Supplementary Information

Fast, solvent-free, and highly efficient synthesis of pyrazolo[3,4-*b*]pyridines using microwave irradiation and $KHSO_4$ as a reusable freen catalyst

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Experimental section, ^1H and ^{13}C NMR spectra of prepared compounds

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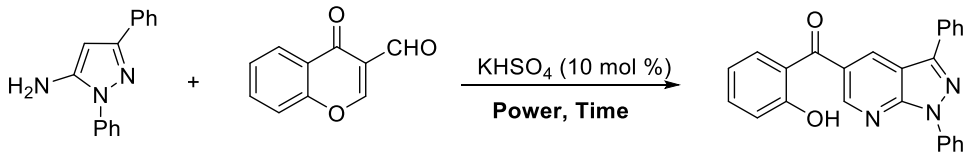
1. Optimization of reaction conditions

Table S1: The influences of the microwave irradiation power and reaction time[a]



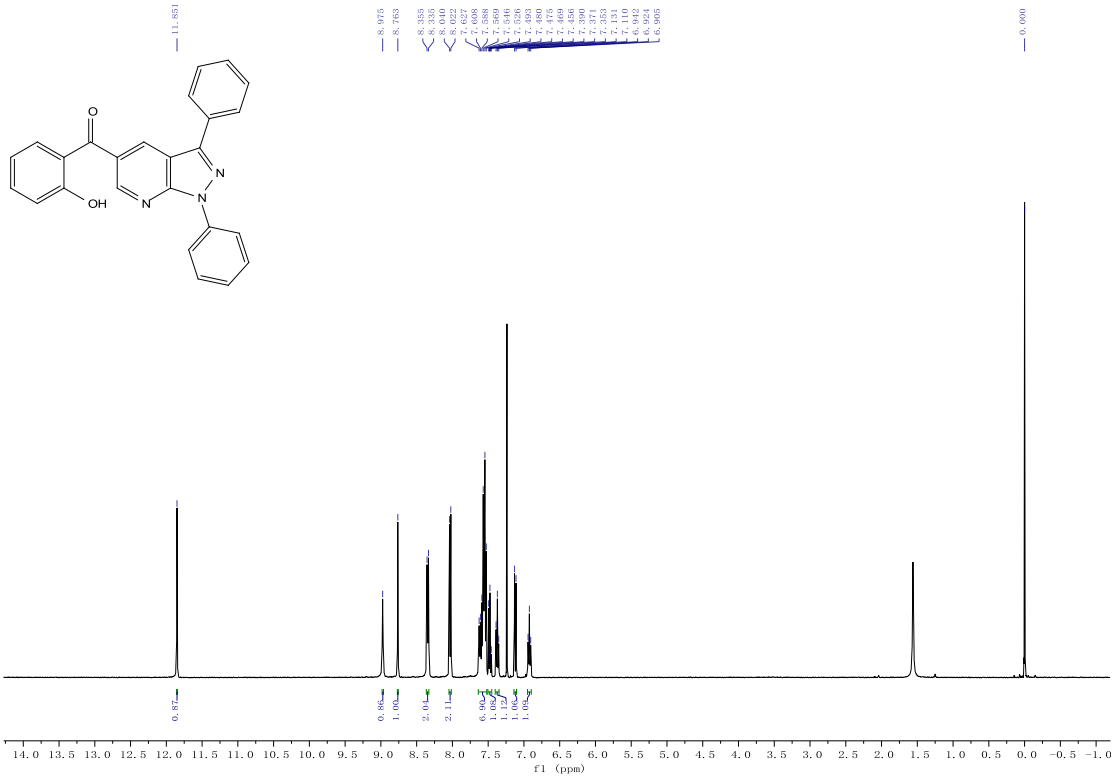
1a **2a** **3a**

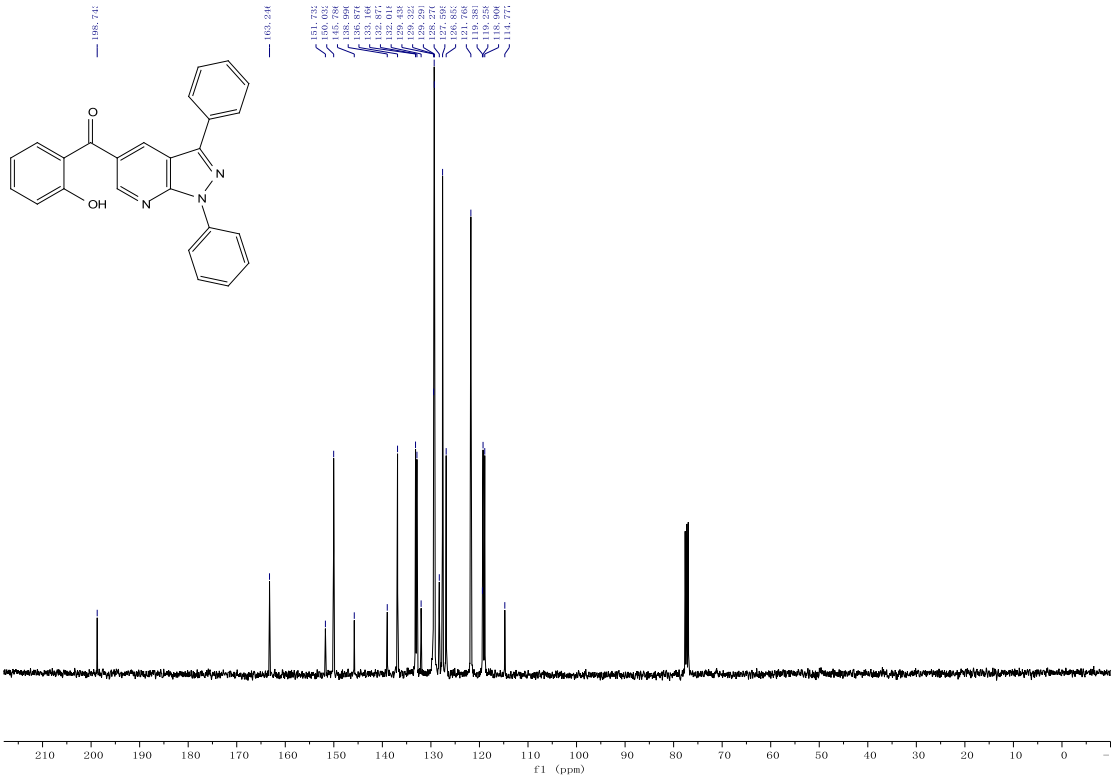
Entry	Microwave power (W)	Reaction time (min)	Yield[b] (%)
1	550	10	85
2	400	10	Trace
3	400	20	10
4	400	30	30
5	400	60	50
6	550	5	60
7	550	20	95
8	550	30	93
9	700	10	96
10	**700**	**5**	**97**
11	700	3	86
12	700	1	10

[a]The reaction standard conditions: **1a** (2 mmol), **2a** (2 mmol) and $KHSO_4$ (10 mol %) were placed in a ceramic crucible, grinded by a pestle for 2 min, reacted under microwave irradiation at specific microwave power for specific time without stir. [b]Isolated yields.

2. Copies of ^{1}H NMR and ^{13}C NMR spectra

(1,3-diphenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxyphenyl)methanone (3a).





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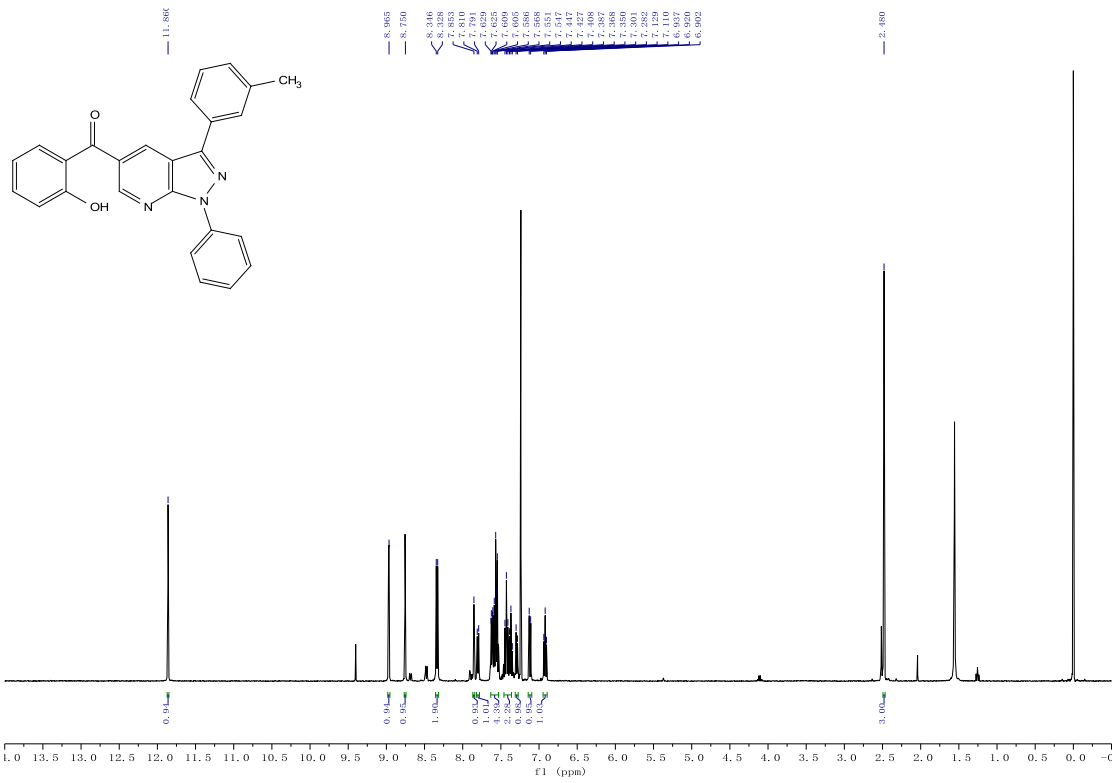
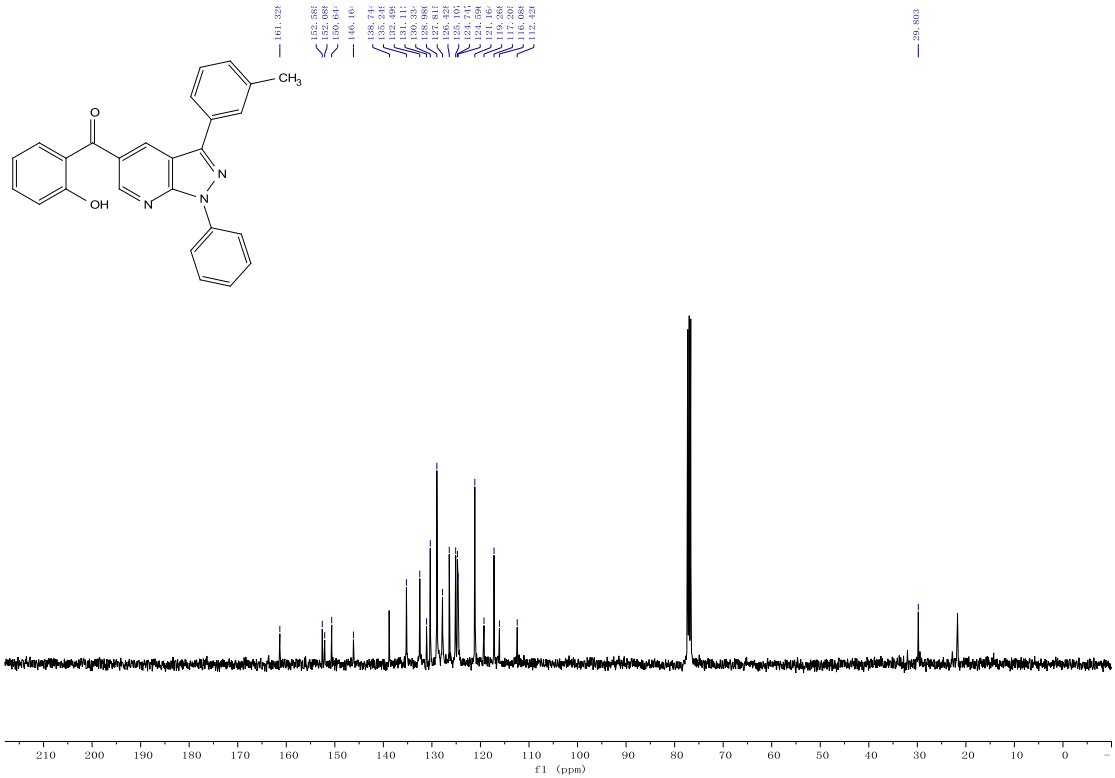
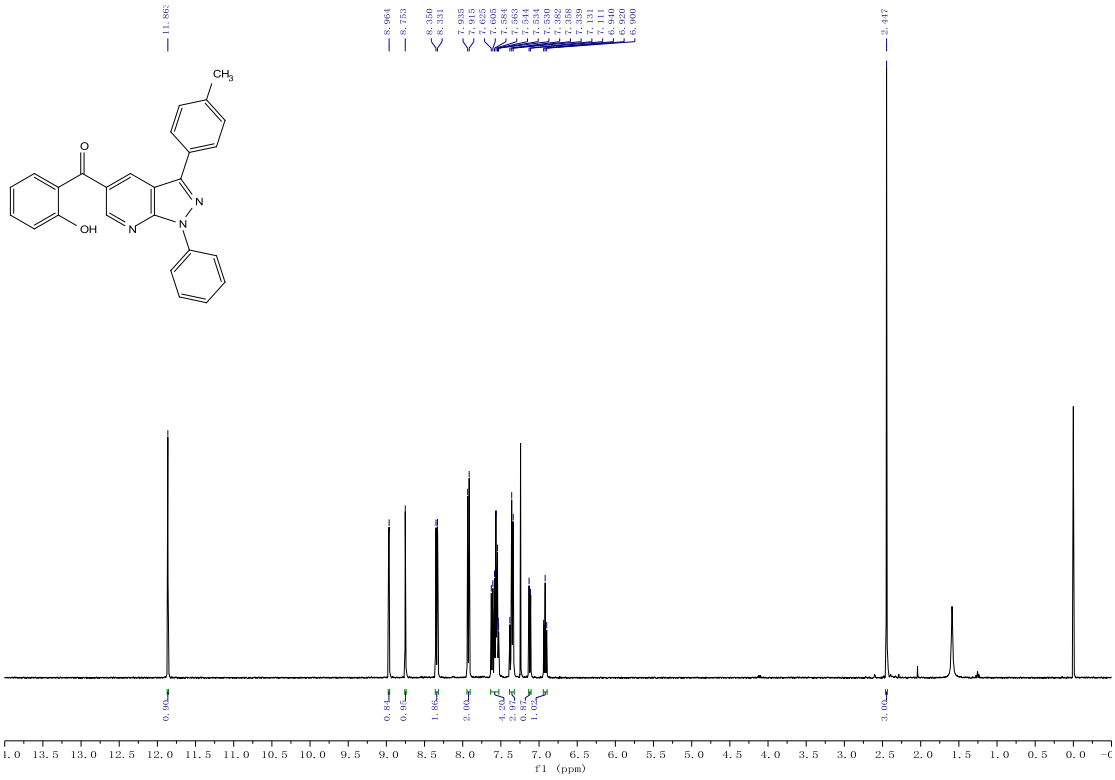
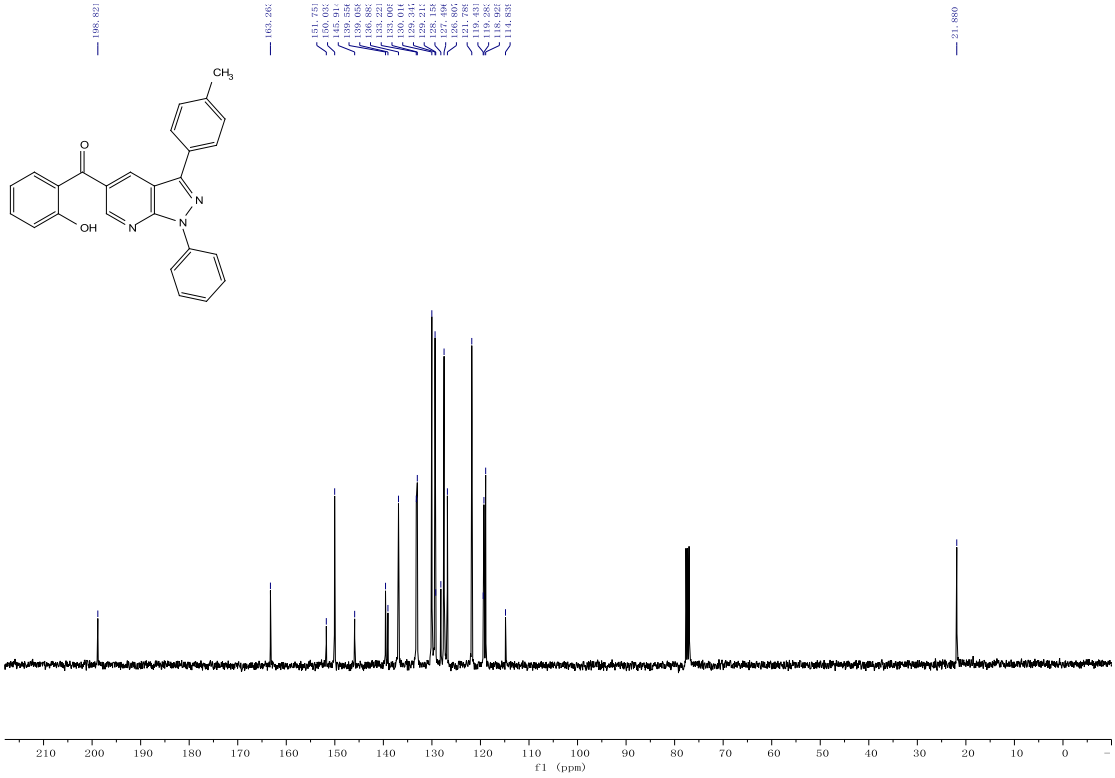


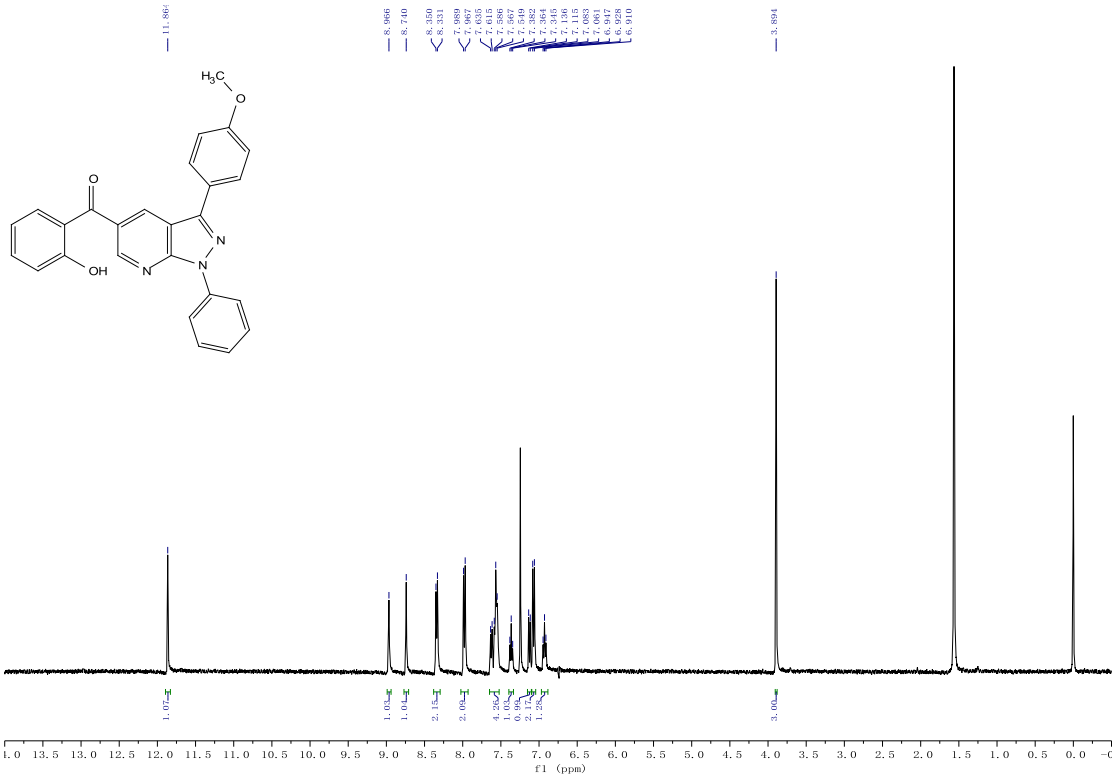


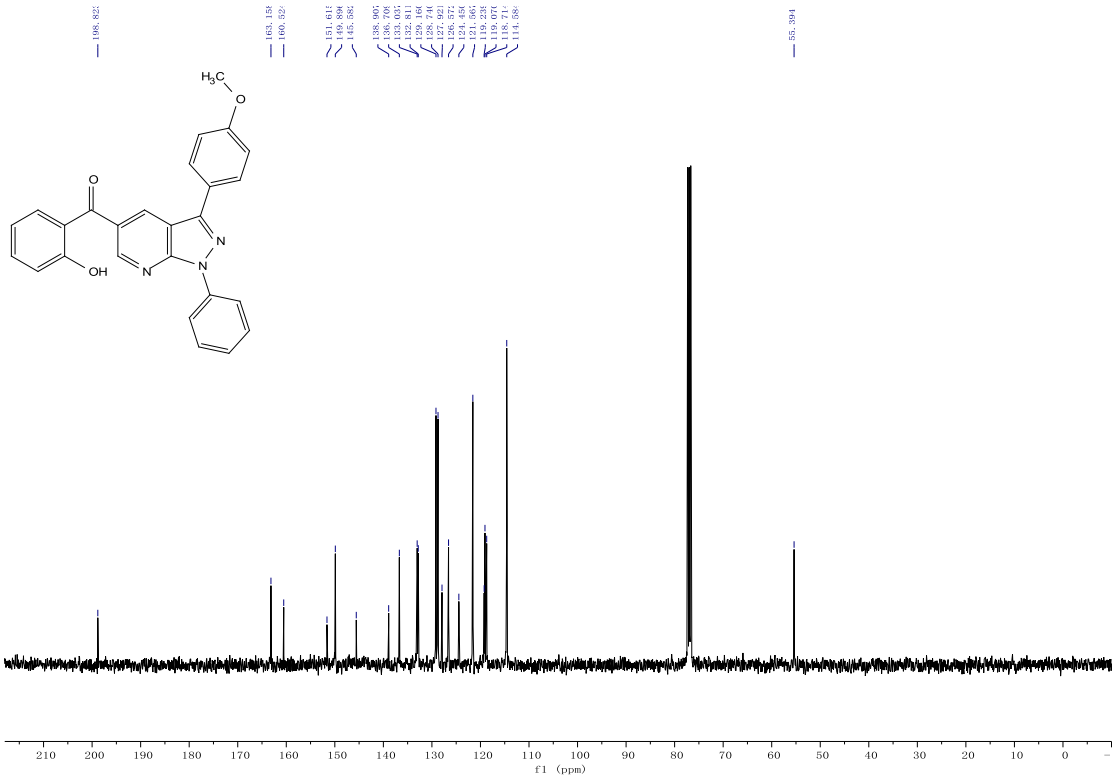
(5-chloro-2-hydroxyphenyl)(1-phenyl-3-(*p*-tolyl)-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)meth anone (3c).





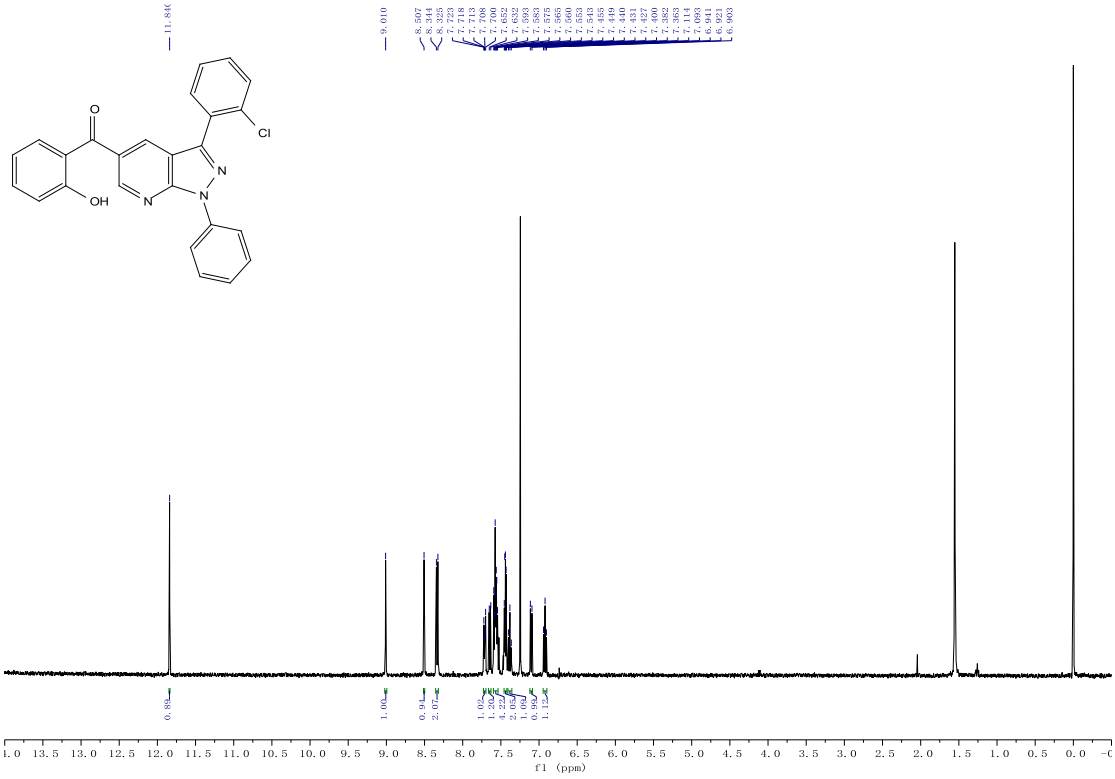
(2-hydroxyphenyl)(3-(4-methoxyphenyl)-1-phenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)methanone (3d).

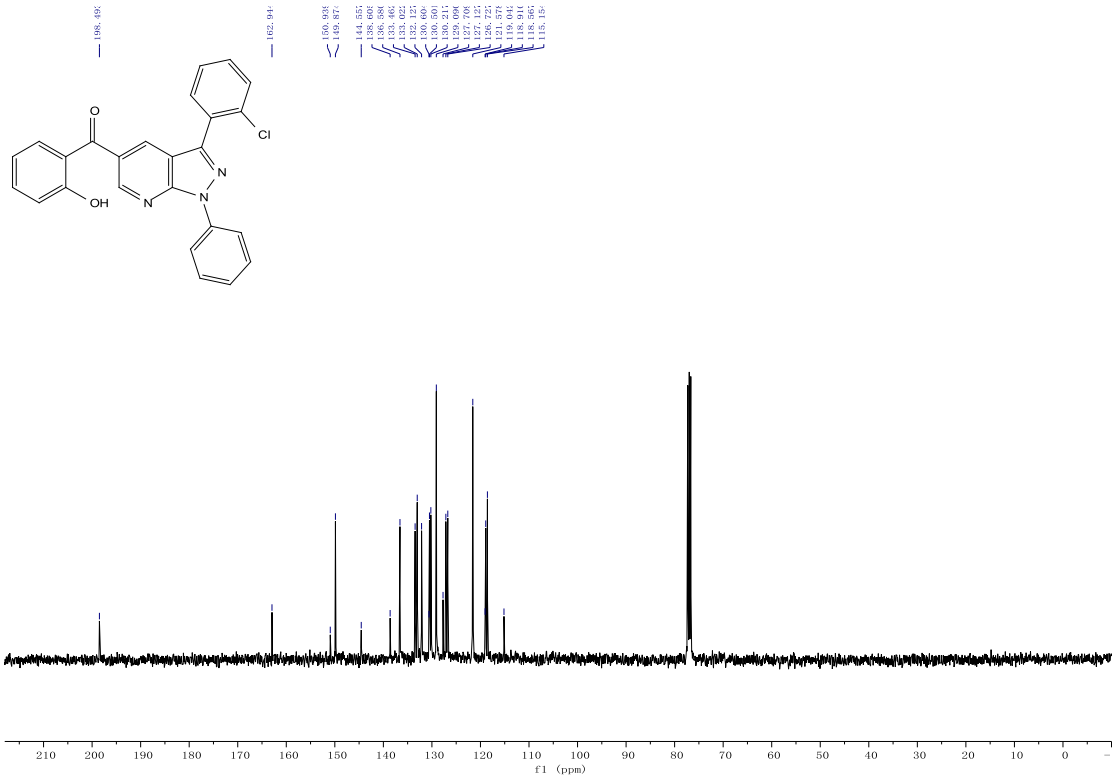




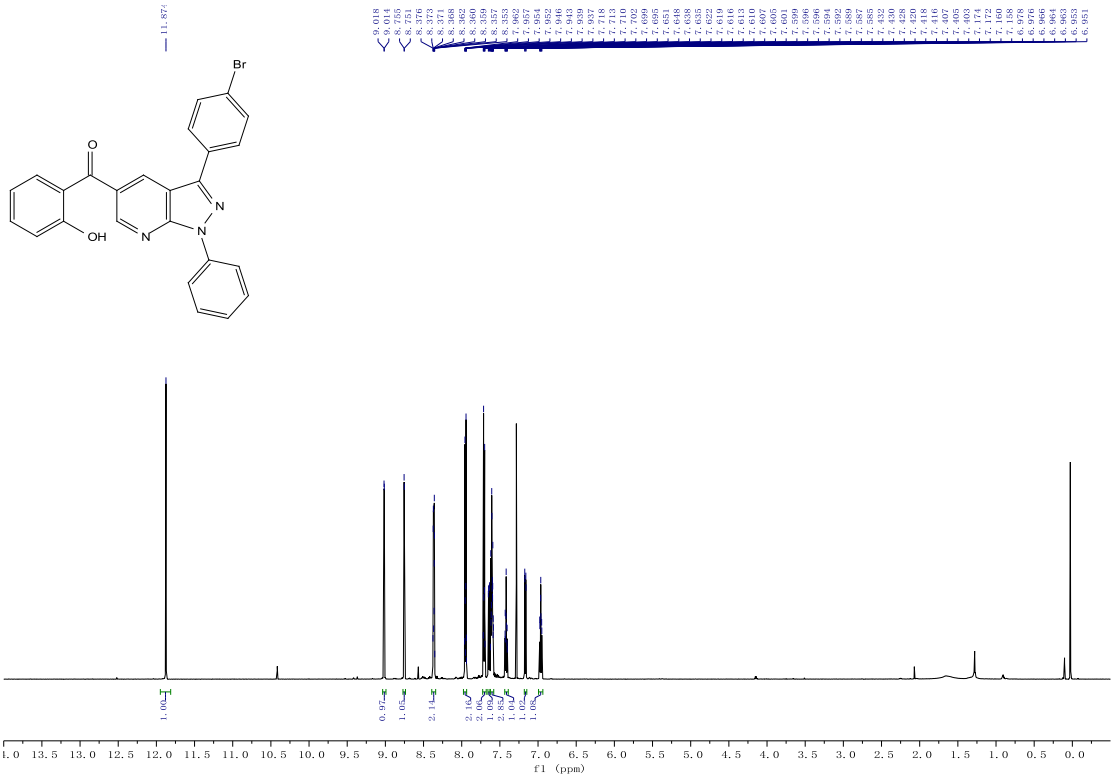
(3-(2-chlorophenyl)-1-phenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxyphenyl)meth

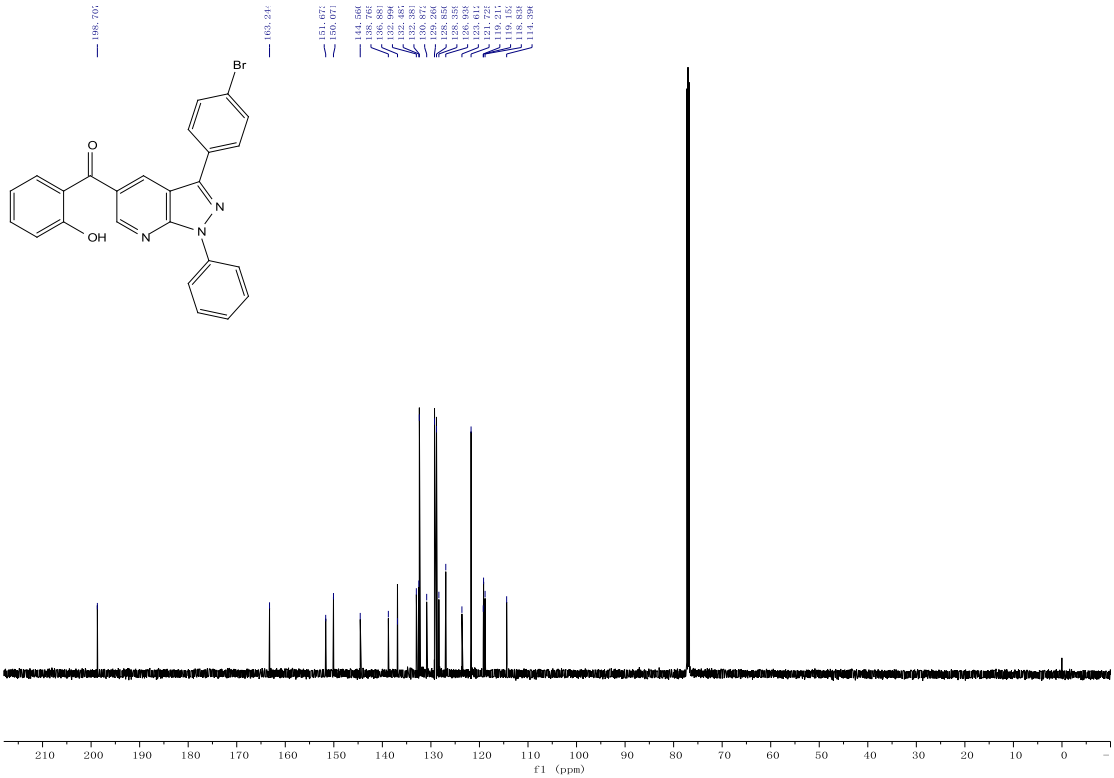
anone (3e).



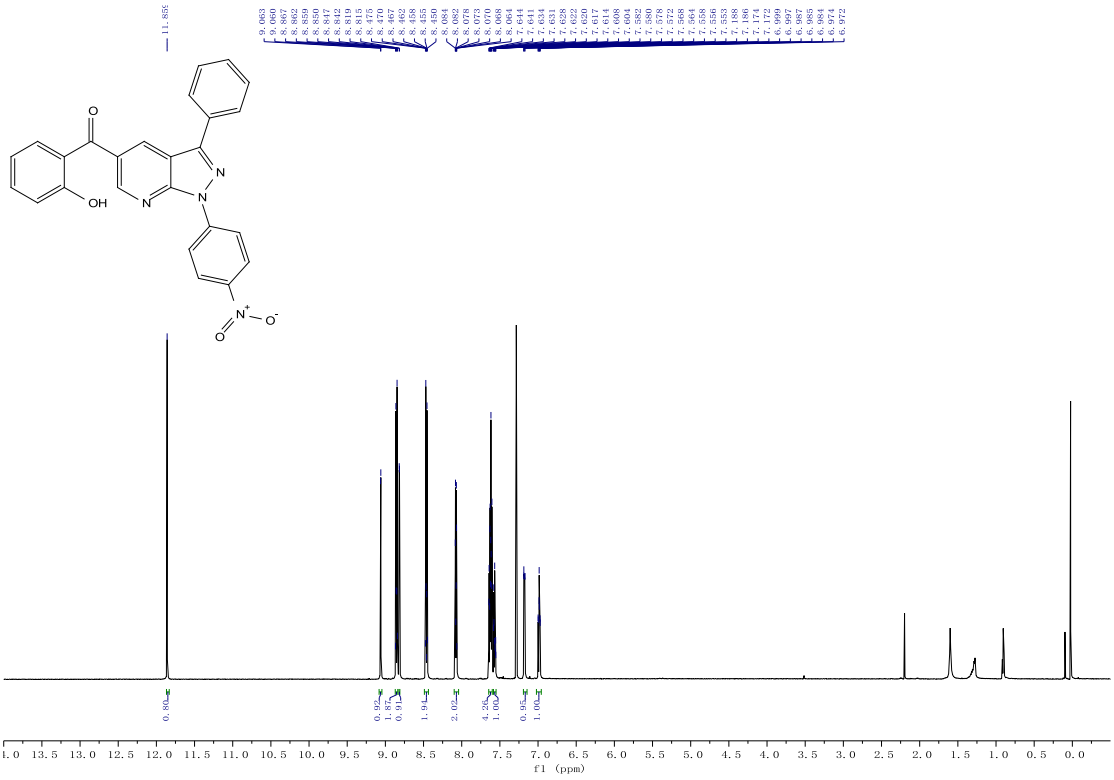


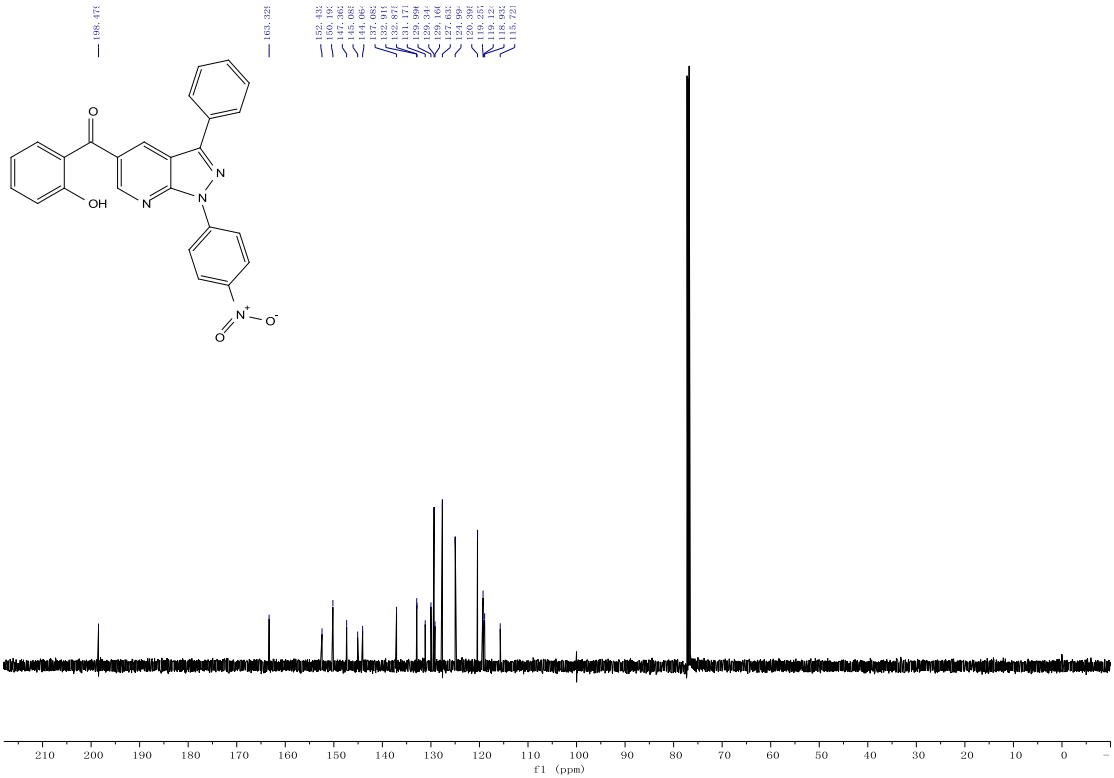
(3-(4-bromophenyl)-1-phenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxyphenyl)meth anone (3f).



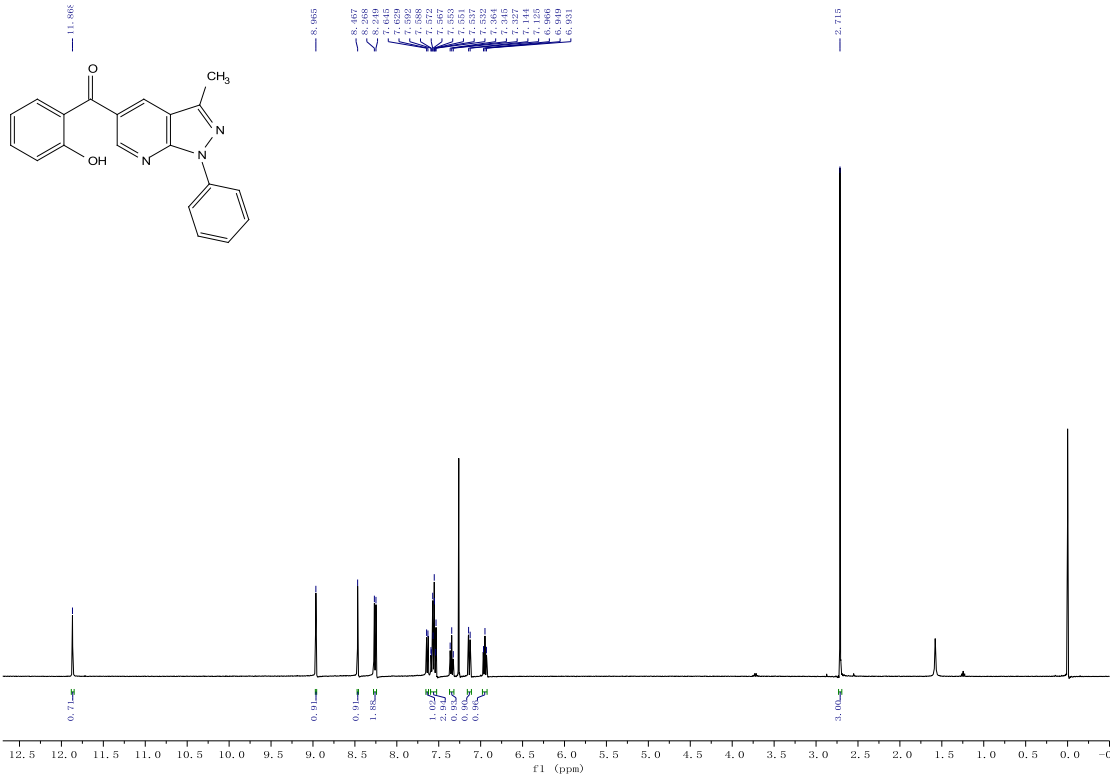


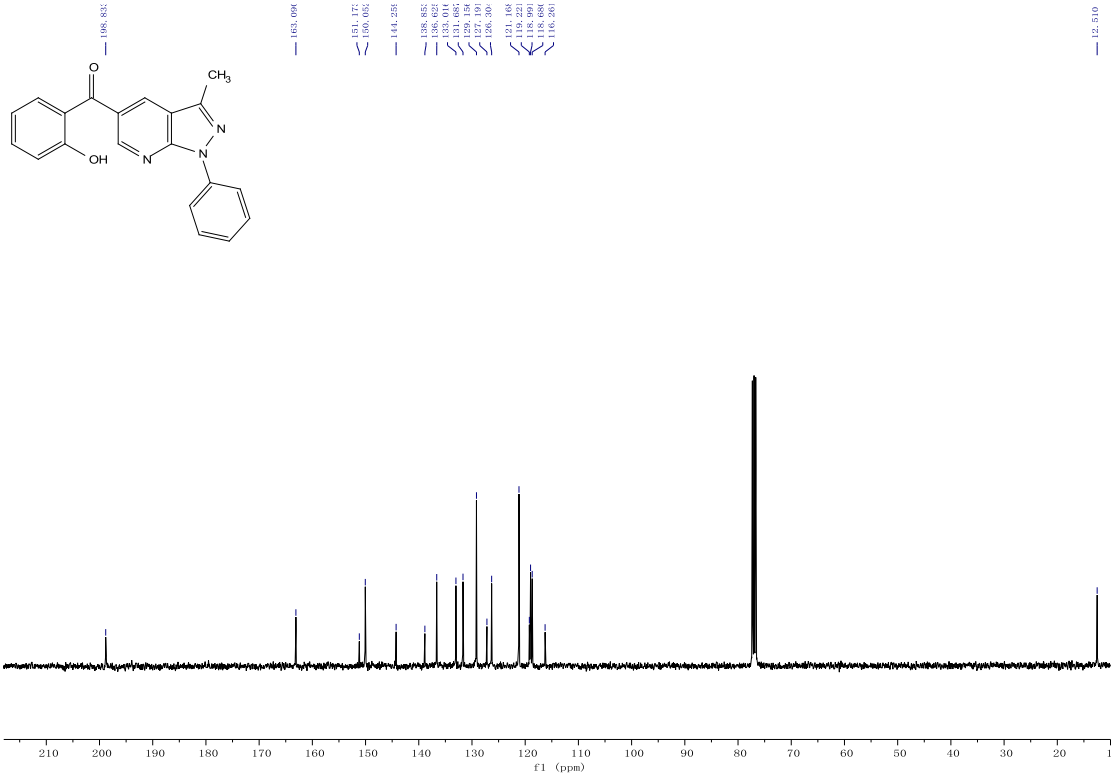
(2-hydroxyphenyl)(1-(4-nitrophenyl)-3-phenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)metha none (3g).



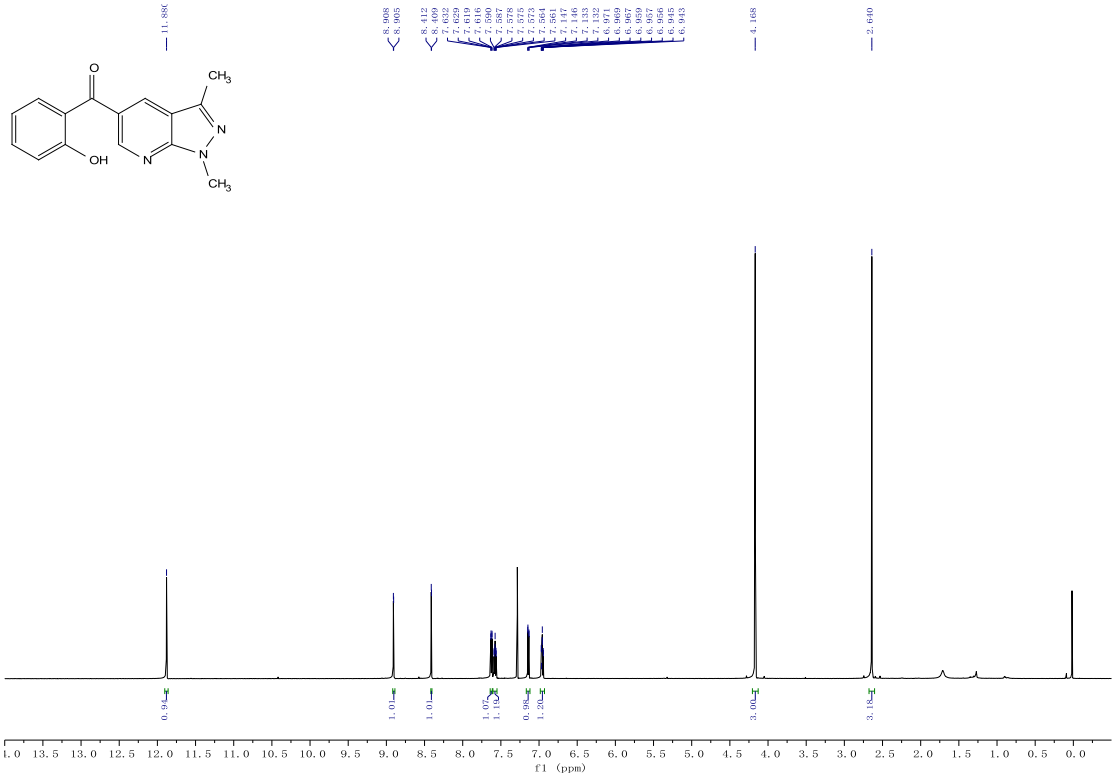


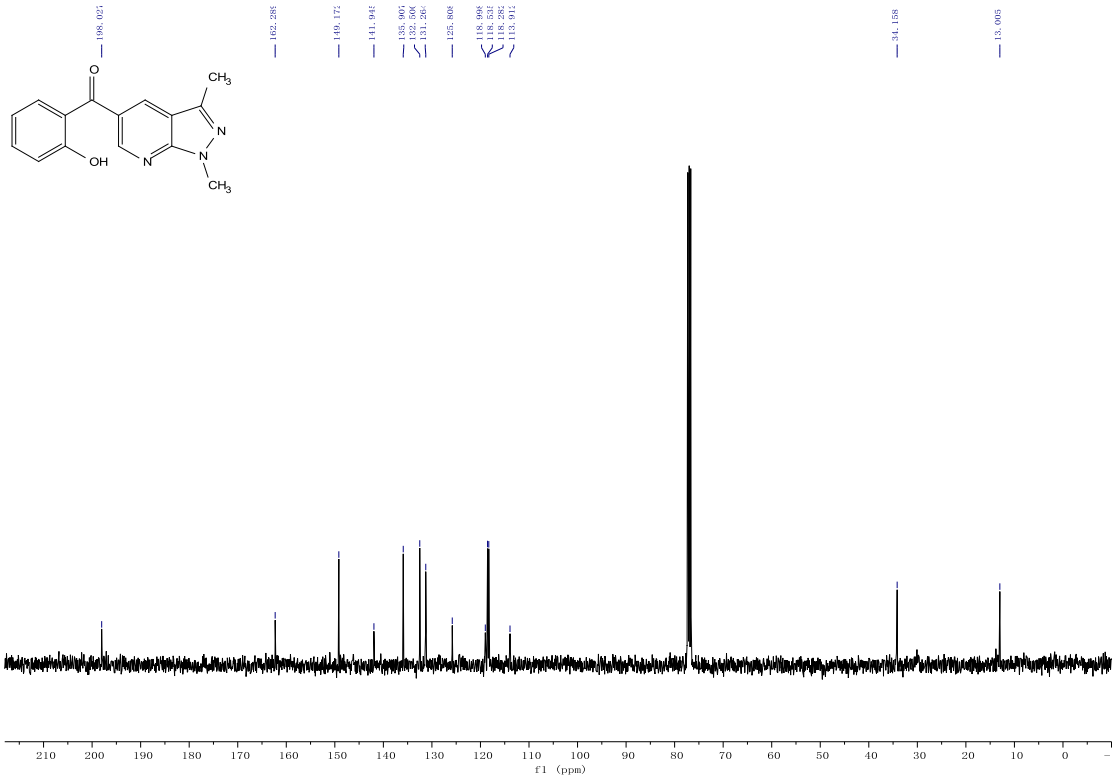
(2-hydroxyphenyl)(3-methyl-1-phenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)methanone (3h).



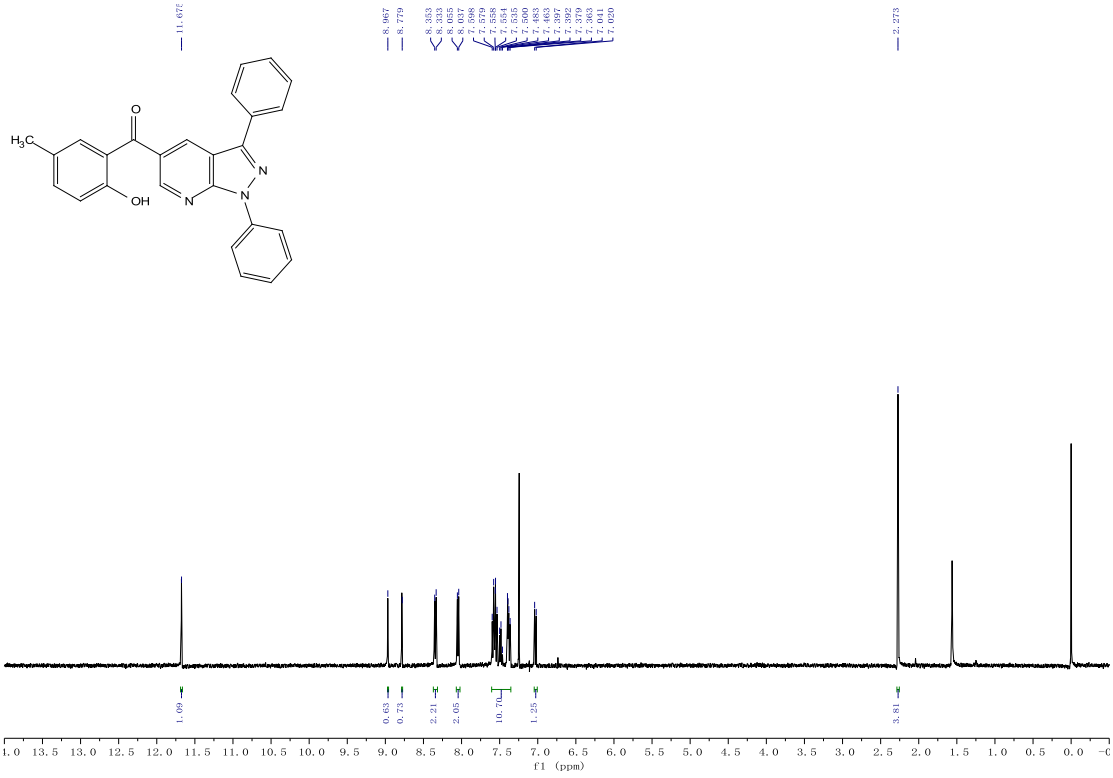


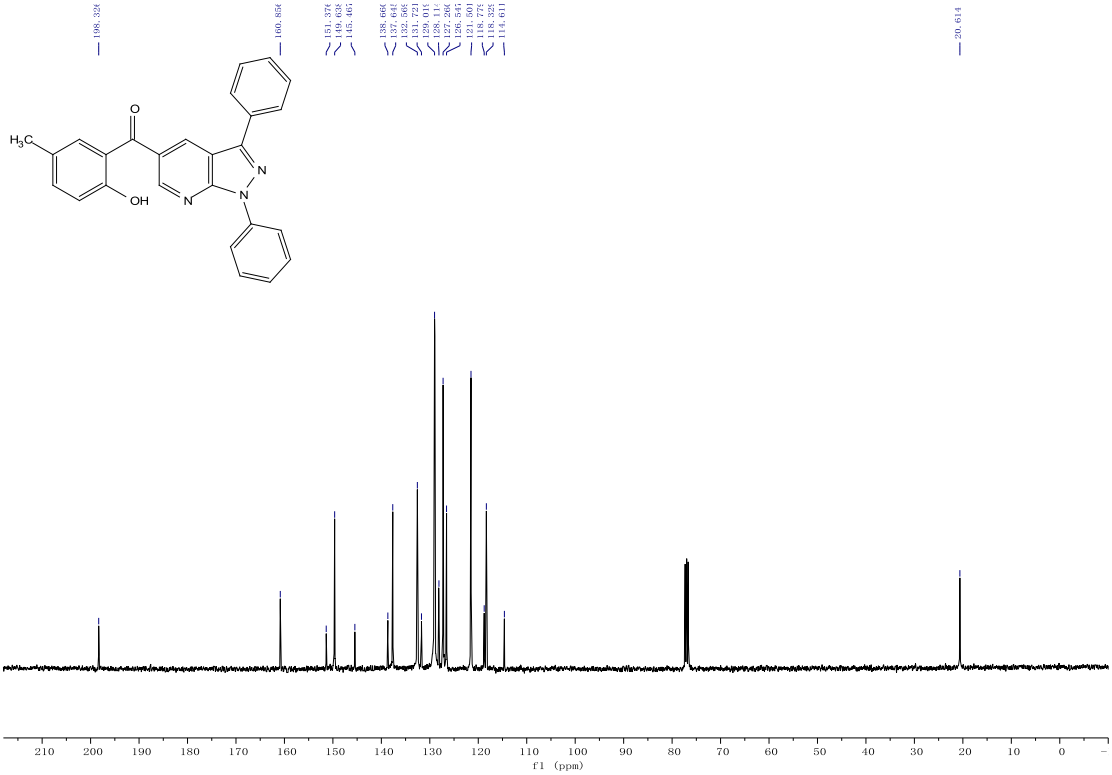
(1,3-dimethyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxyphenyl)methanone (3i).



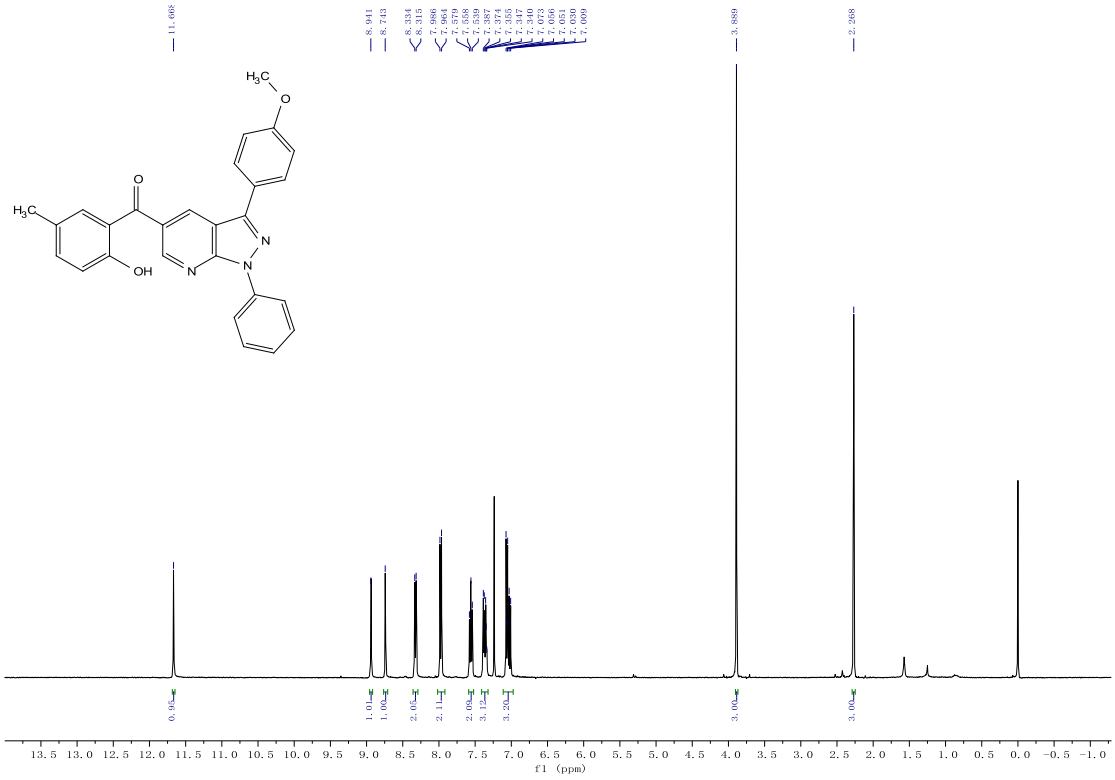


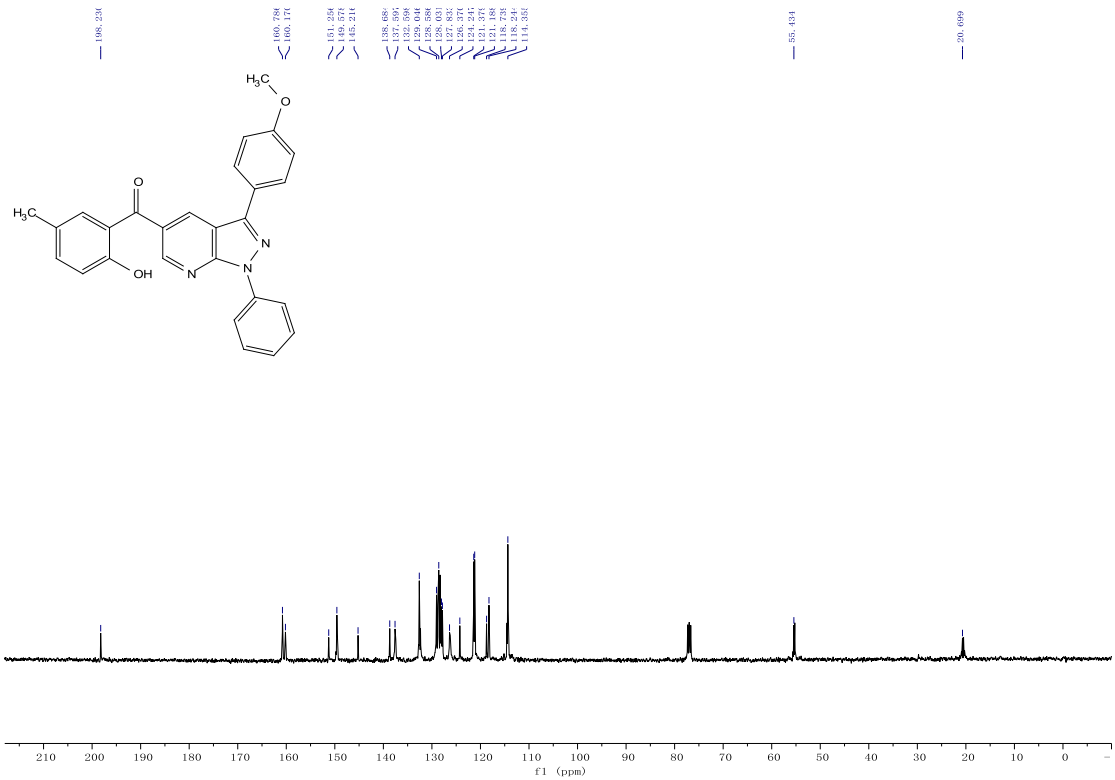
(1,3-diphenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxy-5-methylphenyl)methanone (3j).



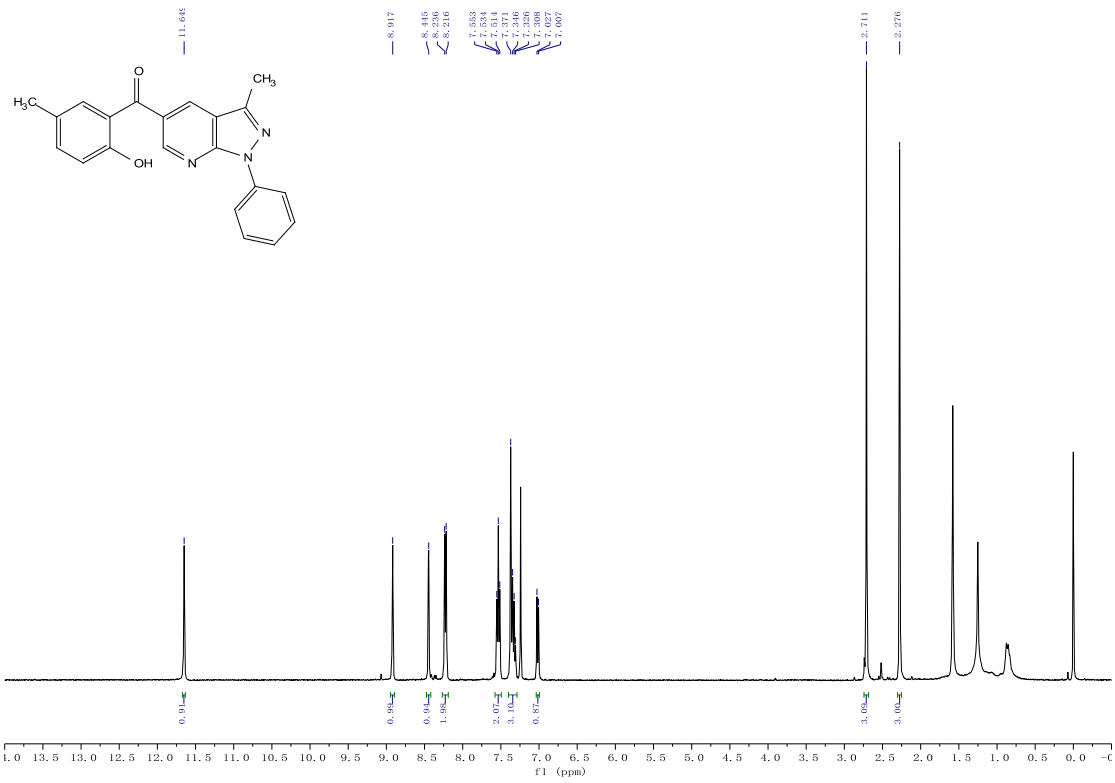


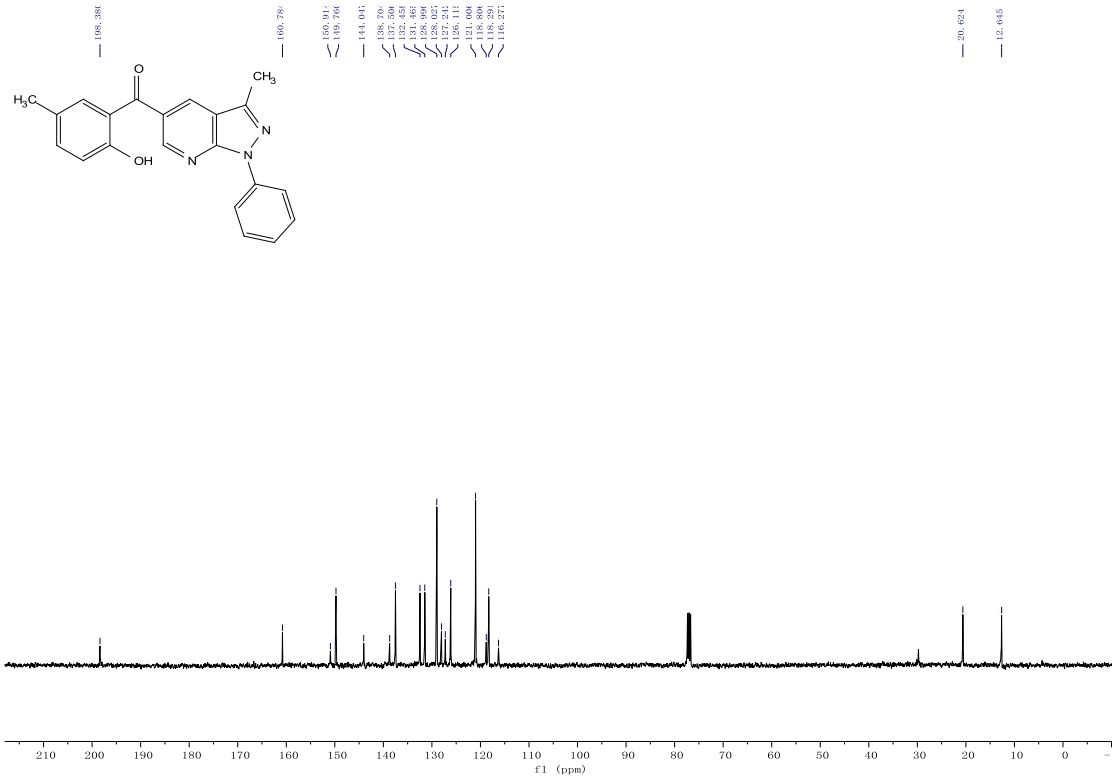
(2-hydroxy-5-methylphenyl)(3-(4-methoxyphenyl)-1-phenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)methanone (3k).



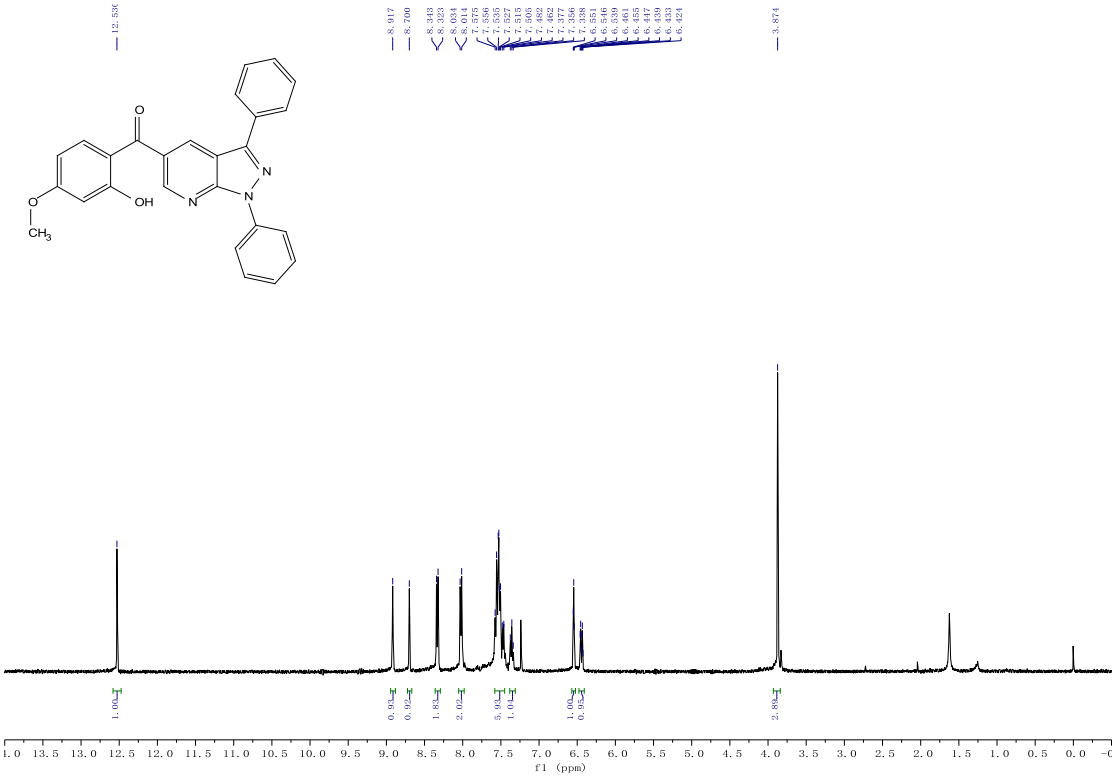


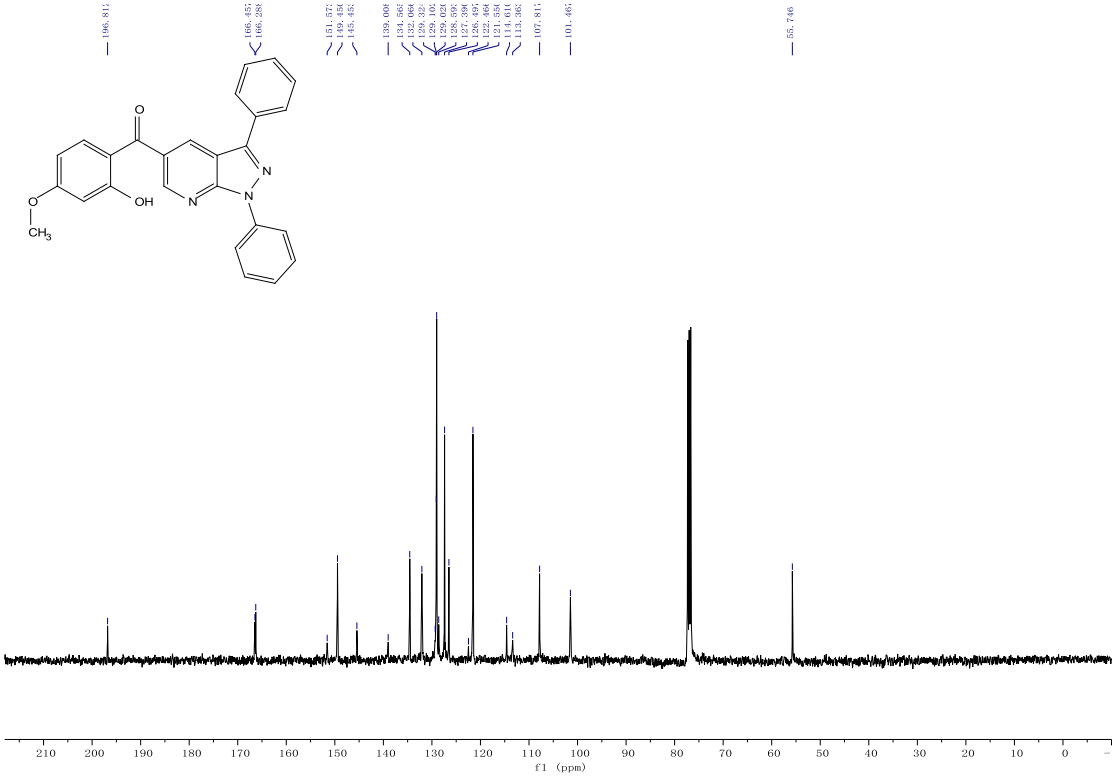
(2-hydroxy-5-methylphenyl)(3-methyl-1-phenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)meth anone (3l).



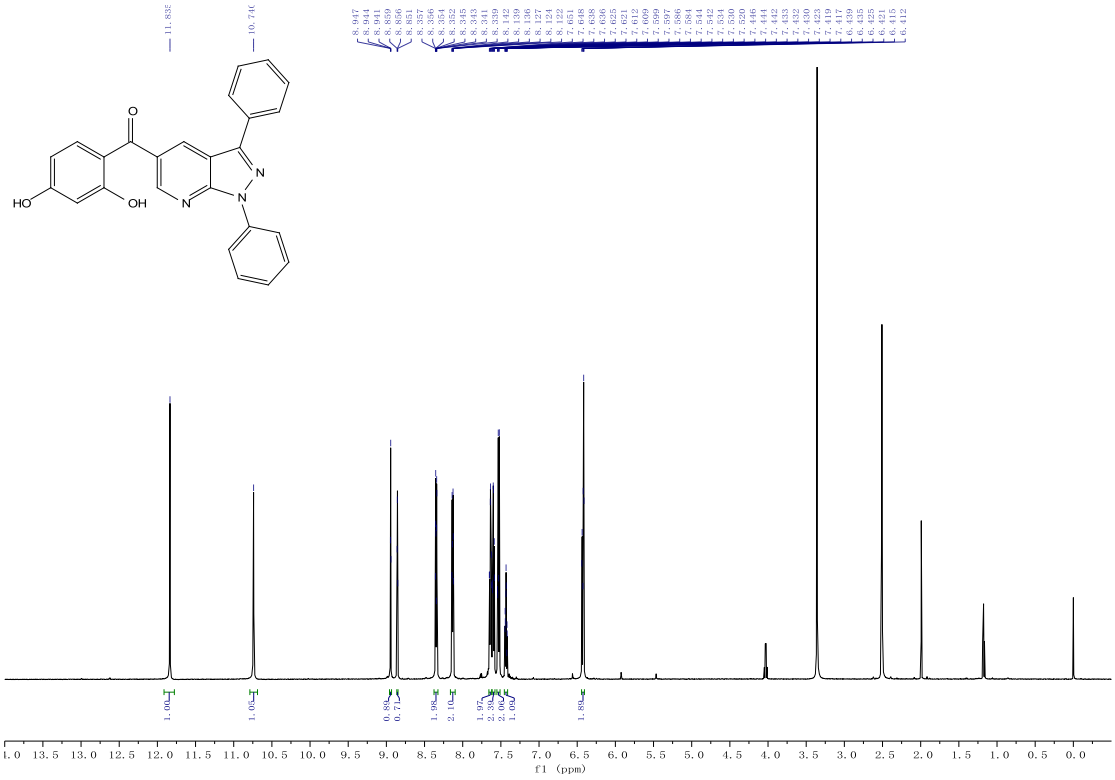


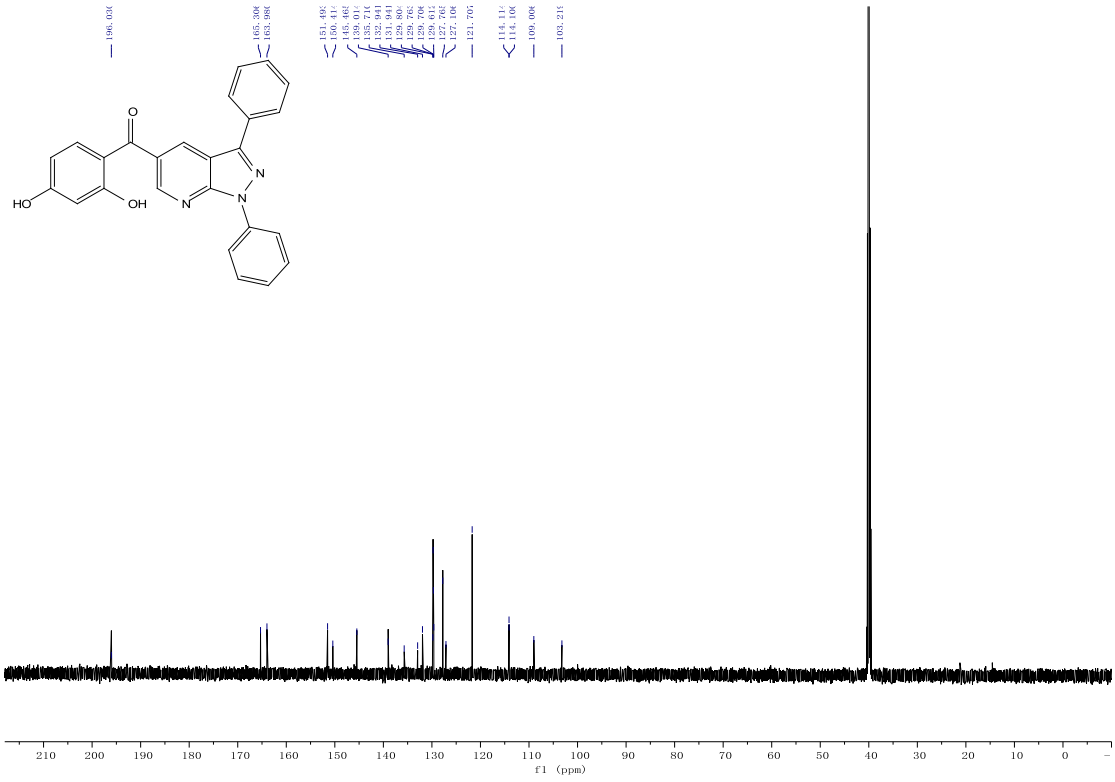
(1,3-diphenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxy-4-methoxyphenyl)methanone (3m).



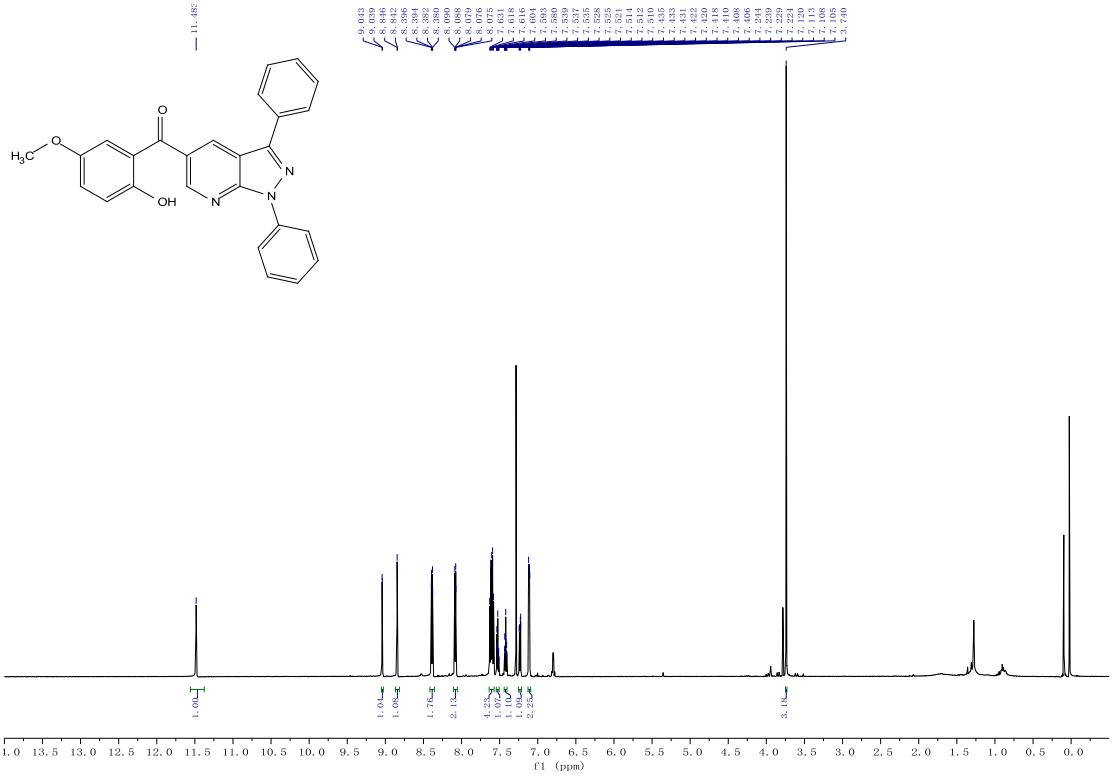


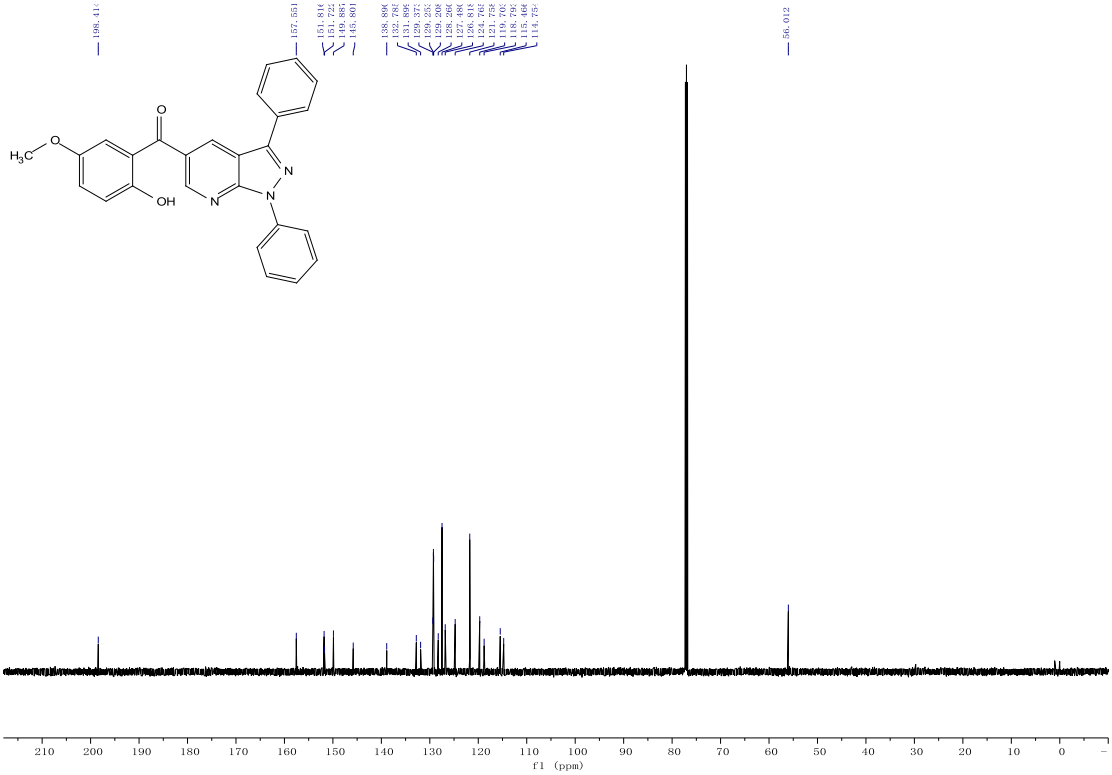
(2,4-dihydroxyphenyl)(1,3-diphenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)methanone (3n).



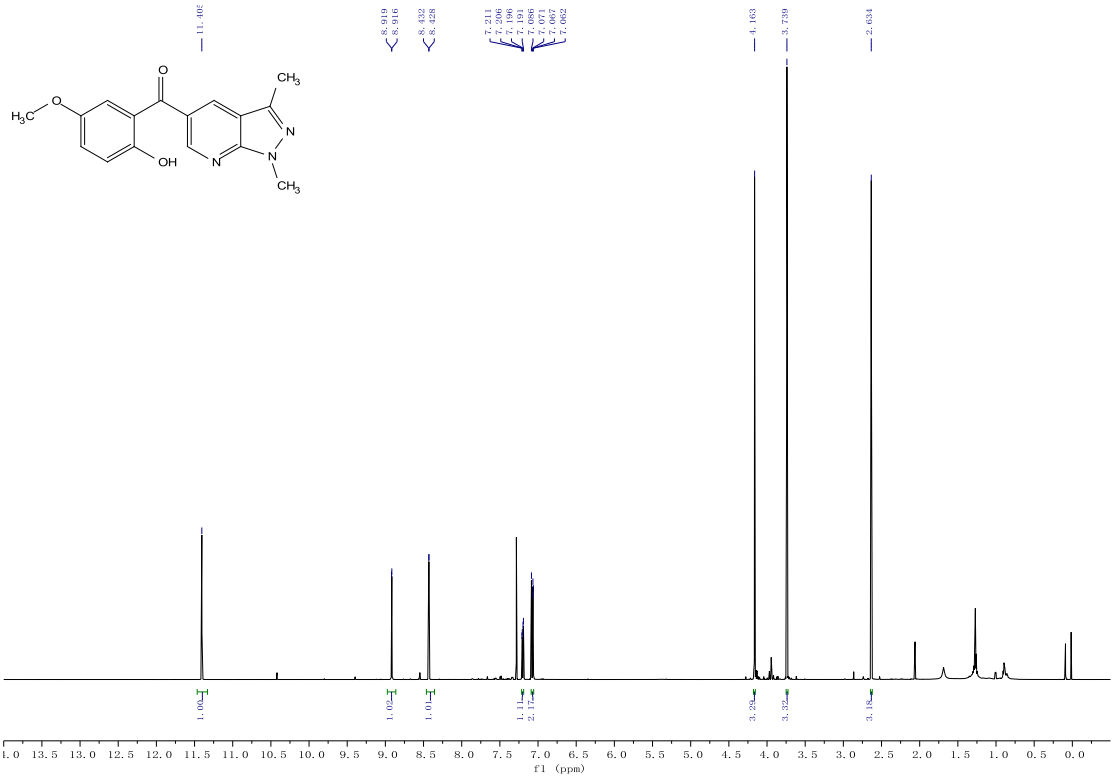


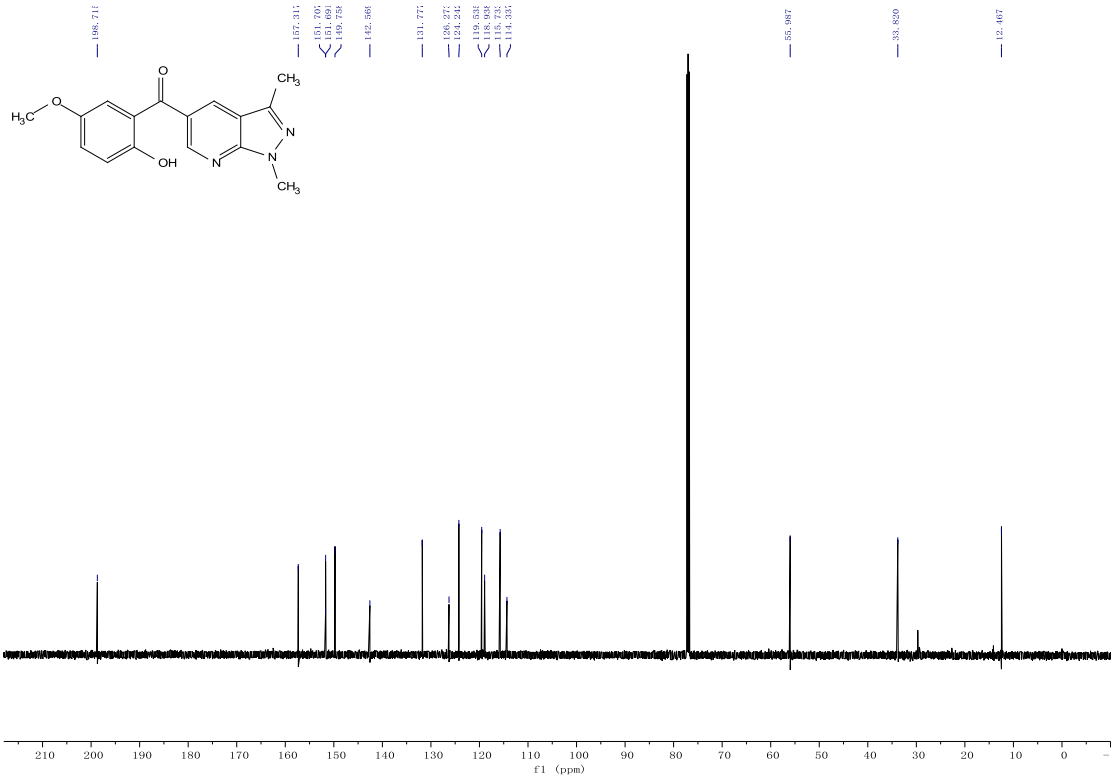
(1,3-diphenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxy-5-methoxyphenyl)methanone (3o).





(1,3-dimethyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxy-5-methoxyphenyl)methanone (3p).





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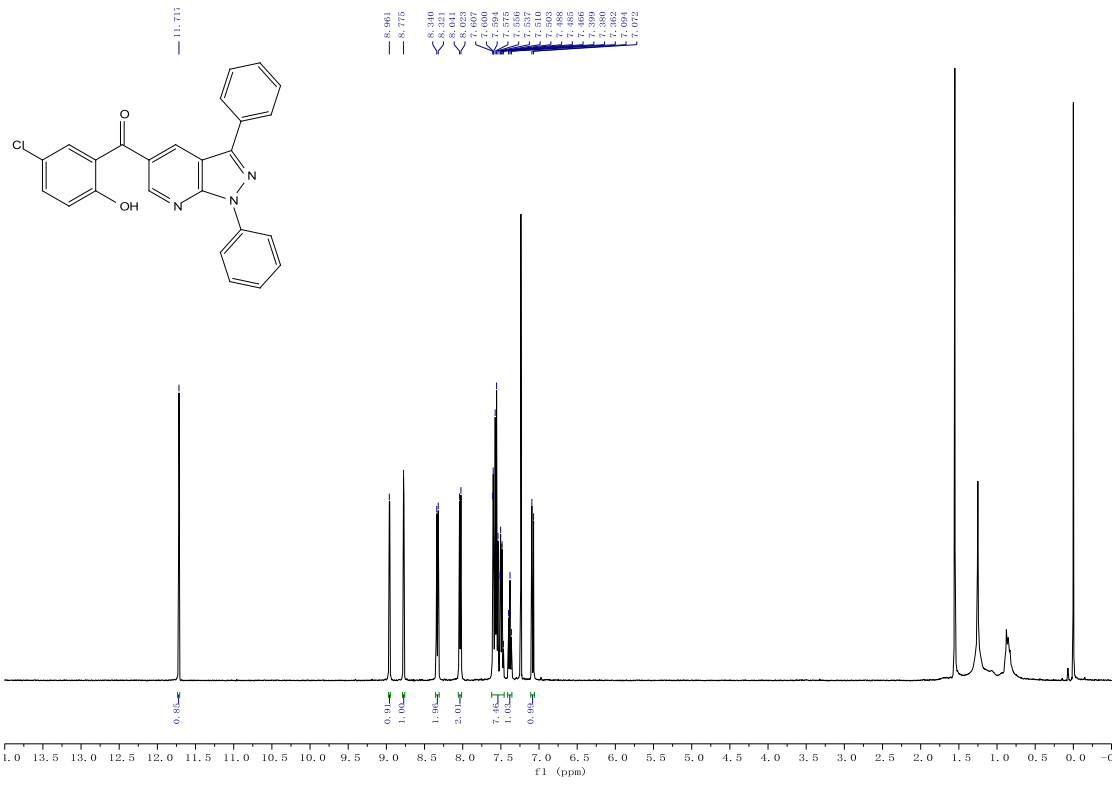
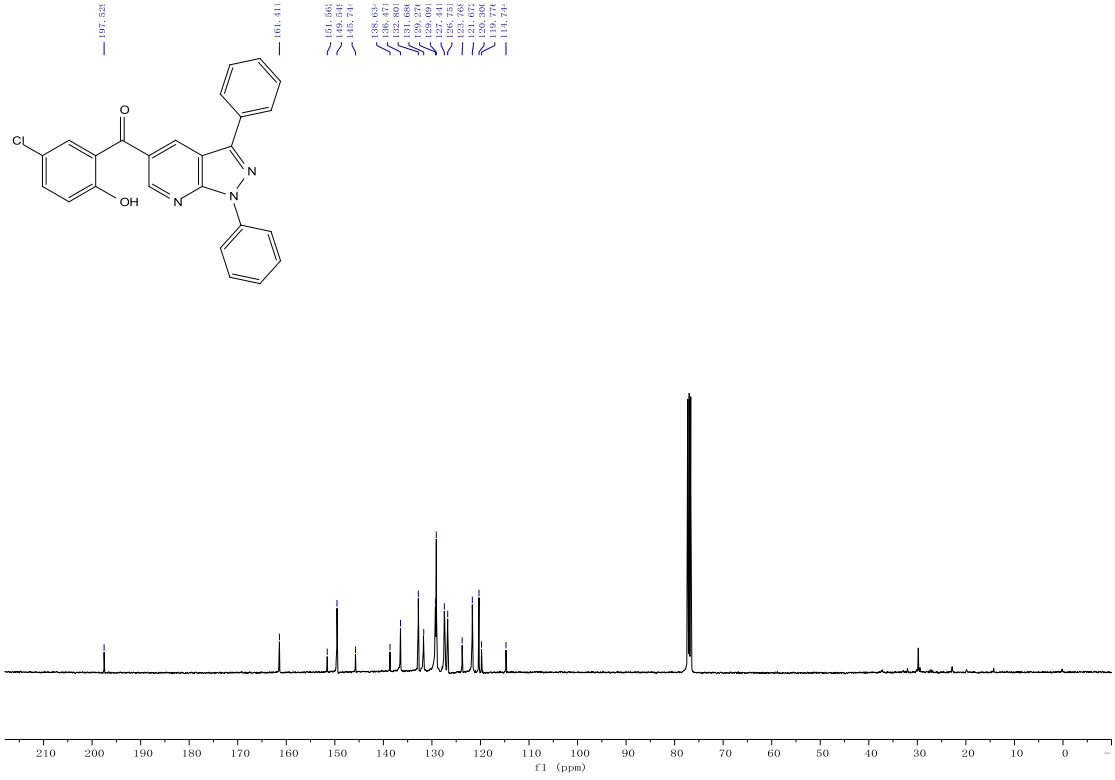
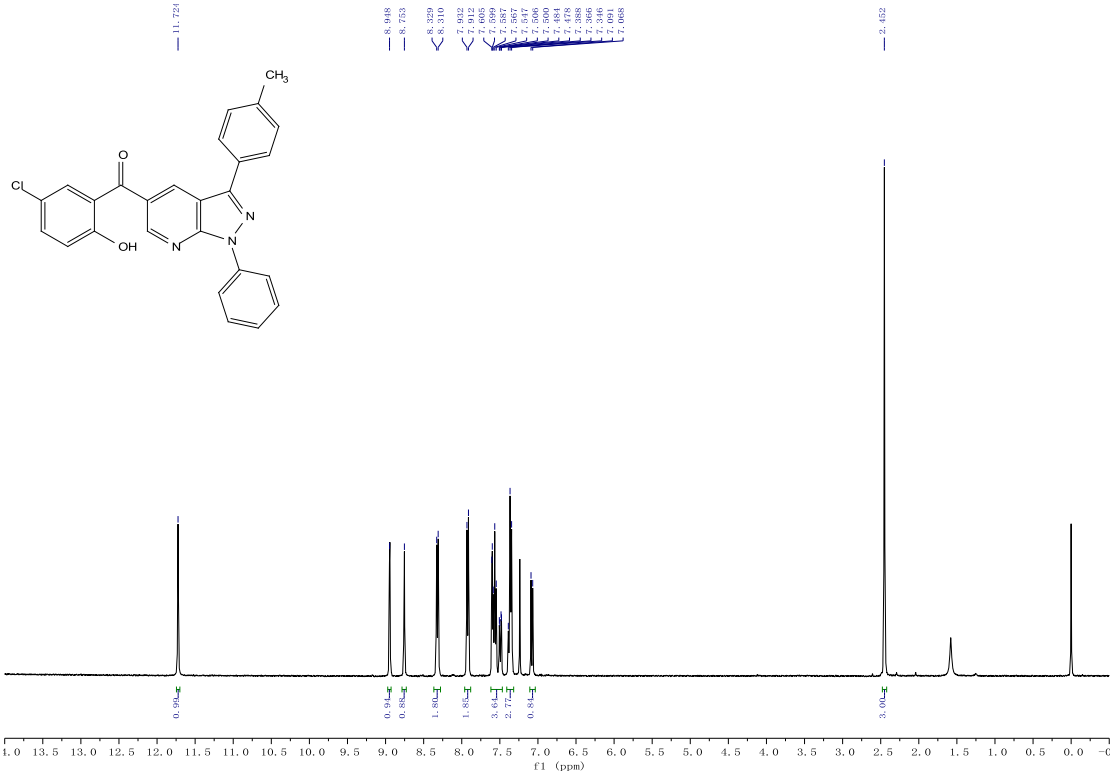
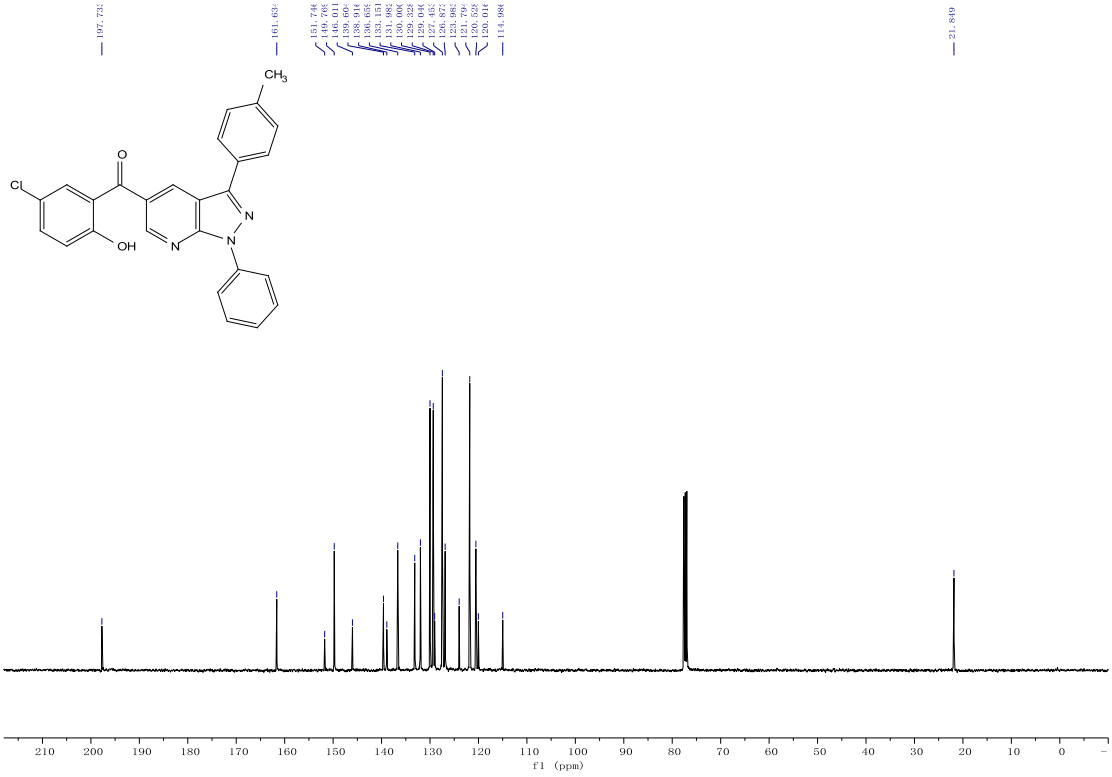




(5-chloro-2-hydroxyphenyl)(1-phenyl-3-(*p*-tolyl)-*1H*-pyrazolo[3,4-b]pyridin-5-yl)meth anone (3r).





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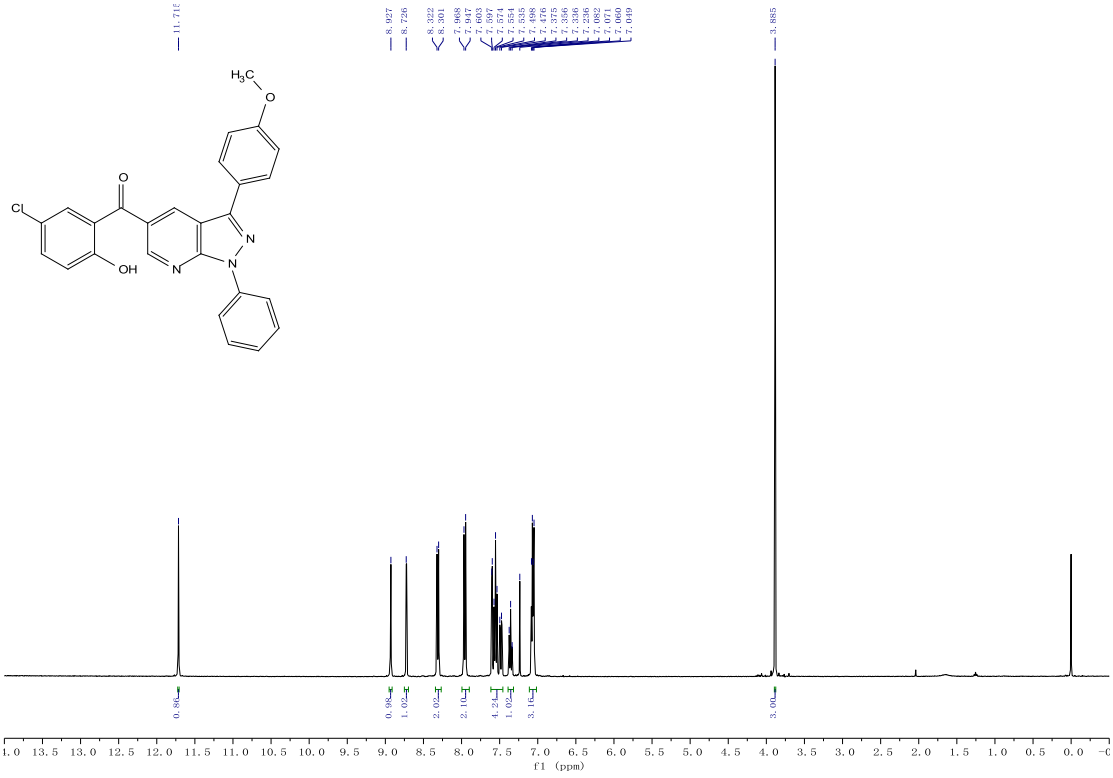
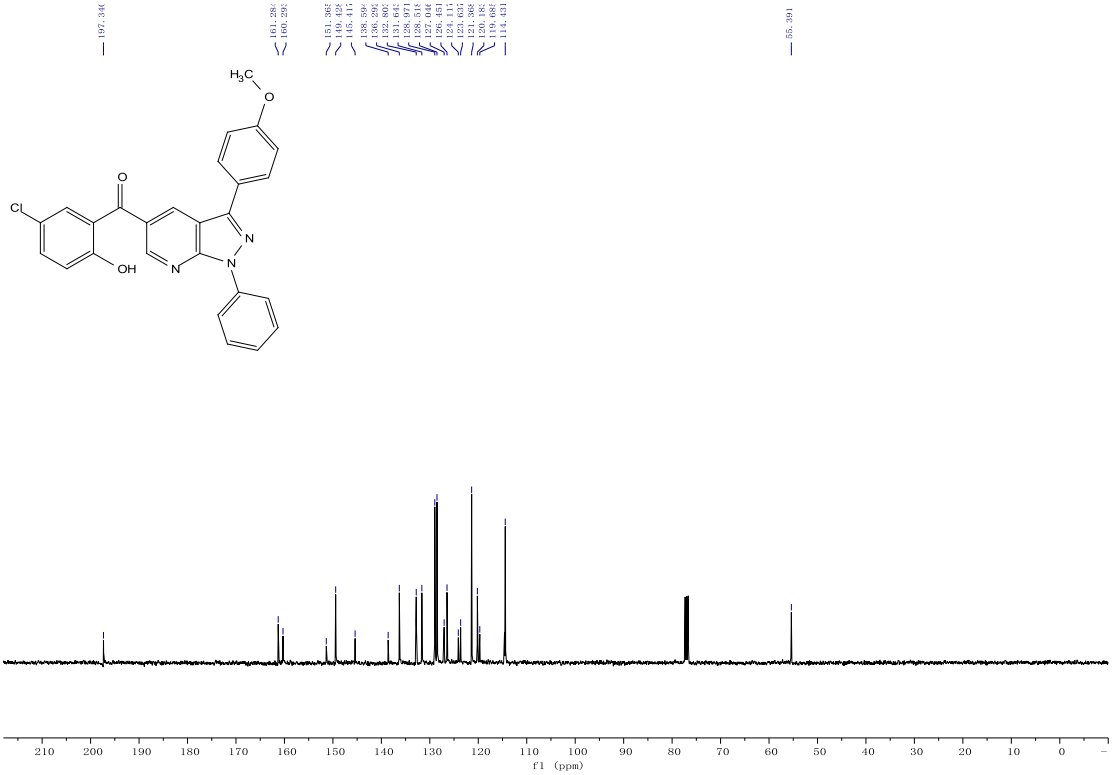
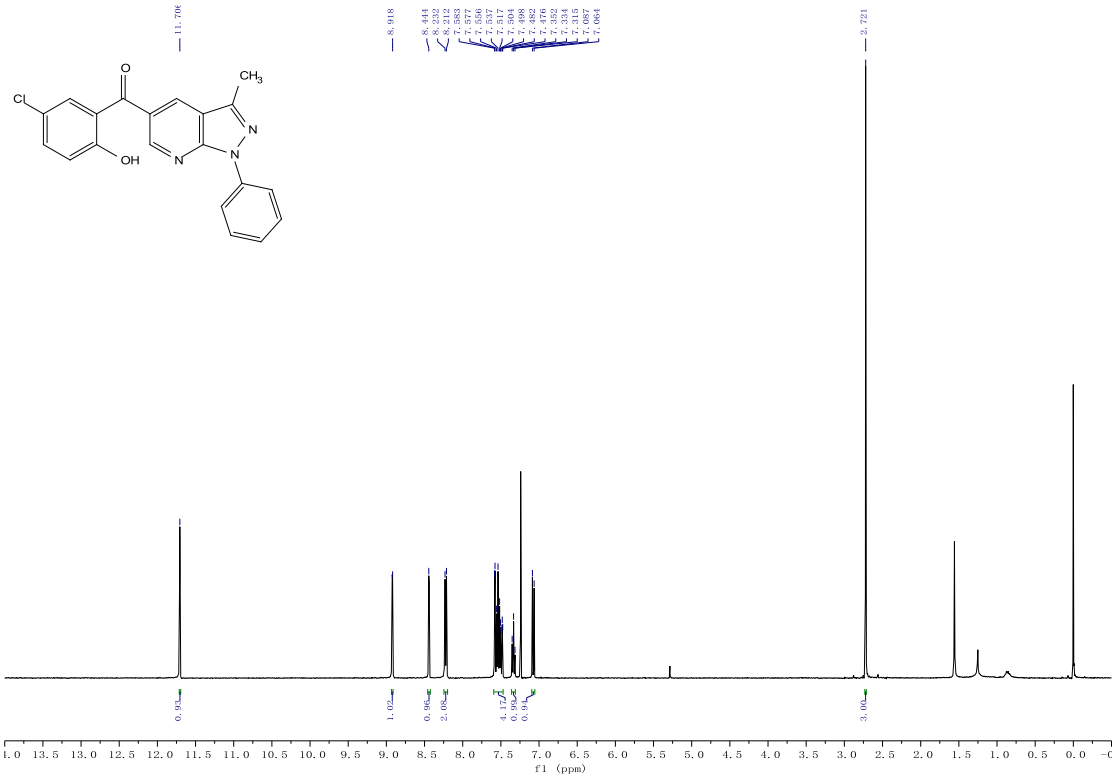
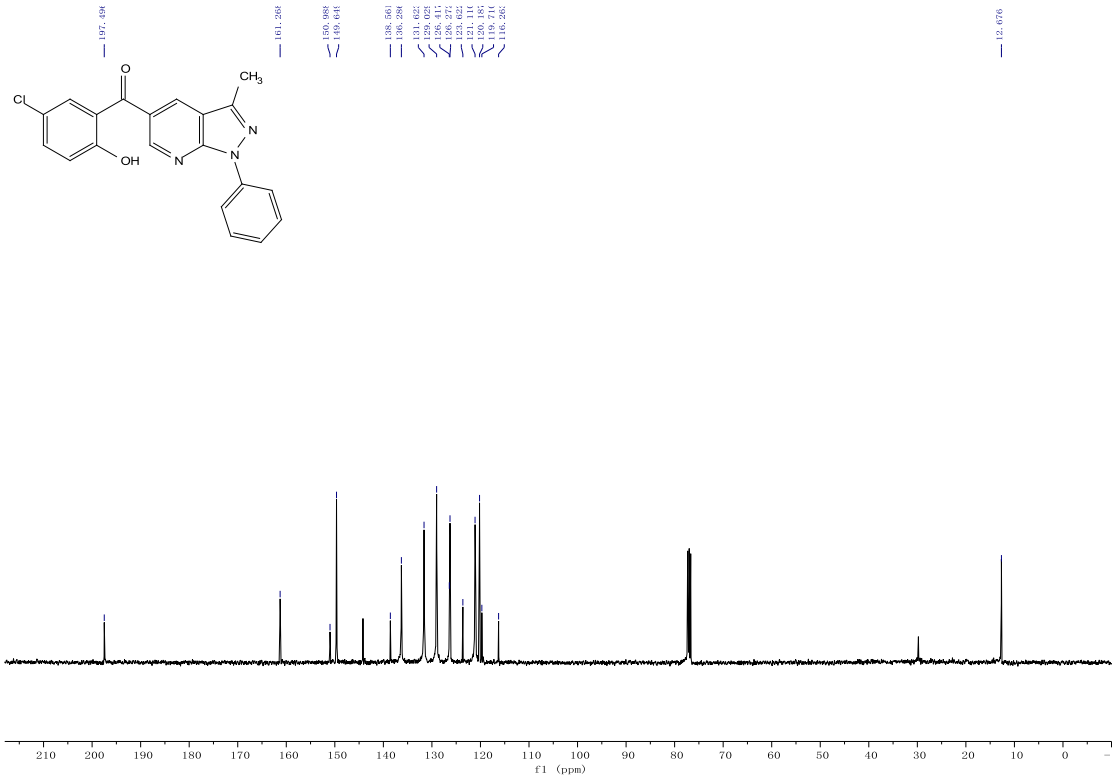




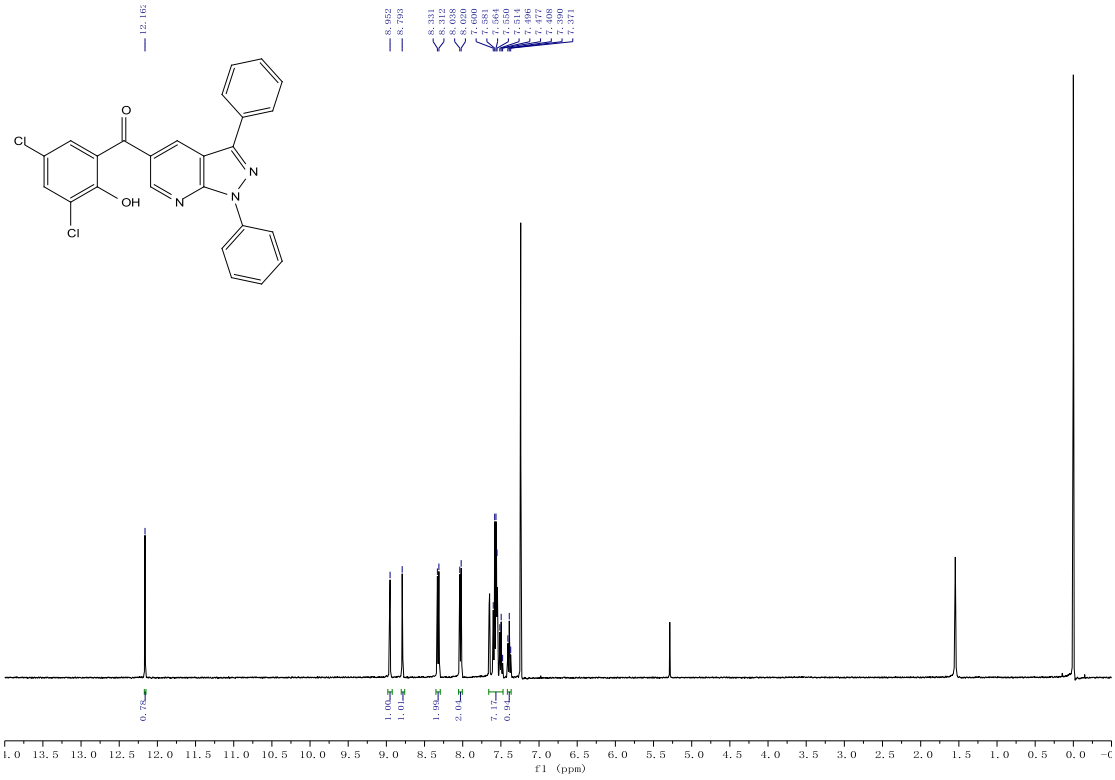
(5-chloro-2-hydroxyphenyl)(3-methyl-1-phenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)meth

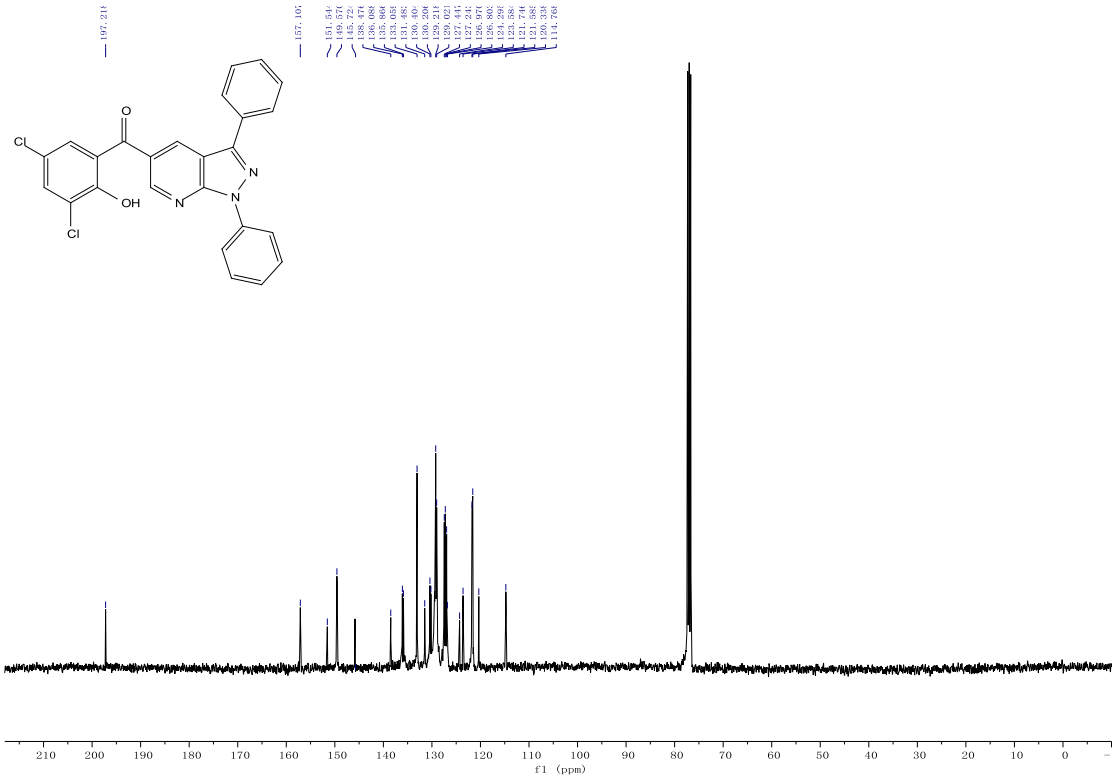
anone (3t).





(3,5-dichloro-2-hydroxyphenyl)(1,3-diphenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)methanone (3u).





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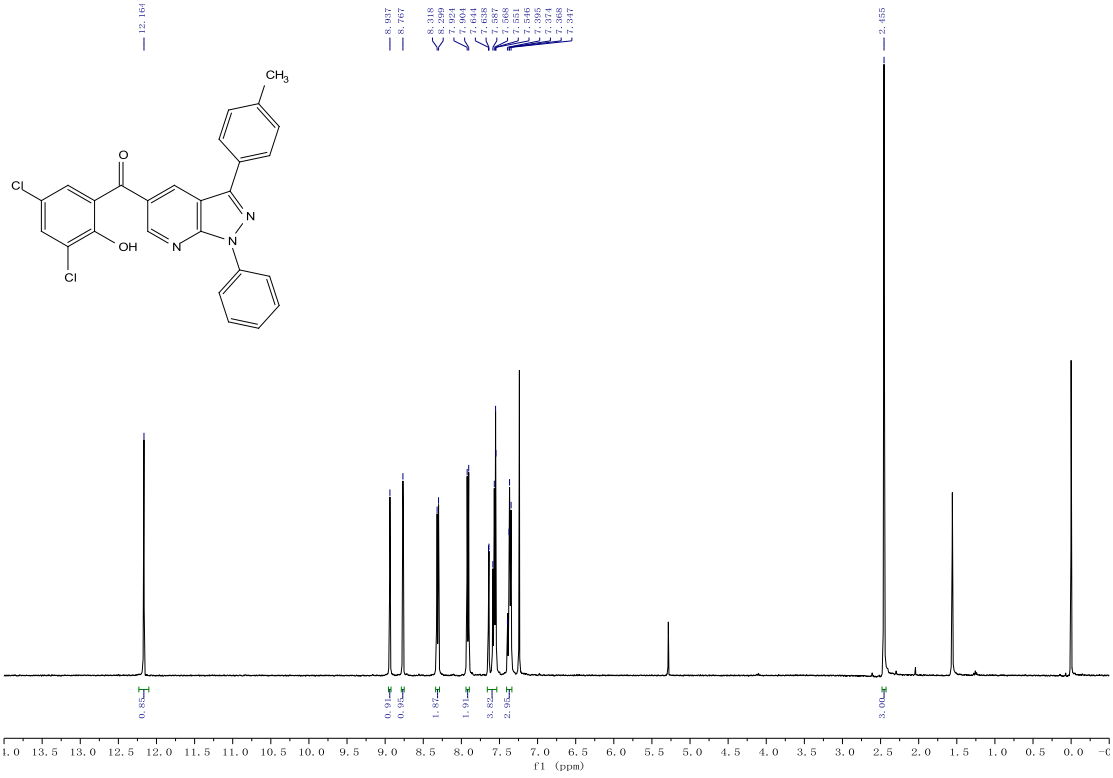

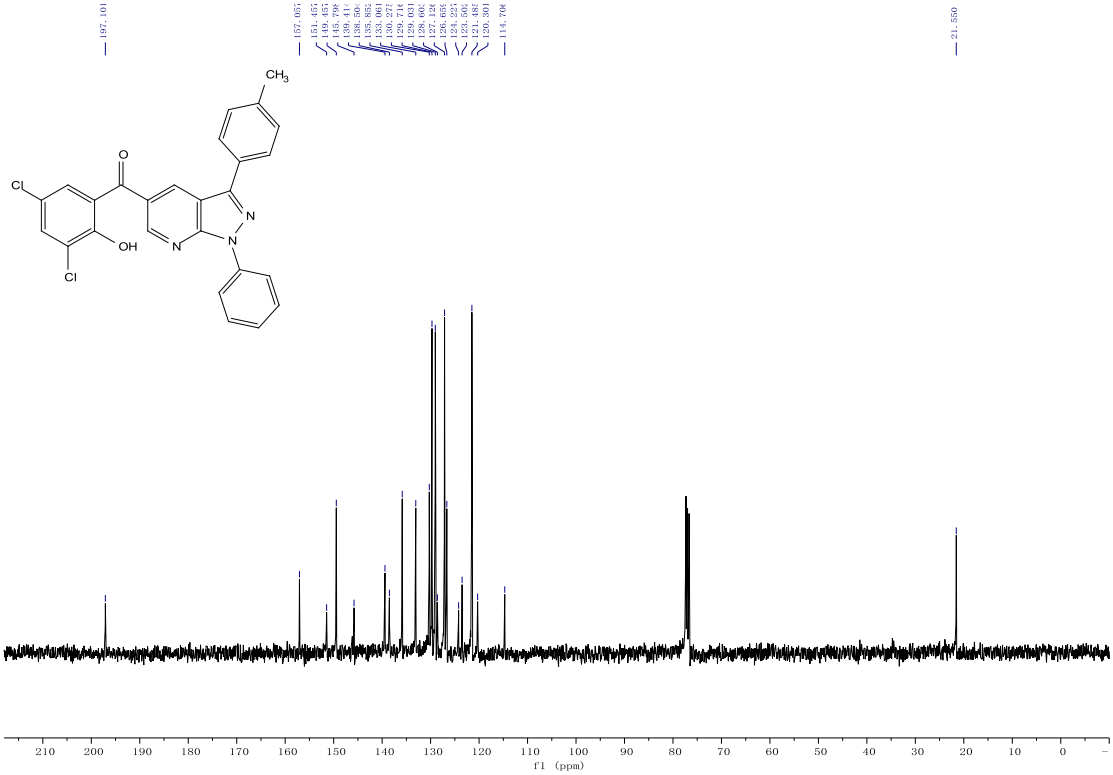

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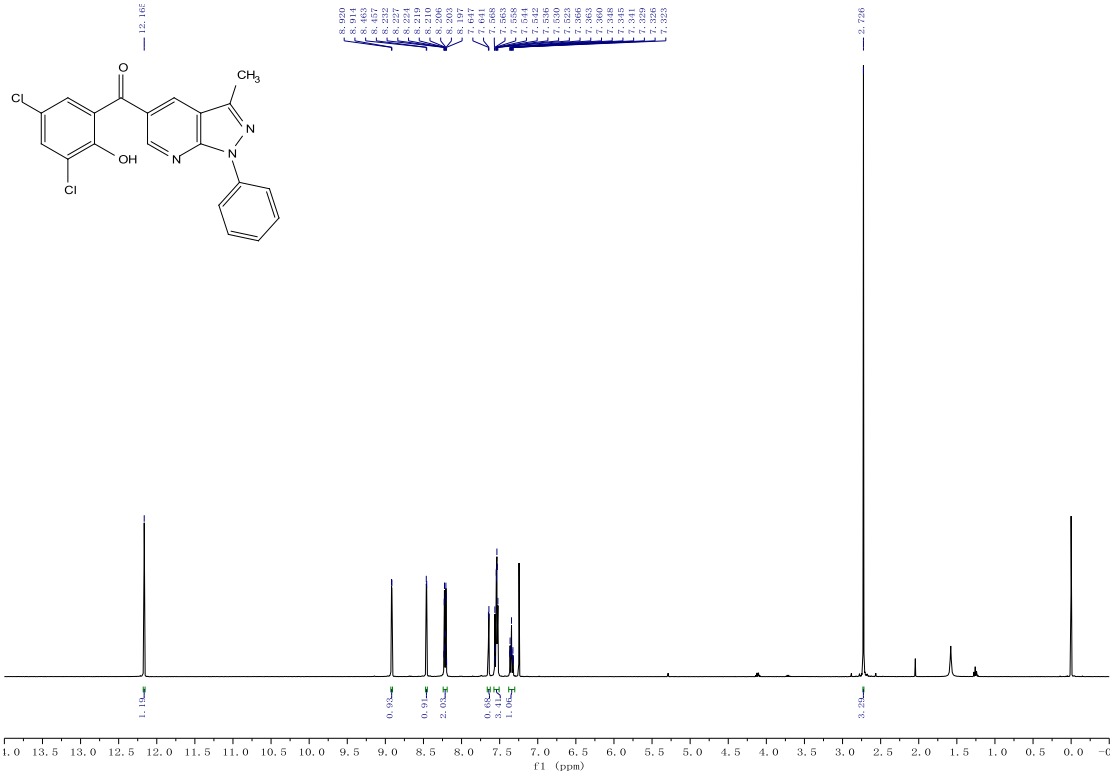
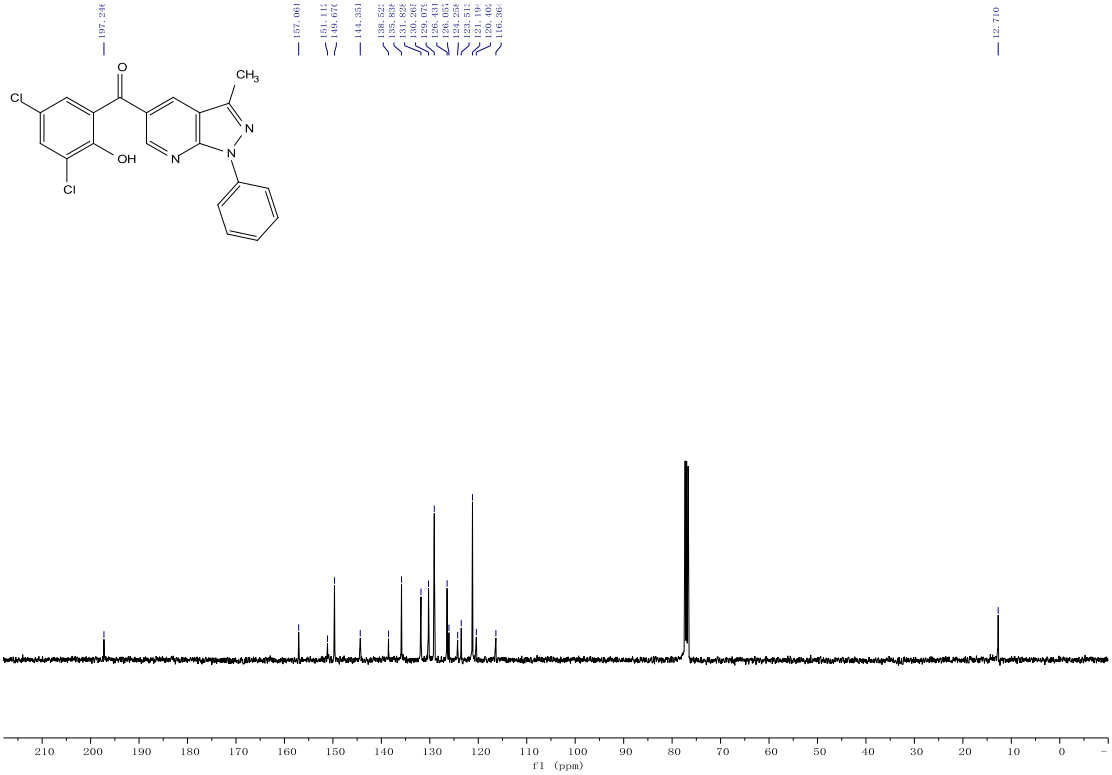
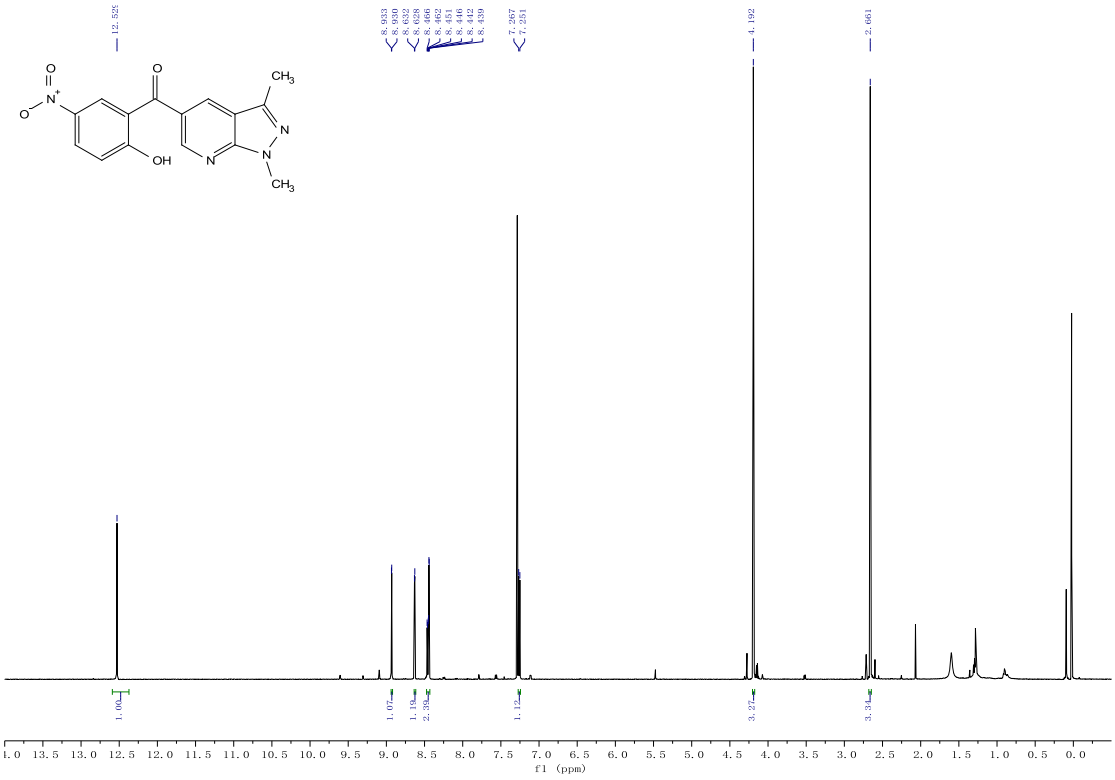
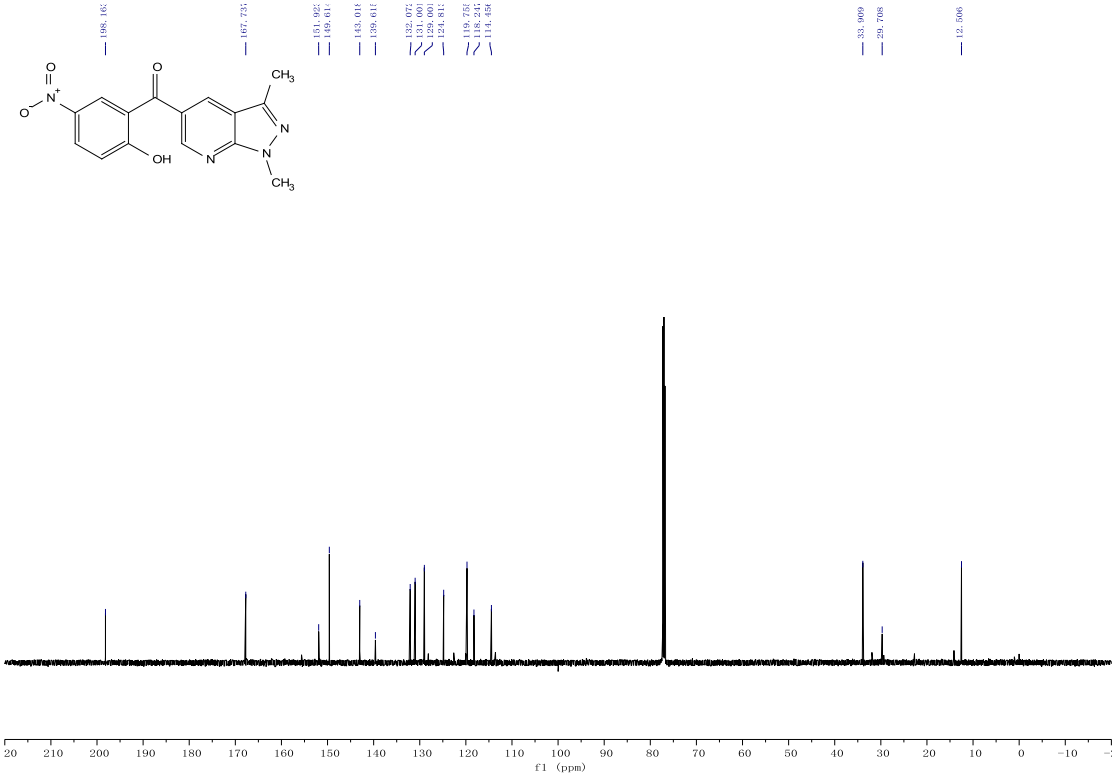




(1,3-dimethyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxy-5-nitrophenyl)methanone

(3x)





(1,3-diphenyl-*1H*-pyrazolo[3,4-*b*]pyridin-5-yl)(2-hydroxy-5-nitrophenyl)methanone (3y).