

Microwave-assisted Synthesis of Quinazolinone Derivatives by Efficient and Rapid Iron-Catalyzed Cyclization in Water

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200237, China

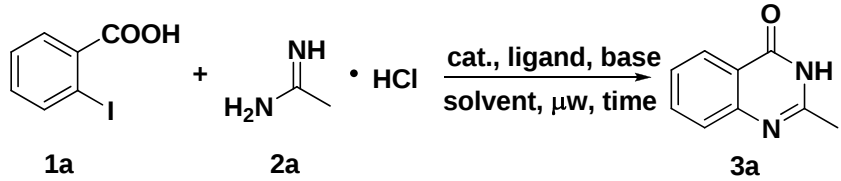
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Table S1. Optimization of the reaction conditions (temperature and time).^a

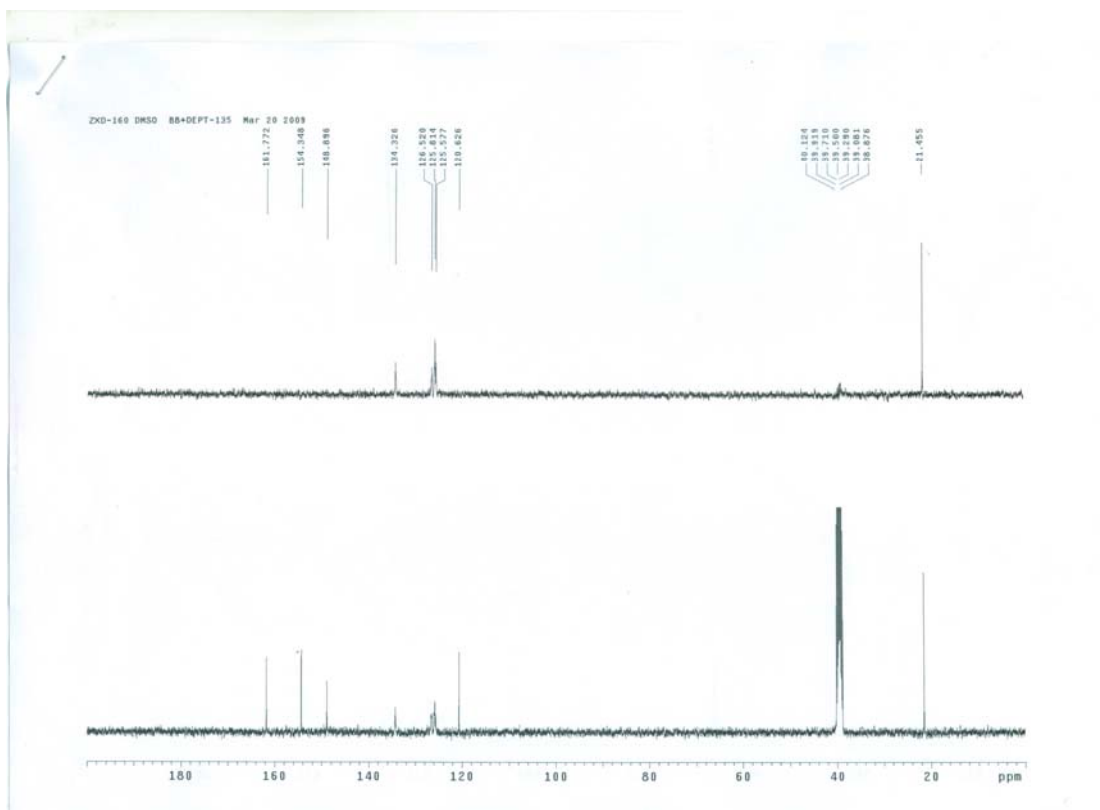
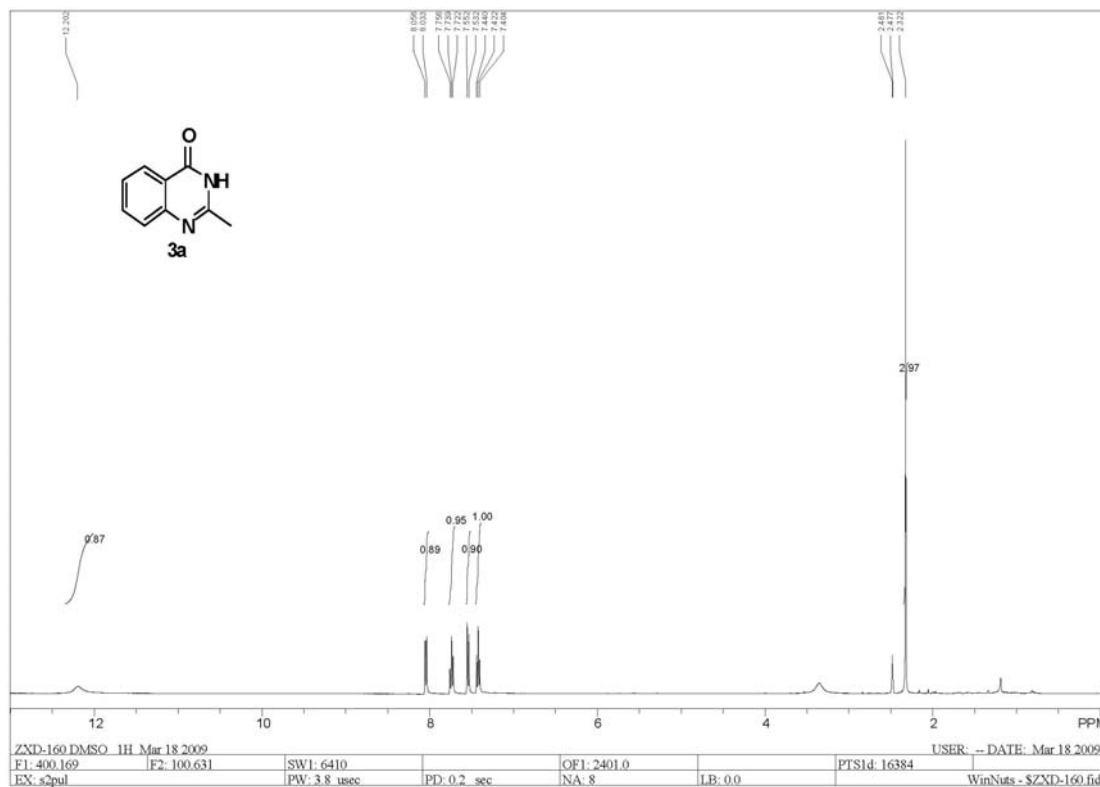
 1a 2a 3a							
Entry	Catalyst	Ligand	Base	Temp	Time	Solvent	Yield (%) ^b
1	Fe ₂ (acac) ₃	DMEDA	Cs ₂ CO ₃	100 °C	30min	DMF	85
2	Fe ₂ (acac) ₃	TMEDA	Cs ₂ CO ₃	100 °C	30min	DMF	trace
3	Fe ₂ (acac) ₃	L-pro	Cs ₂ CO ₃	100 °C	30min	DMF	79
4	Fe ₂ (acac) ₃	DMEDA	K ₃ PO ₄	100 °C	30min	DMF	81
5	Fe ₂ (acac) ₃	DMEDA	DBU	100 °C	30min	DMF	78
6	Fe ₂ (acac) ₃	DMEDA	NaOtBu	100 °C	30min	DMF	73
7	Fe ₂ (acac) ₃	DMEDA	Cs ₂ CO ₃	100 °C	30min	THF	69
8	Fe ₂ (acac) ₃	DMEDA	Cs ₂ CO ₃	100 °C	30min	toluene	71
9	Fe ₂ O ₃	DMEDA	Cs ₂ CO ₃	100 °C	30min	DMF	73
10	Fe ₂ O ₃	L-pro	Cs ₂ CO ₃	100 °C	30min	DMF	74
11	Fe ₂ O ₃	TMEDA	Cs ₂ CO ₃	100 °C	30min	DMF	trace
12	Fe ₂ (acac) ₃	DMEDA	Cs ₂ CO ₃	80 °C	30min	DMF	79
13	Fe ₂ (acac) ₃	DMEDA	Cs ₂ CO ₃	120 °C	30min	DMF	84
14	Fe ₂ (acac) ₃	DMEDA	Cs ₂ CO ₃	100 °C	15min	DMF	61
15	Fe ₂ (acac) ₃	DMEDA	Cs ₂ CO ₃	100 °C	45min	DMF	85
16	FeCl ₃	L-proline	Cs ₂ CO ₃	100 °C	30min	DMF	84
17	FeCl ₃	L-proline	Cs ₂ CO ₃	80 °C	30min	DMF	75
18	FeCl ₃	L-proline	Cs ₂ CO ₃	120 °C	30min	DMF	81
19	FeCl ₃	L-proline	Cs ₂ CO ₃	100 °C	15min	DMF	63
20	FeCl ₃	L-proline	Cs ₂ CO ₃	100 °C	45min	DMF	85
21	FeCl ₃	L-proline	Cs ₂ CO ₃	120 °C	15min	H ₂ O	61
22	FeCl ₃	L-proline	Cs ₂ CO ₃	120 °C	45min	H ₂ O	81
23	FeCl ₃	-	Cs ₂ CO ₃	120 °C	45min	H ₂ O	79
24	FeCl ₃	-	Cs ₂ CO ₃	120 °C	60min	H ₂ O	81
25	FeCl ₃	-	Cs ₂ CO ₃	135 °C	30min	H ₂ O	80
26	FeCl ₃	-	Cs ₂ CO ₃	150 °C	30min	H ₂ O	79

27 ^c	FeCl ₃	L-proline	Cs ₂ CO ₃	120 °C	30min	H ₂ O	15
28 ^c	FeCl ₃	L-proline	Cs ₂ CO ₃	120 °C	12h	H ₂ O	73

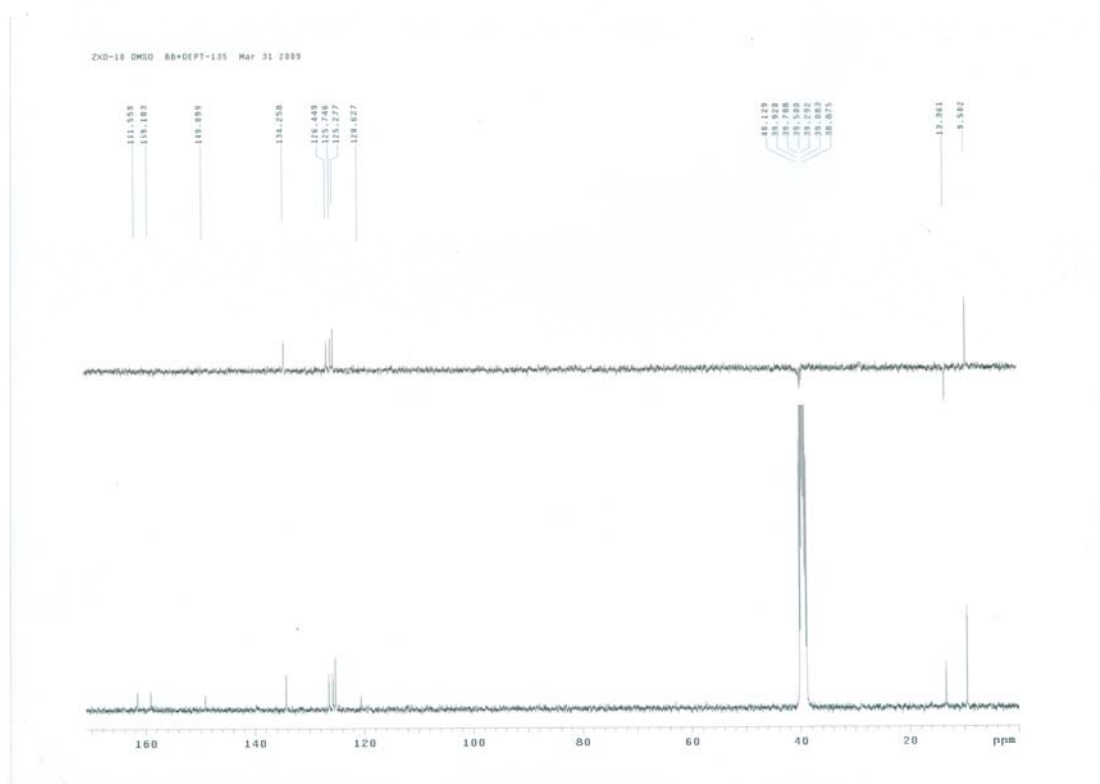
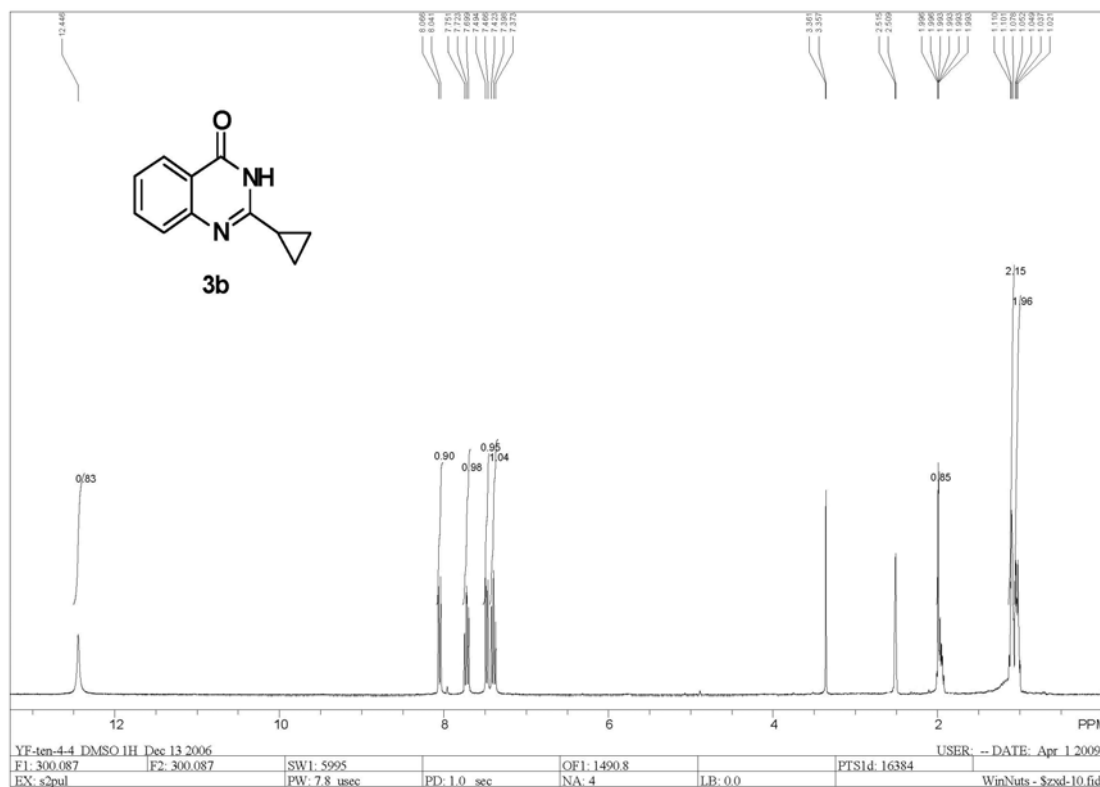
^a Reaction conditions: 2-iodobenzoic acid (1.0 mmol), acetamidine hydrochloride (1.5 mmol), catalyst (0.1 mmol), ligand (0.2 mmol), base (2 mmol), solvent (6 mL) with microwave-assisted under a nitrogen atmosphere. ^b Yield of isolated product. ^c The general method without microwave heating was adopted.

The ^1H and ^{13}C NMR spectra of compounds 3a-j and 4 a-n

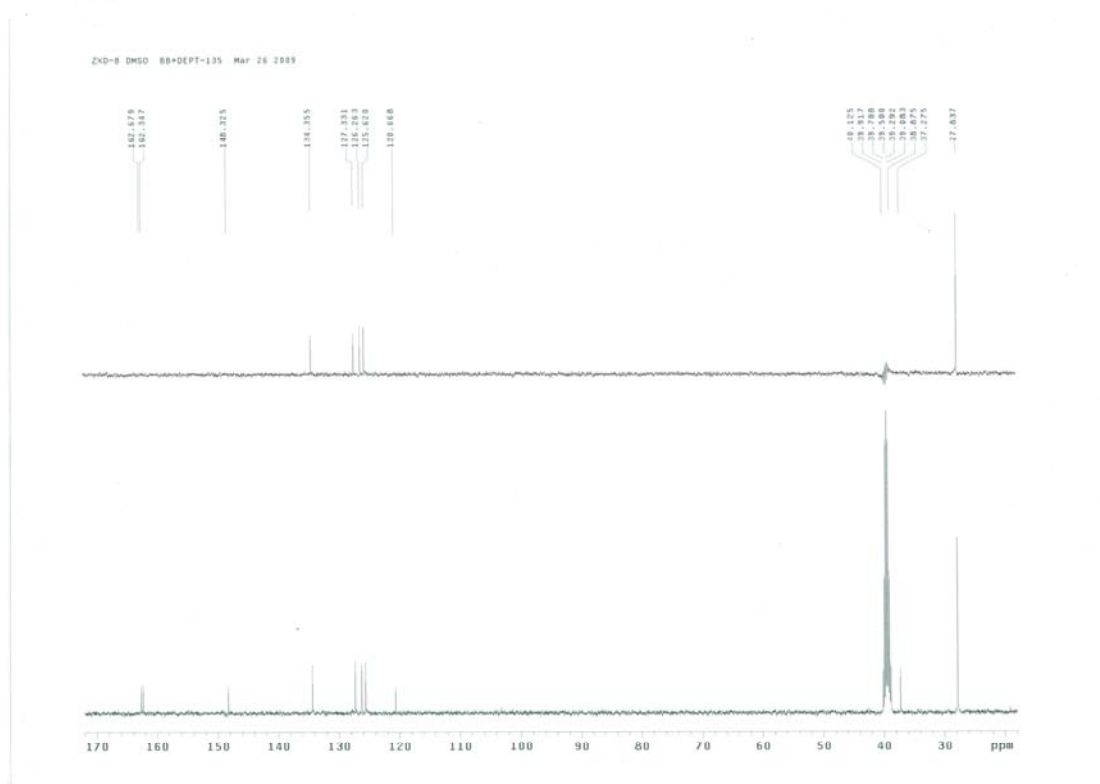
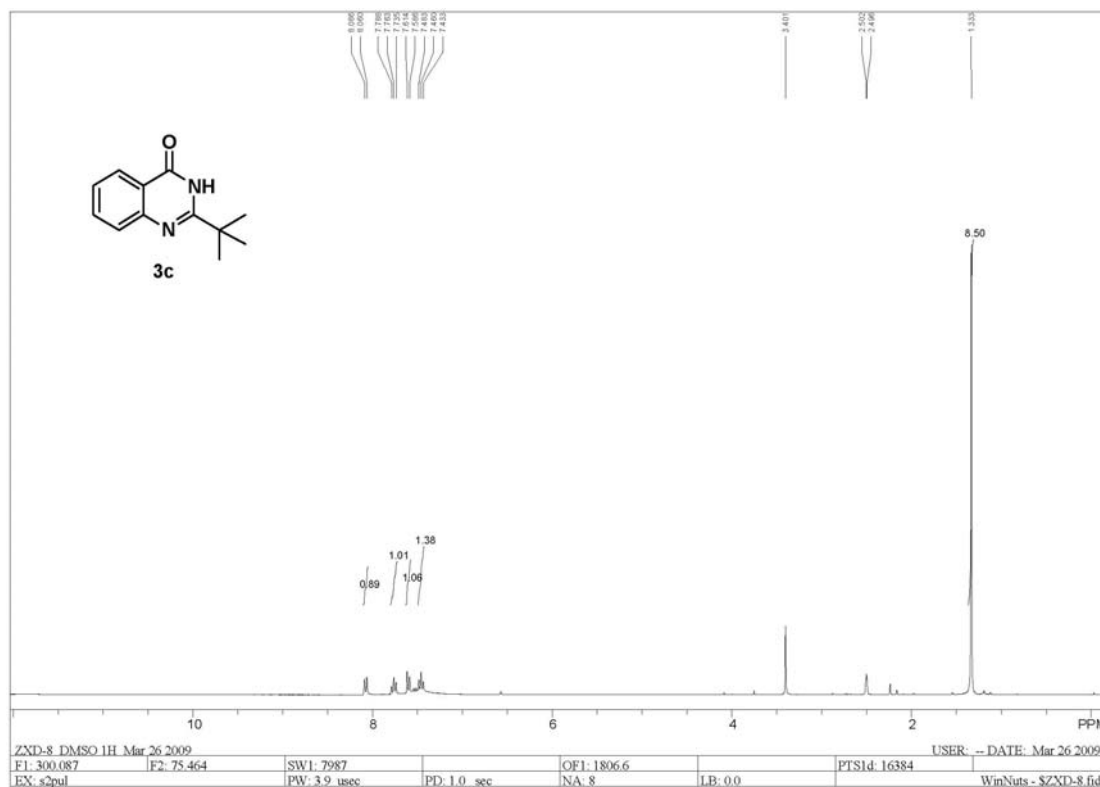
2-Methylquinazolin-4(3H)-one (3a)



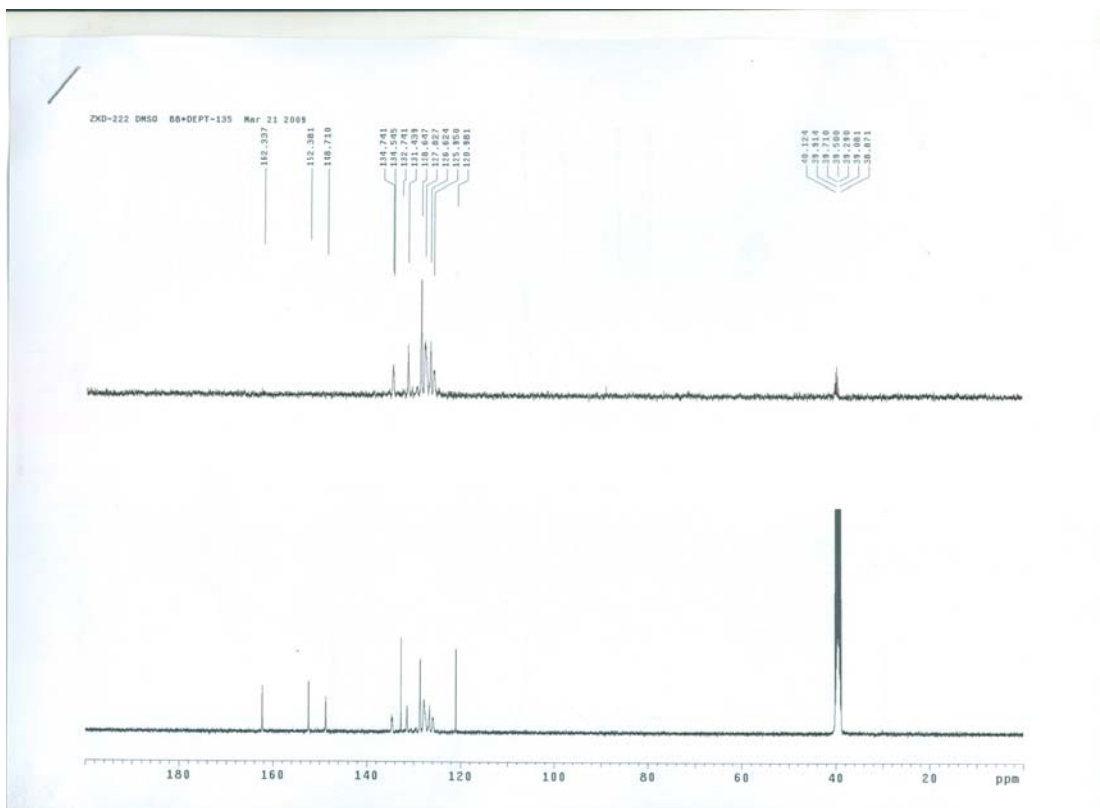
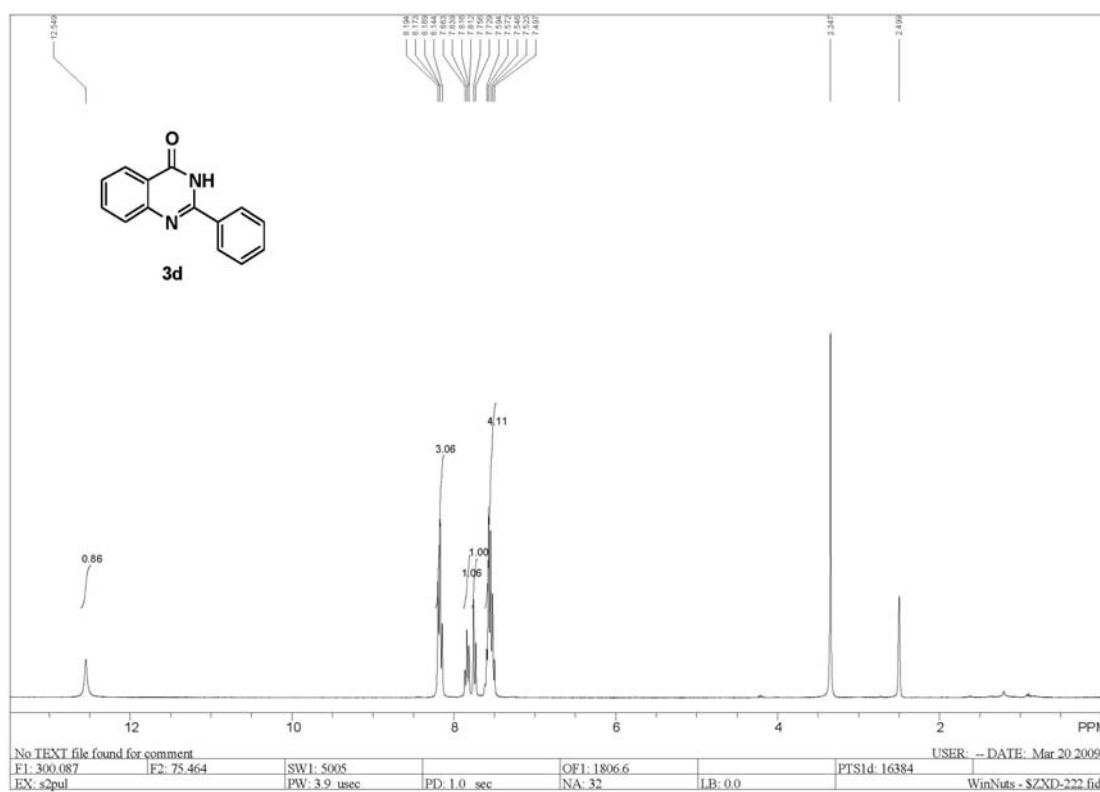
2-cyclopropylquinazolin-4(3H)-one (3b)



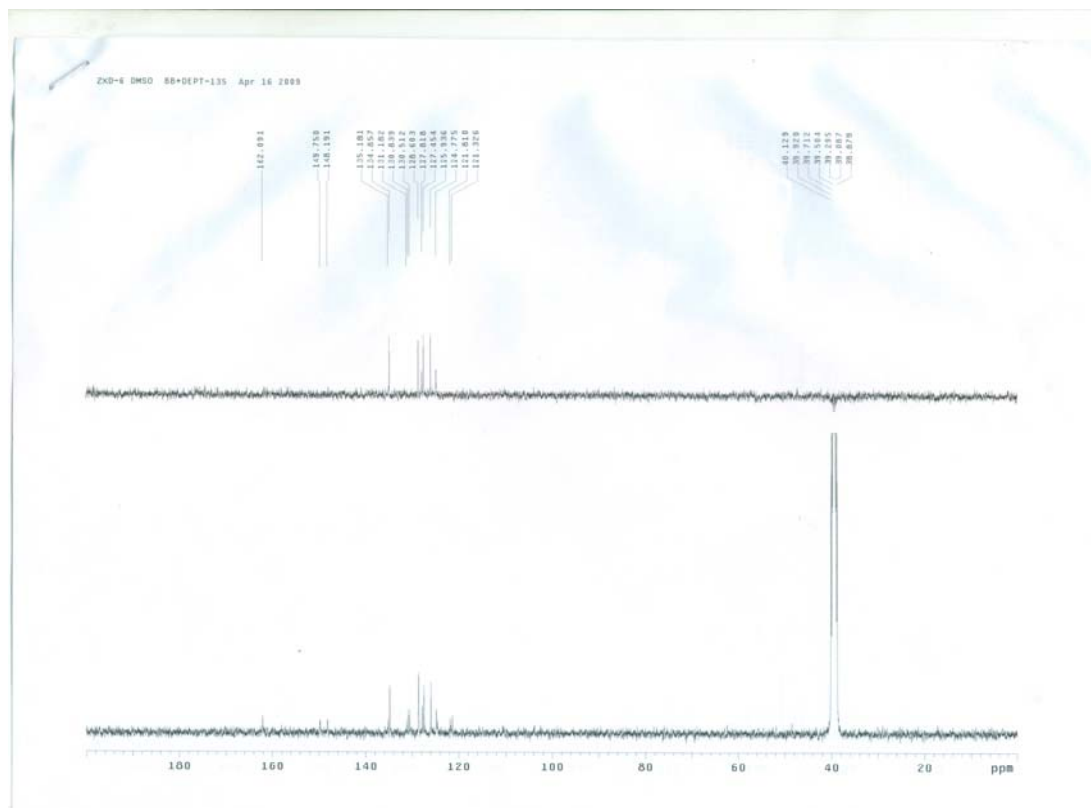
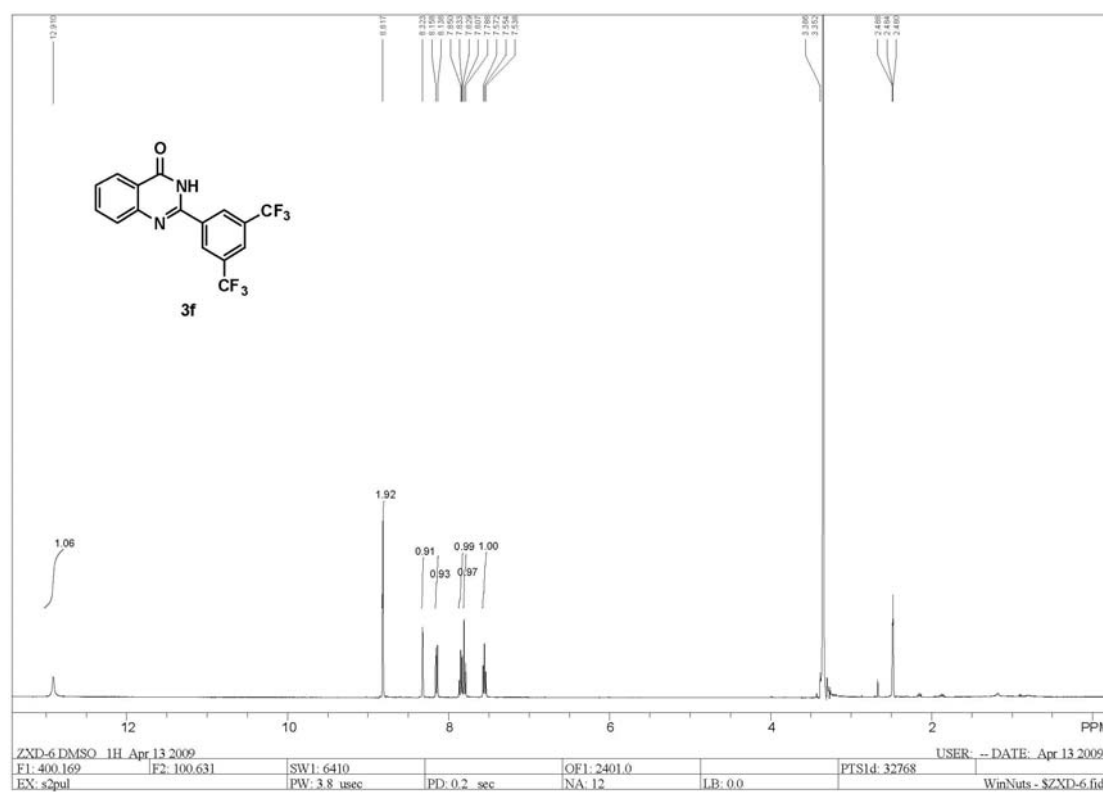
2-*tert*-butylquinazolin-4(3H)-one (3c)



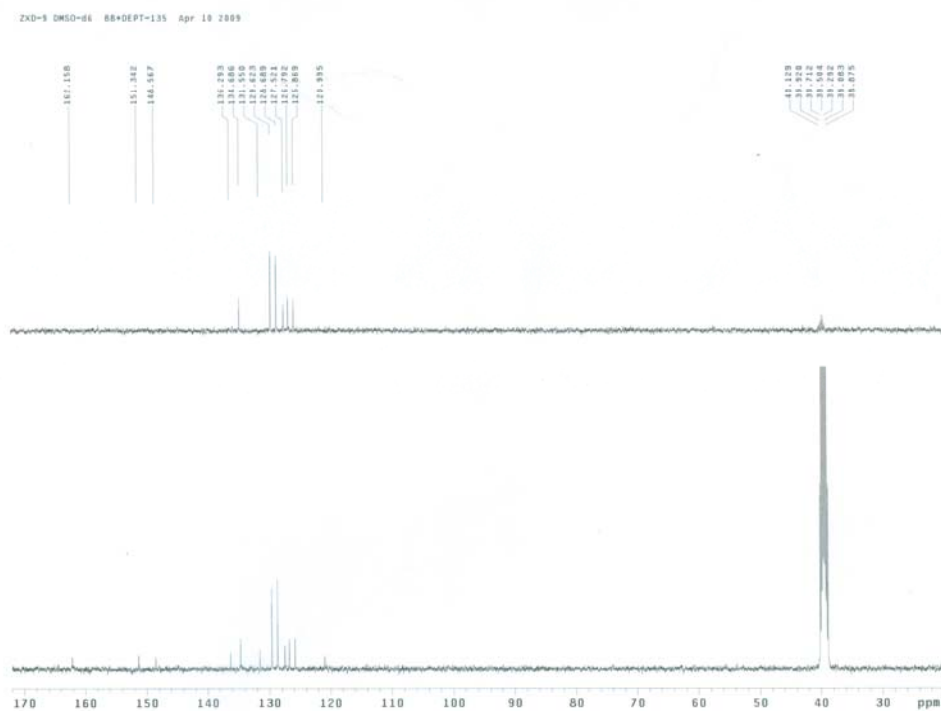
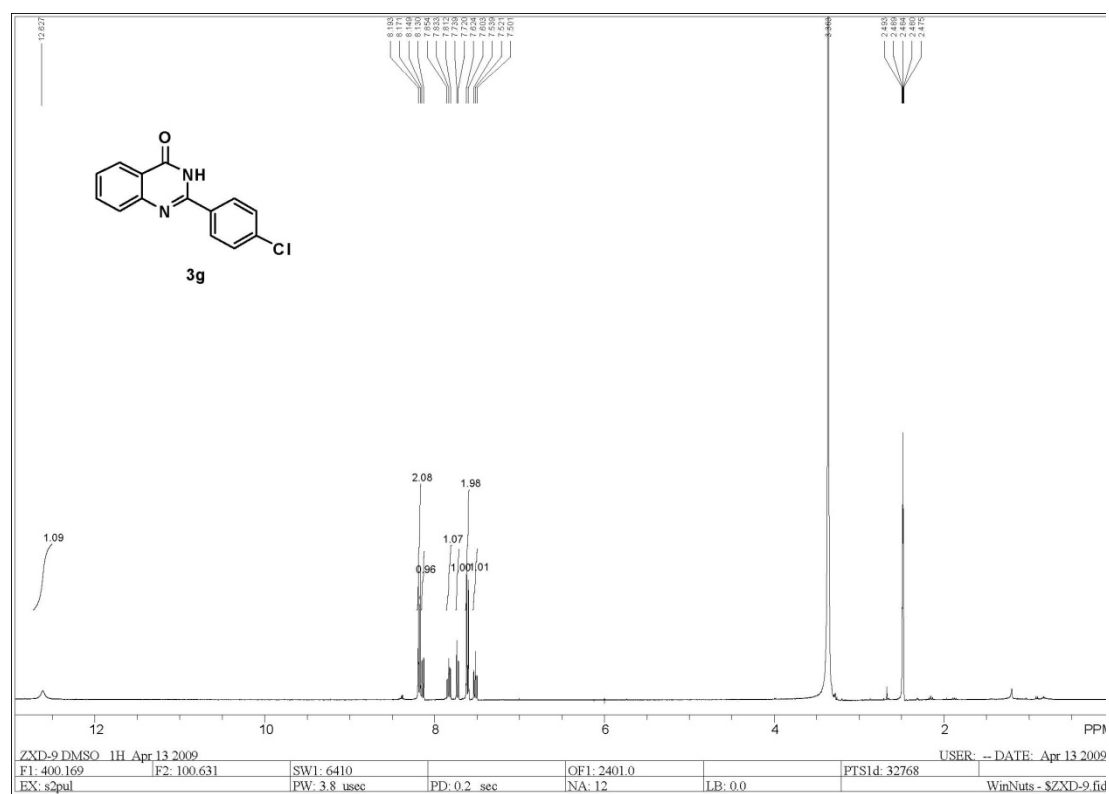
2-Phenylquinazolin-4(3H)-one (3d)



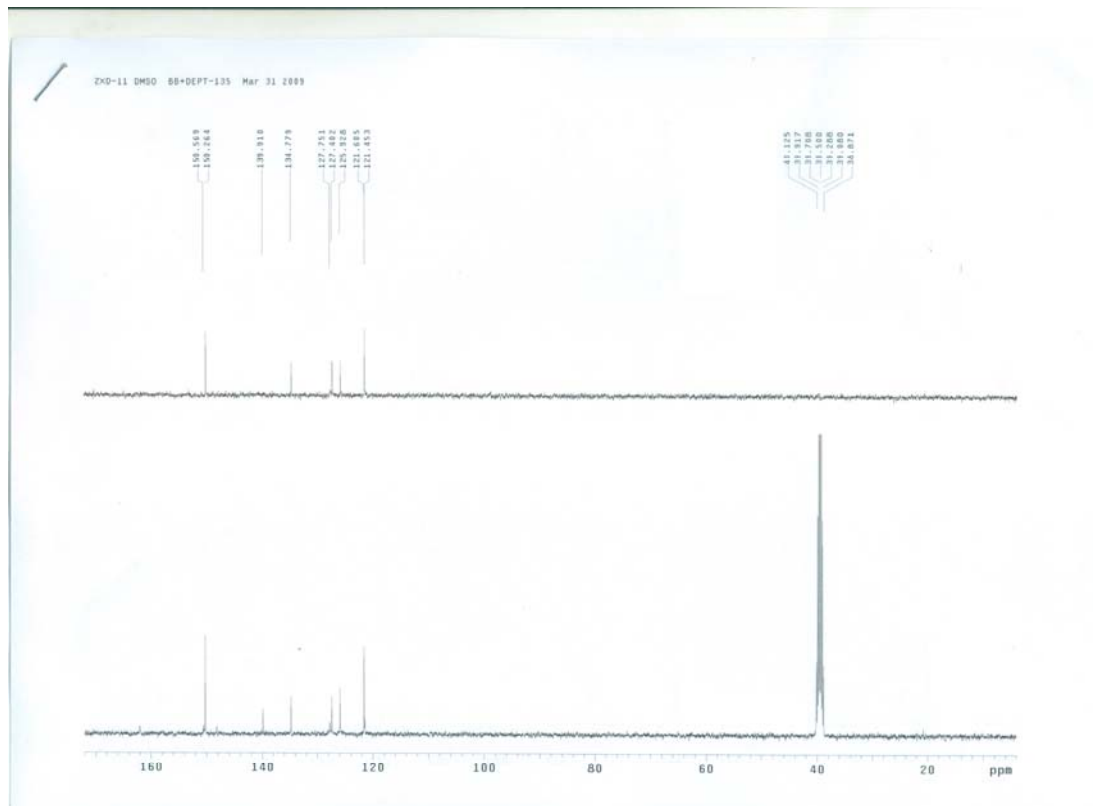
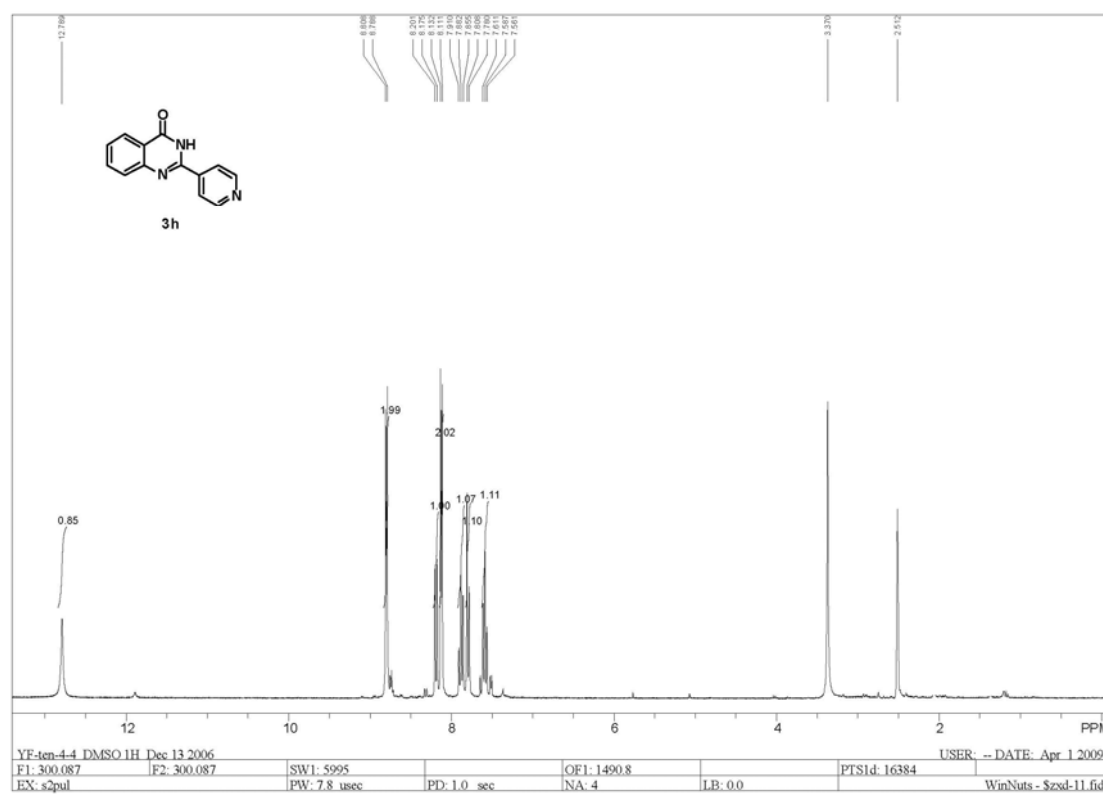
2-(3,5-bis(trifluoromethyl)phenyl)quinazolin-4(3H)-one (3f).



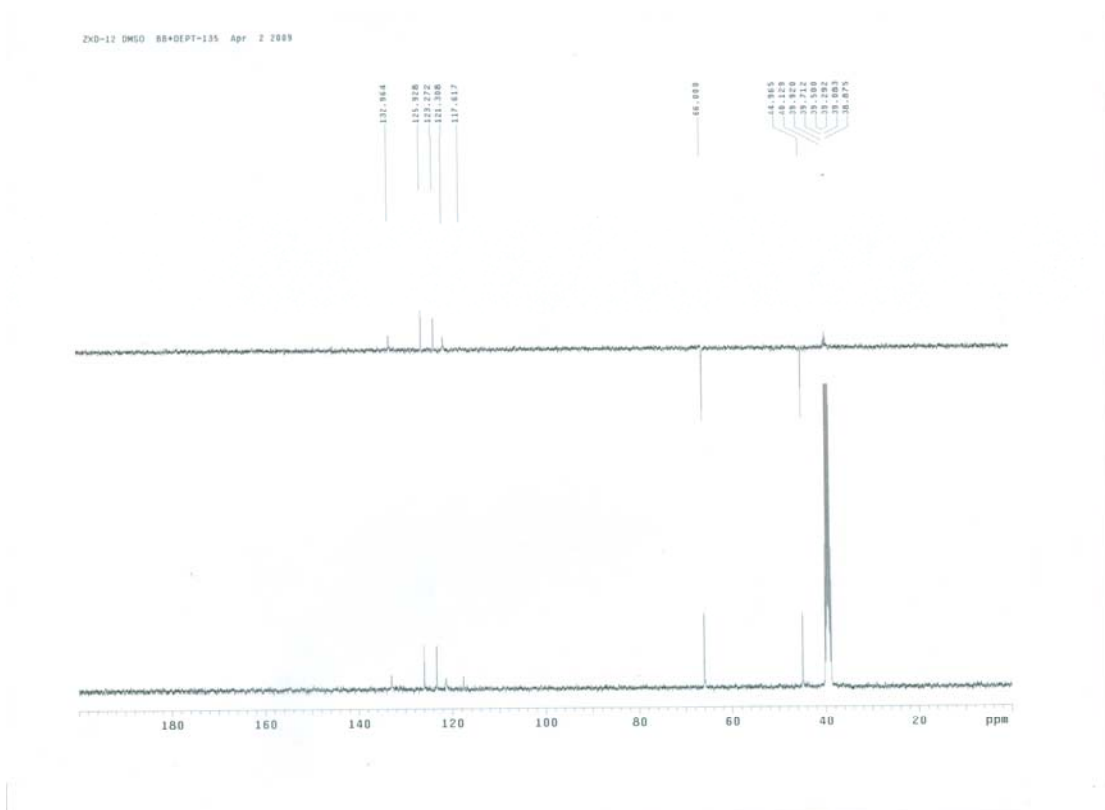
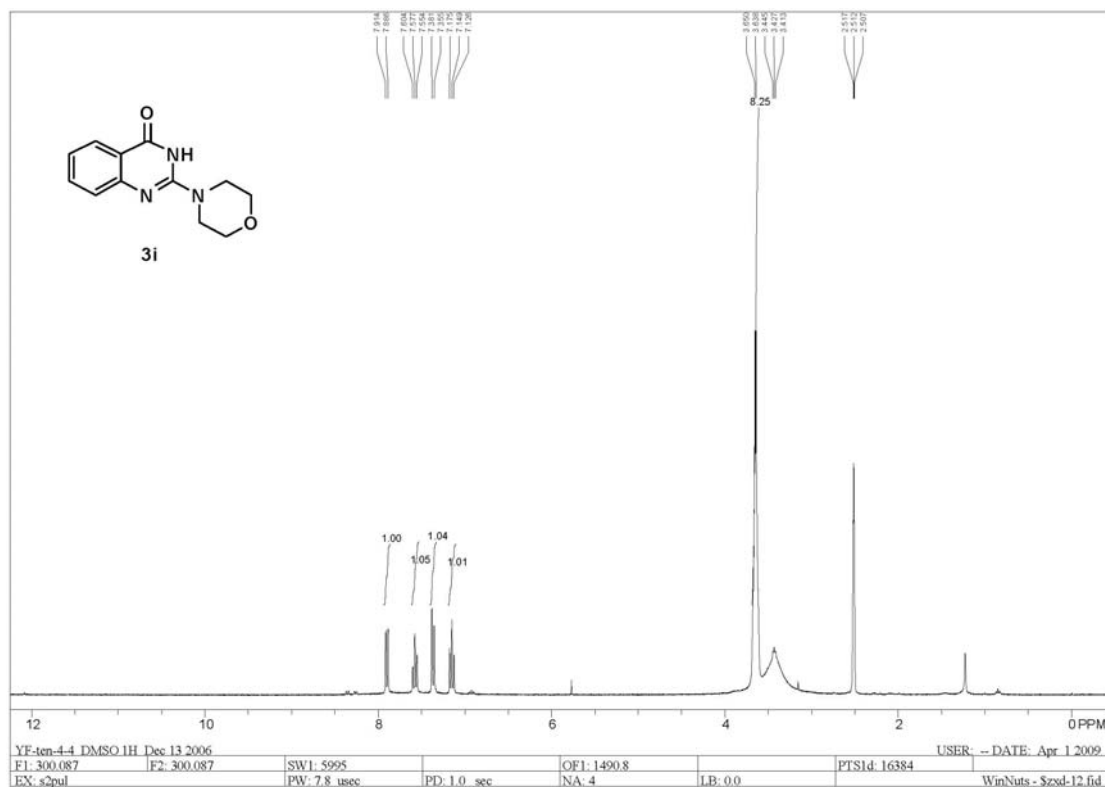
2-(4-chlorophenyl)quinazolin-4(3H)-one (3g).



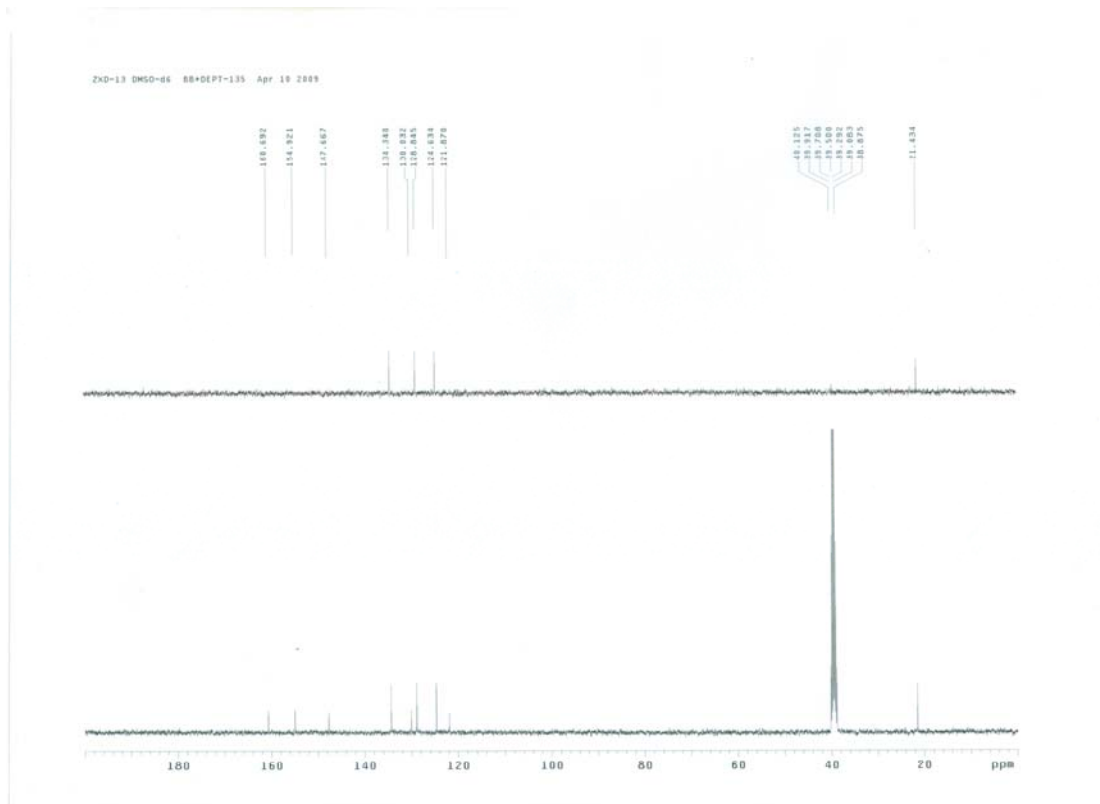
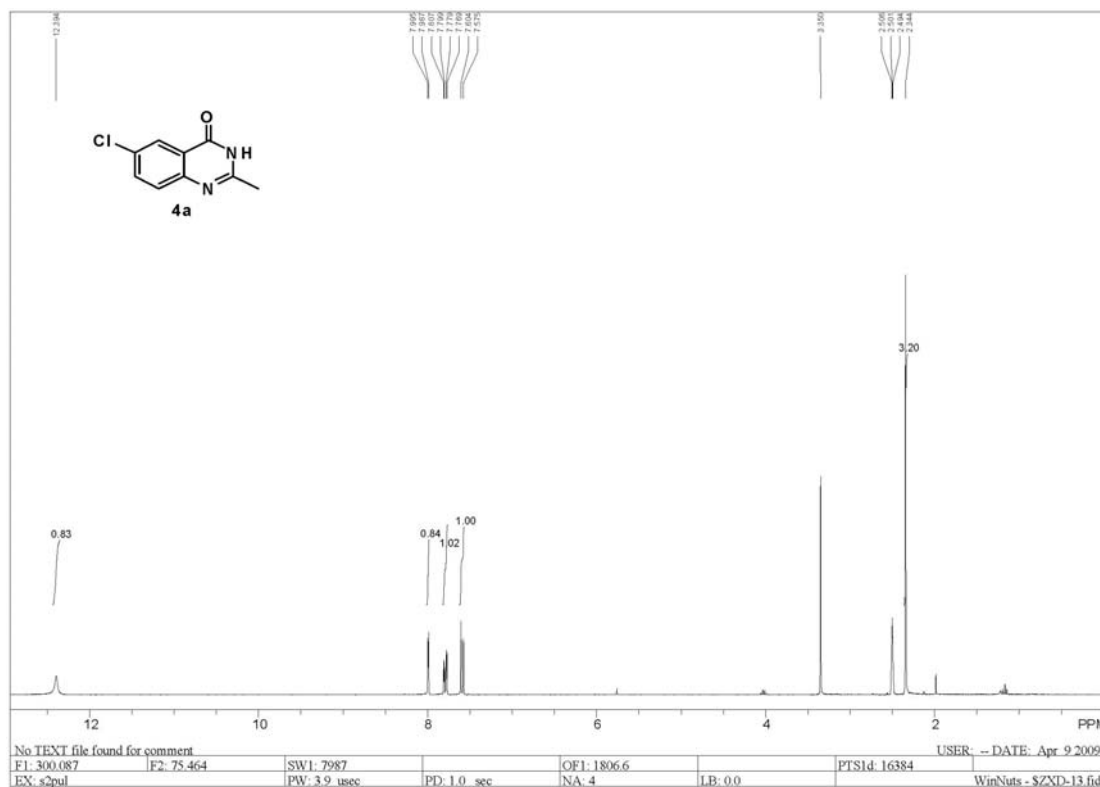
2-(pyridin-4-yl)quinazolin-4(3H)-one (3h)



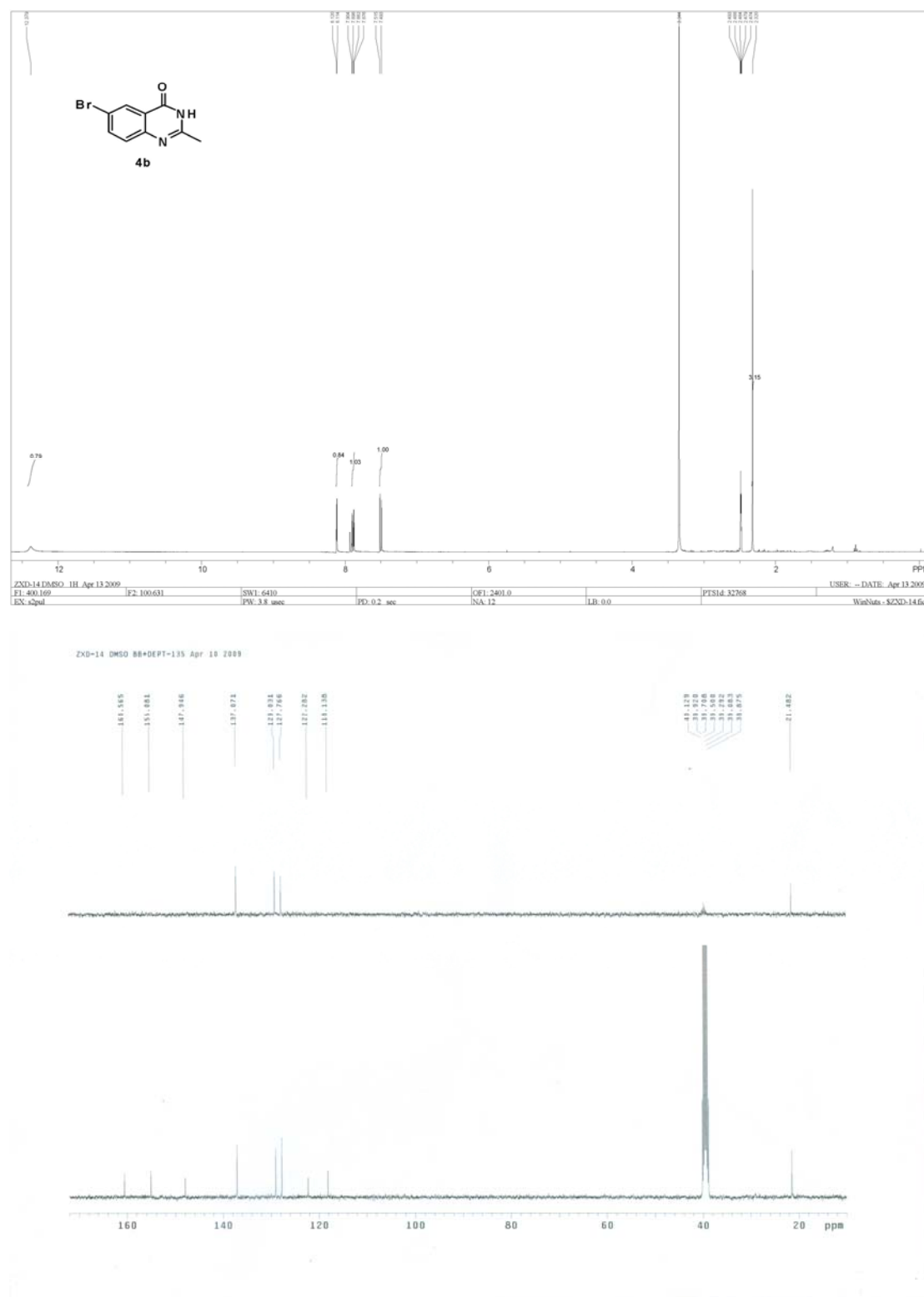
2-morpholinoquinazolin-4(3H)-one (3i)



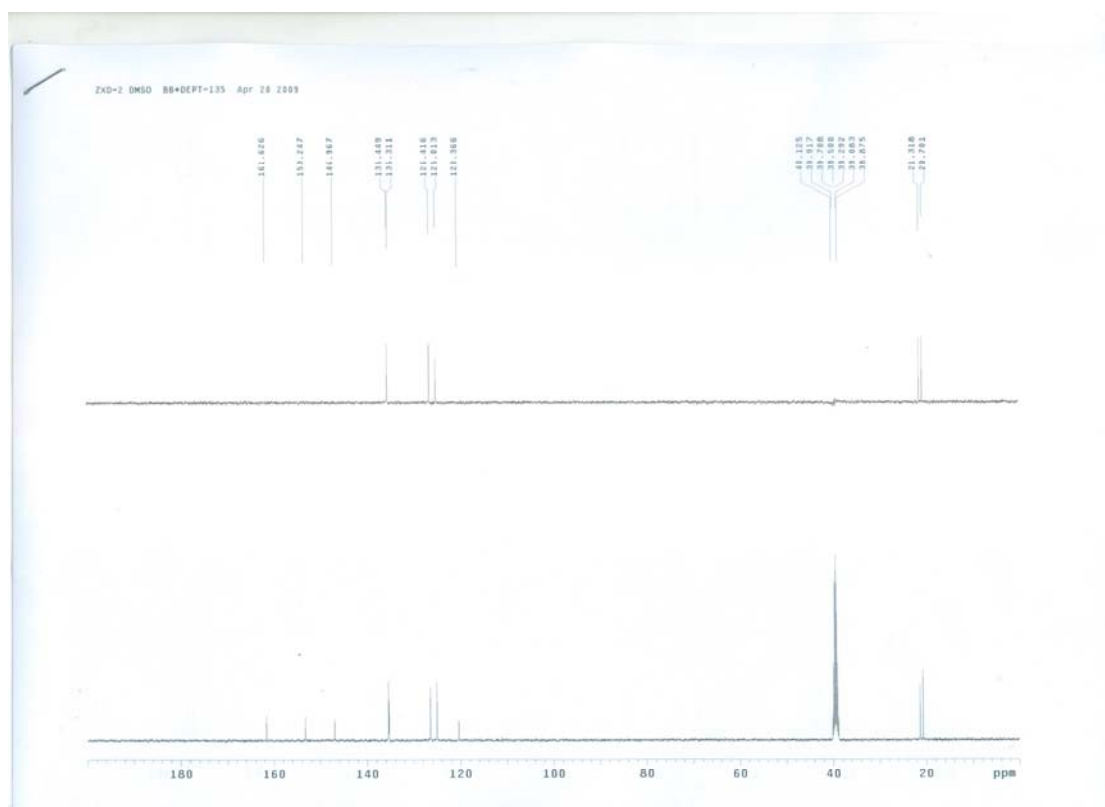
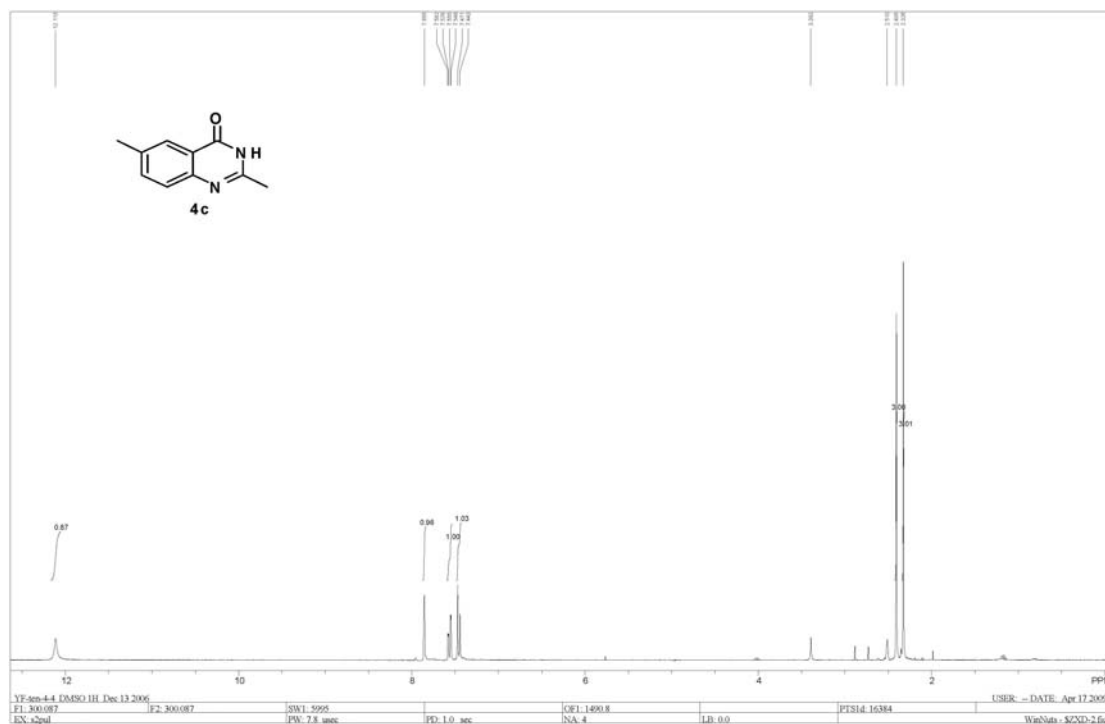
6-chloro-2-methylquinazolin-4(3H)-one (4a)



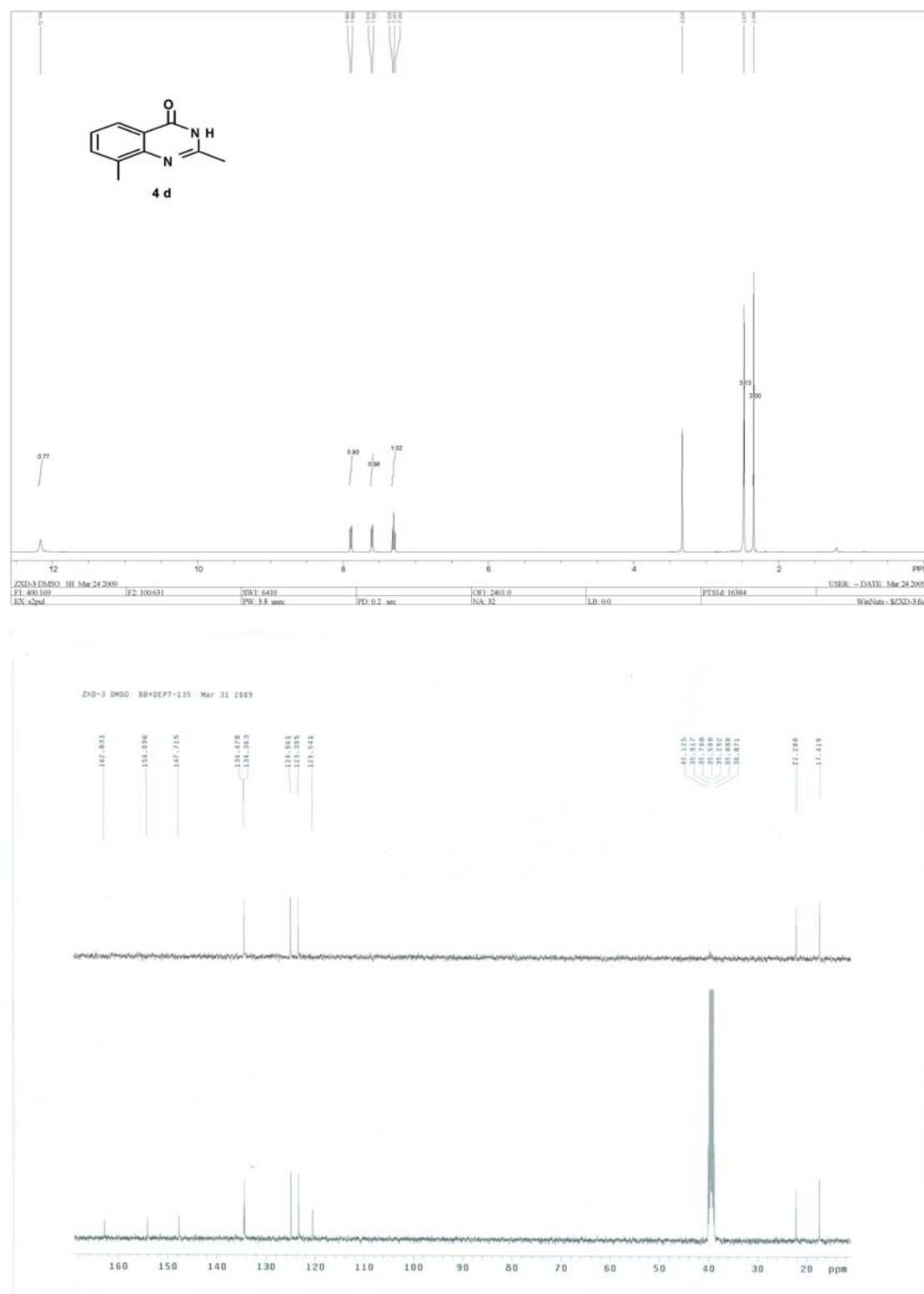
6-bromo-2-methylquinazolin-4(3H)-one (4b)



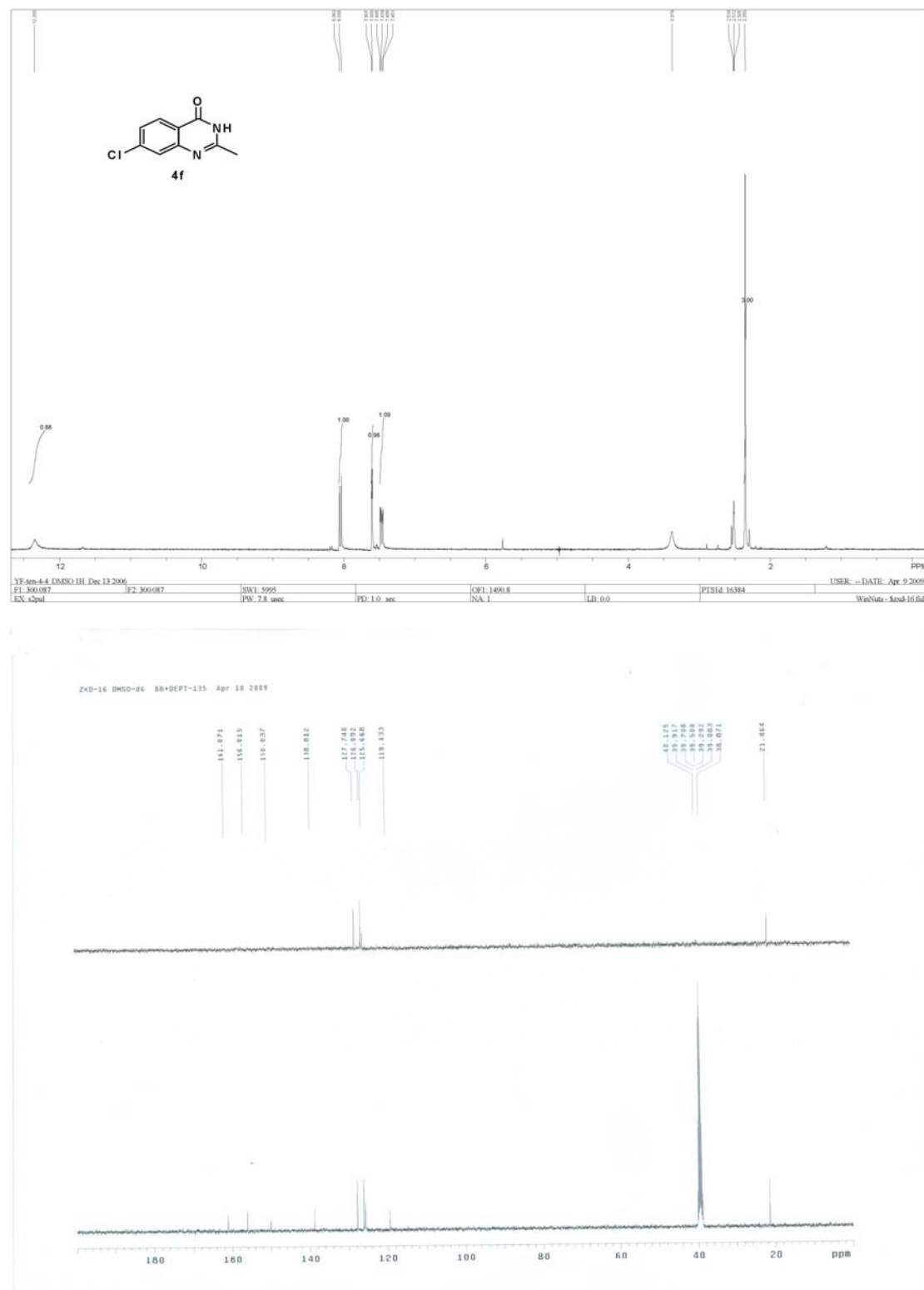
2,6-dimethylquinazolin-4(3H)-one (4c)



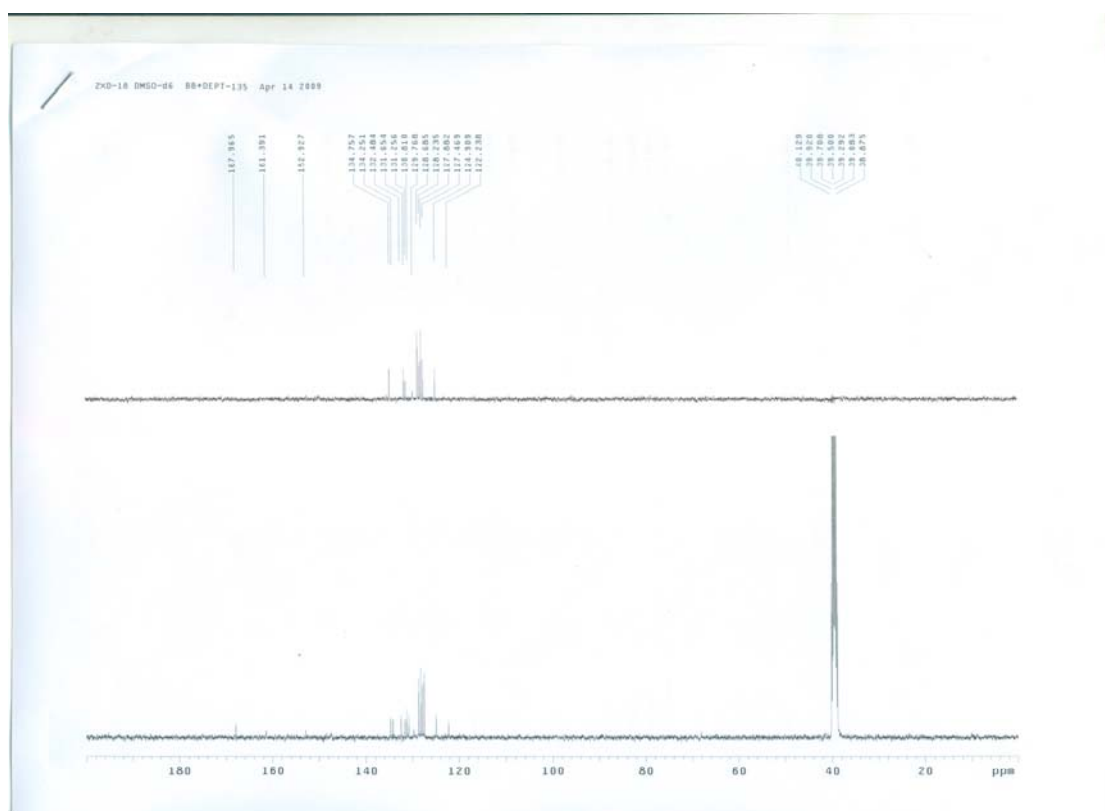
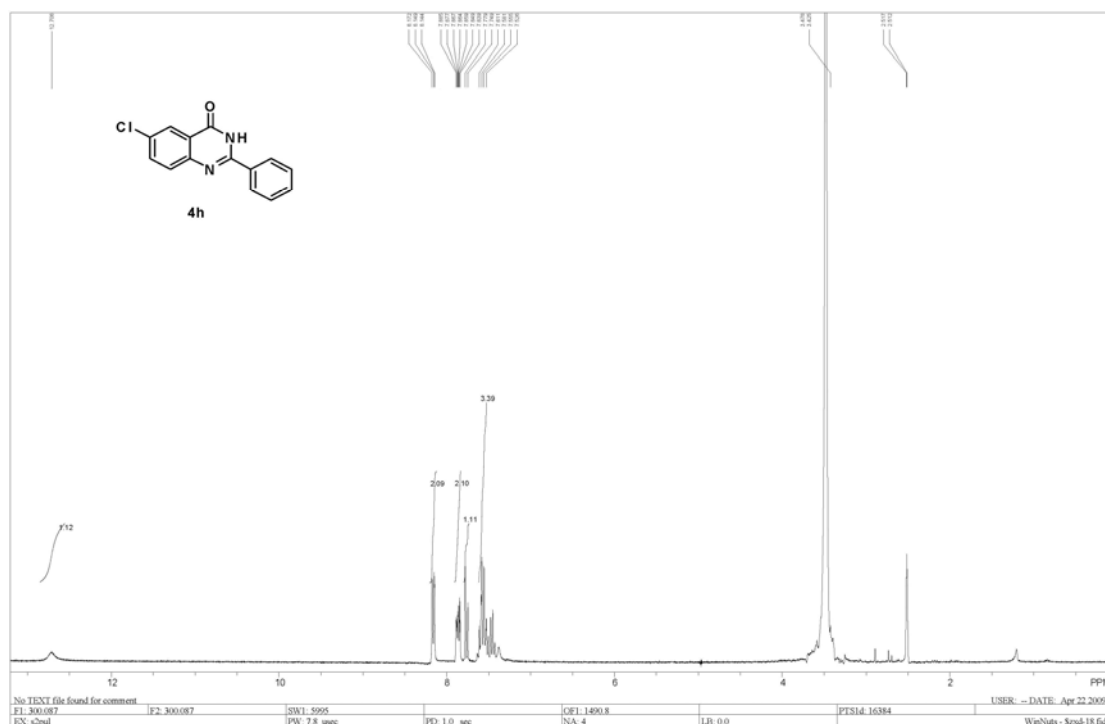
2,8-dimethylquinazolin-4(3H)-one (4d)



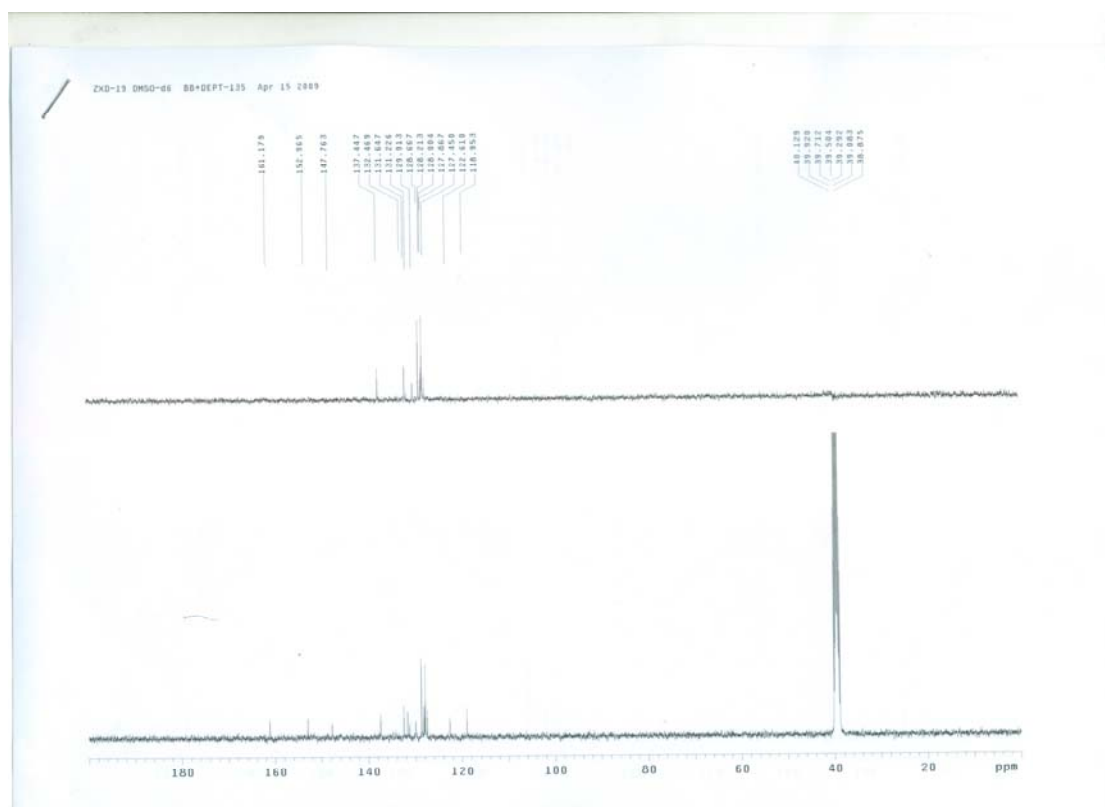
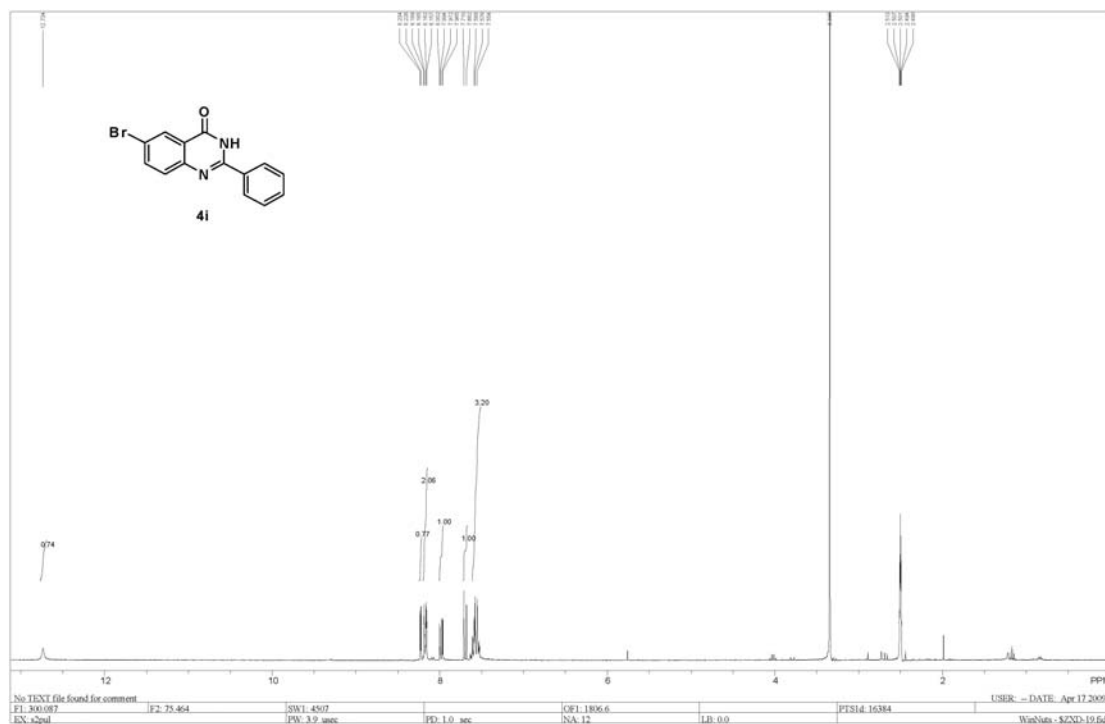
7-chloro-2-methylquinazolin-4(3H)-one (4f)



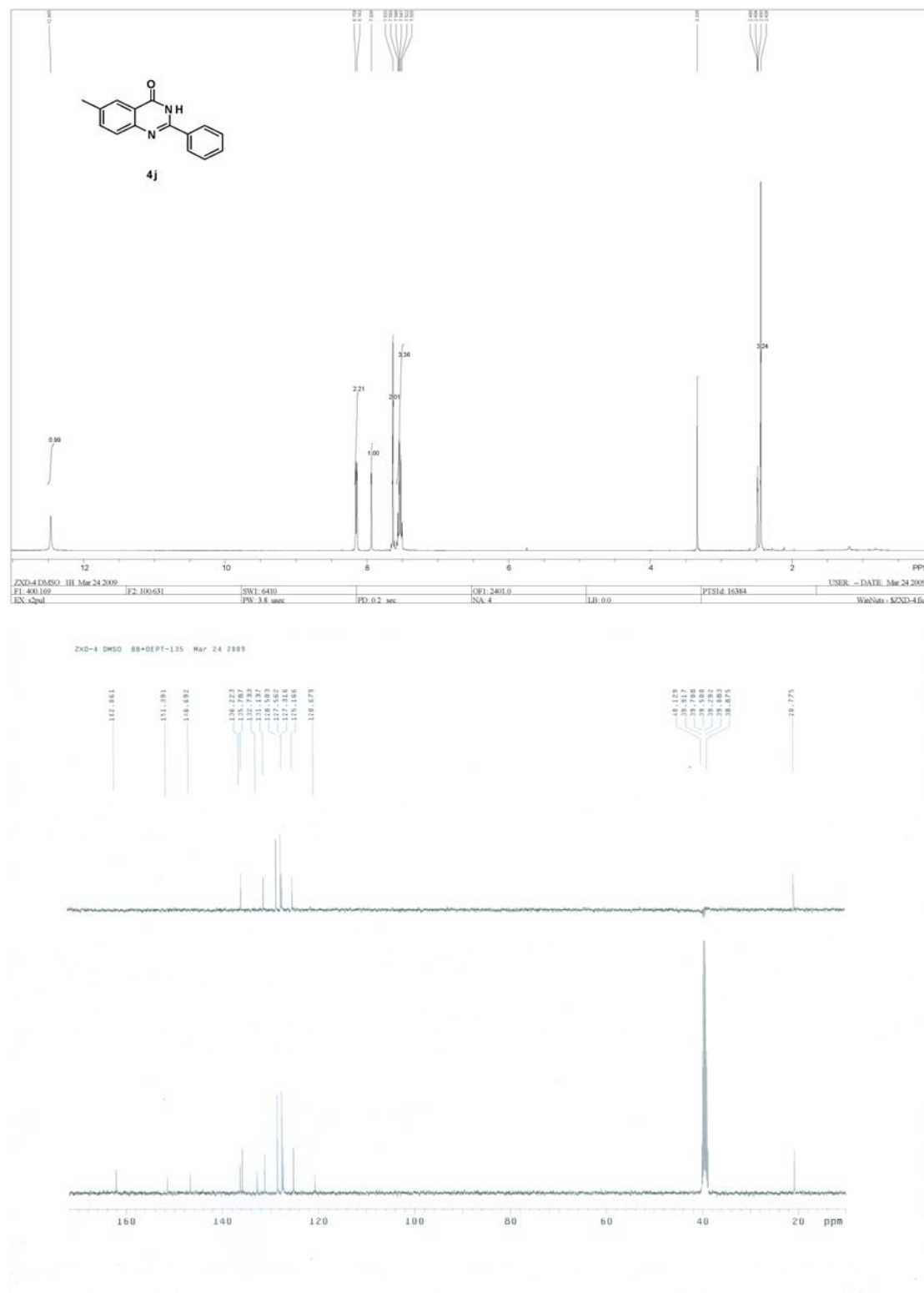
6-chloro-2-phenylquinazolin-4(3H)-one (4h)



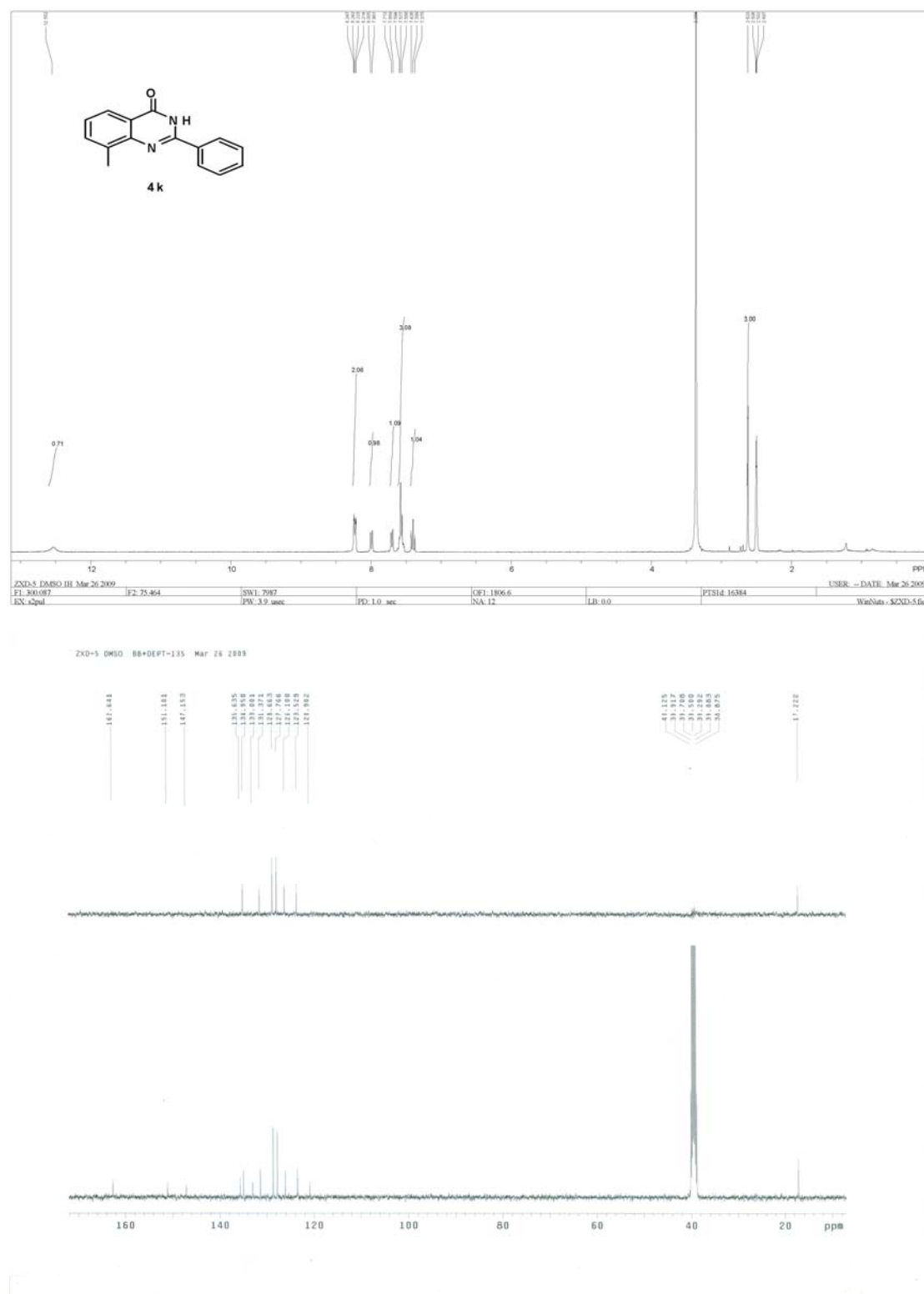
6-bromo-2-phenylquinazolin-4(3H)-one (4i)



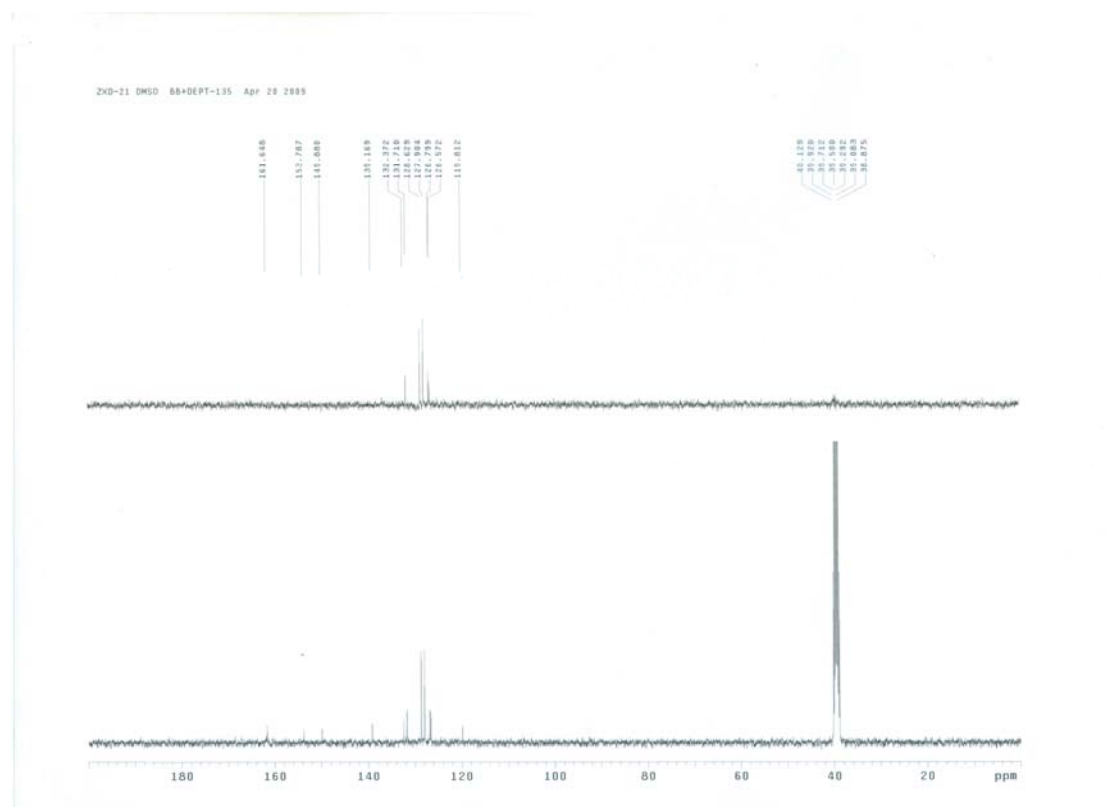
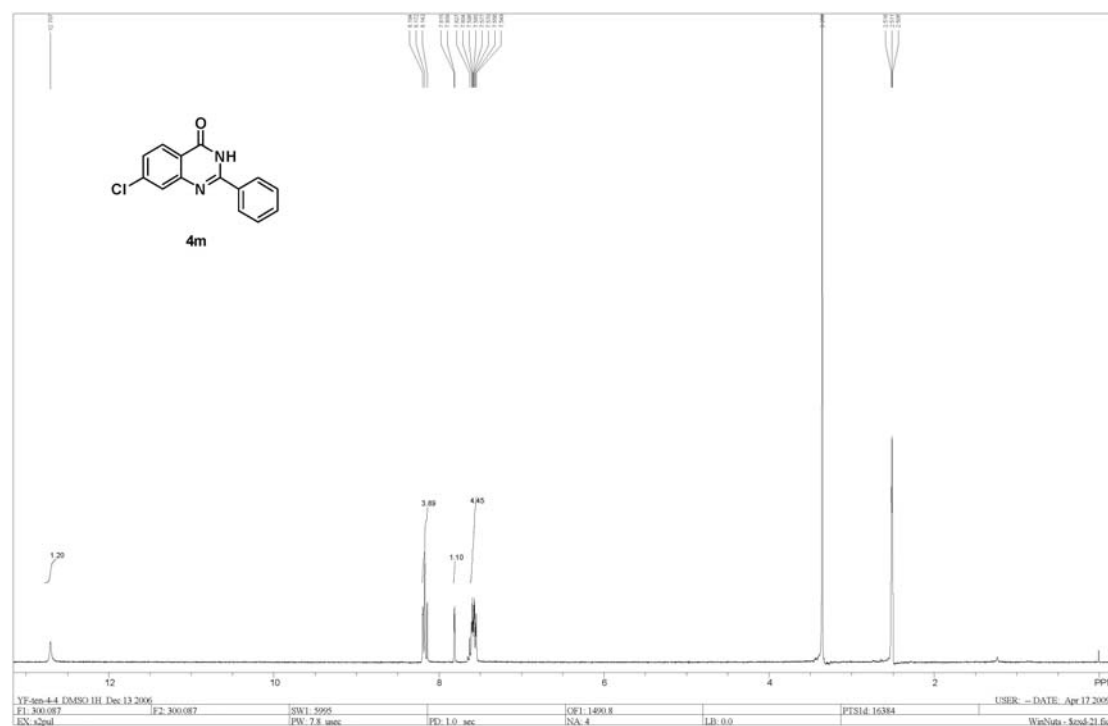
6-methyl-2-phenylquinazolin-4(3H)-one (4j)



8-methyl-2-phenylquinazolin-4(3H)-one (4k)



7-chloro-2-phenylquinazolin-4(3H)-one (4m)



6,7-dimethoxy-2-phenylquinazolin-4(3H)-one (4n)

