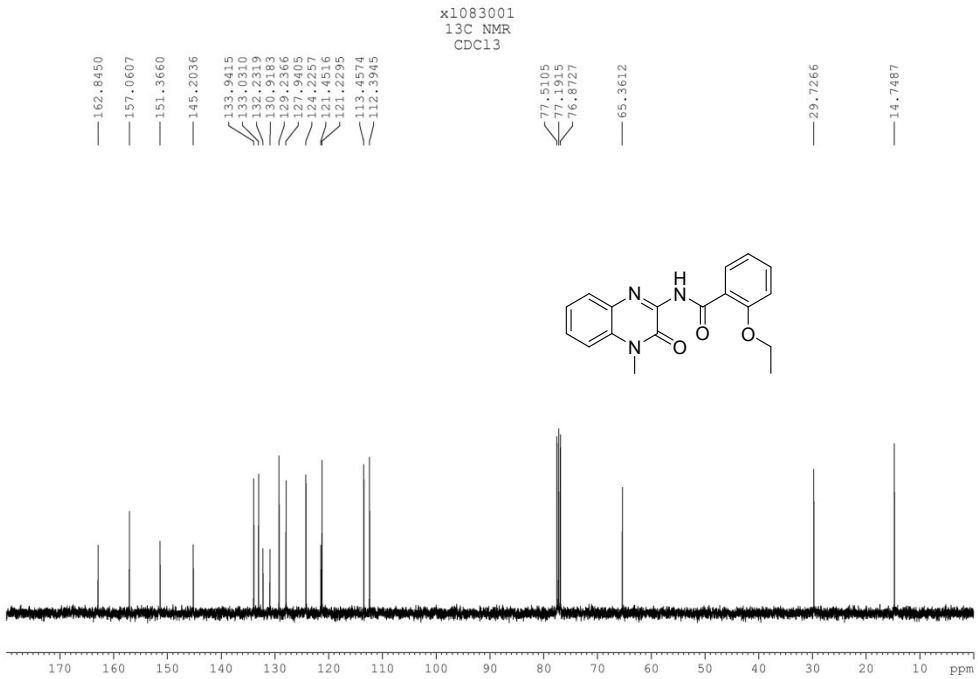


Fig. 6 ^{13}C NMR spectrum of compound **3ac**

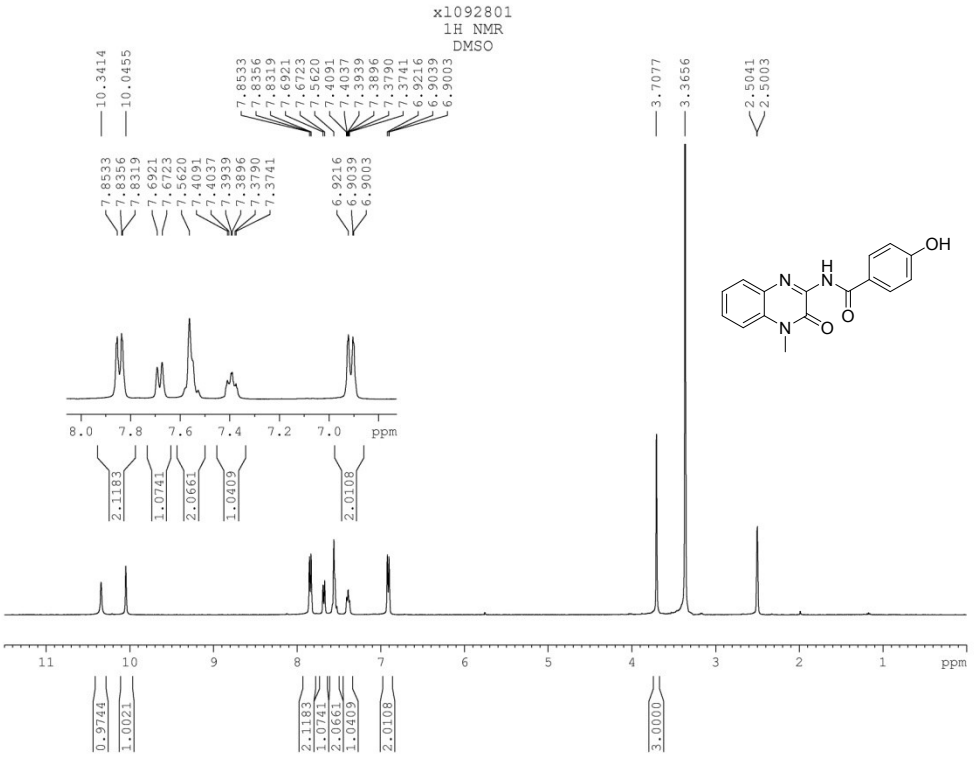


Fig. 7 ^{1}H NMR spectrum of compound **3ad**

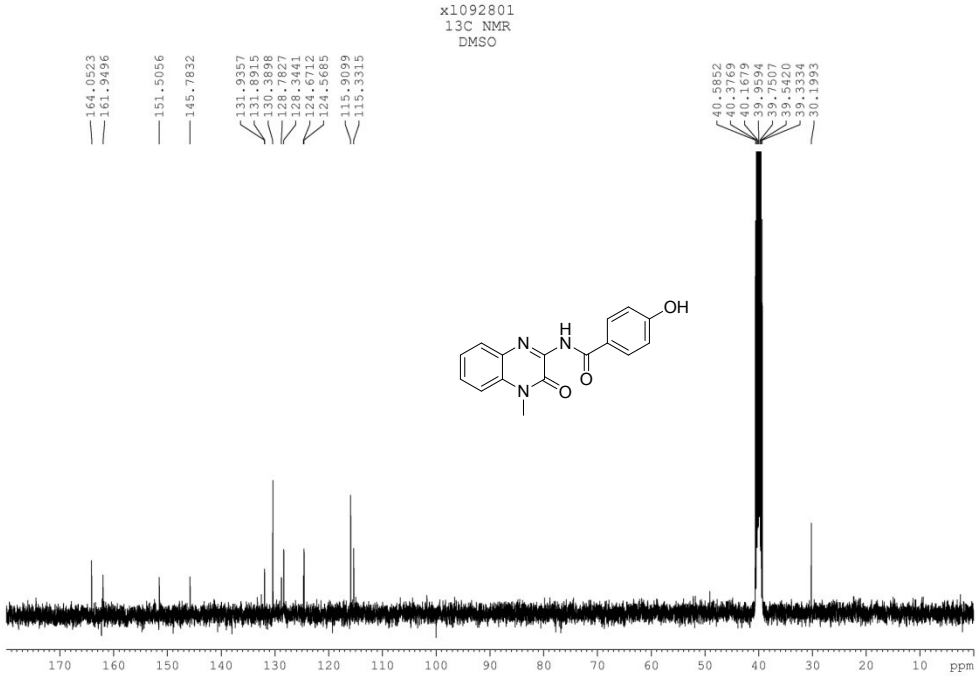


Fig. 8 ^{13}C NMR spectrum of compound **3ad**

Fig. 9 ^{1}H NMR spectrum of compound **3ae**

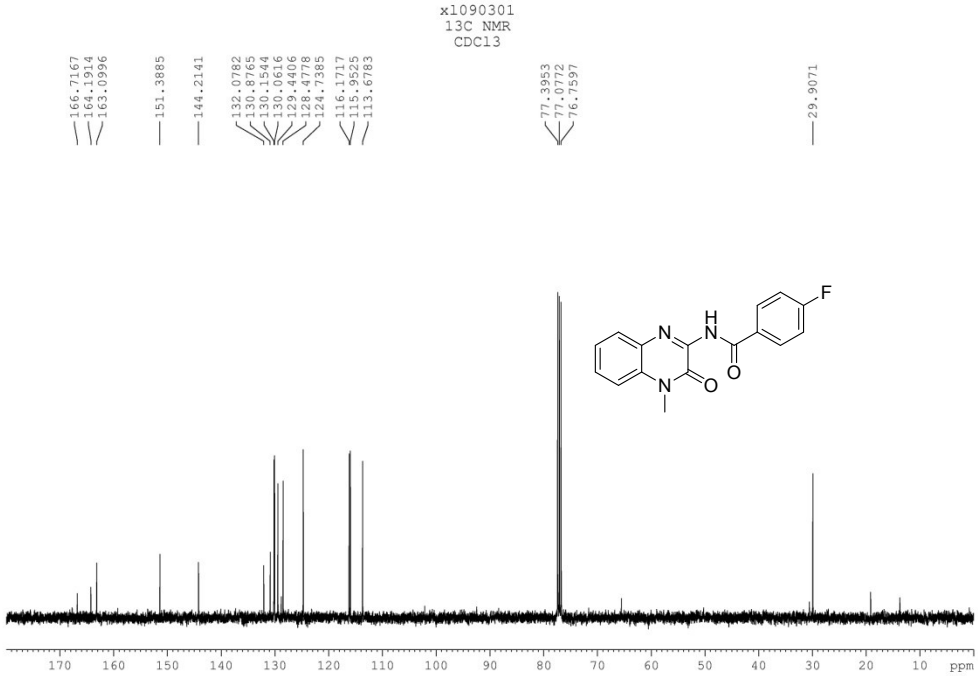


Fig. 10 ^{13}C NMR spectrum of compound **3ae**

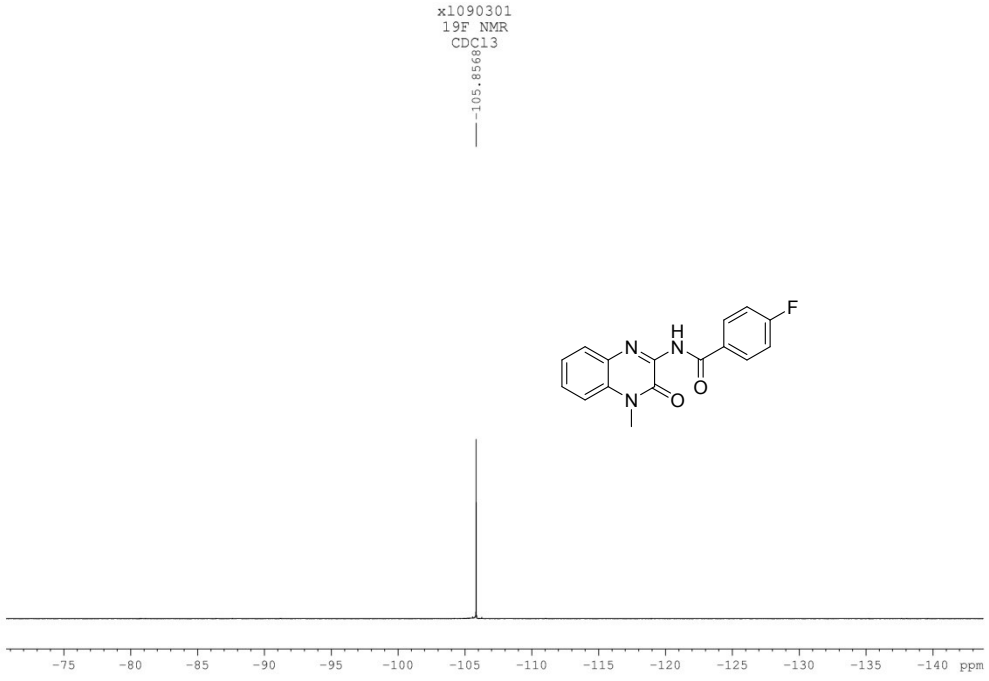


Fig. 11 ^{19}F NMR spectrum of compound **3ae**

Fig. 12 ^{1}H NMR spectrum of compound **3af**

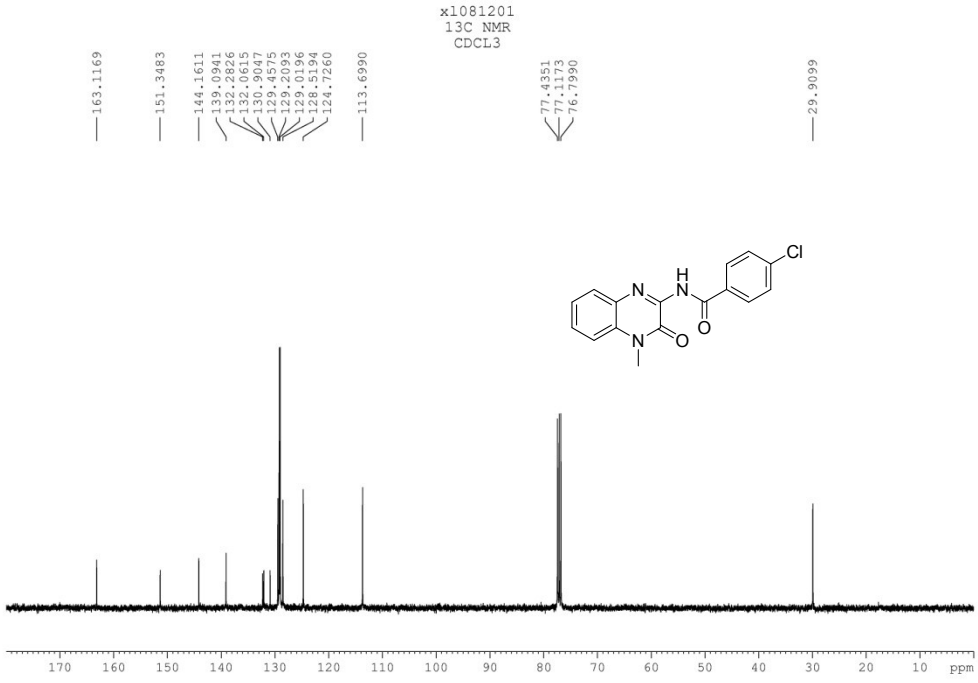


Fig. 13 ^{13}C NMR spectrum of compound **3af**

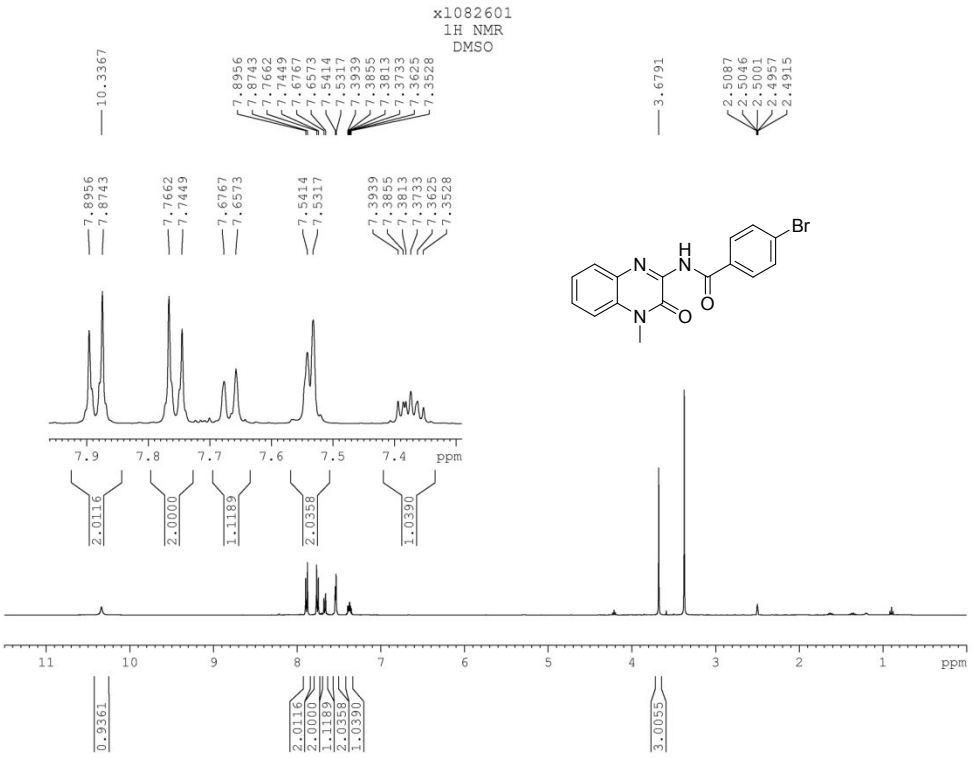


Fig. 14 ^{1}H NMR spectrum of compound **3ag**

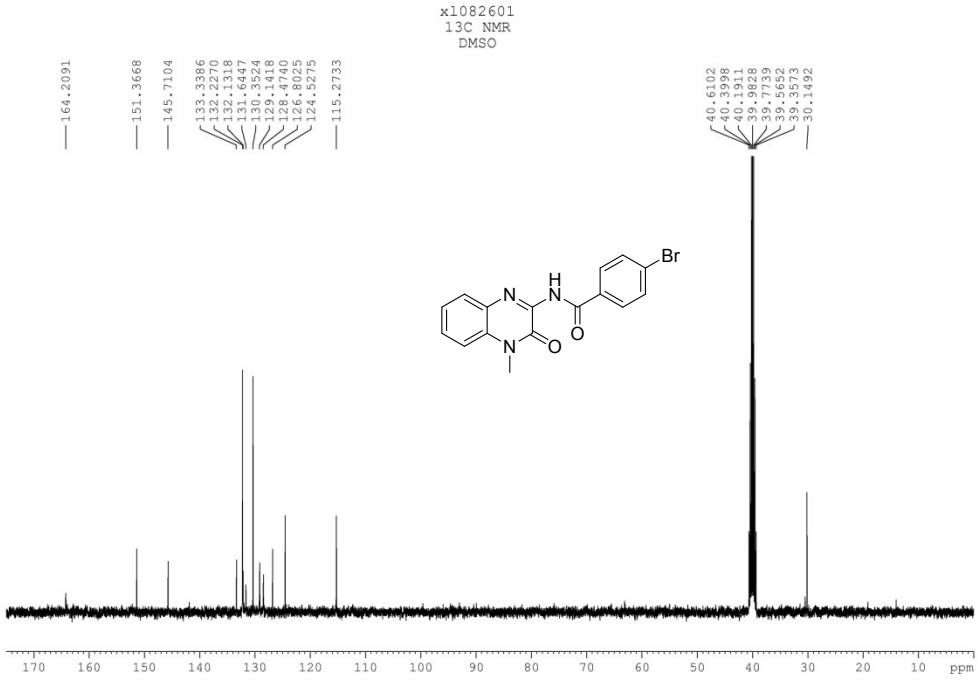


Fig. 15 ^{13}C NMR spectrum of compound **3ag**

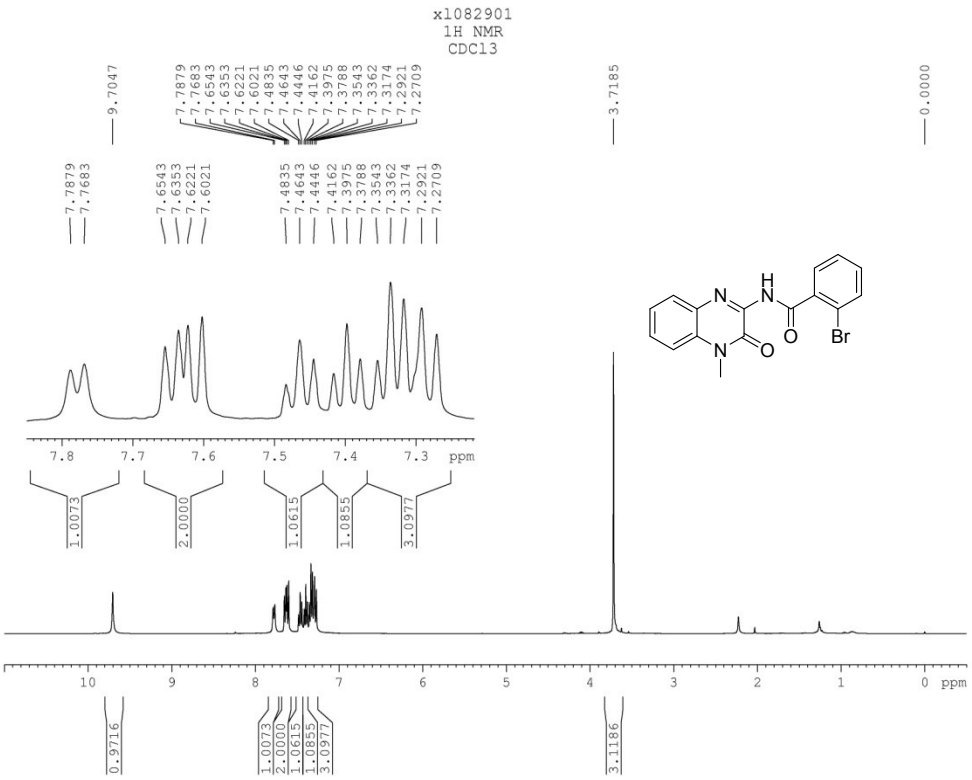


Fig. 16 ^{1}H NMR spectrum of compound **3ah**

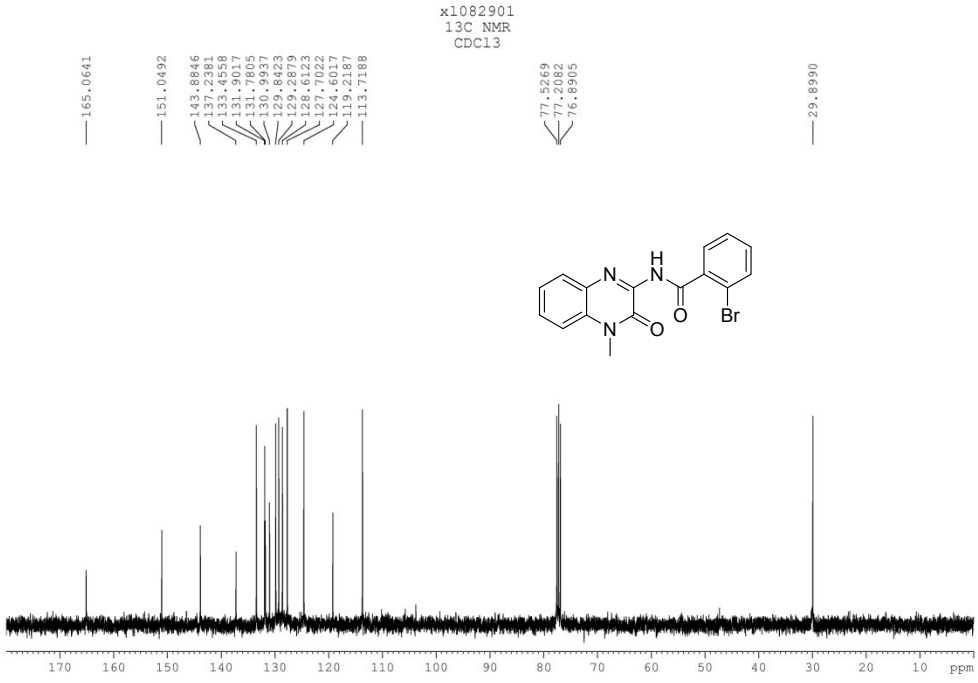


Fig. 17 ^{13}C NMR spectrum of compound **3ah**

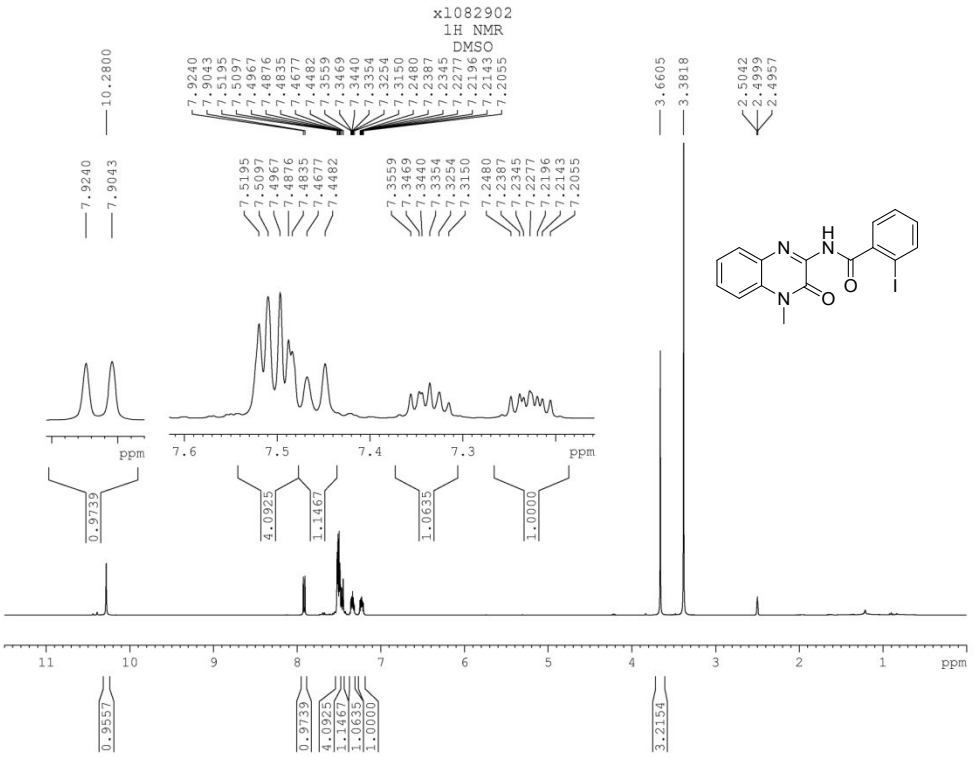


Fig. 18 ^{1}H NMR spectrum of compound **3ai**

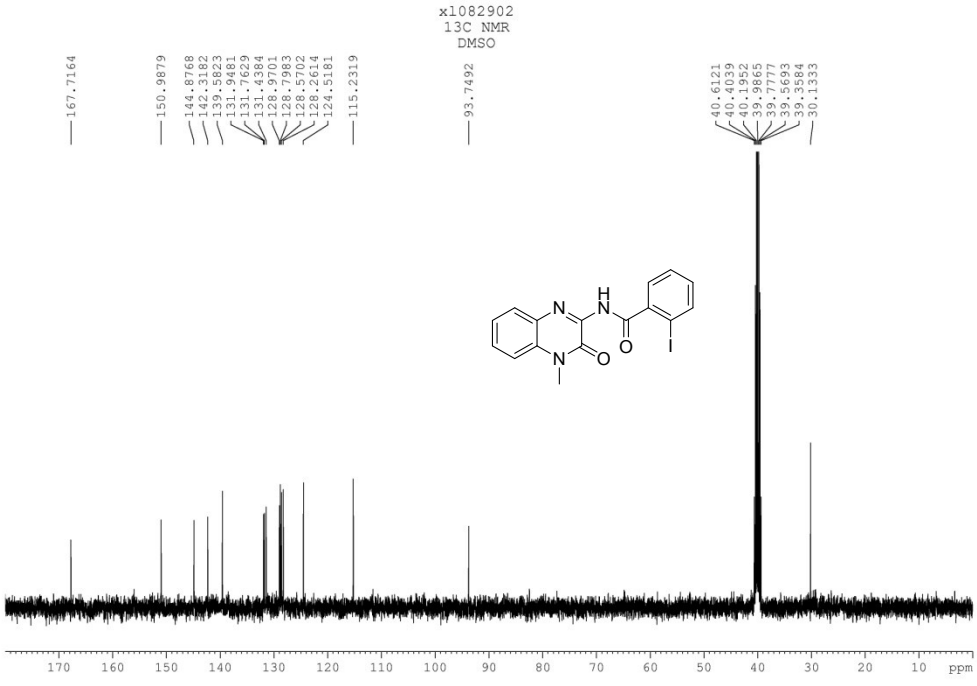


Fig. 19 ^{13}C NMR spectrum of compound **3ai**

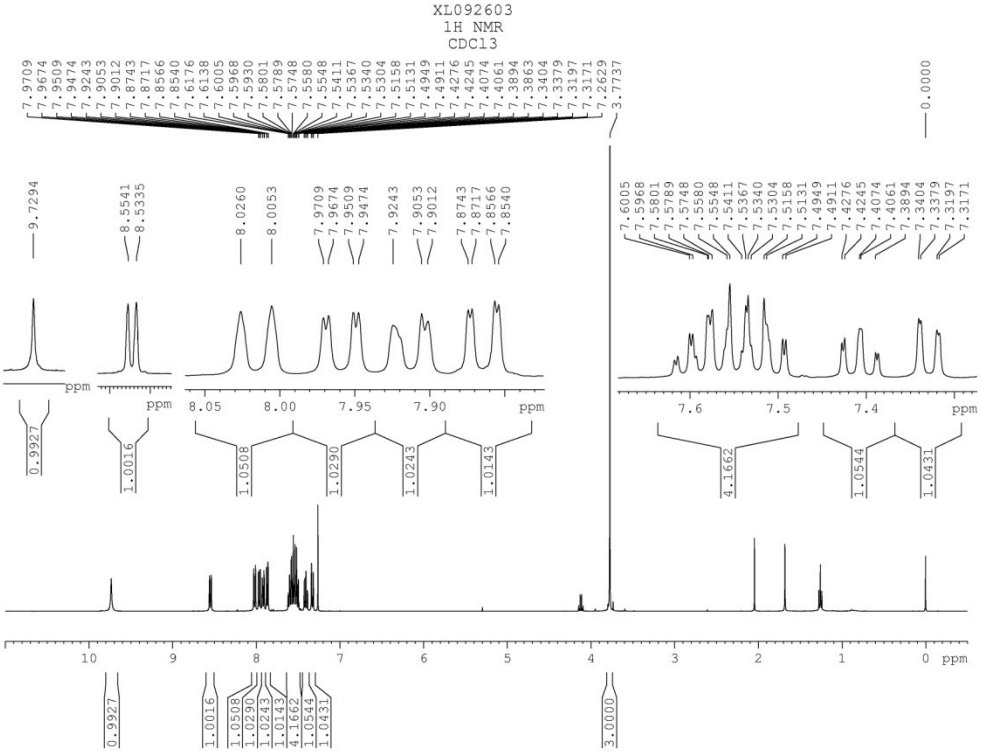


Fig. 20 ^{1}H NMR spectrum of compound **3ak**

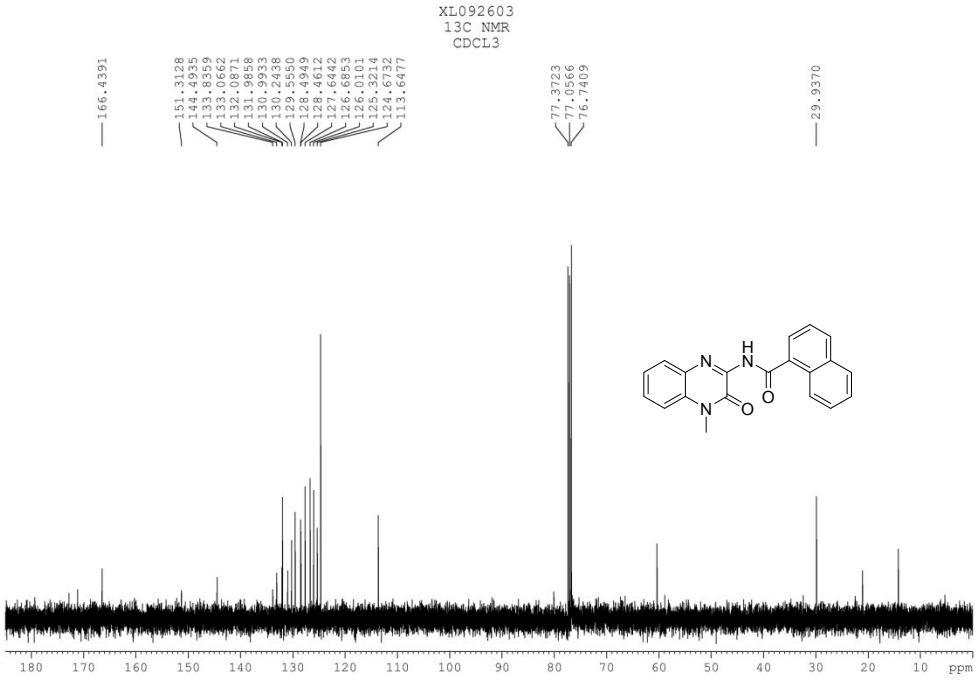


Fig. 21 ^{13}C NMR spectrum of compound **3ak**

Fig. 22 ^{1}H NMR spectrum of compound **3al**

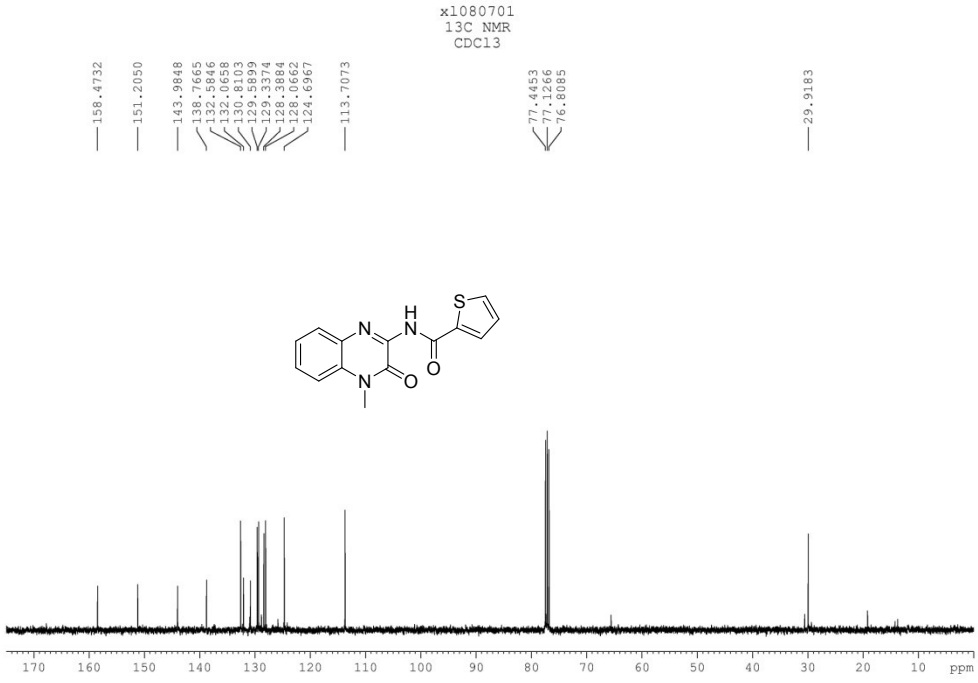


Fig. 23 ^{13}C NMR spectrum of compound **3al**

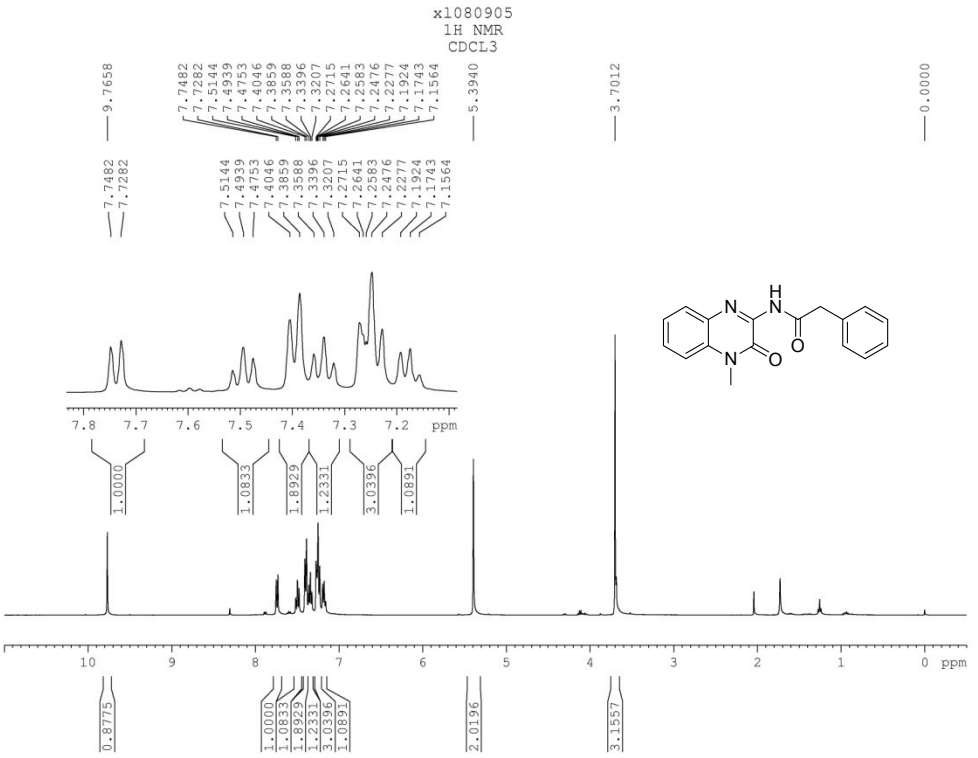


Fig. 24 ^{1}H NMR spectrum of compound **3am**

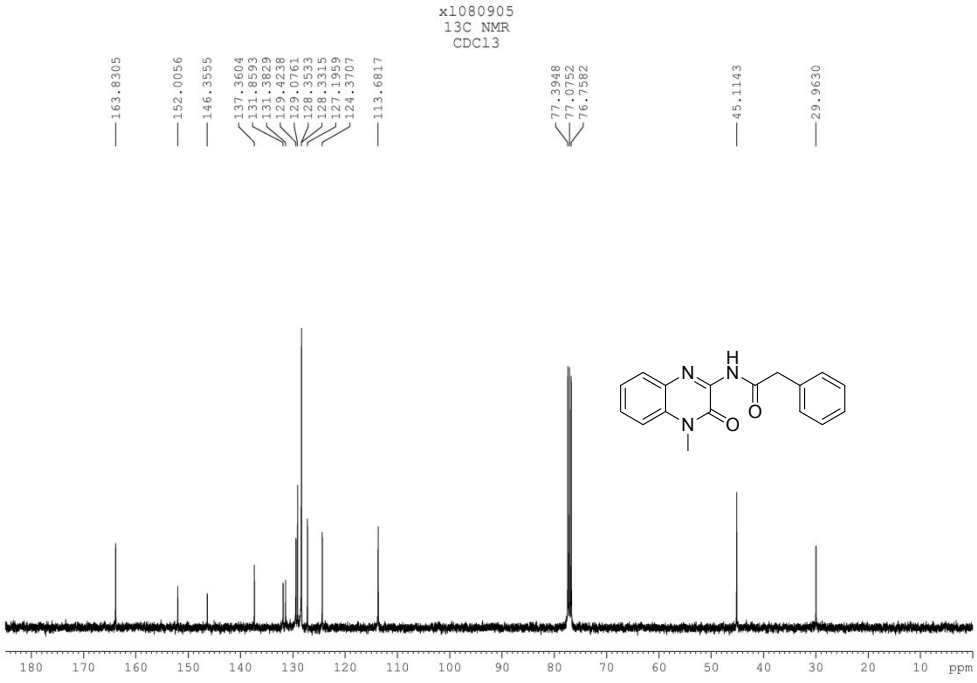


Fig. 25 ^{13}C NMR spectrum of compound **3am**

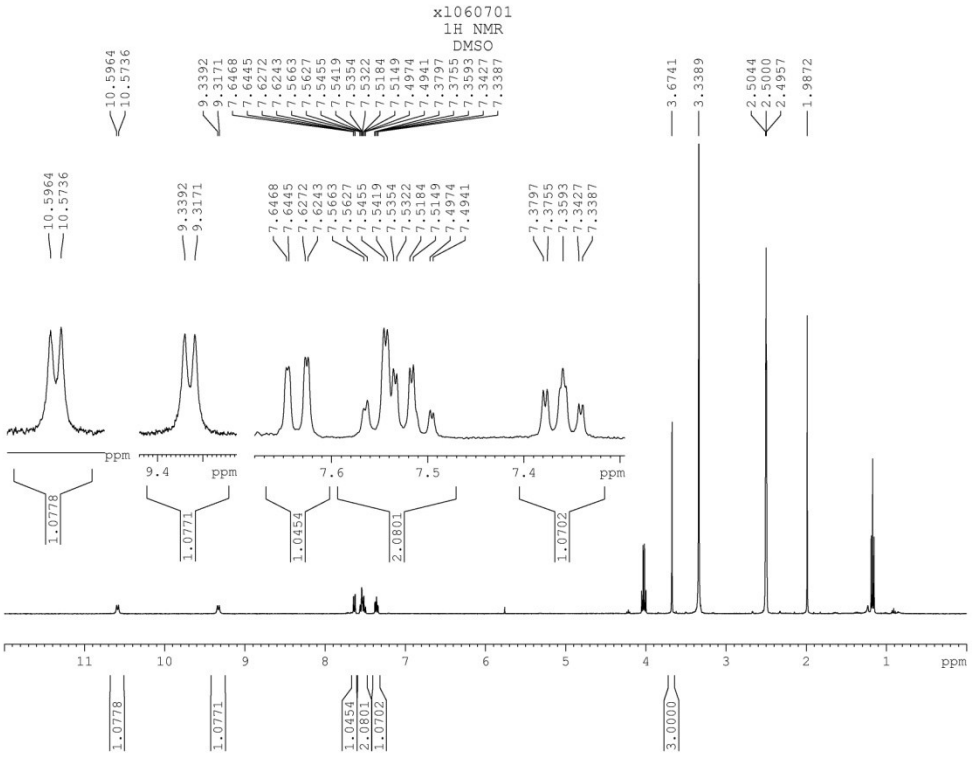


Fig. 26 ^{1}H NMR spectrum of compound **3an**

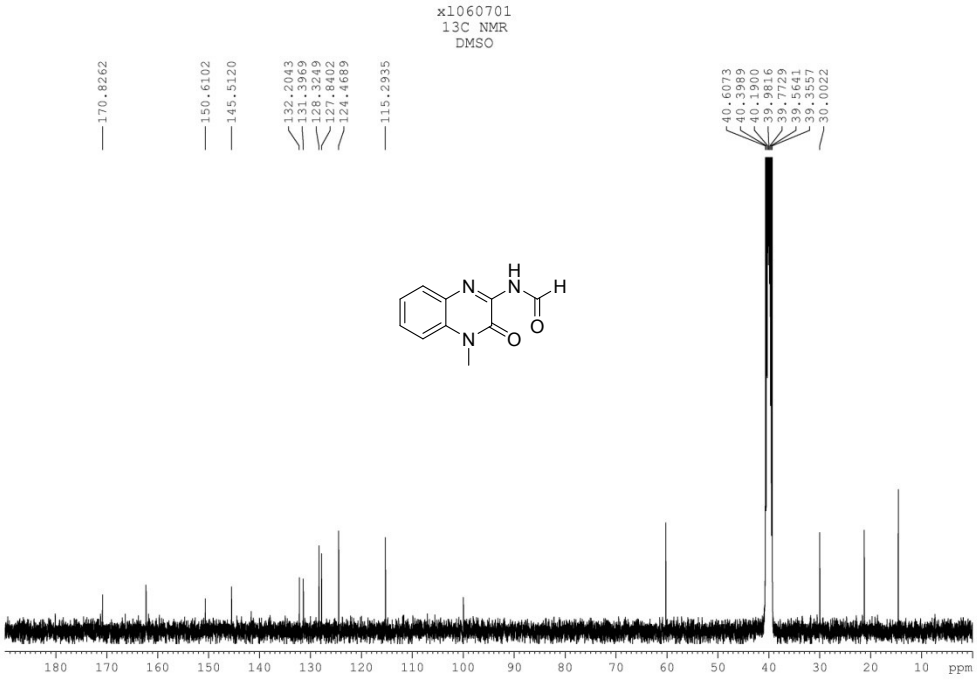


Fig. 27 ^{13}C NMR spectrum of compound **3an**

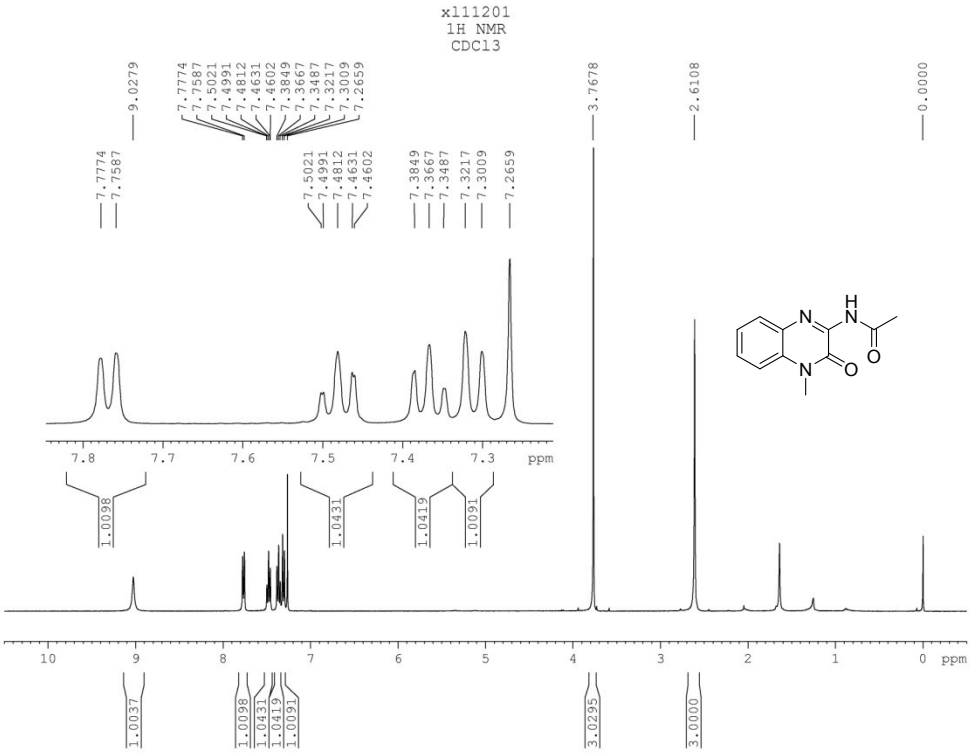


Fig. 28 ^{1}H NMR spectrum of compound **3ao**

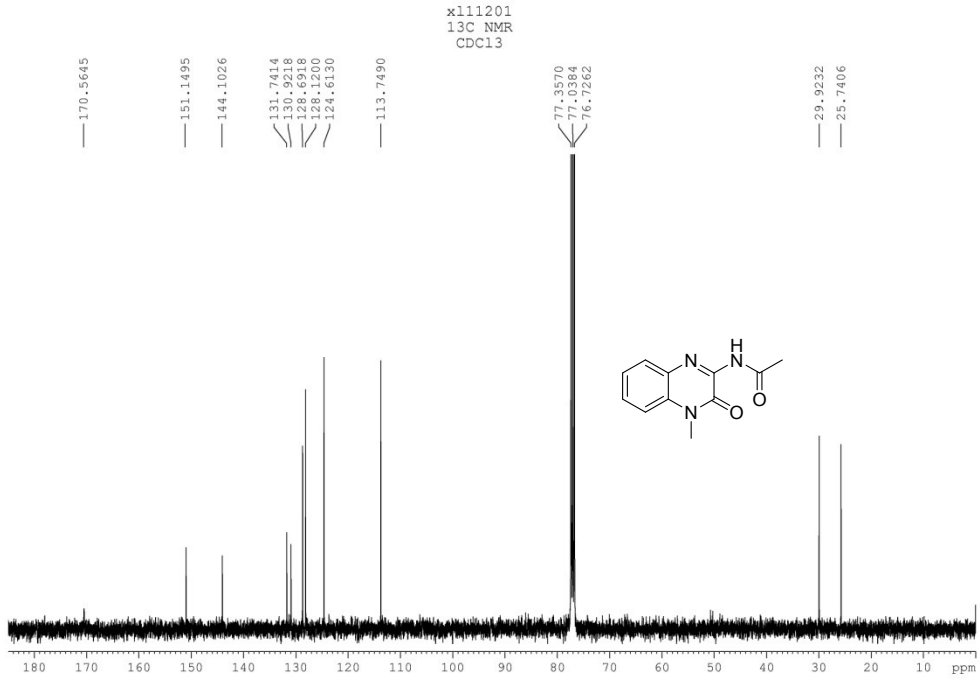


Fig. 29 ^{13}C NMR spectrum of compound **3ao**

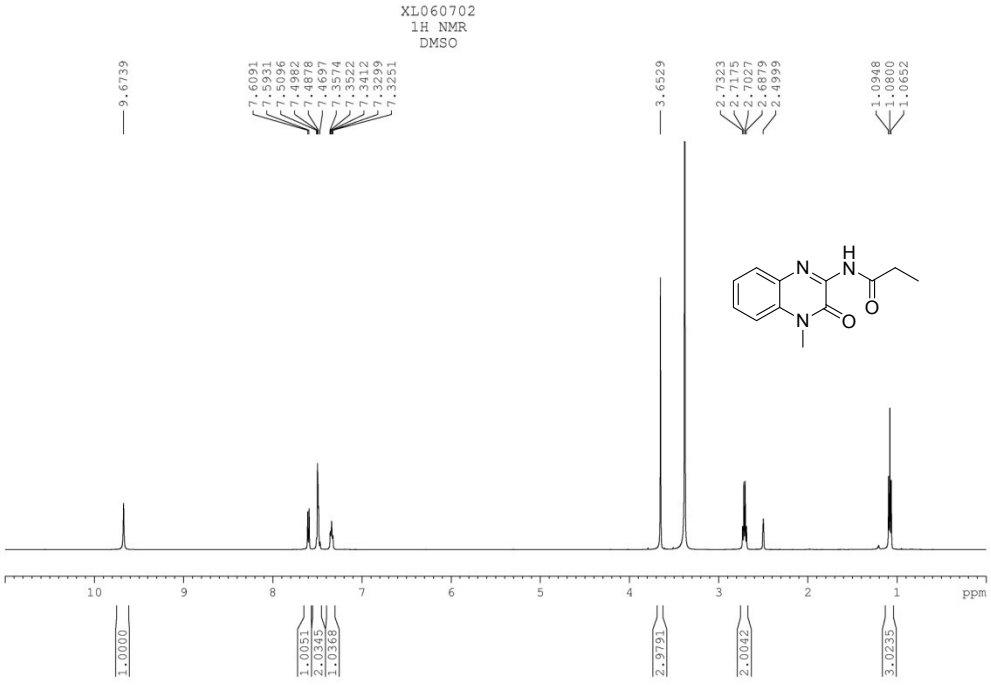


Fig. 30 ^{1}H NMR spectrum of compound **3ap**

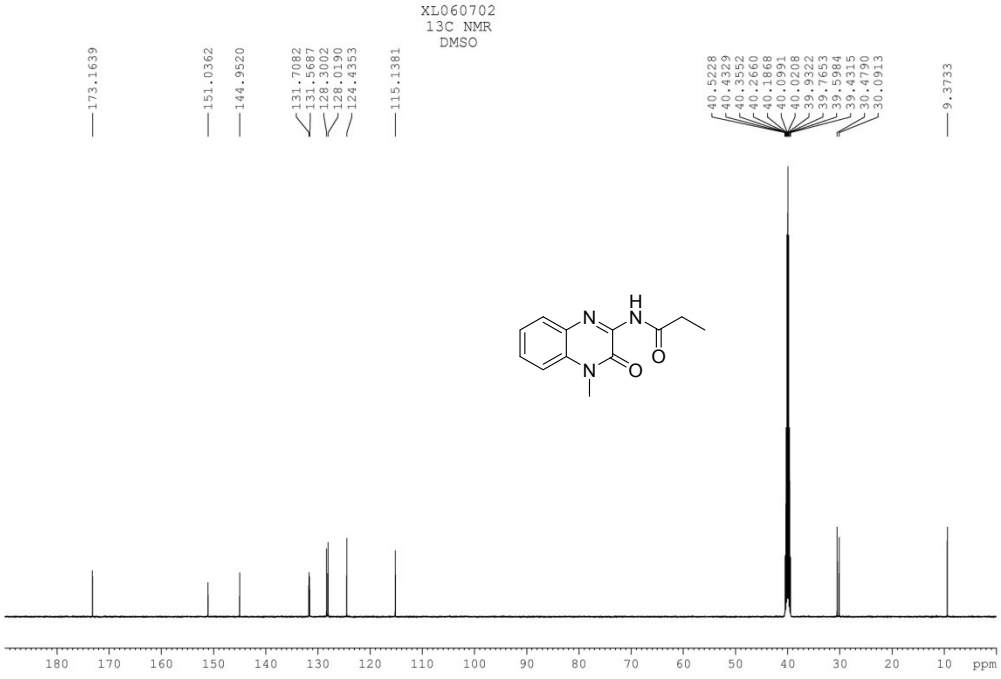


Fig. 31 ^{13}C NMR spectrum of compound **3ap**

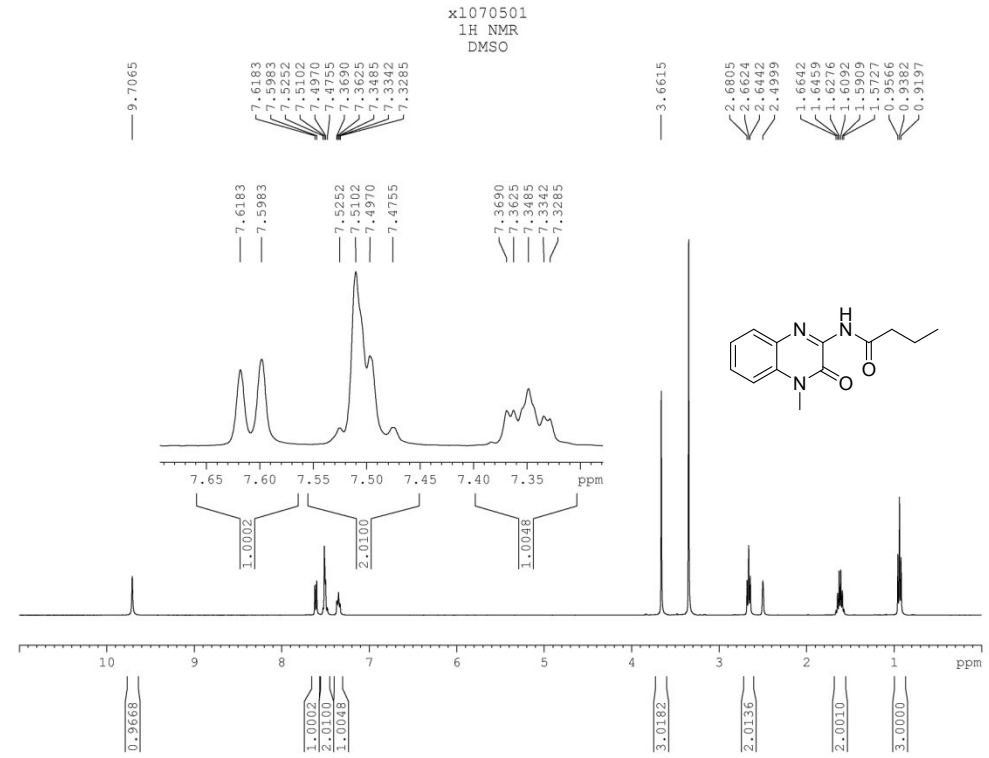


Fig. 32 ^{1}H NMR spectrum of compound **3aq**

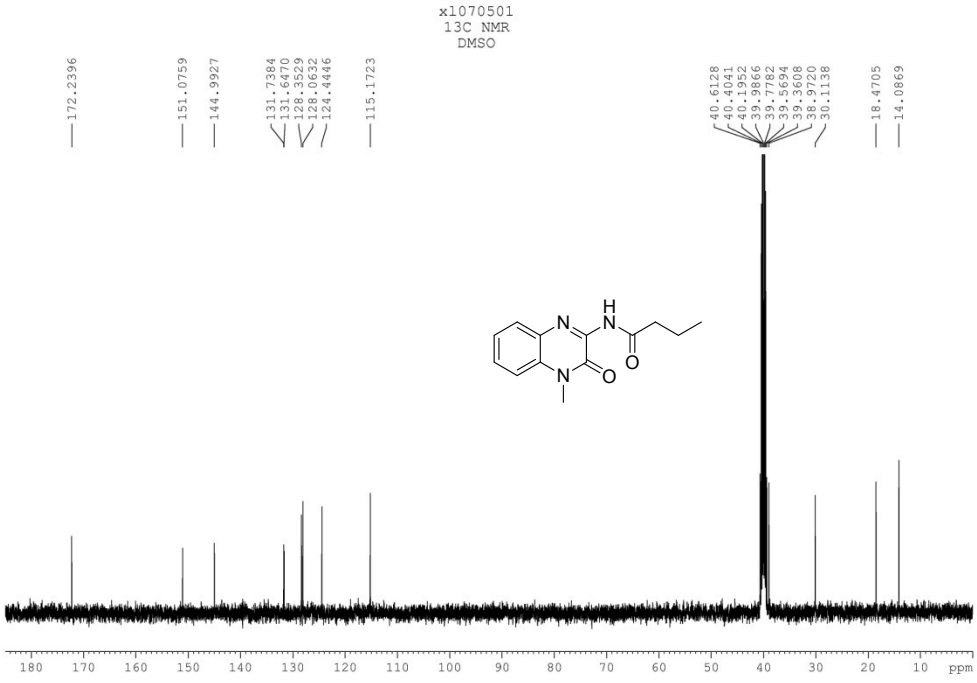


Fig. 33 ^{13}C NMR spectrum of compound **3aq**

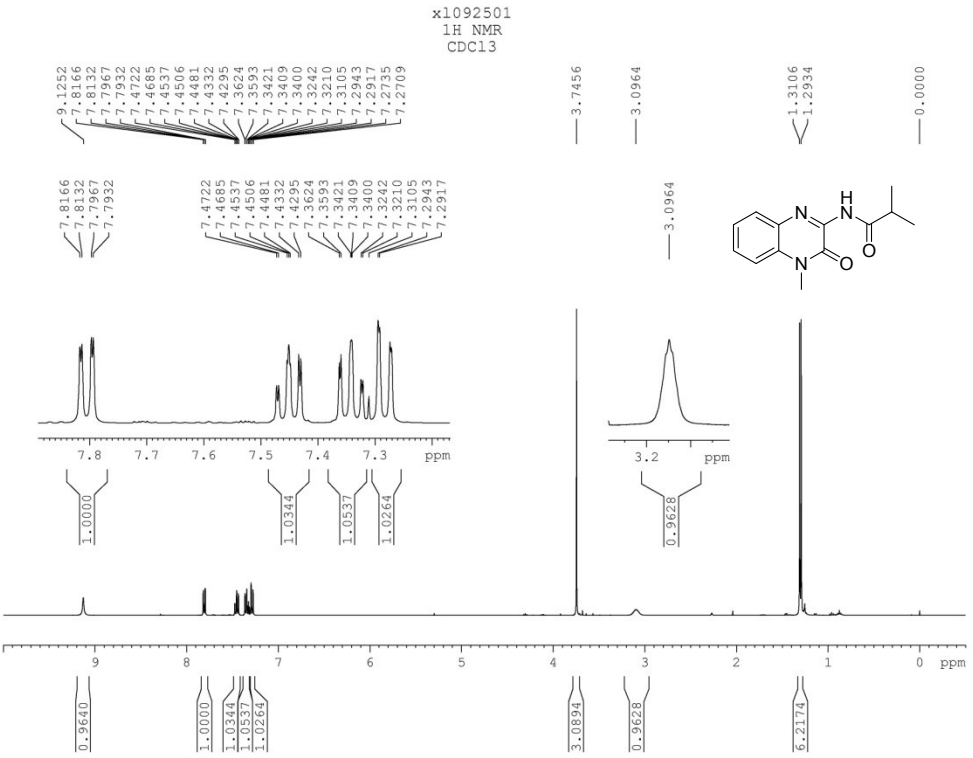


Fig. 34 ^{1}H NMR spectrum of compound **3ar**

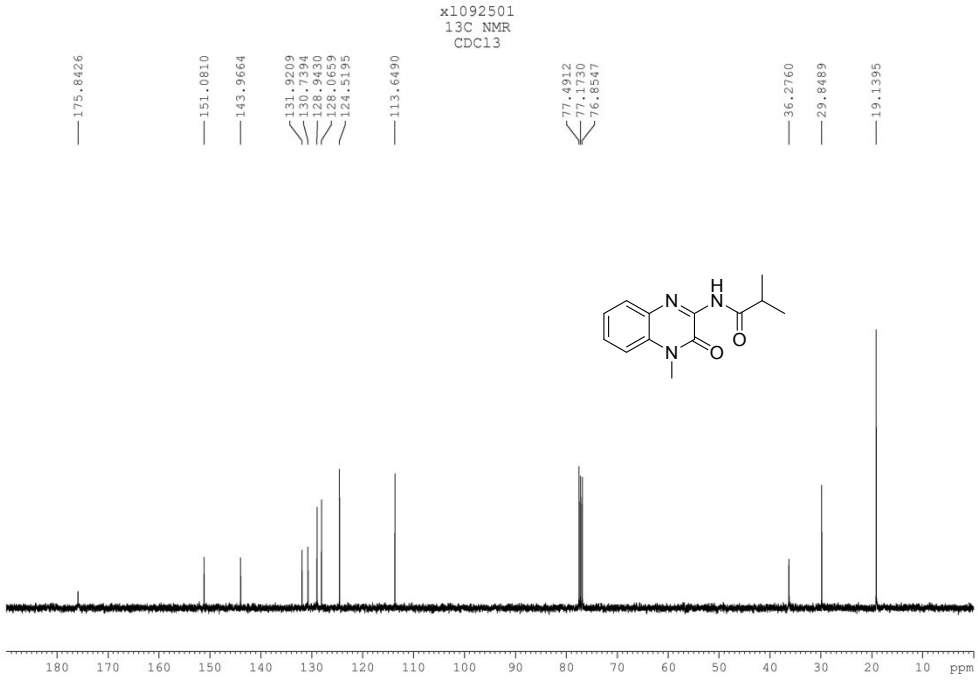


Fig. 35 ^{13}C NMR spectrum of compound **3ar**

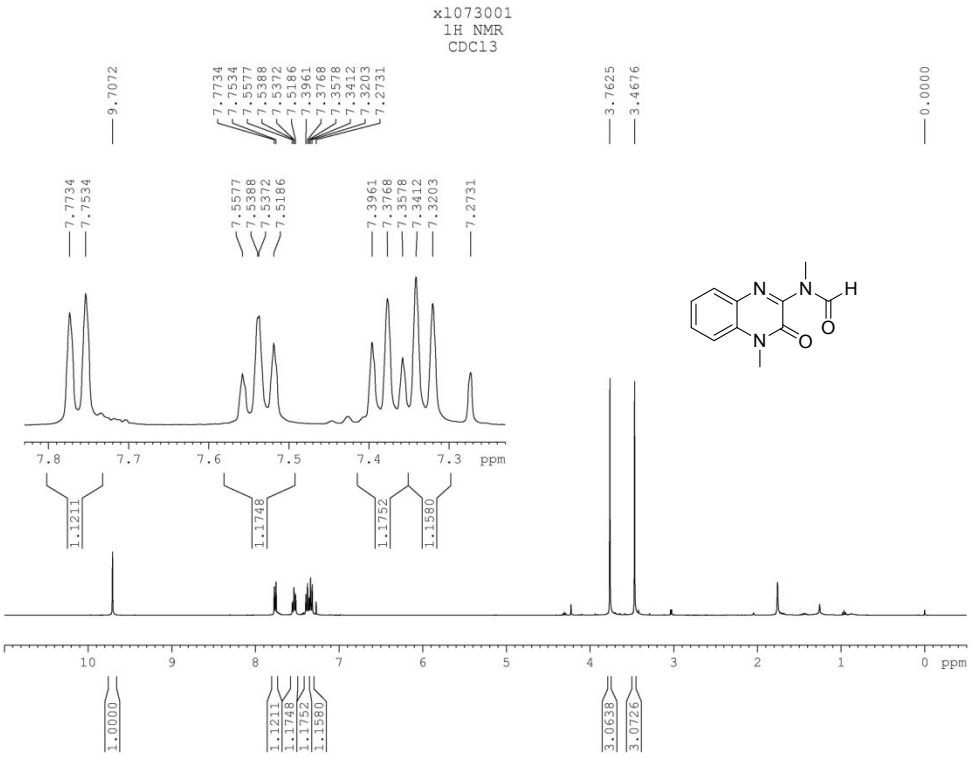


Fig. 36 ^{1}H NMR spectrum of compound **3as**

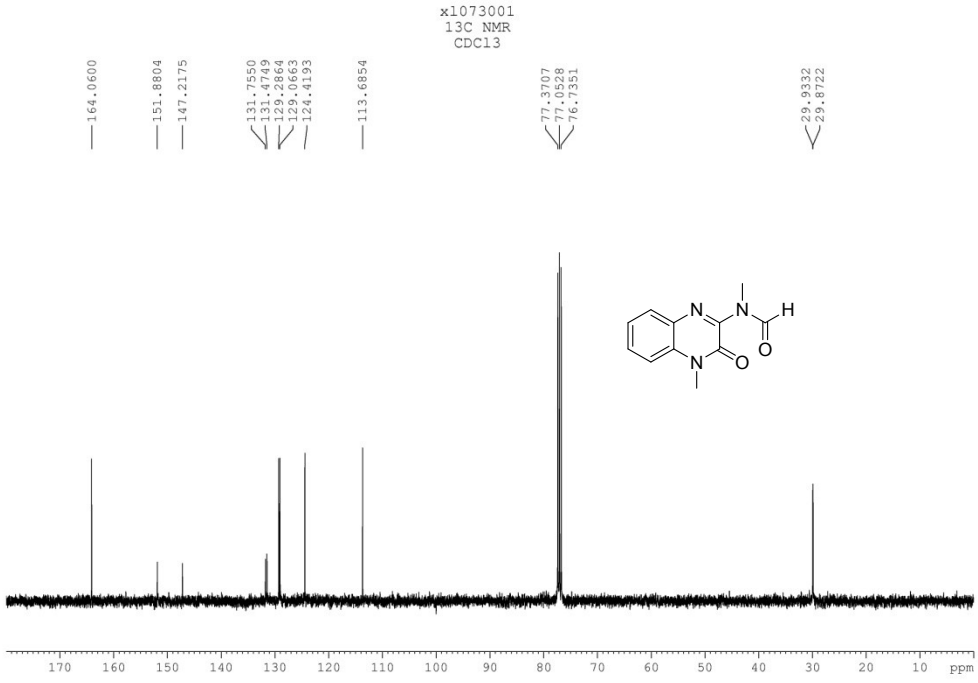


Fig. 37 ^{13}C NMR spectrum of compound **3as**

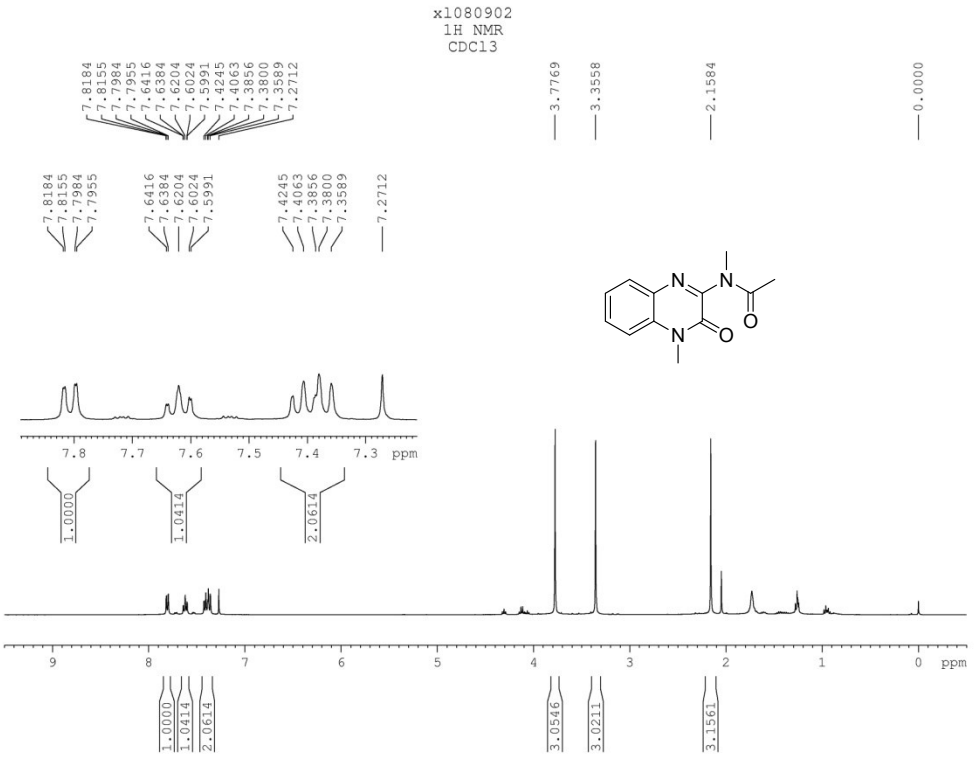


Fig. 38 ^{1}H NMR spectrum of compound **3at**

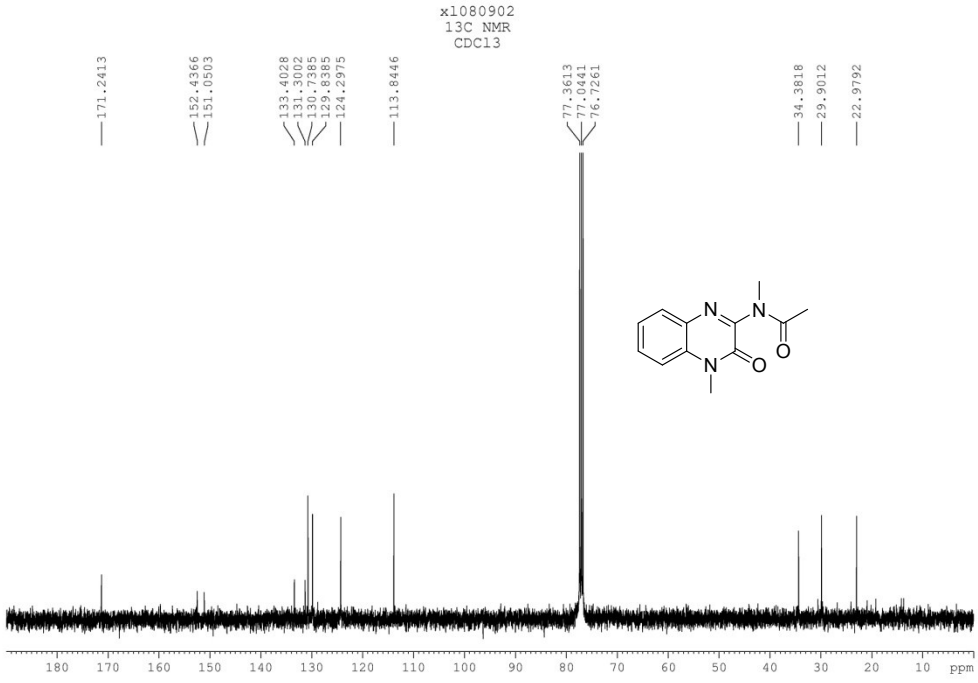


Fig. 39 ^{13}C NMR spectrum of compound **3at**

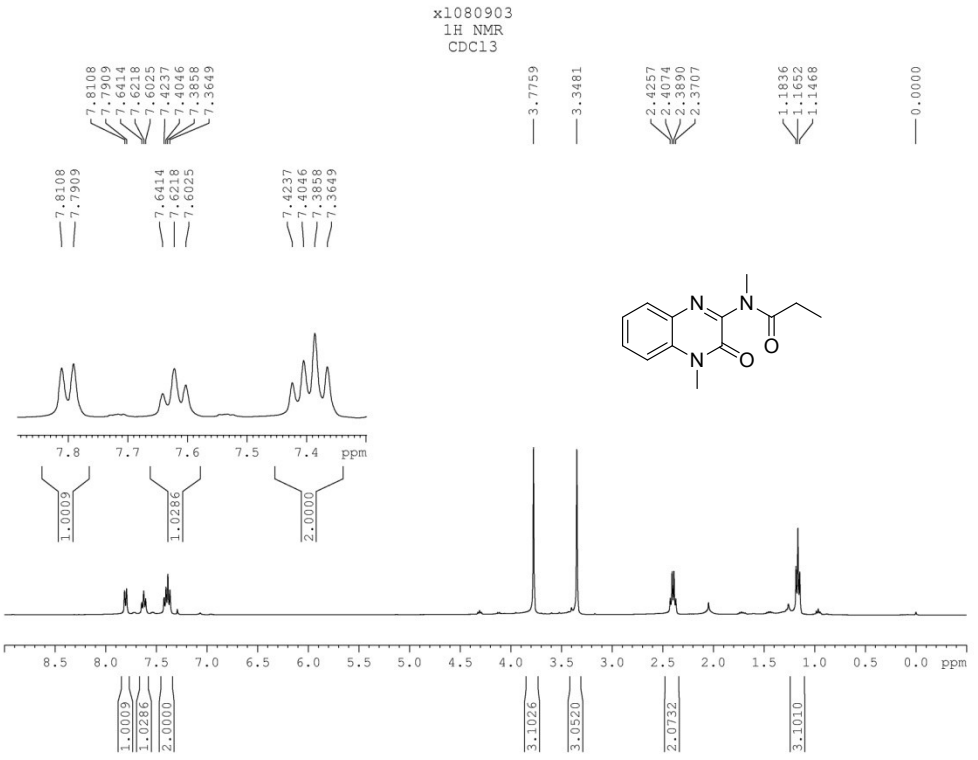


Fig. 40 ^{1}H NMR spectrum of compound **3au**

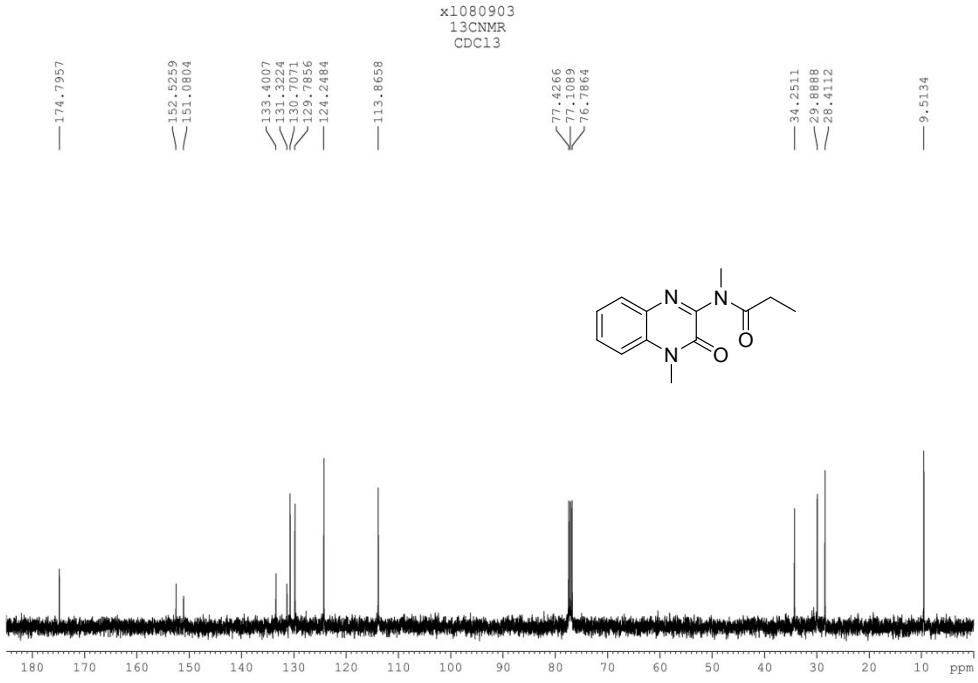


Fig. 41 ^{13}C NMR spectrum of compound **3au**

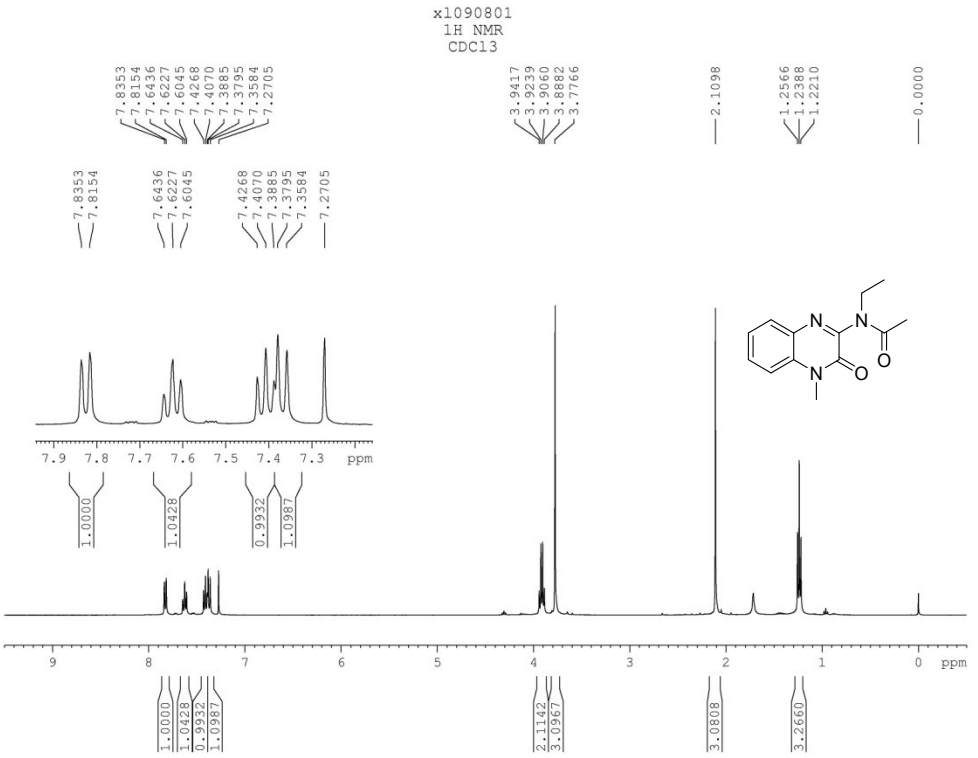


Fig. 42 ^{1}H NMR spectrum of compound **3av**

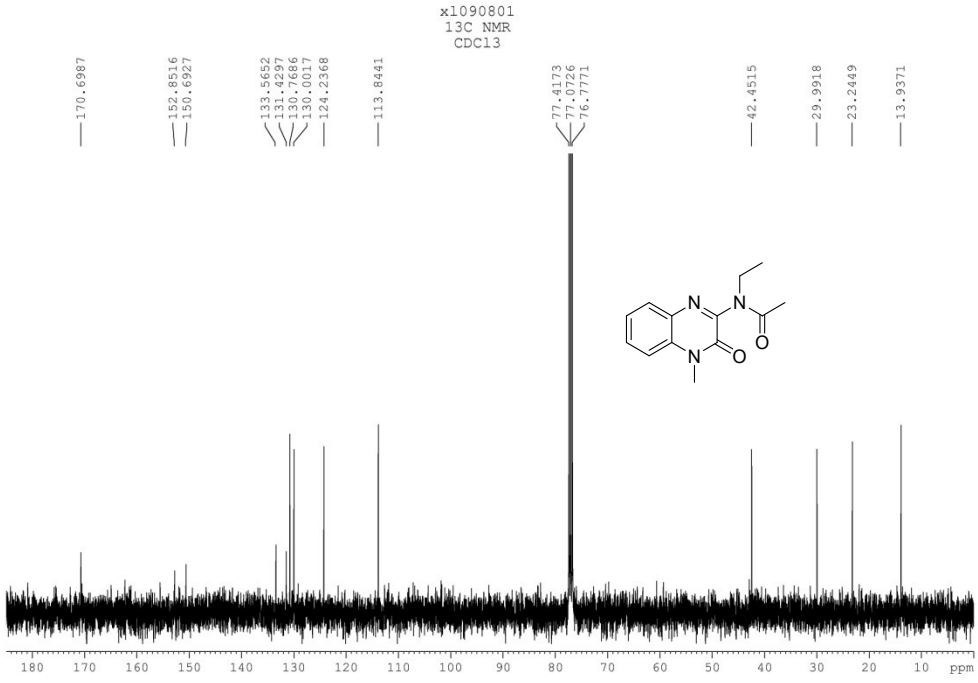


Fig. 43 ^{13}C NMR spectrum of compound **3av**

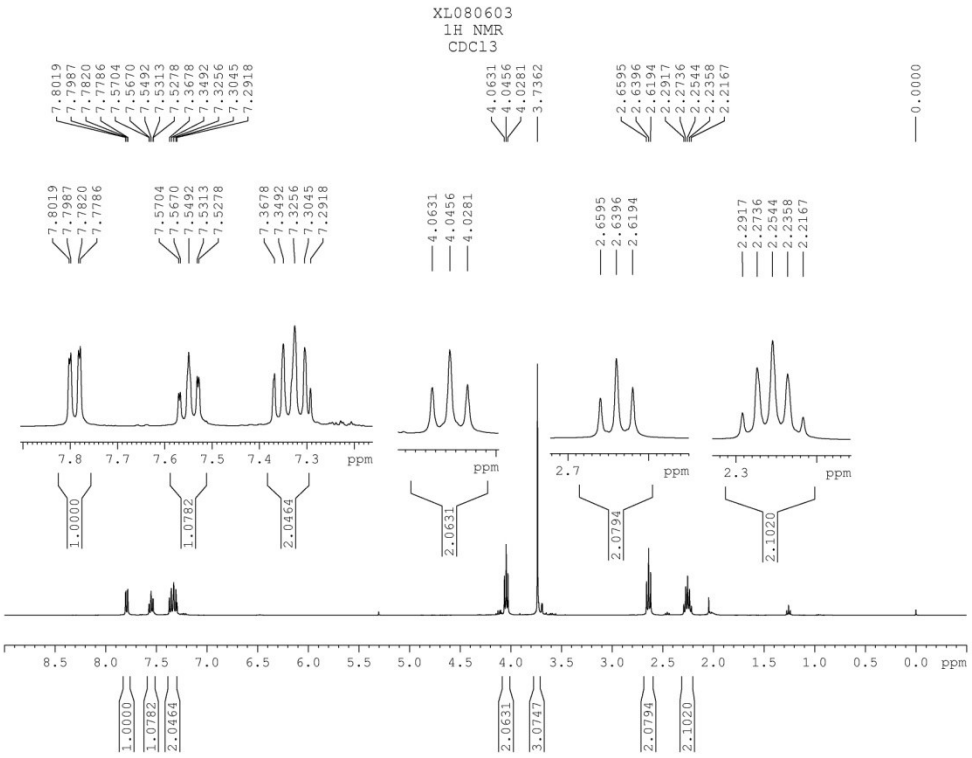


Fig. 44 ^{1}H NMR spectrum of compound **3aw**

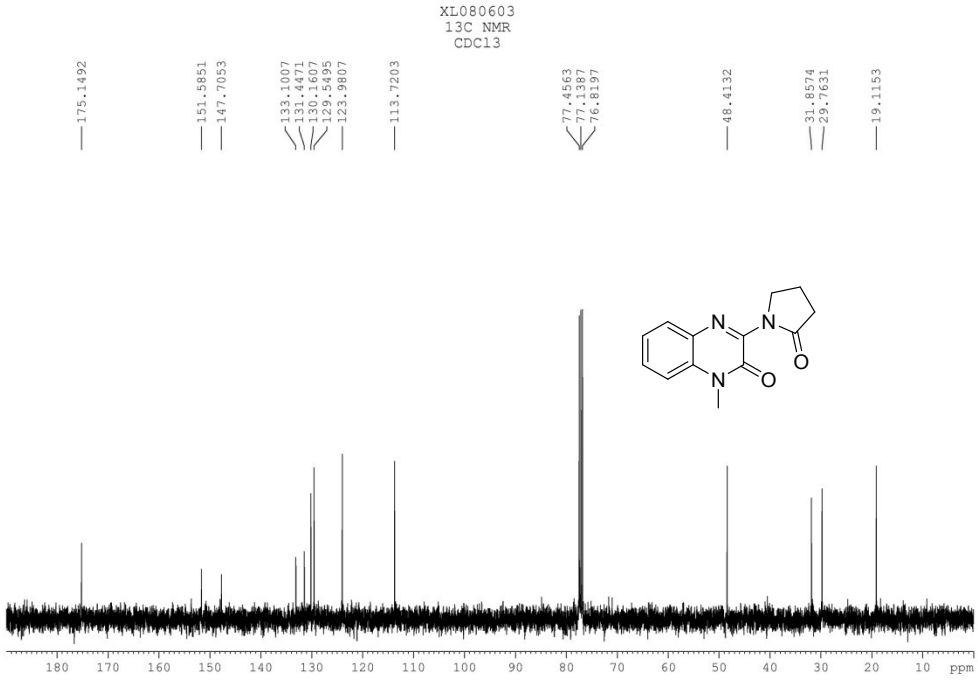


Fig. 45 ^{13}C NMR spectrum of compound **3aw**

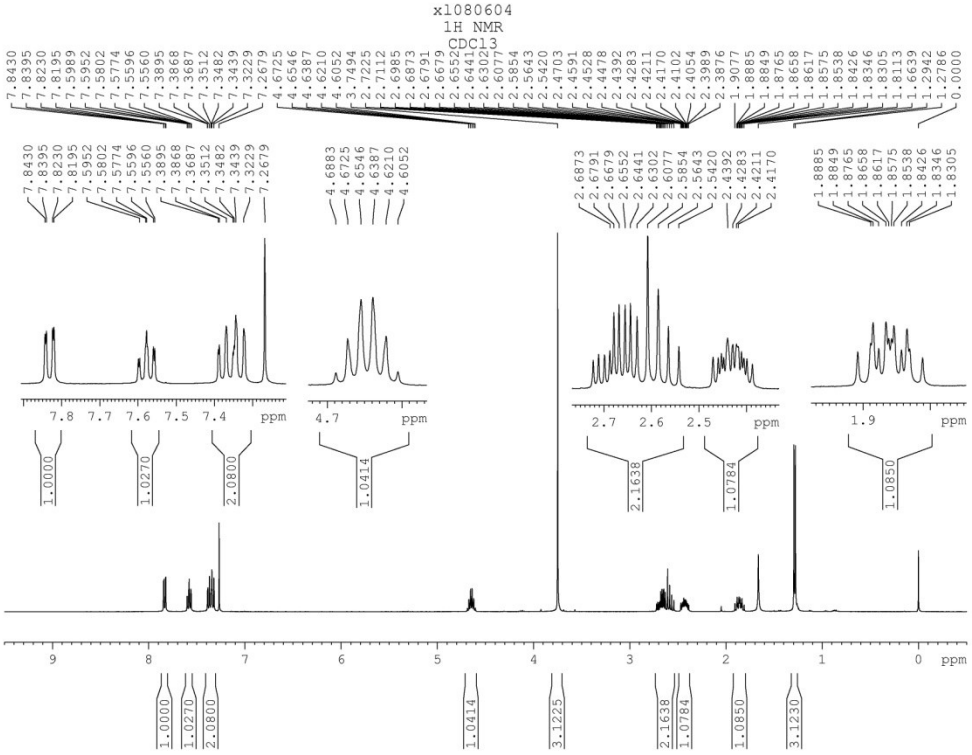


Fig. 46 ^{1}H NMR spectrum of compound **3ax**

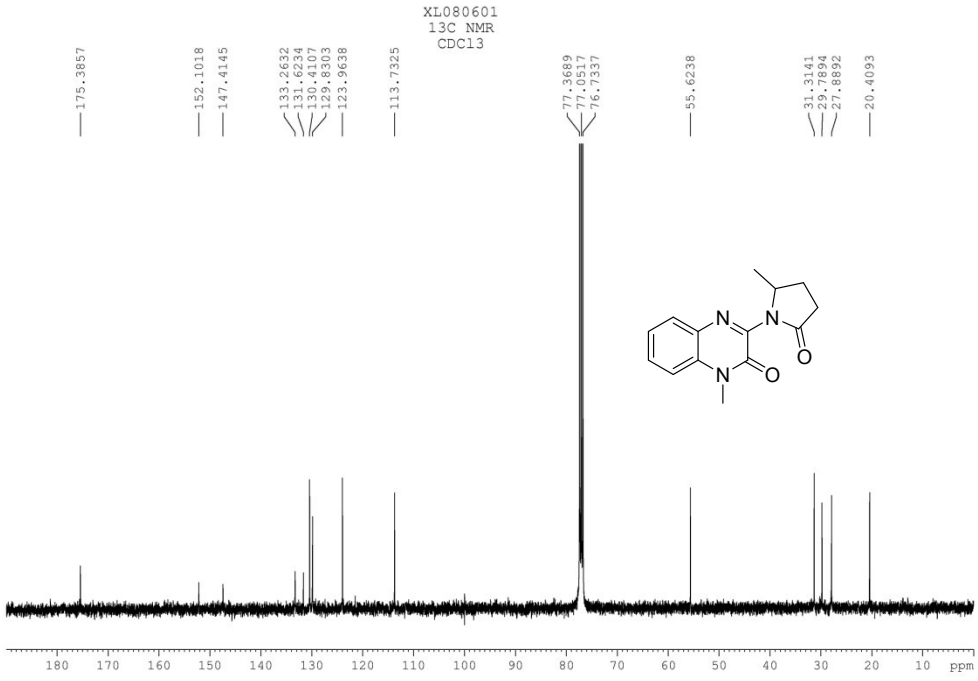


Fig. 47 ^{13}C NMR spectrum of compound **3ax**

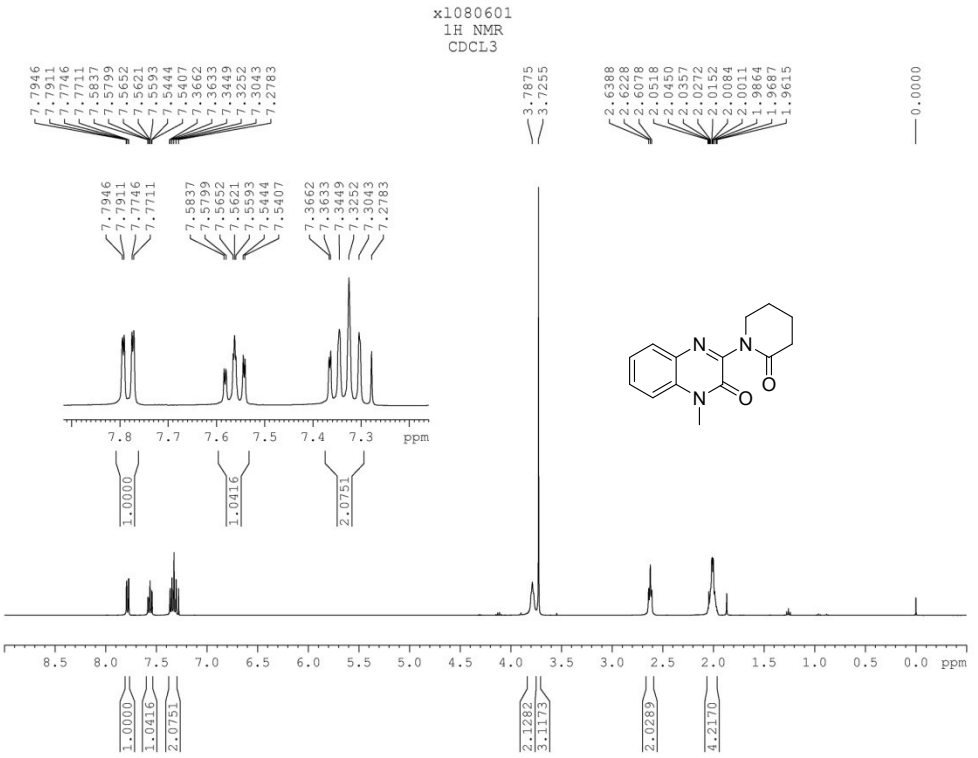


Fig. 48 ^{1}H NMR spectrum of compound **3ay**

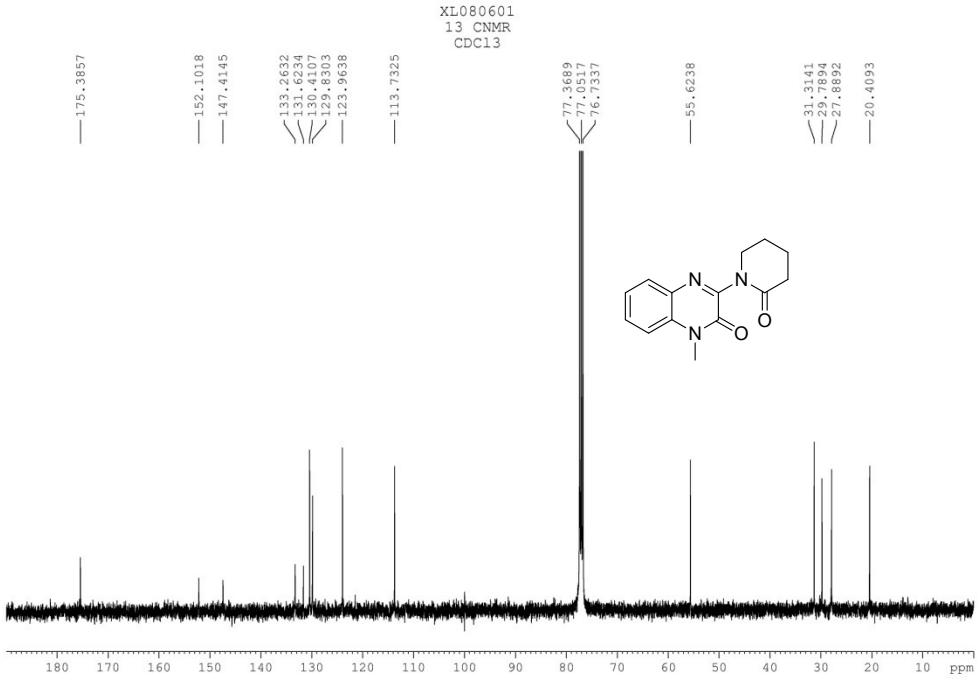


Fig. 49 ^{13}C NMR spectrum of compound **3ay**

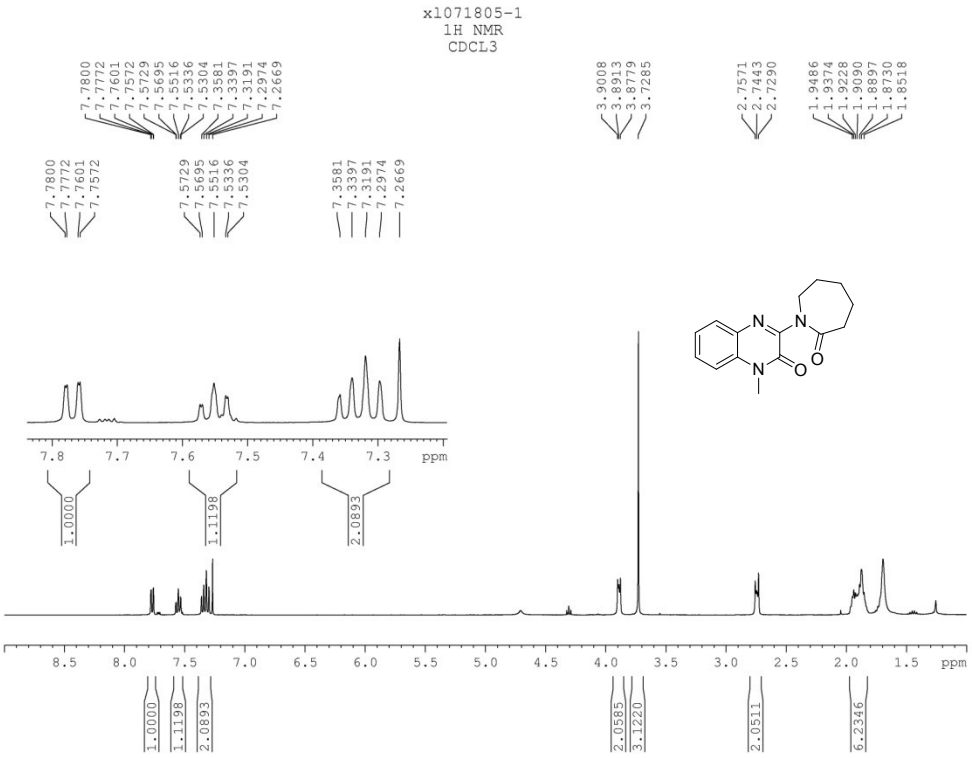


Fig. 50 ^{1}H NMR spectrum of compound **3az**

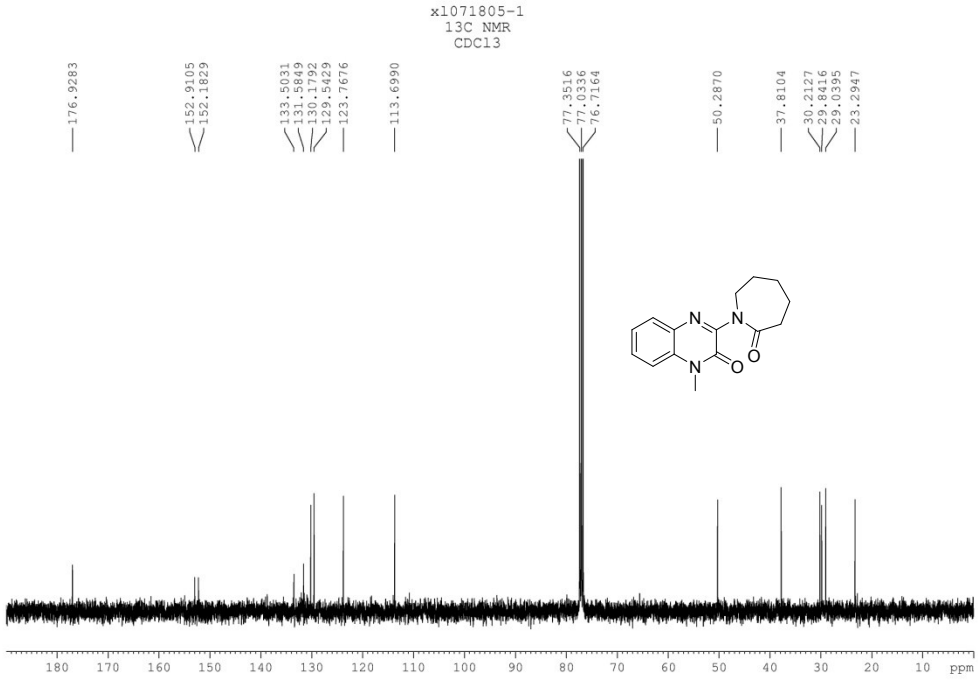


Fig. 51 ^{13}C NMR spectrum of compound **3az**

Fig. 52 ^{1}H NMR spectrum of compound **3az'**

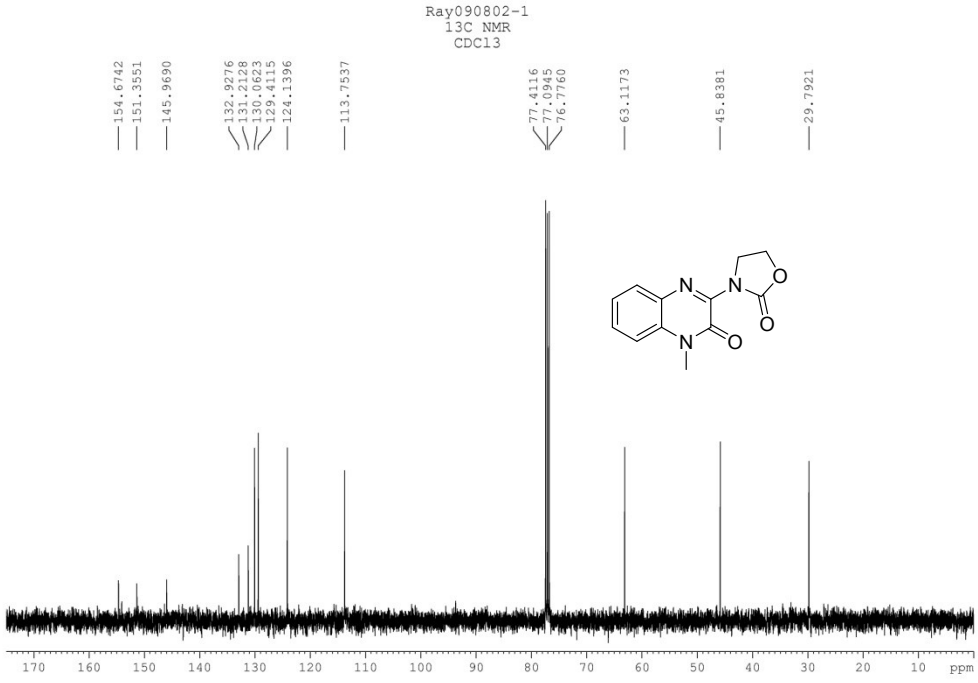


Fig. 53 ^{13}C NMR spectrum of compound **3az'**

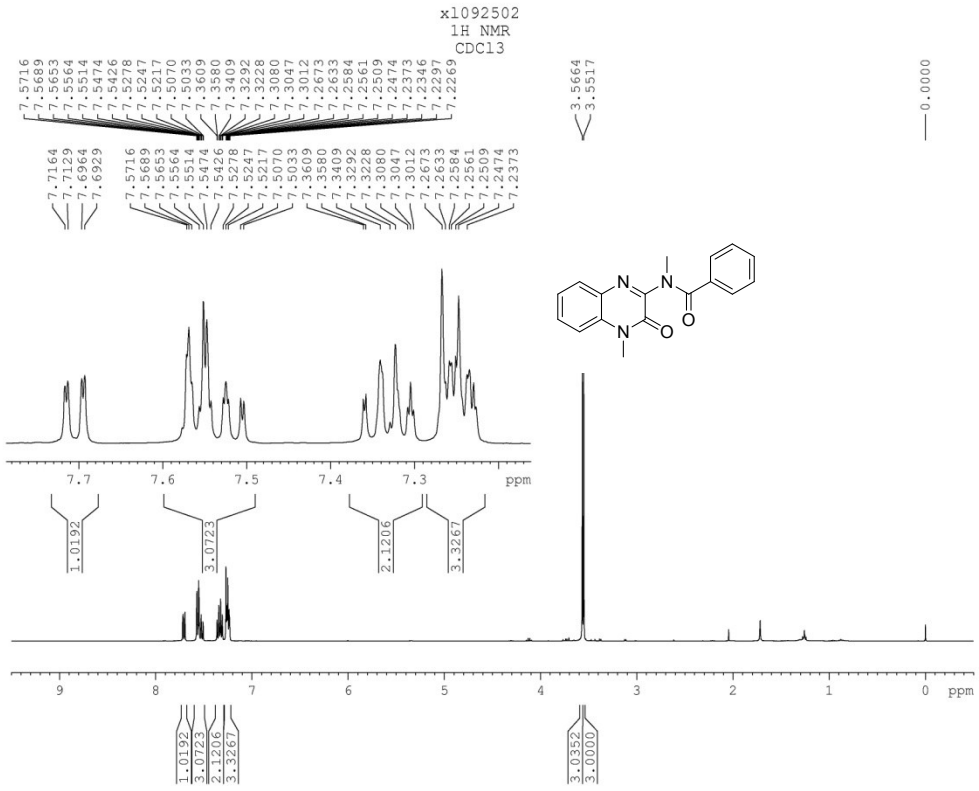


Fig. 54 ^{1}H NMR spectrum of compound **3az''**

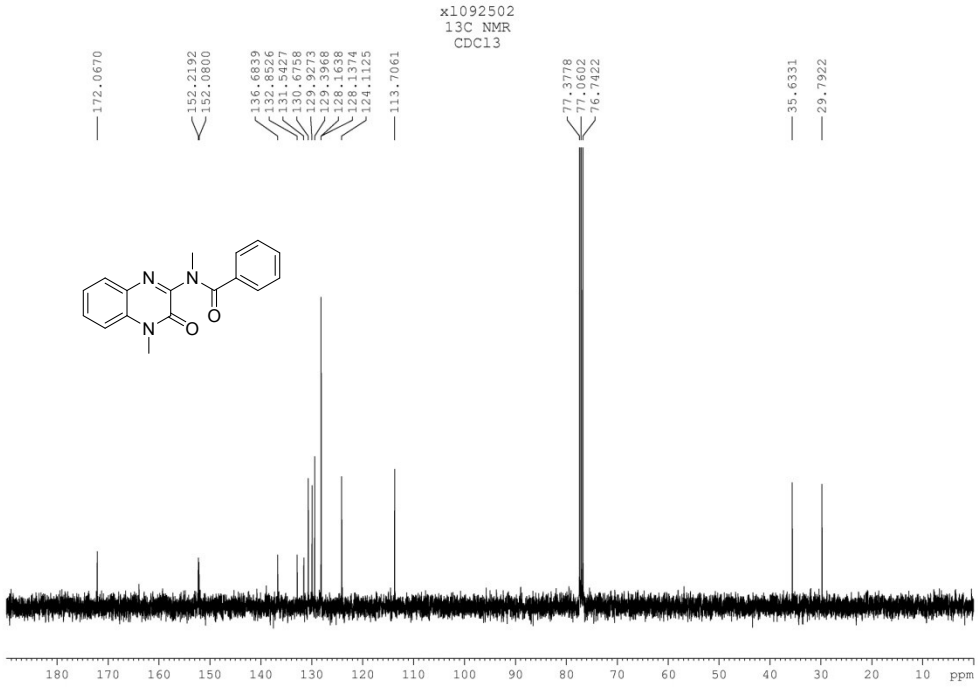


Fig. 55 ^{13}C NMR spectrum of compound **3az''**

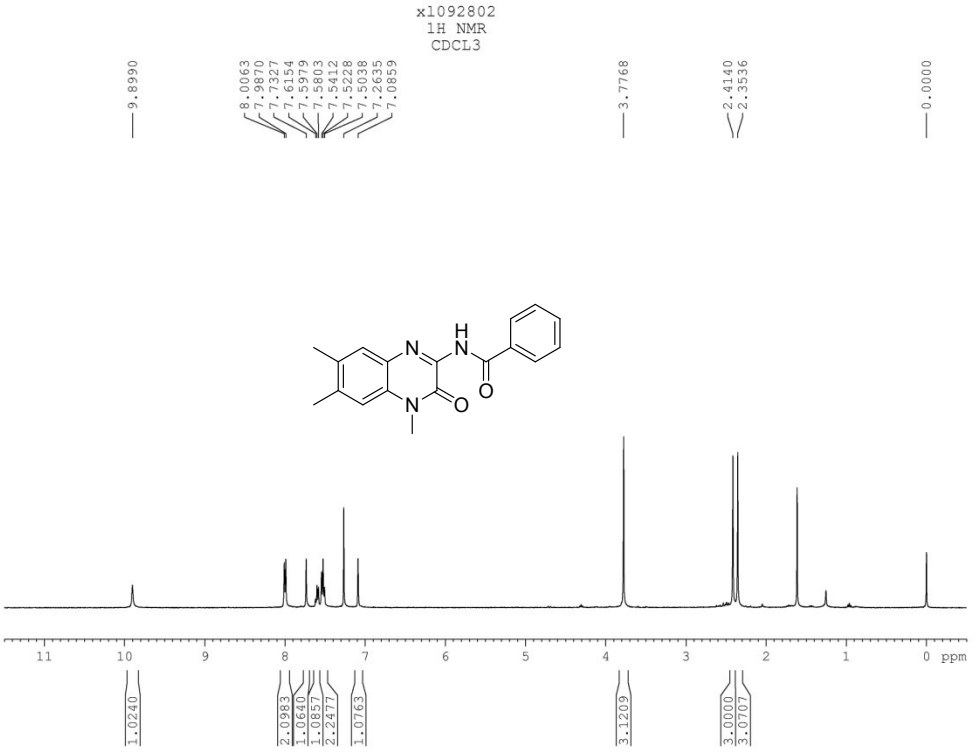


Fig. 56 ^{1}H NMR spectrum of compound **3ba**

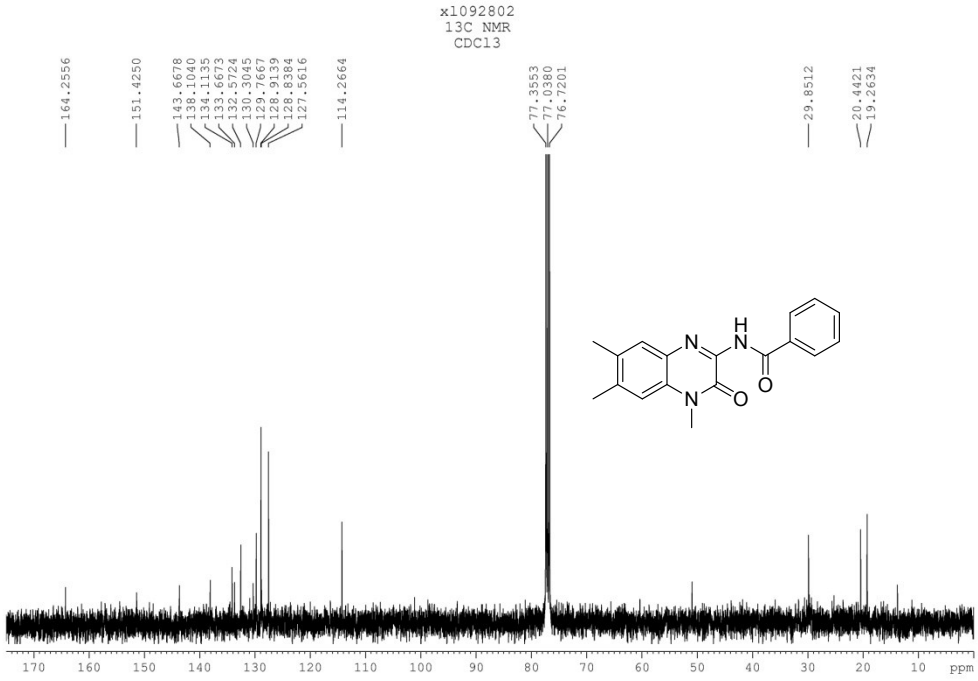


Fig. 57 ^{13}C NMR spectrum of compound **3ba**

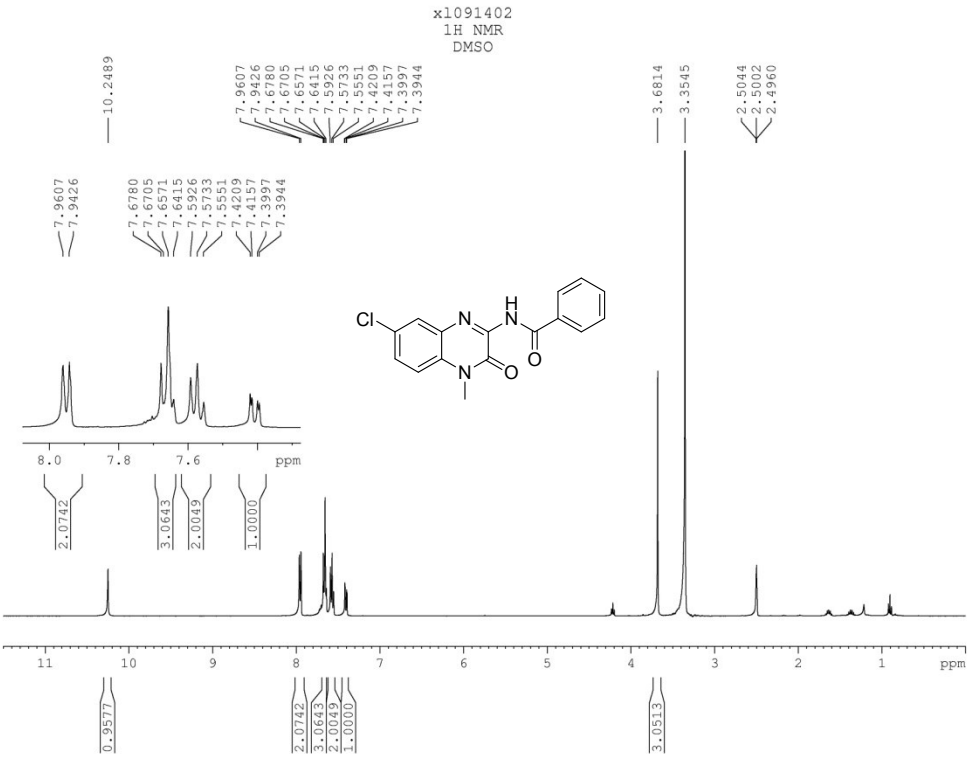


Fig. 58 ^{1}H NMR spectrum of compound **3ca**

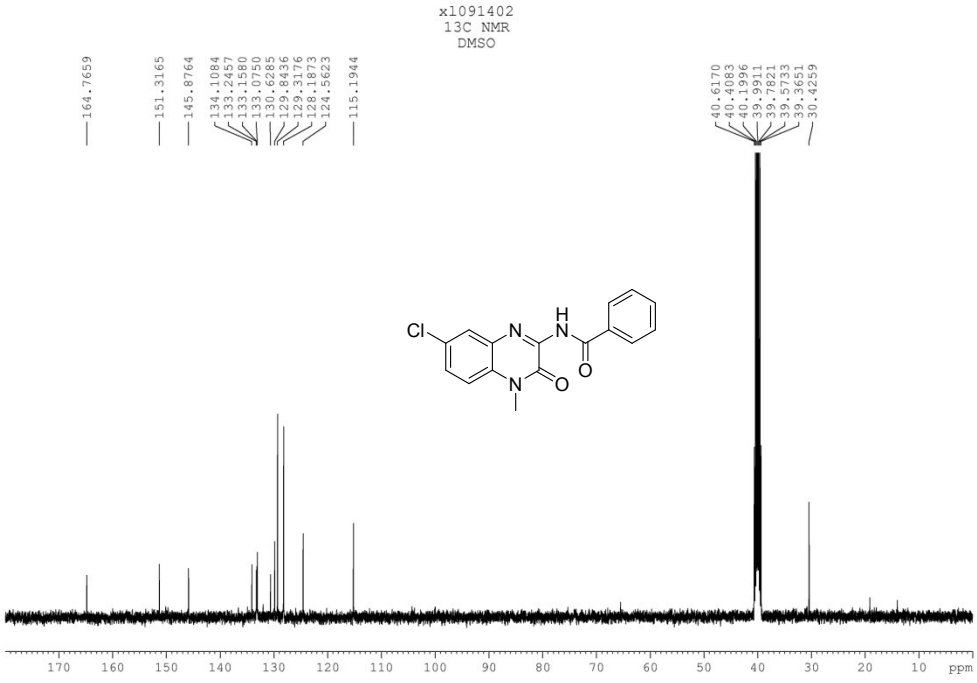


Fig. 59 ^{13}C NMR spectrum of compound **3ca**

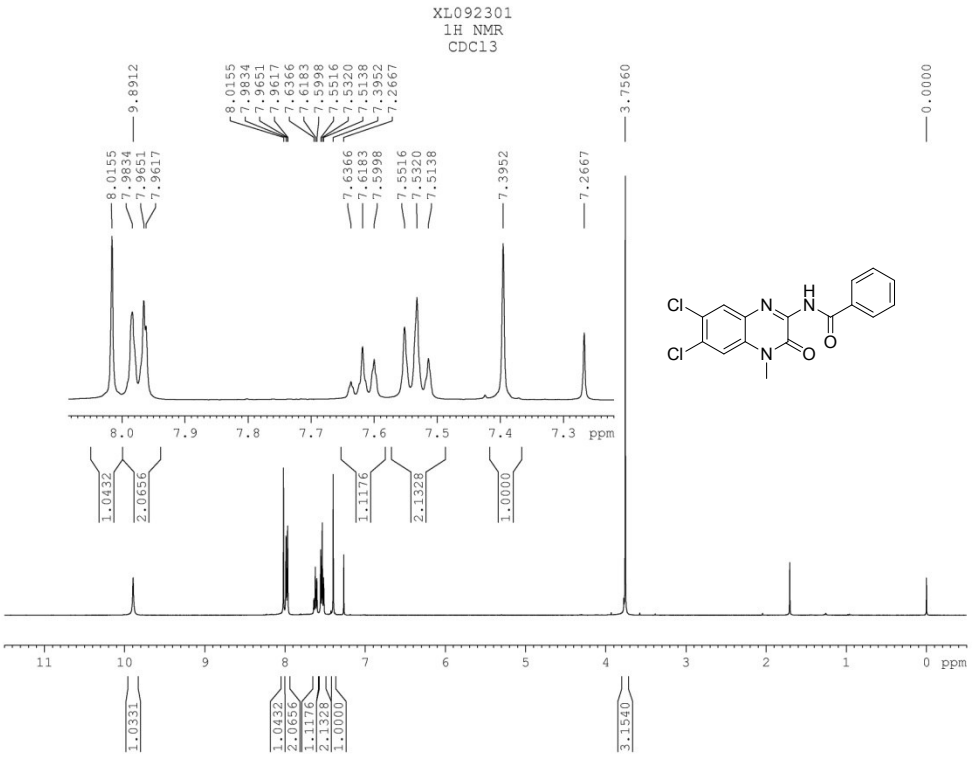


Fig. 60 ^{1}H NMR spectrum of compound **3da**

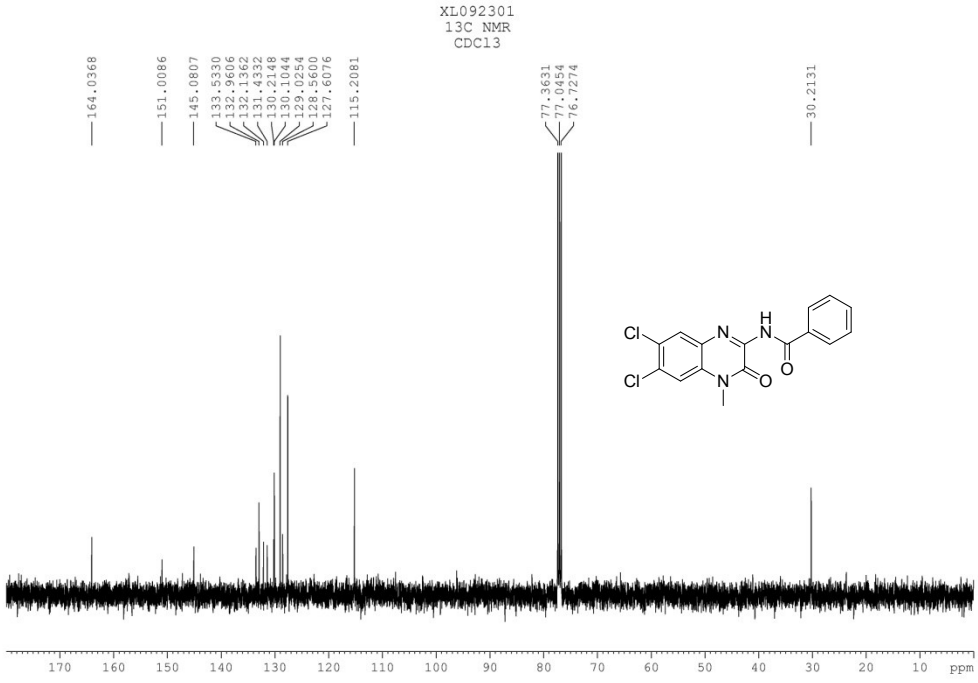


Fig. 61 ^{13}C NMR spectrum of compound **3da**

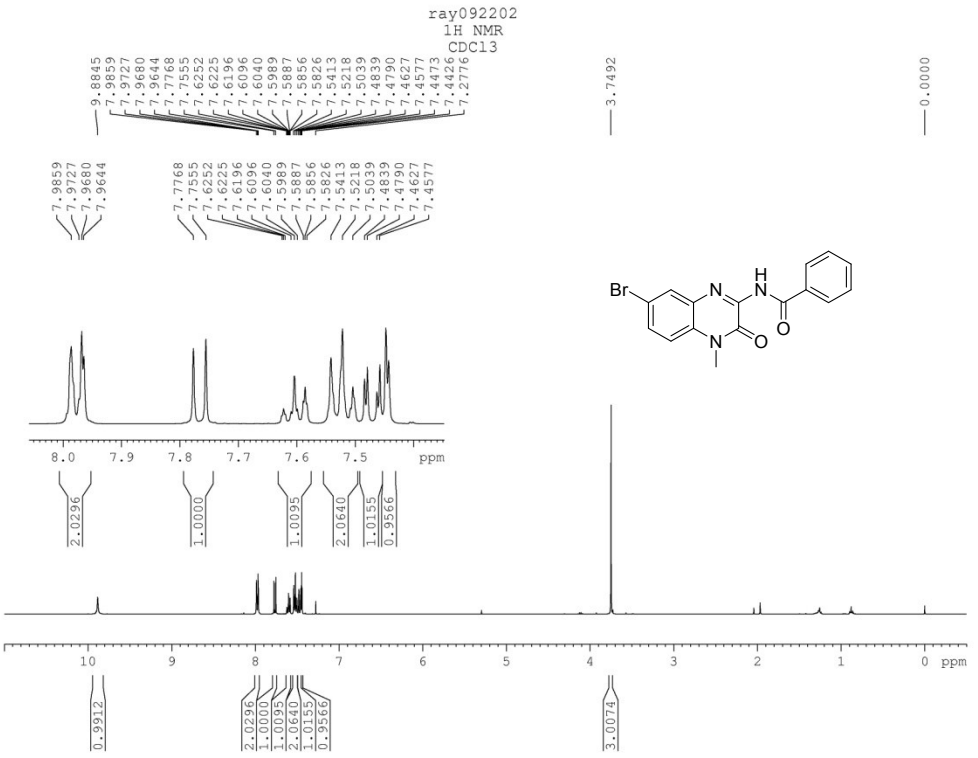


Fig. 62 ^{1}H NMR spectrum of compound **3ea**

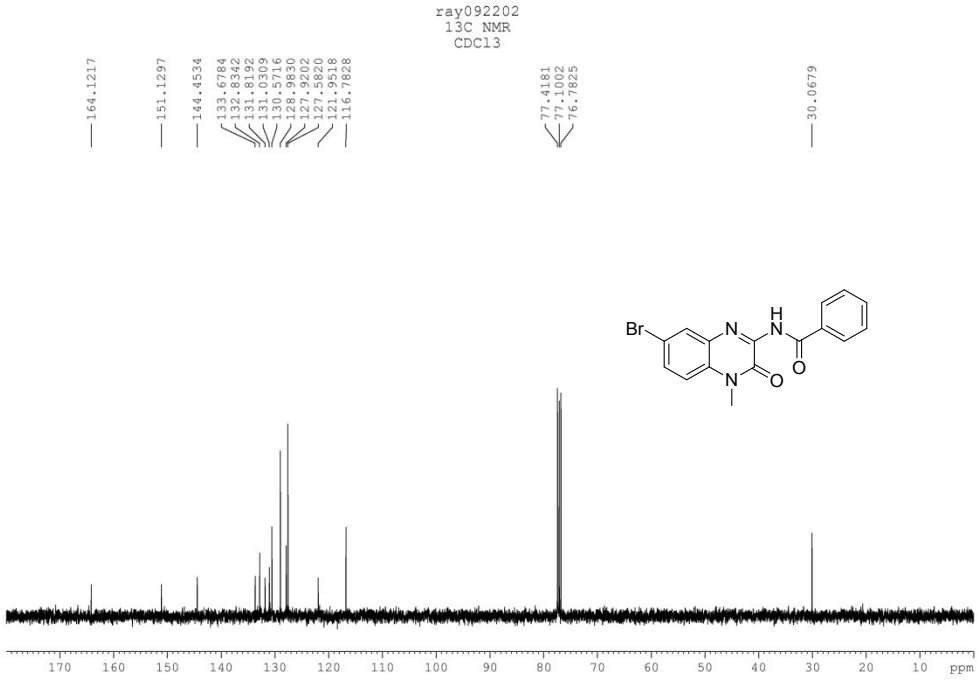


Fig. 63 ^{13}C NMR spectrum of compound **3ea**

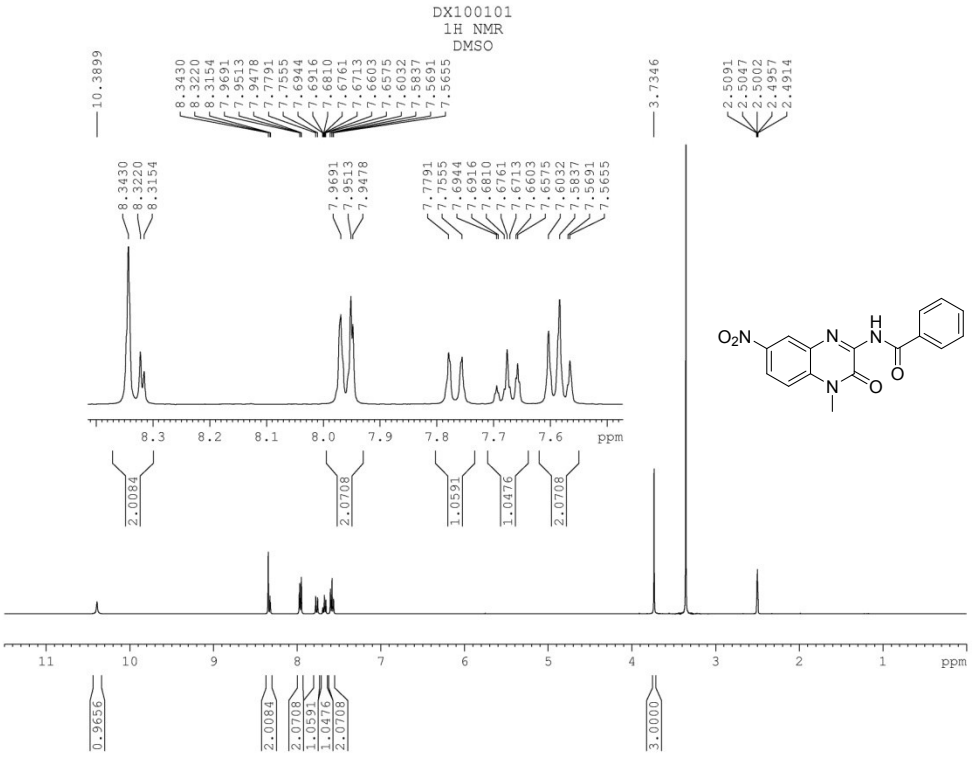


Fig. 64 ^{1}H NMR spectrum of compound **3fa**

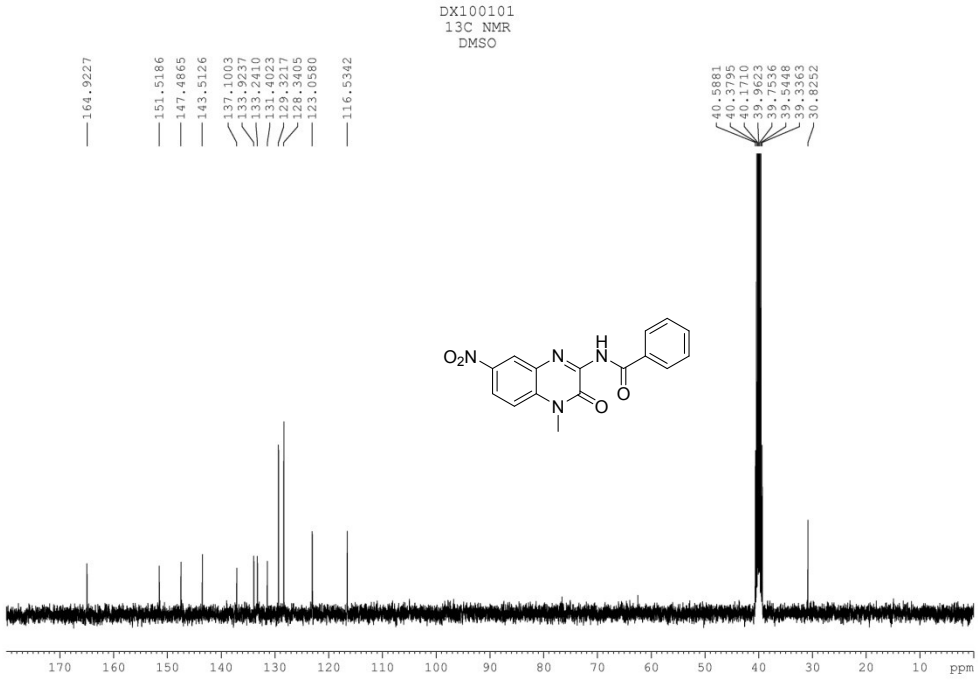


Fig. 65 ^{13}C NMR spectrum of compound **3fa**

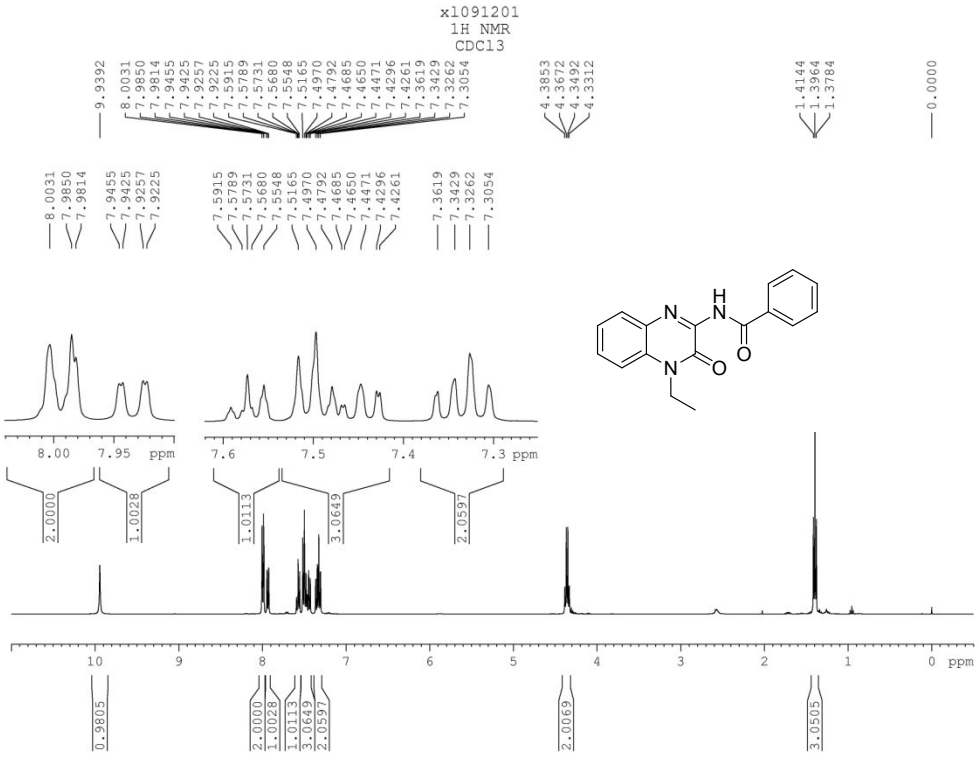


Fig. 66 ^{1}H NMR spectrum of compound **3ga**

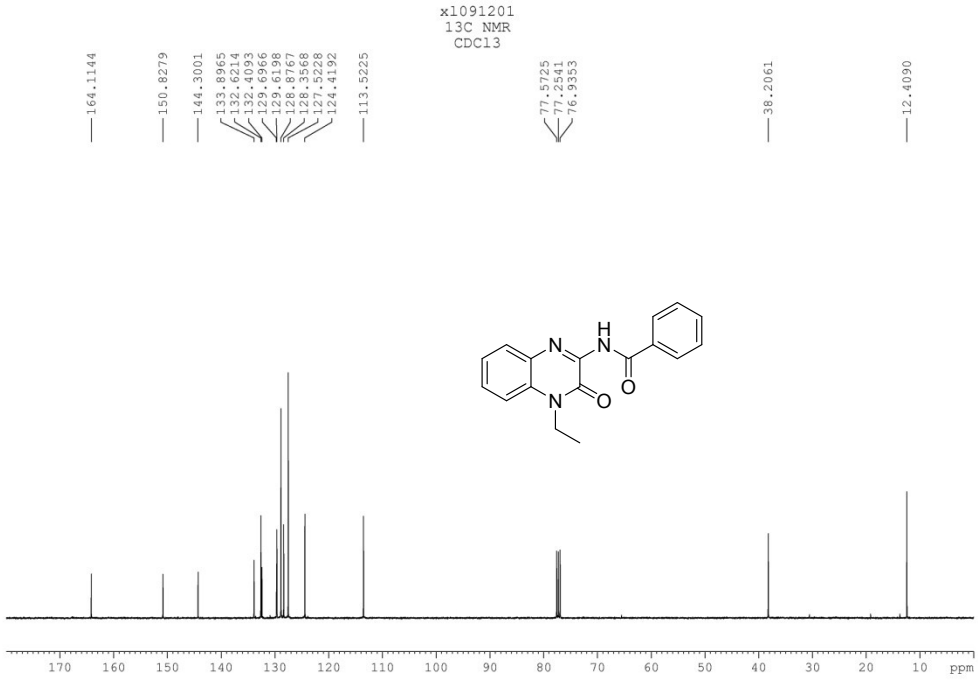


Fig. 67 ^{13}C NMR spectrum of compound **3ga**

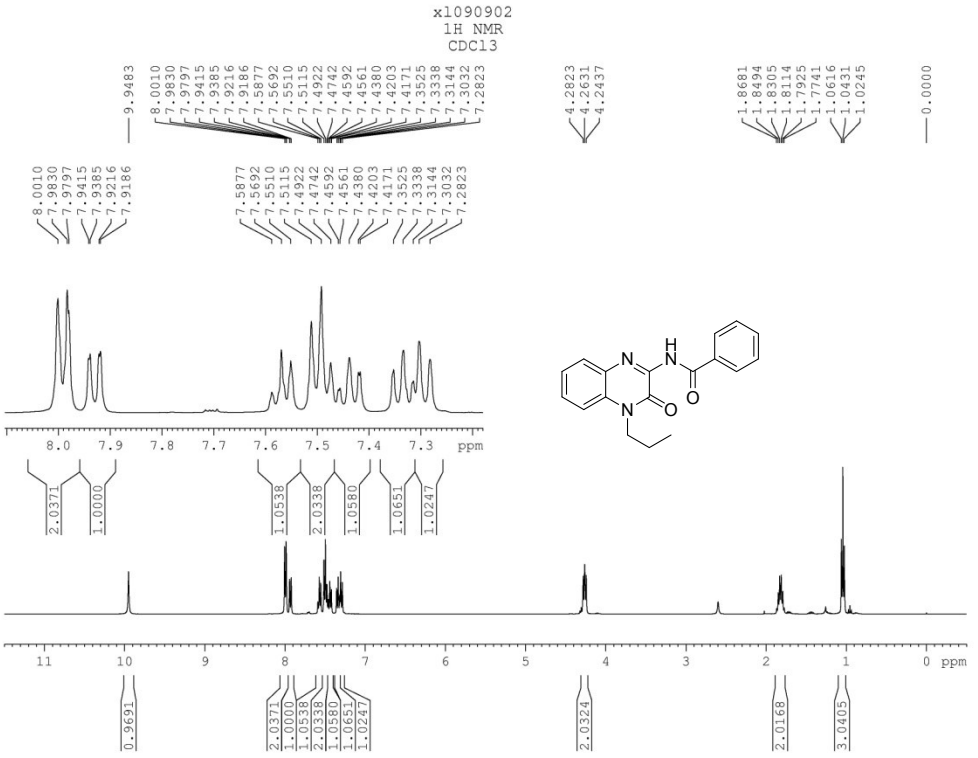


Fig. 68 ^{1}H NMR spectrum of compound **3ha**

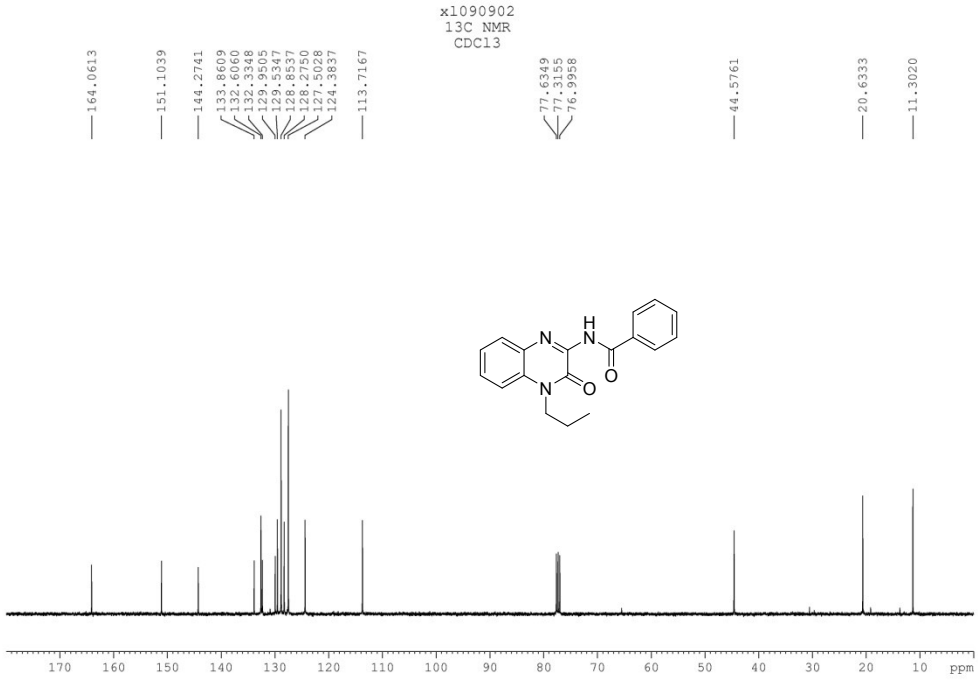


Fig. 69 ^{13}C NMR spectrum of compound **3ha**

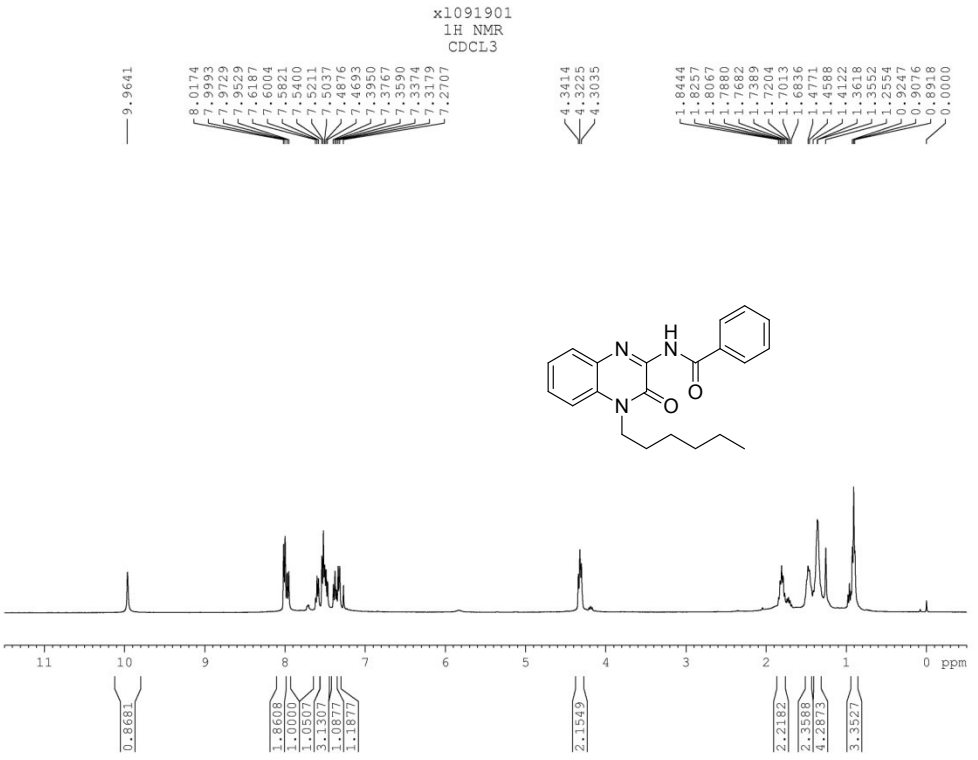


Fig. 70 ^{1}H NMR spectrum of compound **3ia**

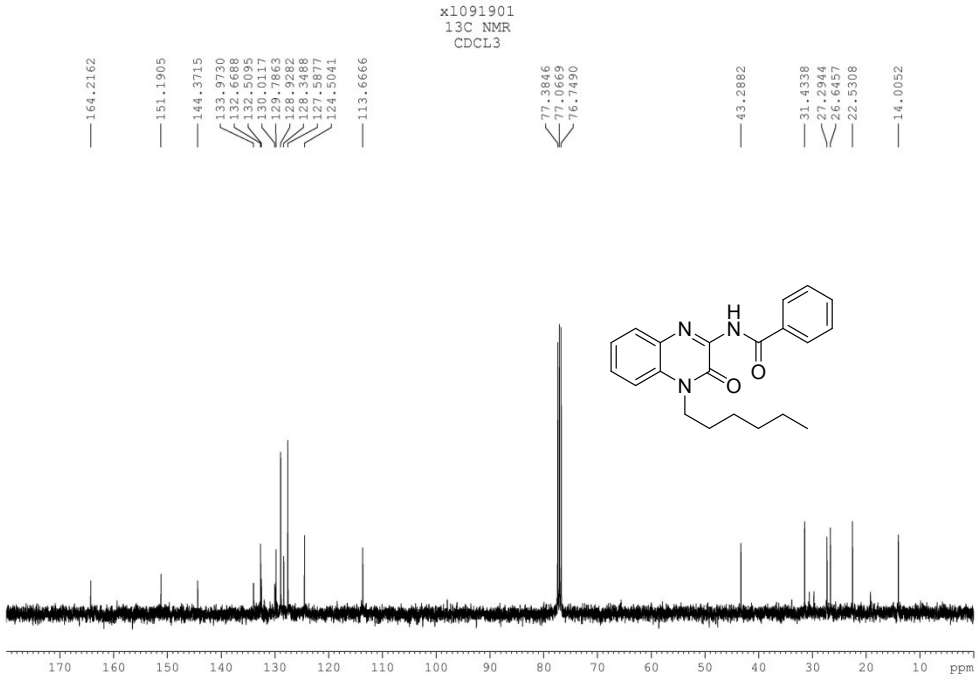


Fig. 71 ^{13}C NMR spectrum of compound **3ia**

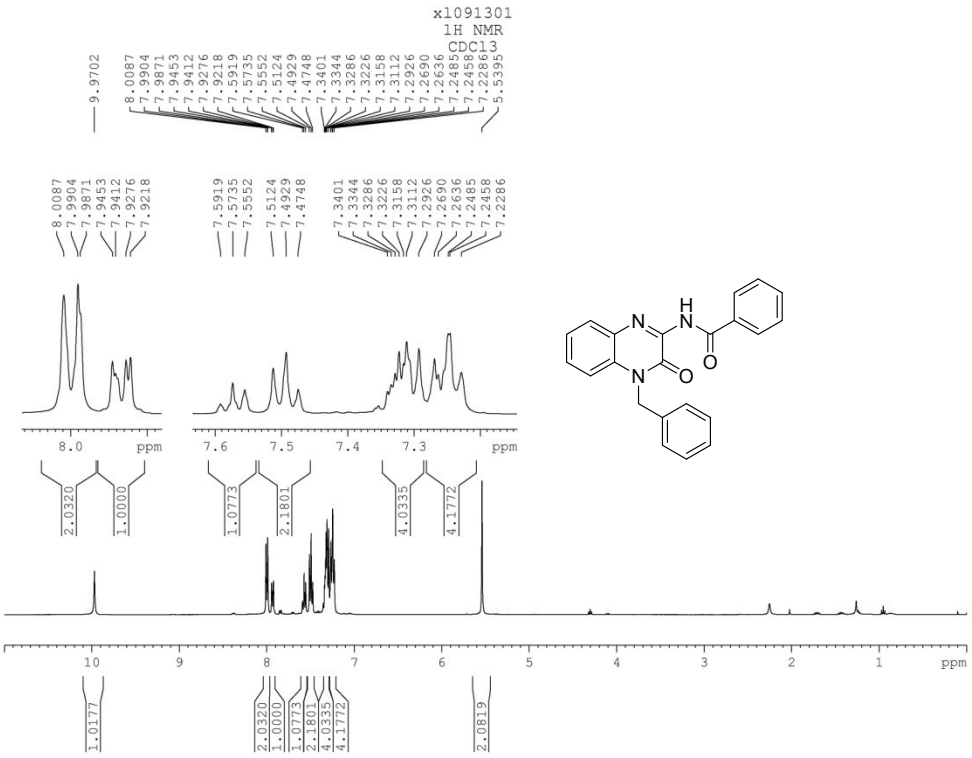


Fig. 72 ^{1}H NMR spectrum of compound **3ja**

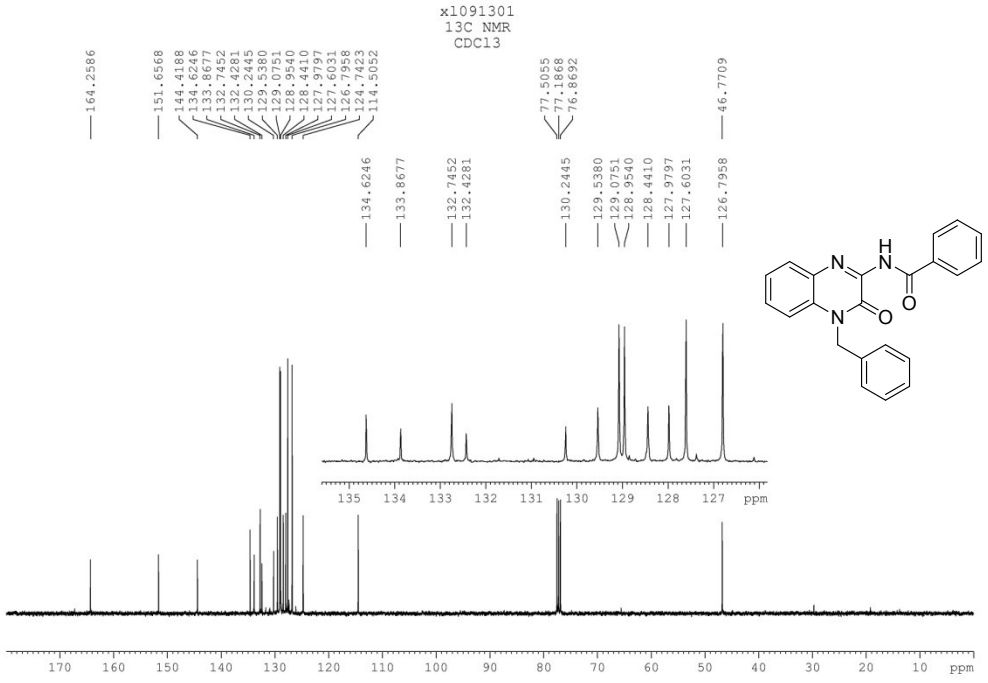


Fig. 73 ^{13}C NMR spectrum of compound **3ja**

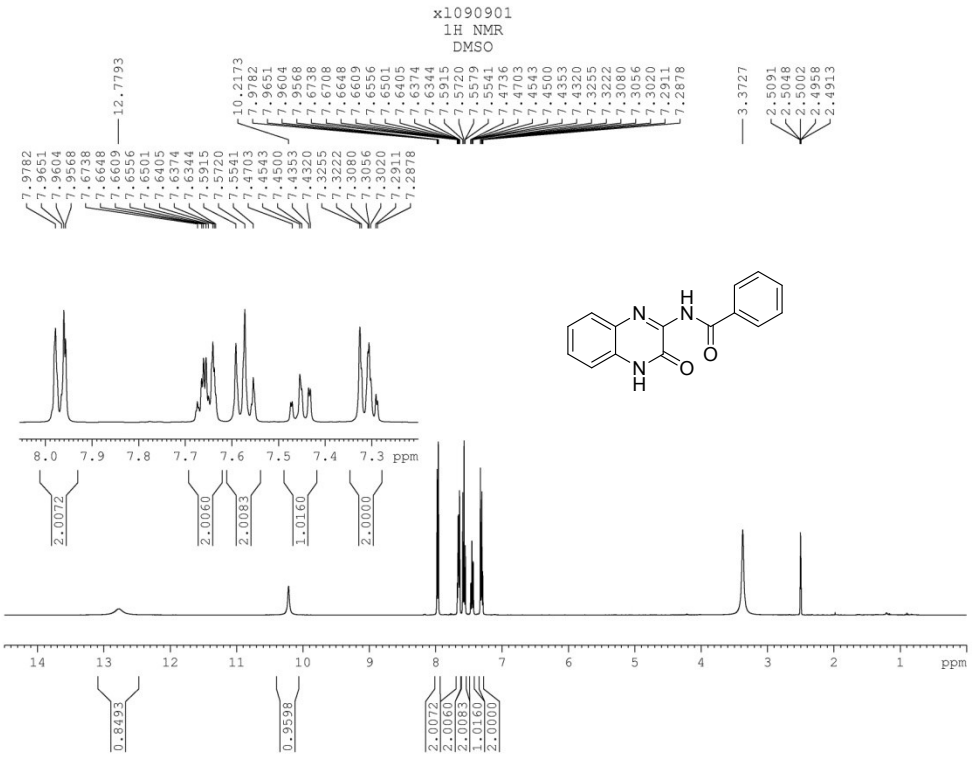


Fig. 74 ^{1}H NMR spectrum of compound **3ka**

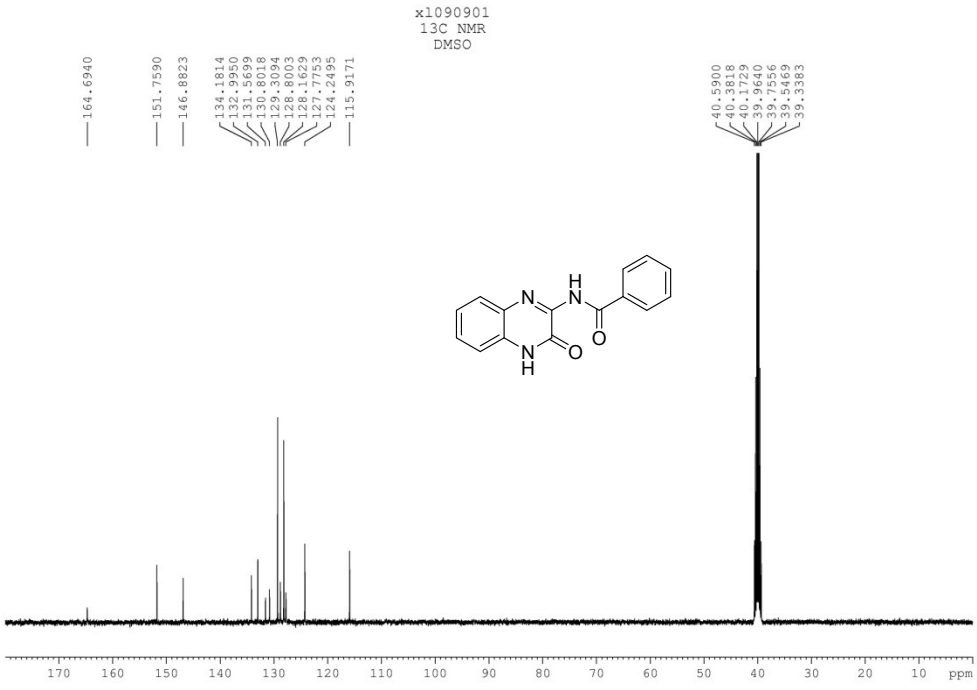


Fig. 75 ^{1}H NMR spectrum of compound **4**

3. NMR and HR MS of the adduct 4 of BHT and benzamide radical

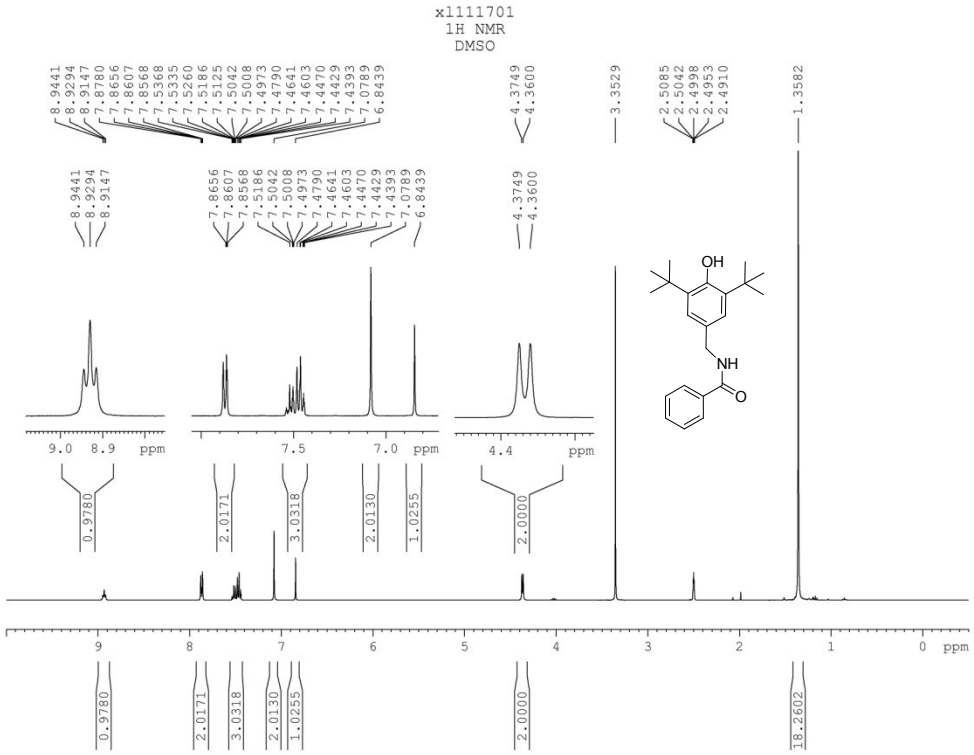


Fig. 76 ^{1}H NMR spectrum of compound **4**

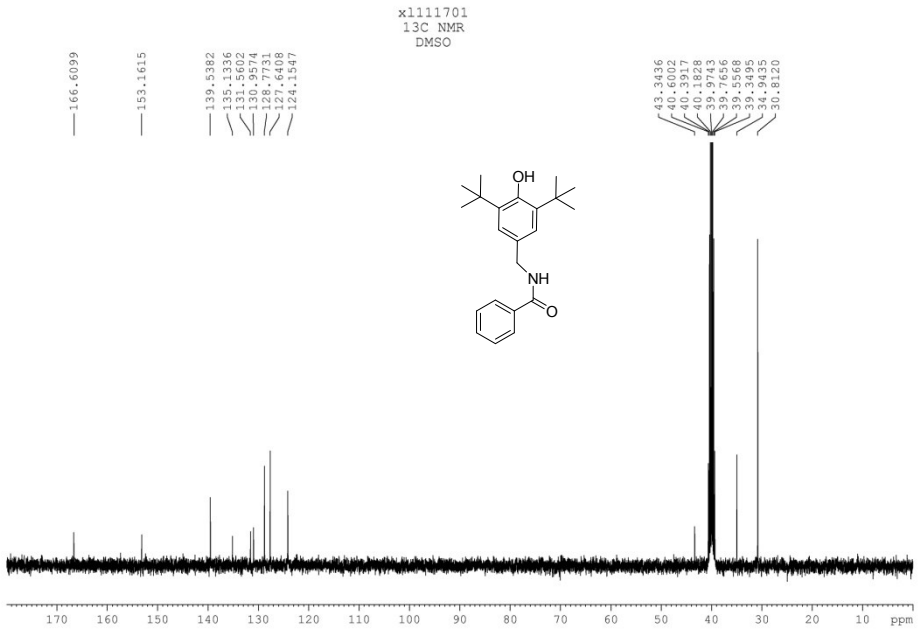


Fig. 77 ^{1}H NMR spectrum of compound **4**

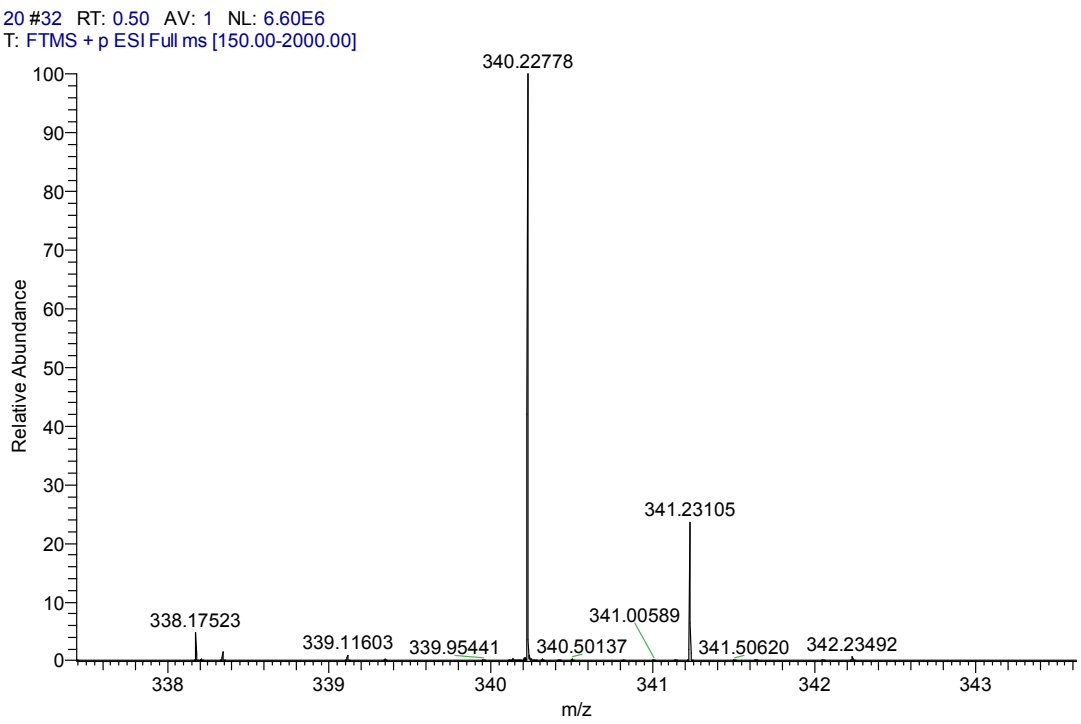


Fig. 78 HR MS of the adduct **4** of BHT and benzamide radical