

Supporting information

An environmentally benign and efficient synthesis of substituted benzothiazole-2-thiol, benzoxazole-2-thiol, benzimidazoline-2-thione in water

Xing Liu, Min Liu, Wan Xu, Meng-Tian Zeng, Hui Zhu, Cai-Zhu Chang, Zhi-Bing

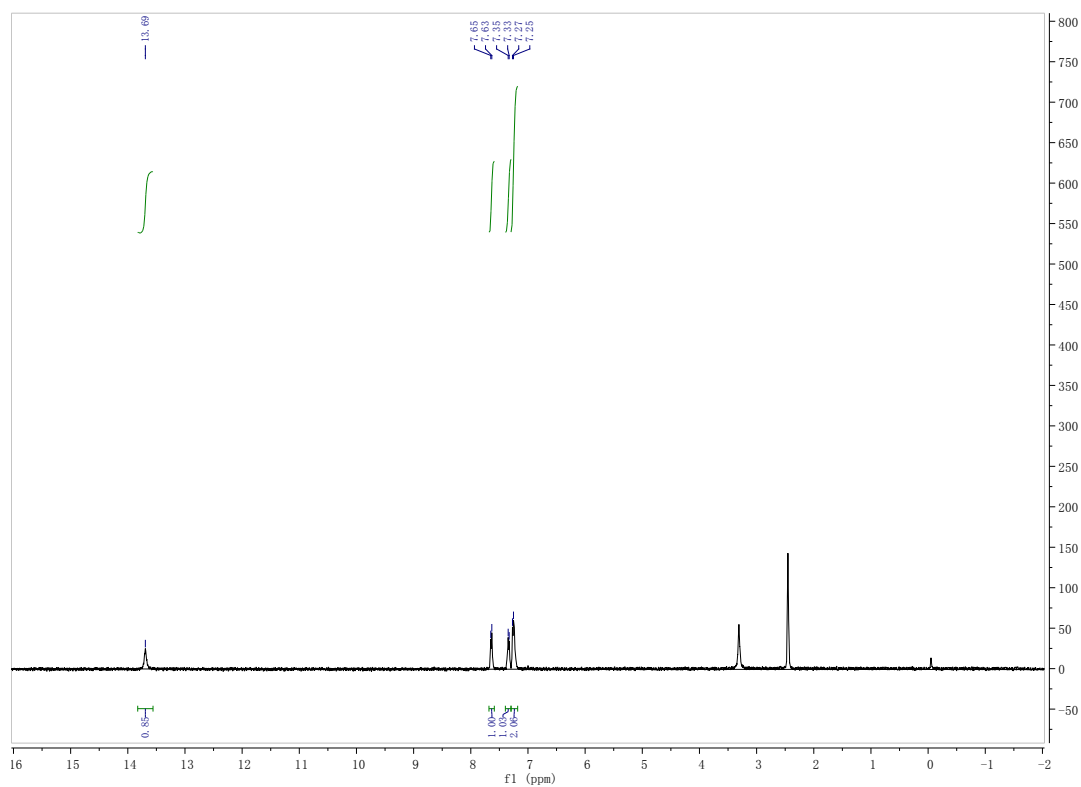
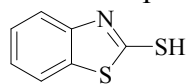
Dong*

School of Chemistry and Environmental Engineering, Wuhan Institute of Technology,
Wuhan 430205, China

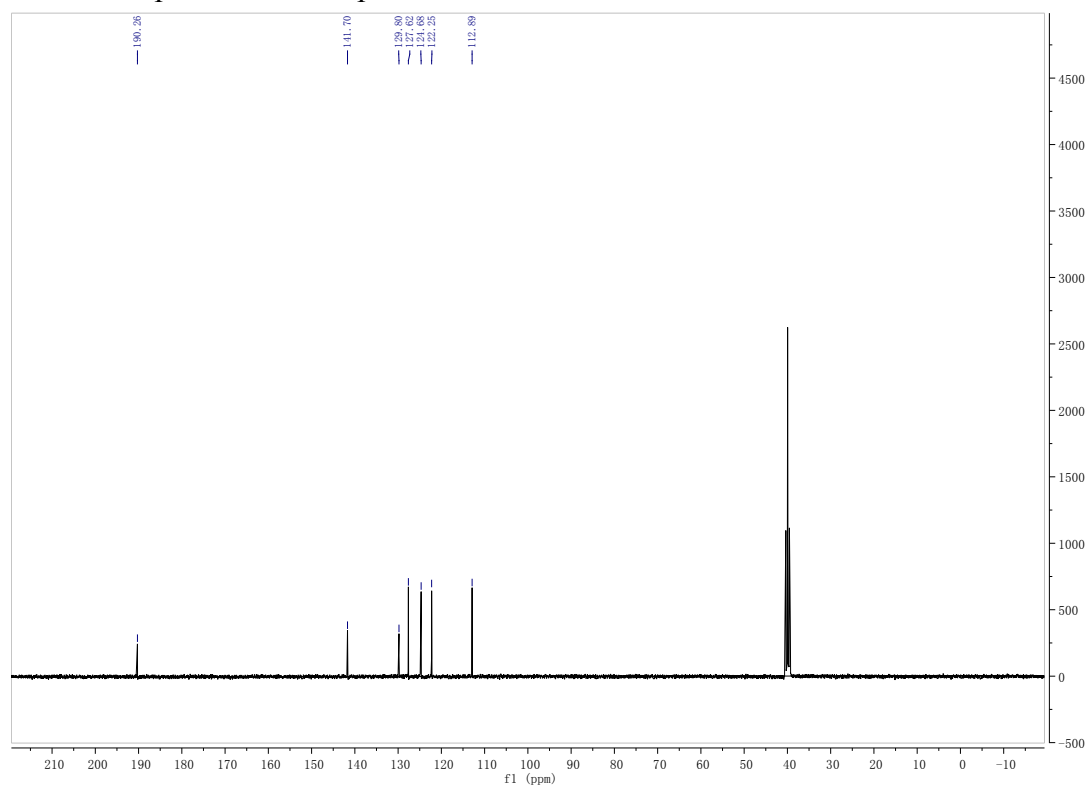
E-mail: dz04982@wit.edu.cn

^1H and ^{13}C -NMR spectra of compounds 3a-3z, 3za-3ze

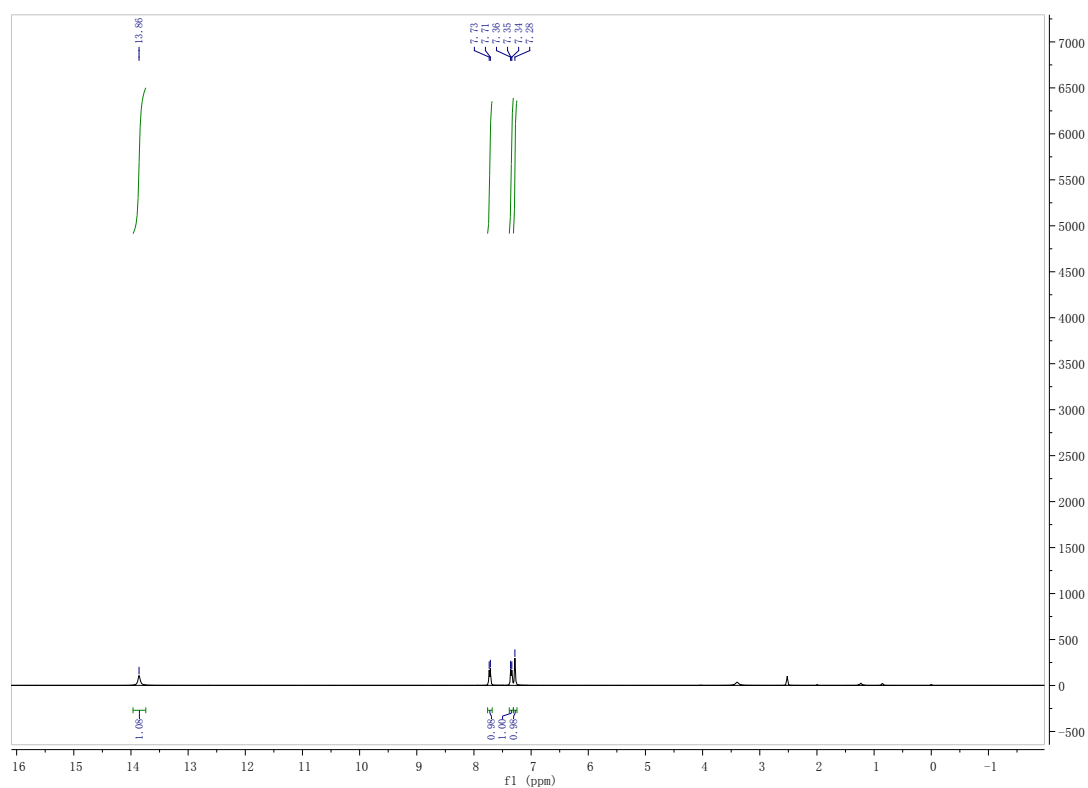
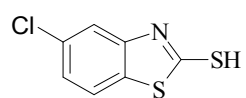
¹H NMR spectrum of compound **3a**



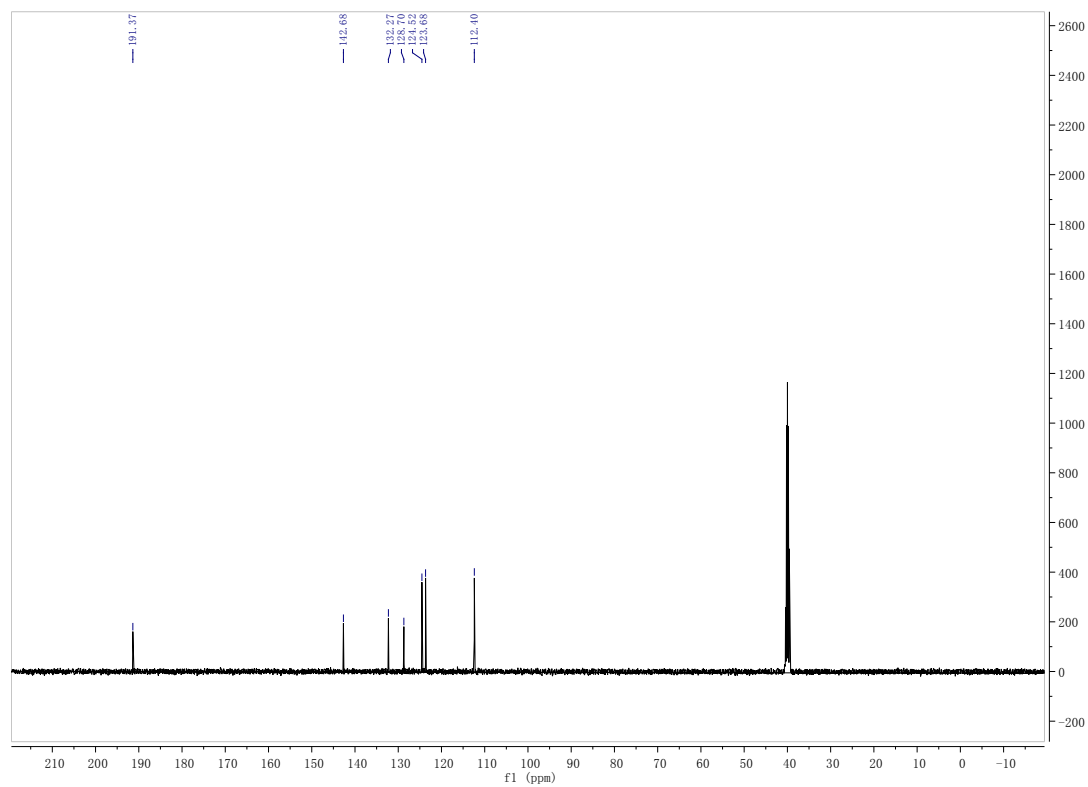
¹³C NMR spectrum of compound **3a**



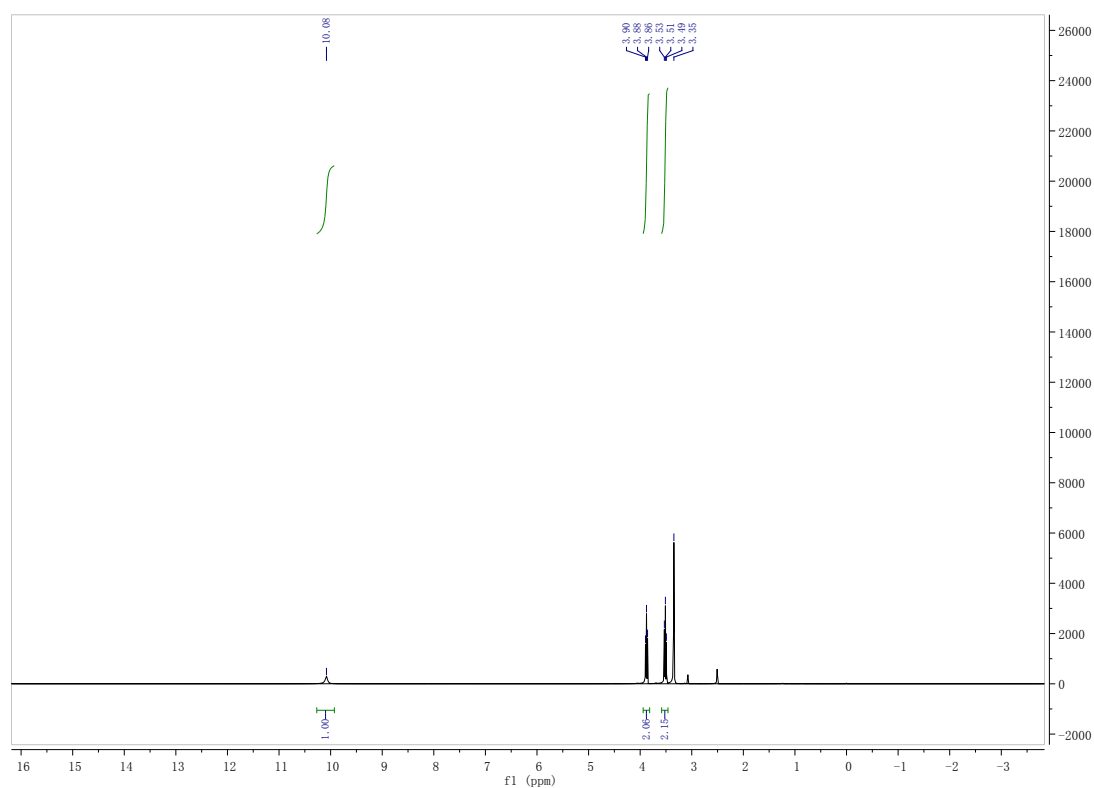
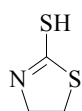
¹H NMR spectrum of compound **3b**



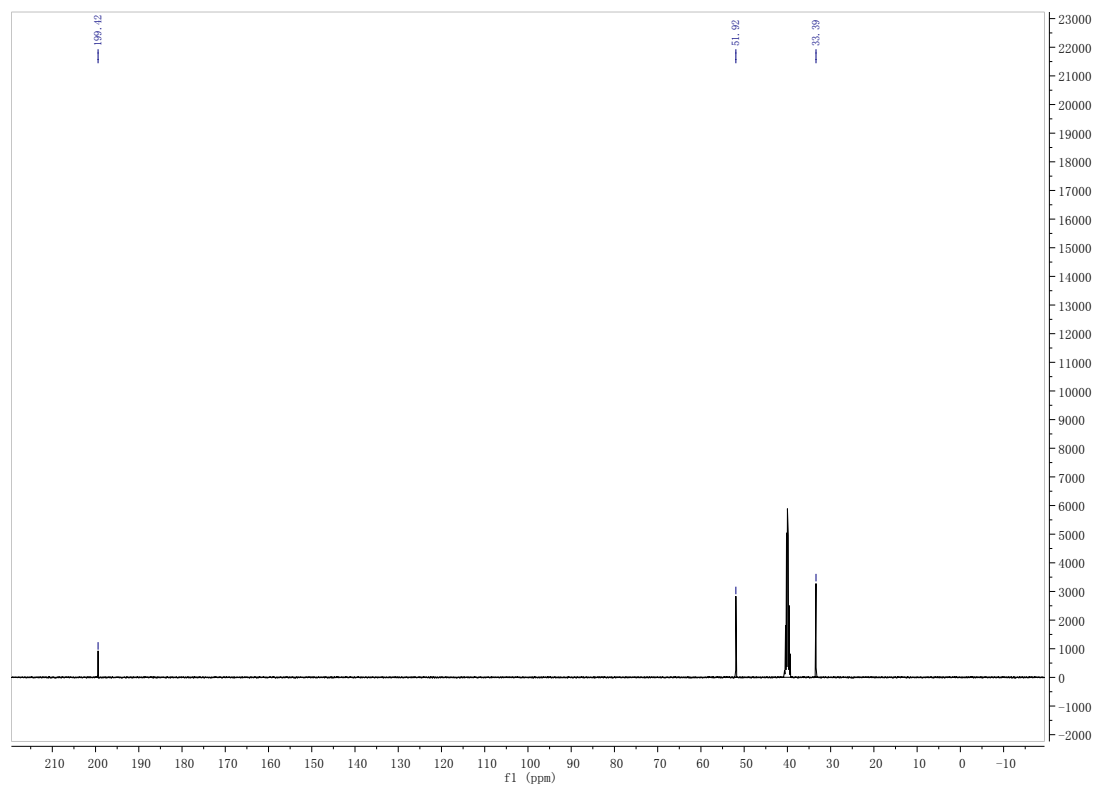
¹³C NMR spectrum of compound **3b**



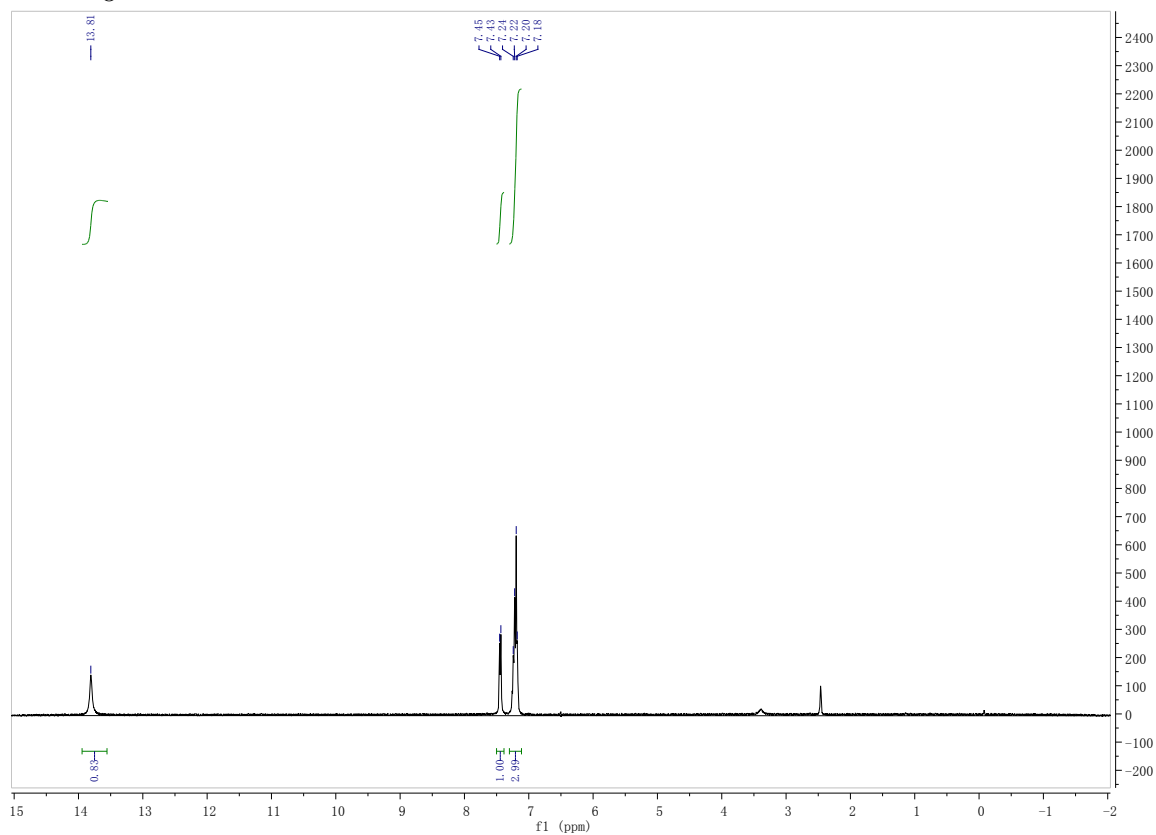
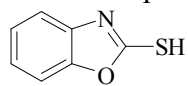
¹H NMR spectrum of compound **3c**



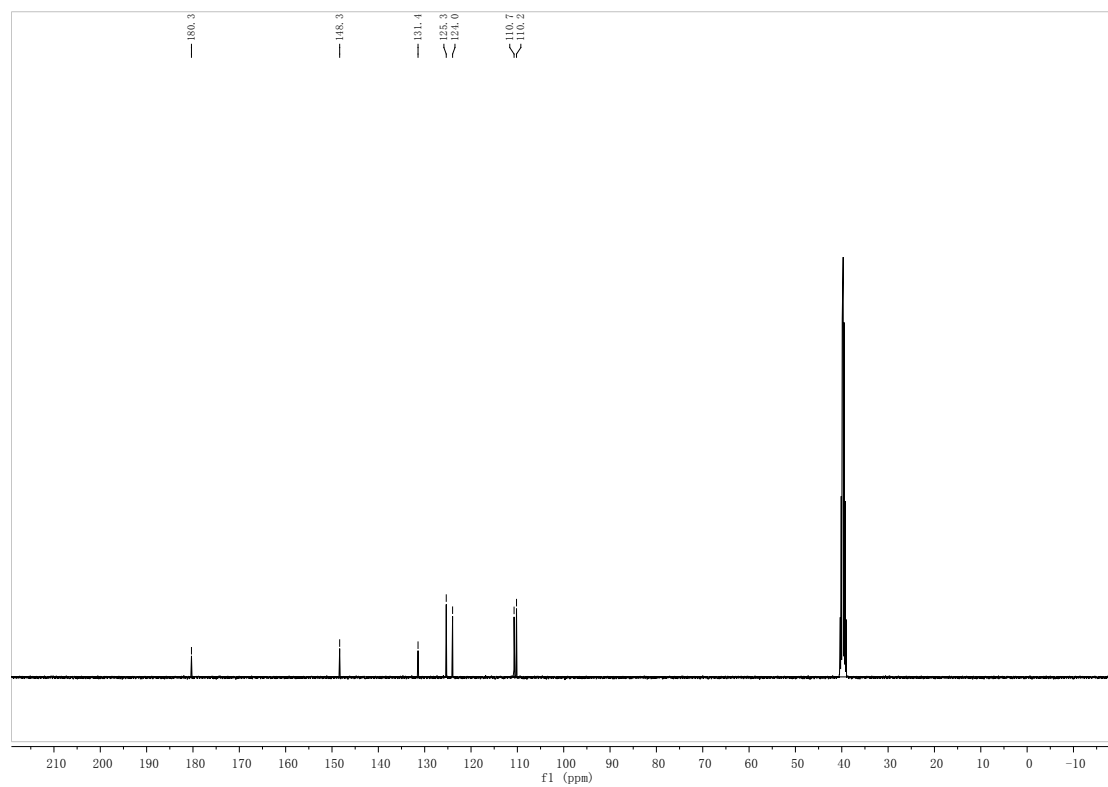
¹³C NMR spectrum of compound **3c**



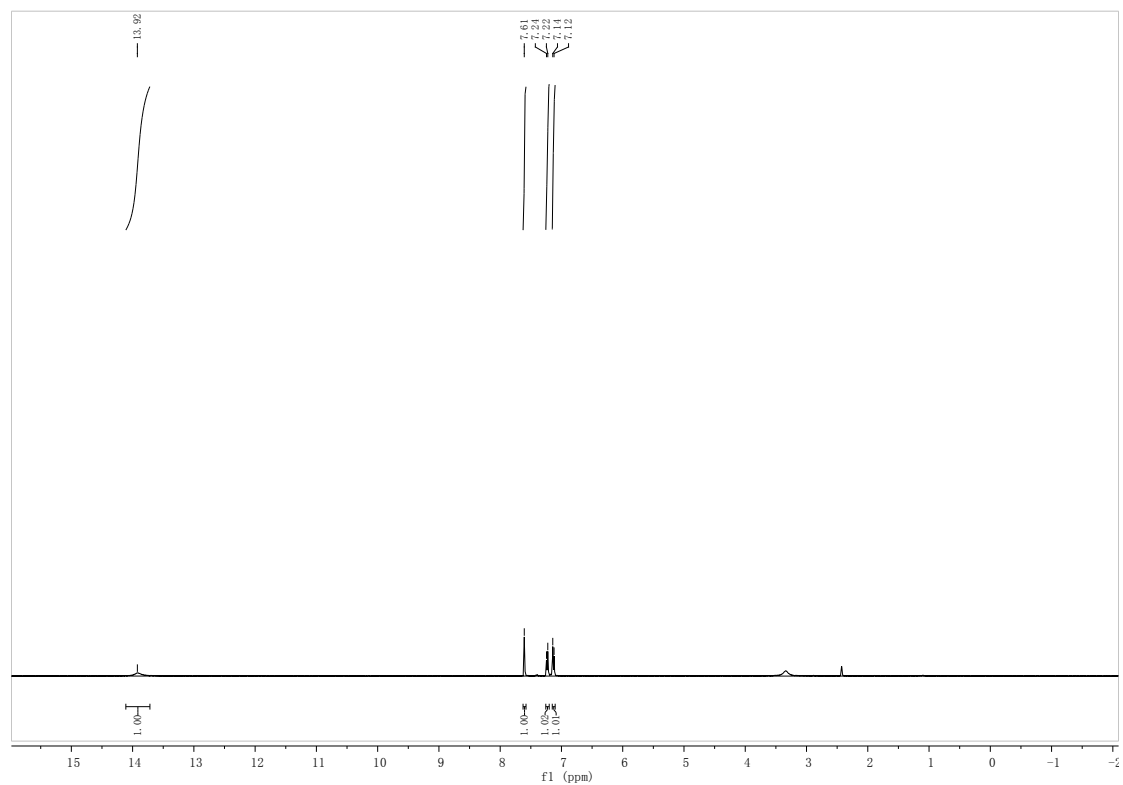
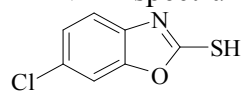
¹H NMR spectrum of compound **3d**



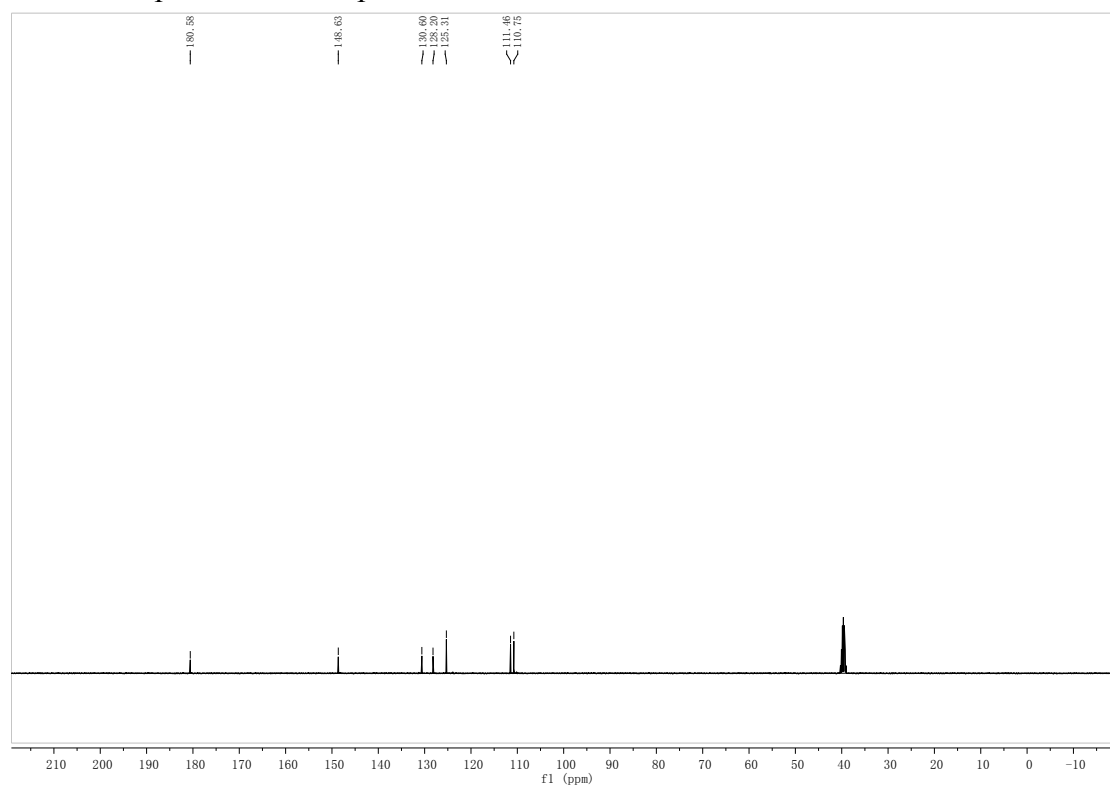
¹³C NMR spectrum of compound **3d**



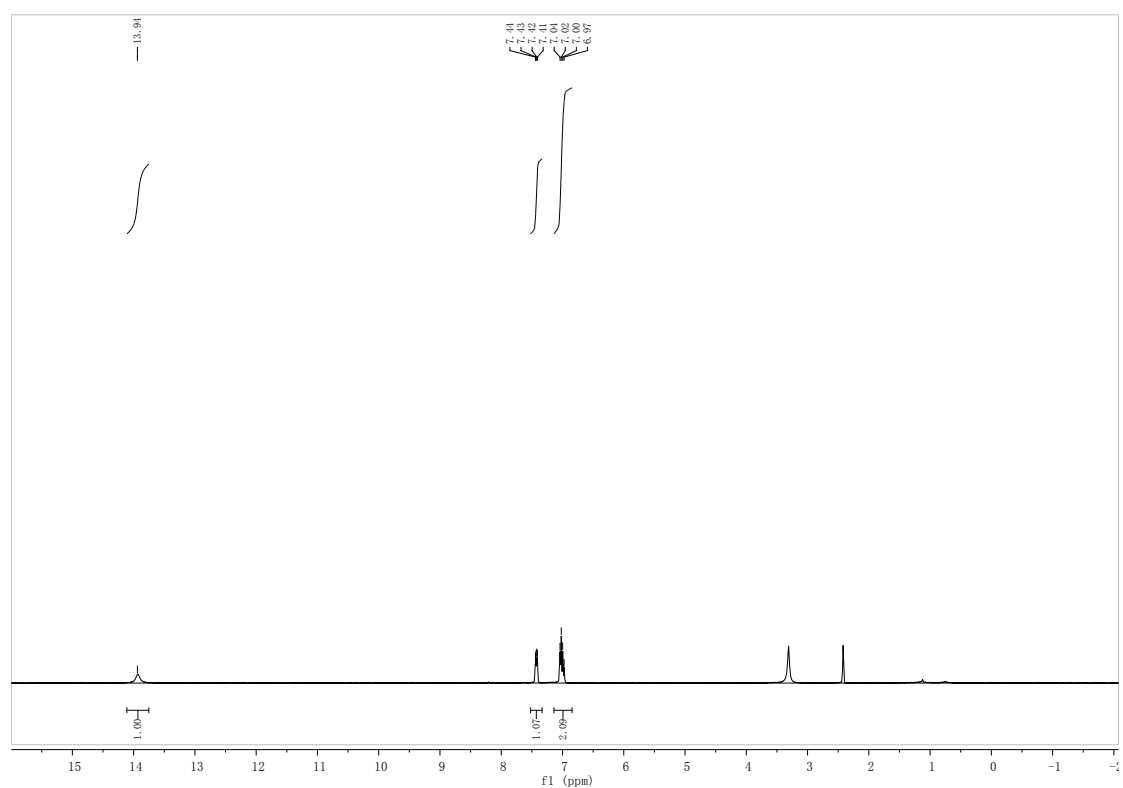
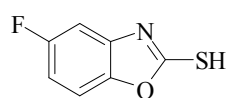
¹H NMR spectrum of compound **3e**



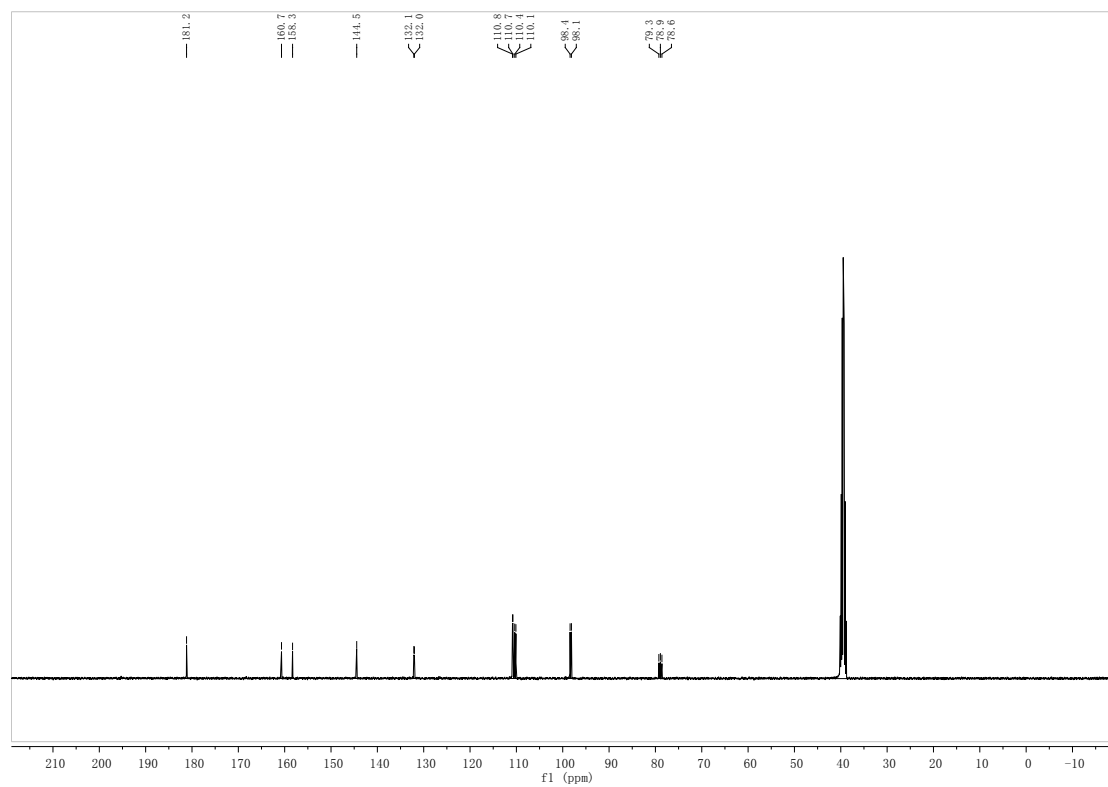
¹³C NMR spectrum of compound **3e**



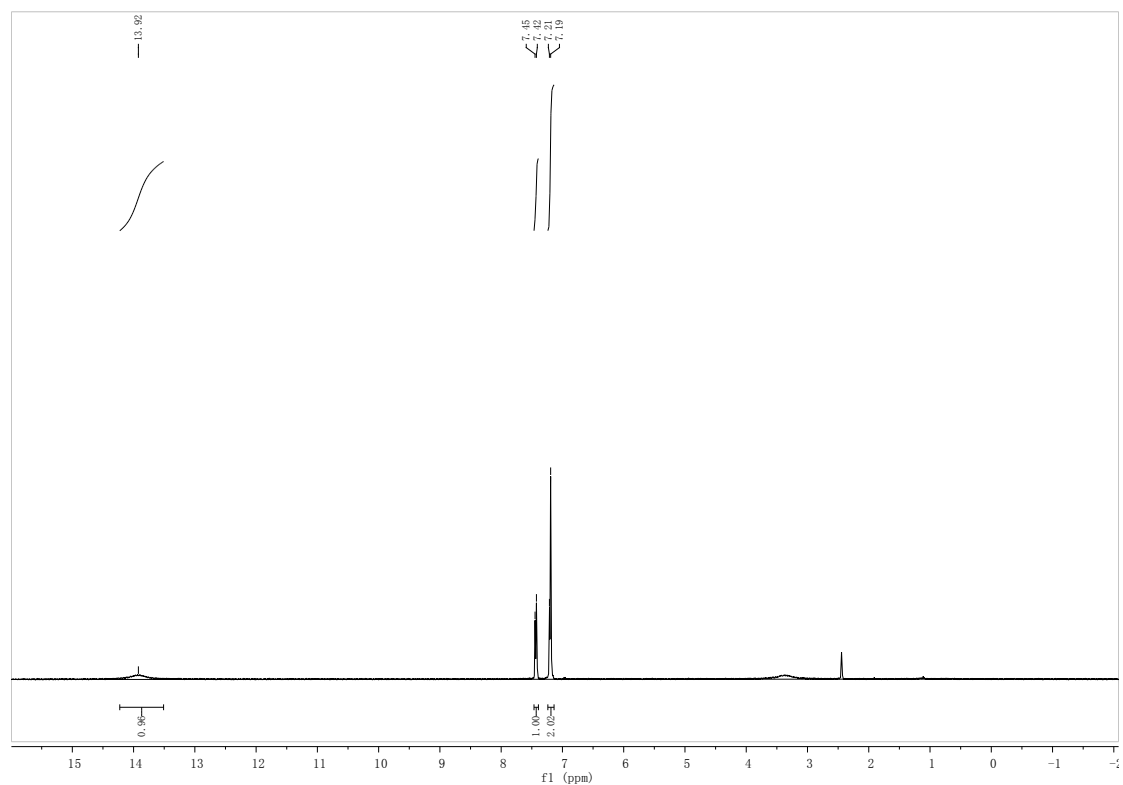
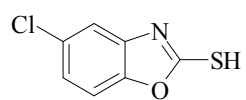
¹H NMR spectrum of compound **3f**



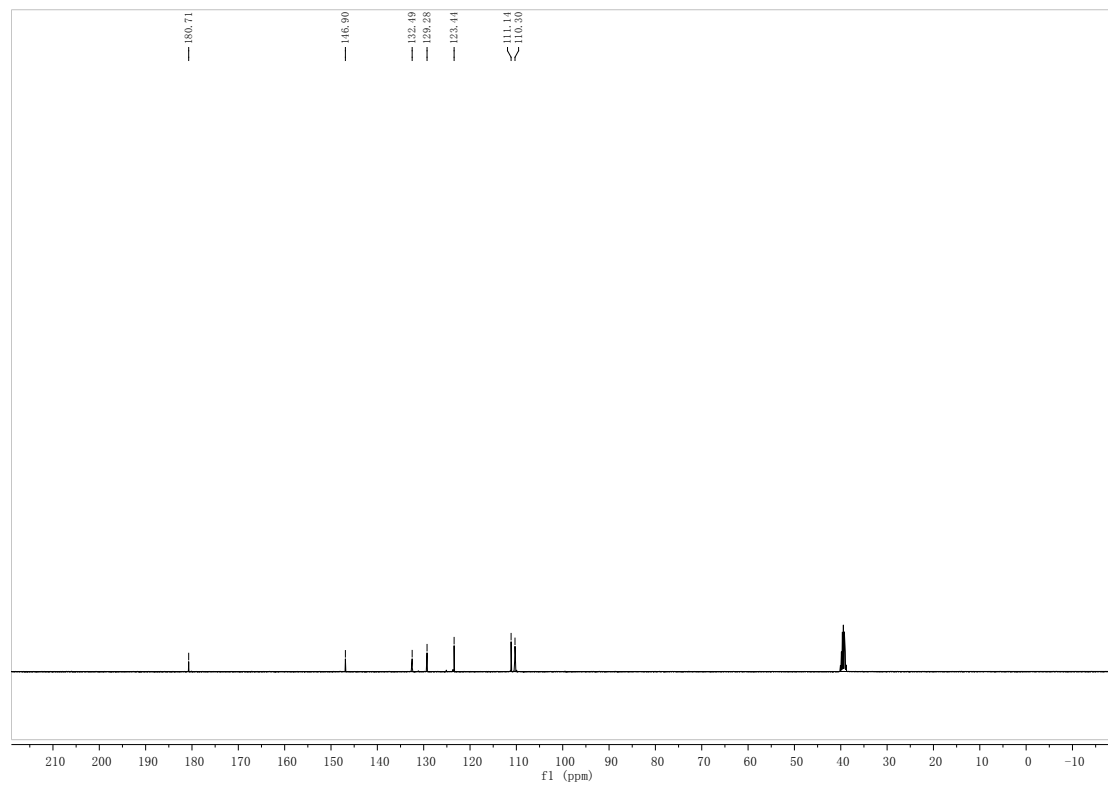
¹³C NMR spectrum of compound **3f**



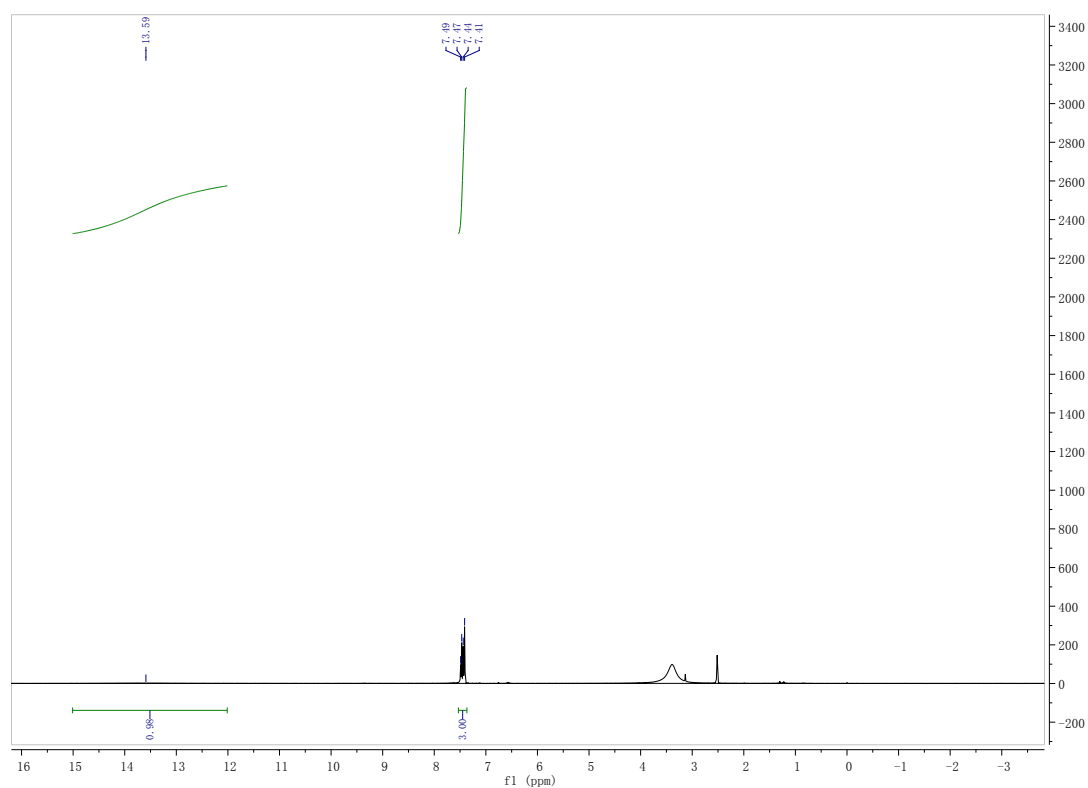
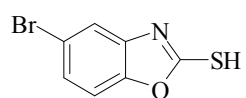
¹H NMR spectrum of compound **3g**



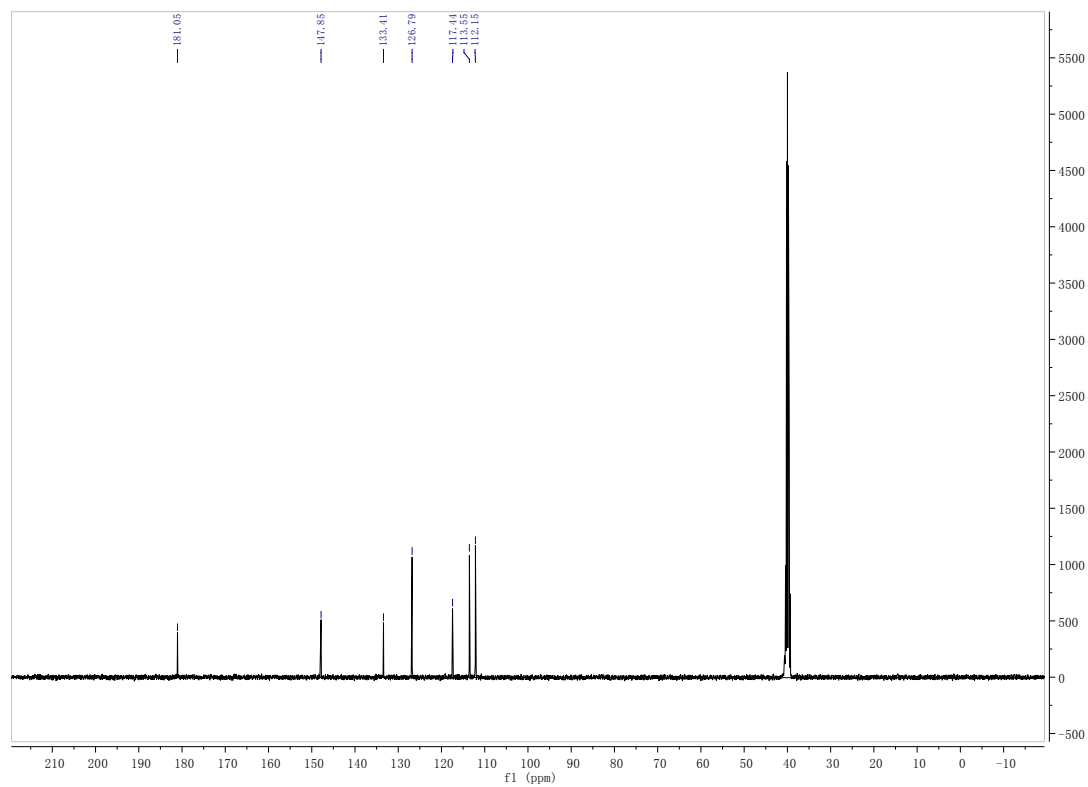
¹³C NMR spectrum of compound **3g**



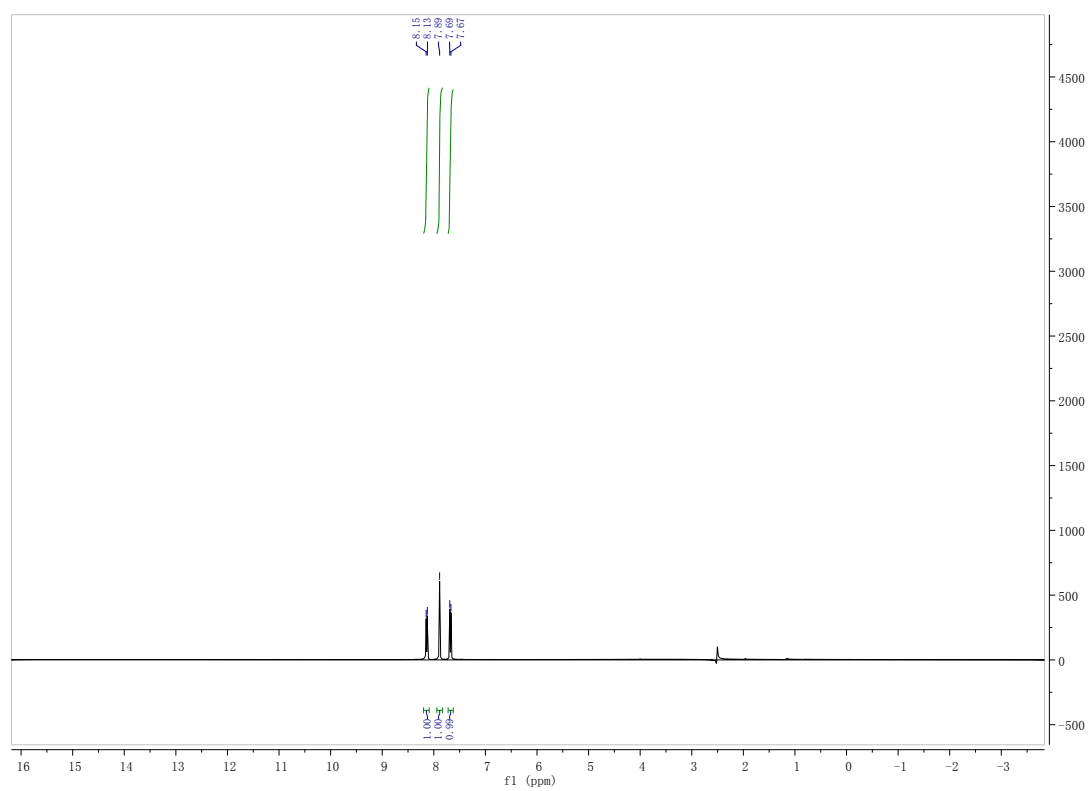
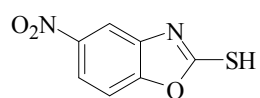
¹H NMR spectrum of compound **3h**



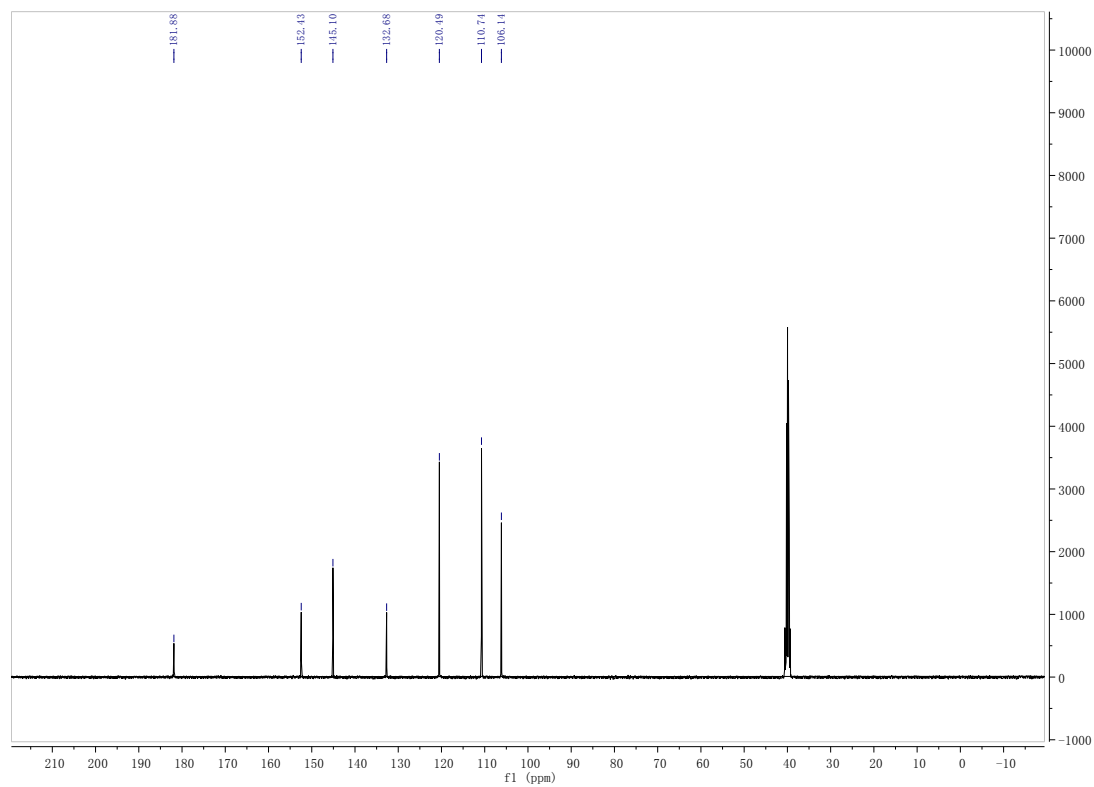
¹³C NMR spectrum of compound **3h**



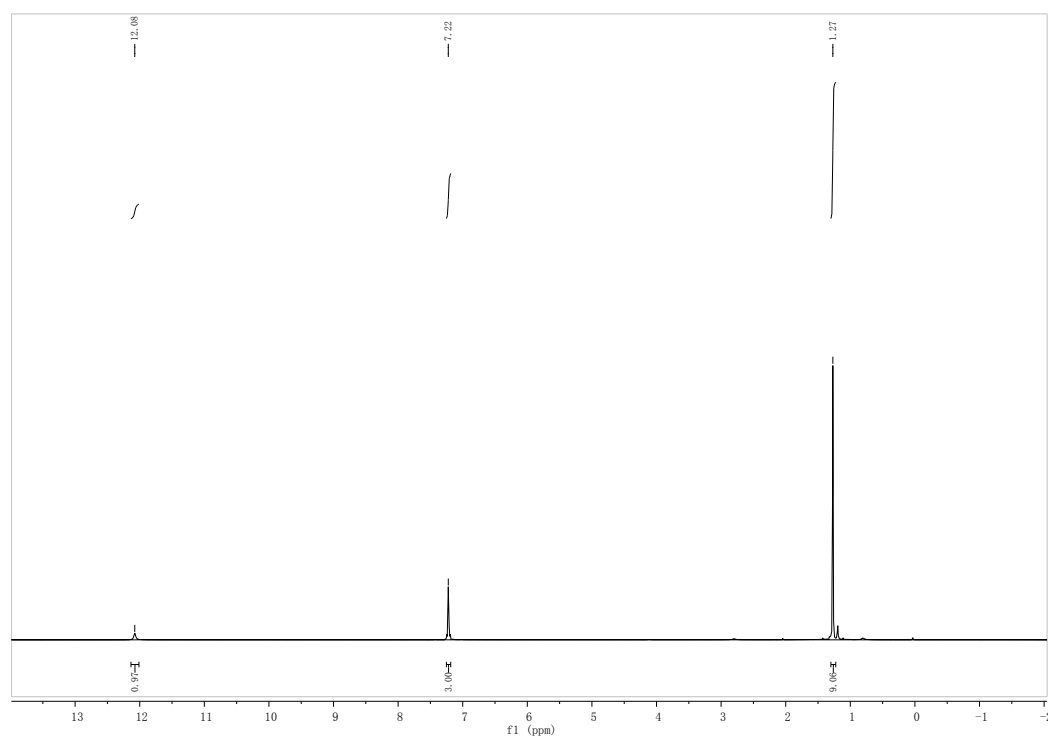
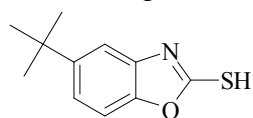
¹H NMR spectrum of compound **3i**



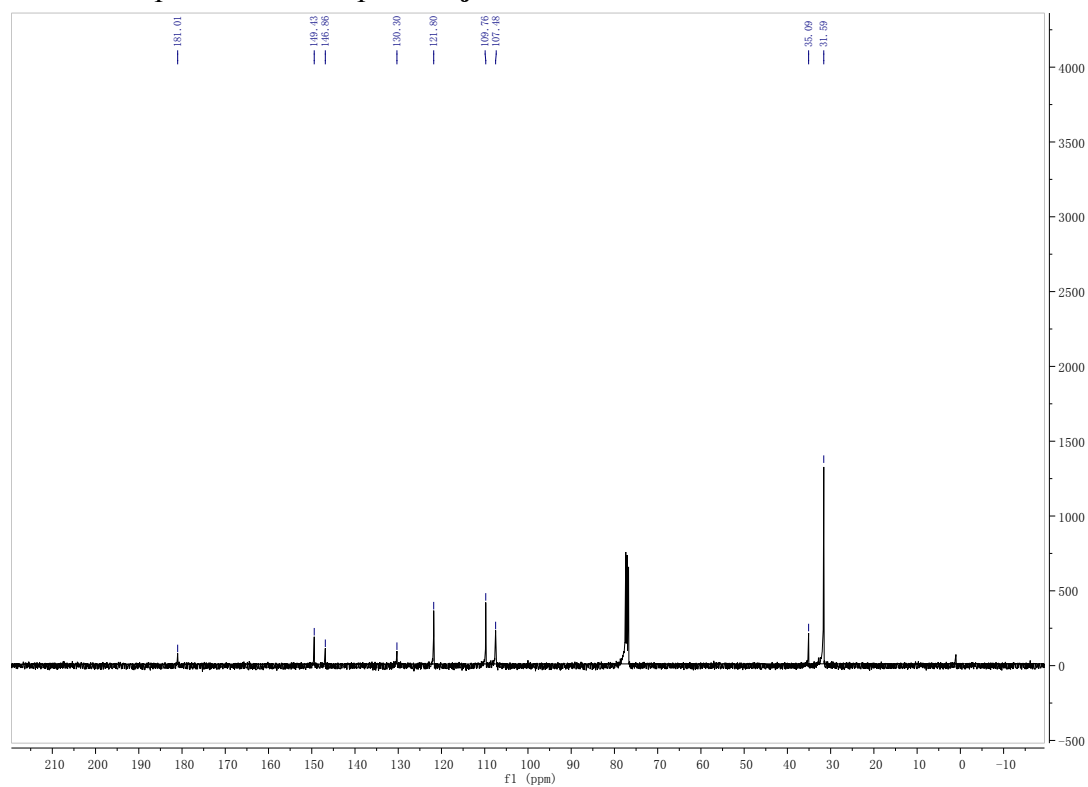
¹³C NMR spectrum of compound **3i**



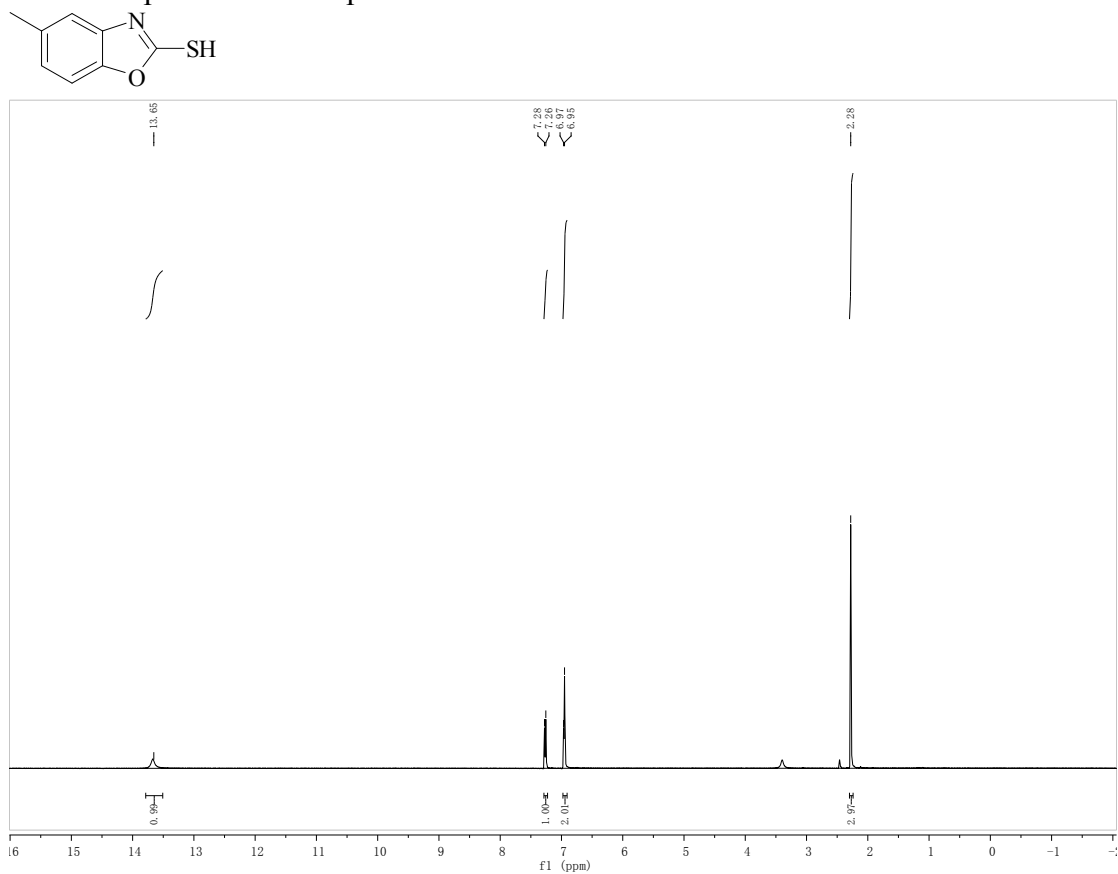
¹H NMR spectrum of compound **3j**



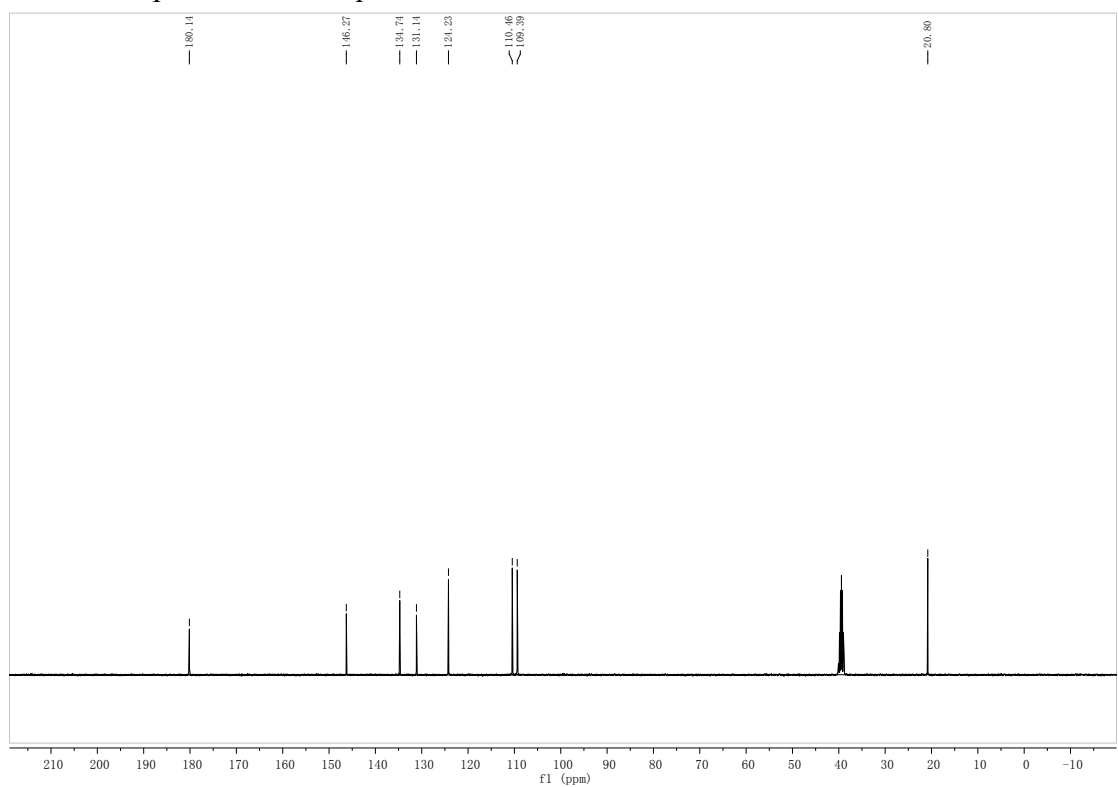
¹³C NMR spectrum of compound **3j**



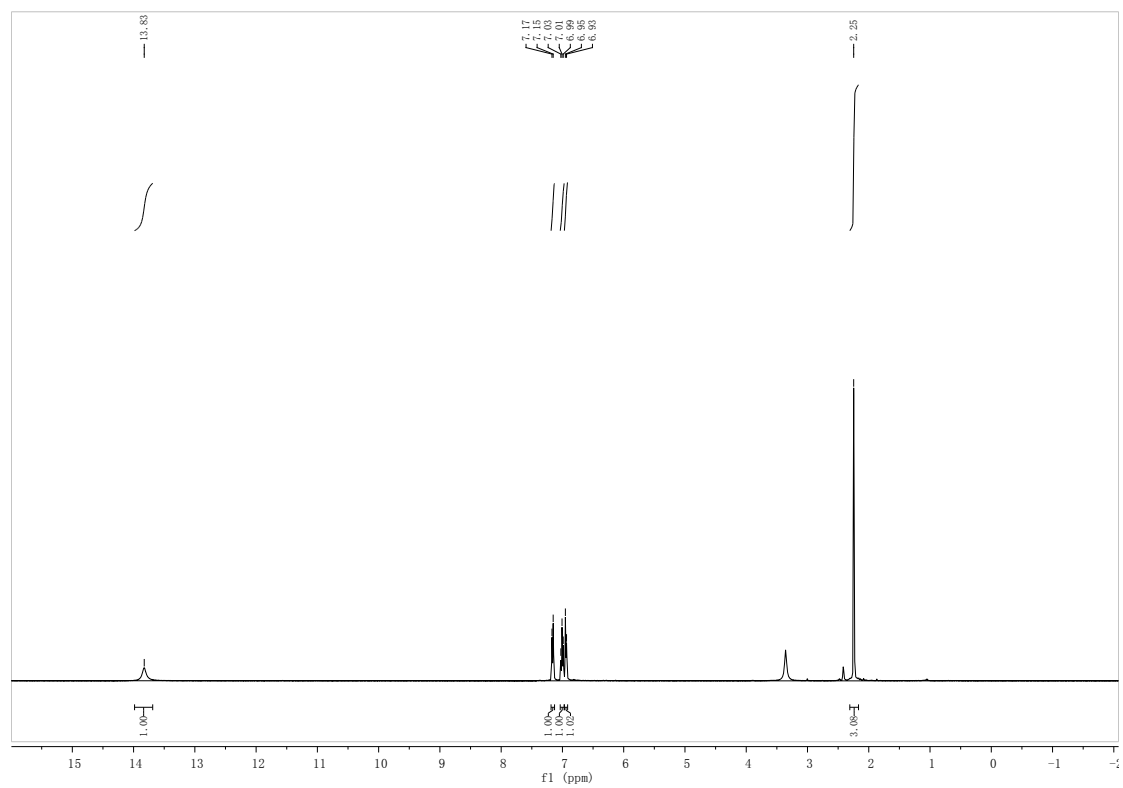
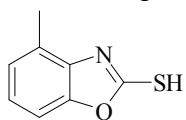
¹H NMR spectrum of compound **3k**



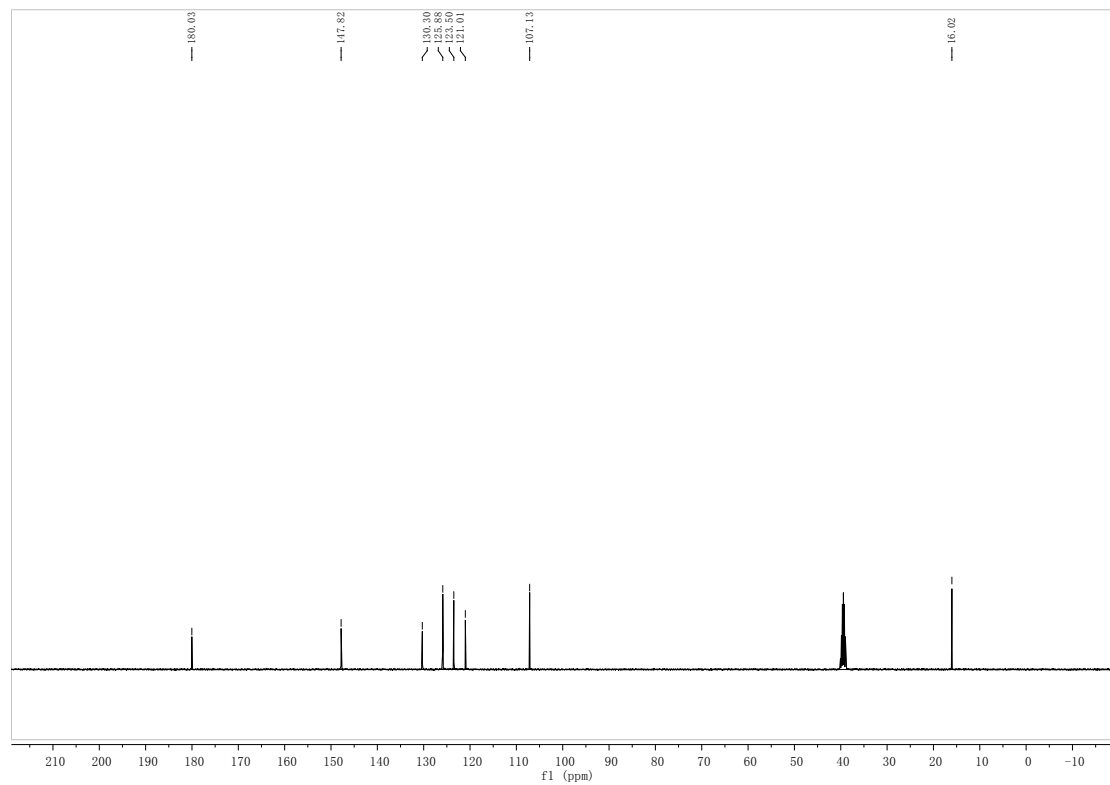
¹³C NMR spectrum of compound **3k**



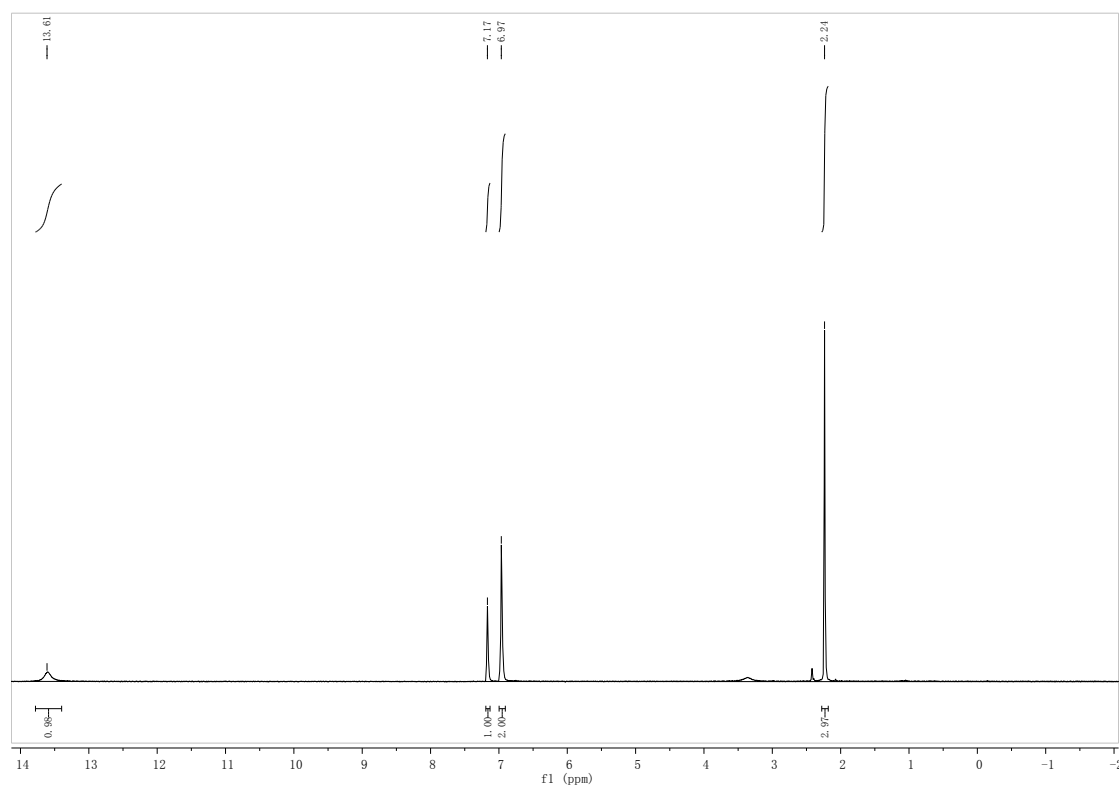
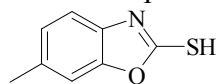
¹H NMR spectrum of compound **31**



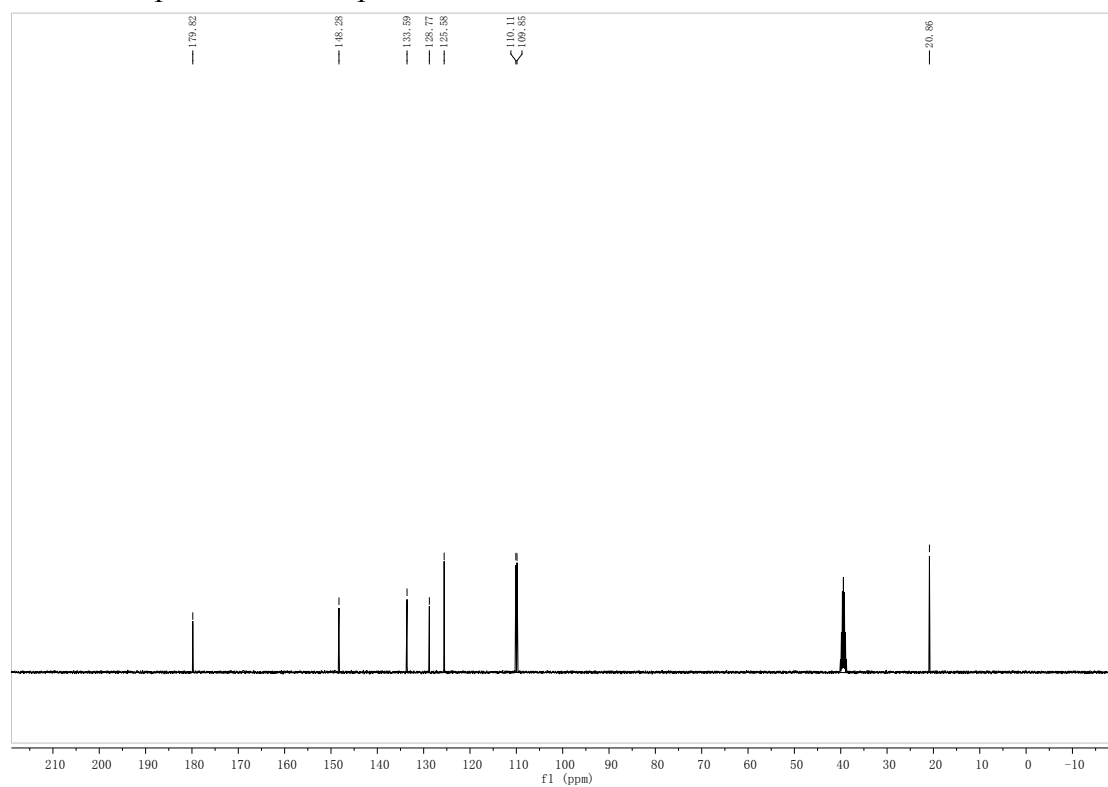
¹³C NMR spectrum of compound **31**



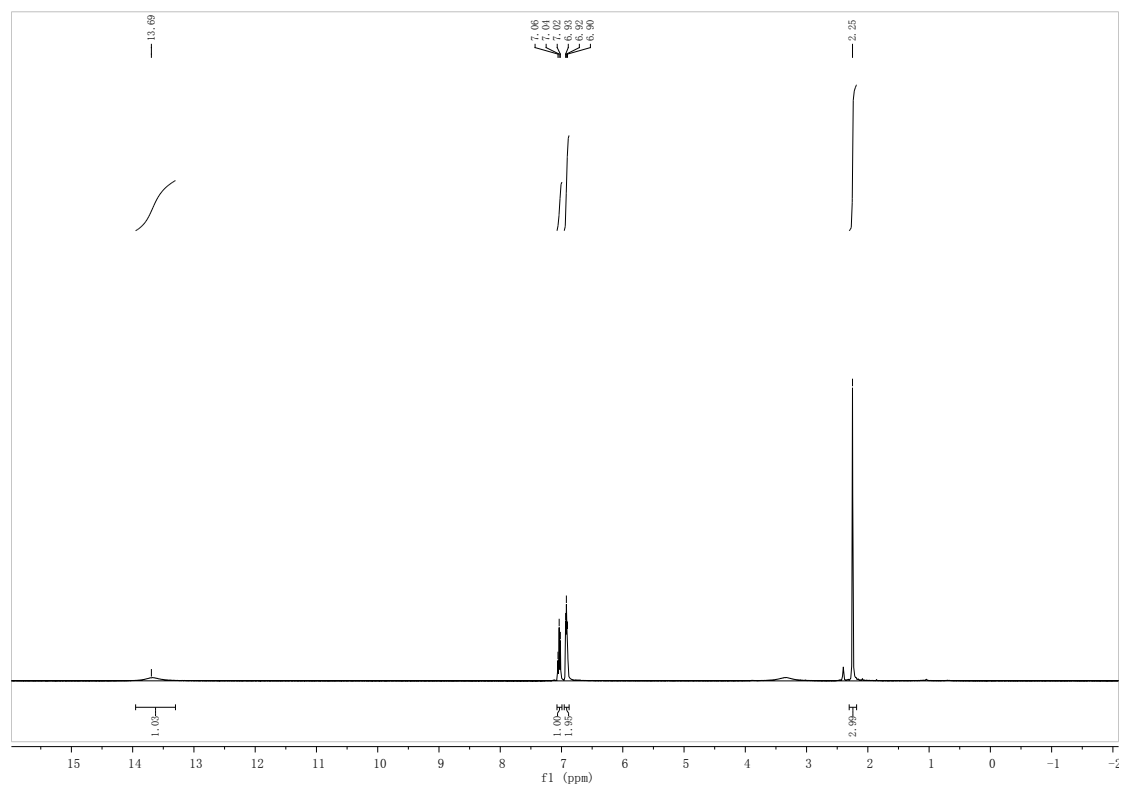
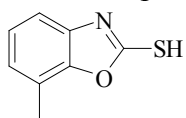
¹H NMR spectrum of compound **3m**



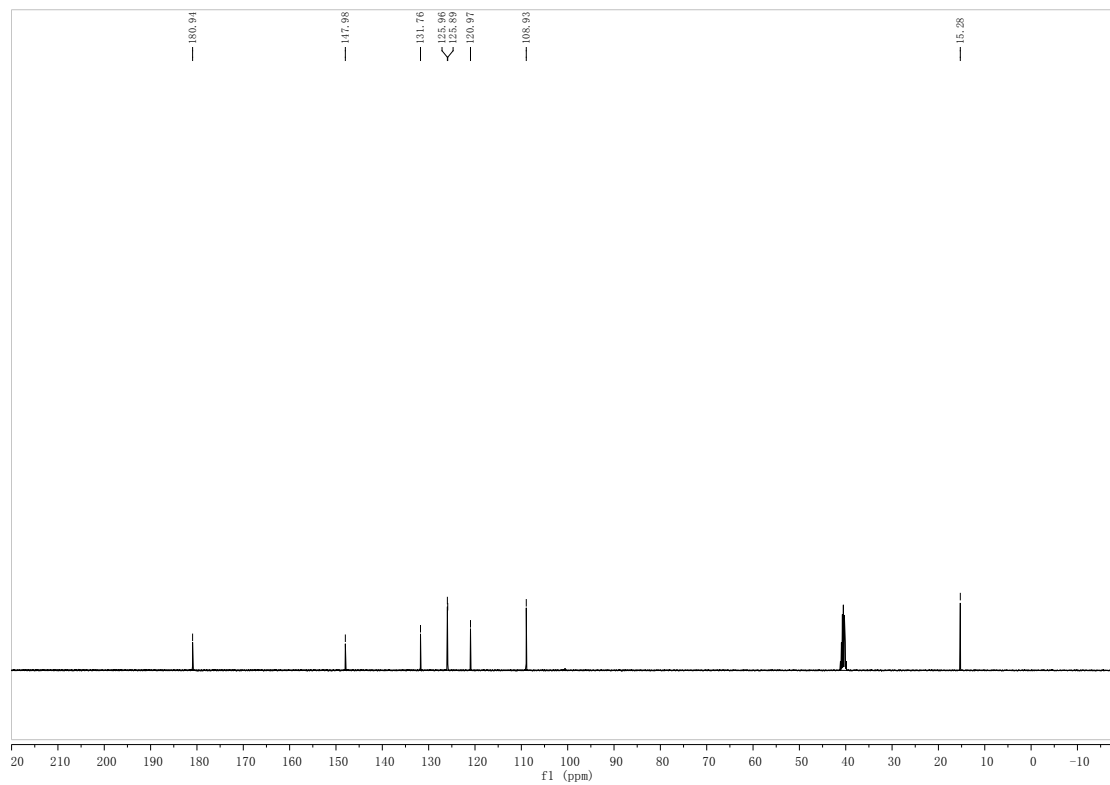
¹³C NMR spectrum of compound **3m**



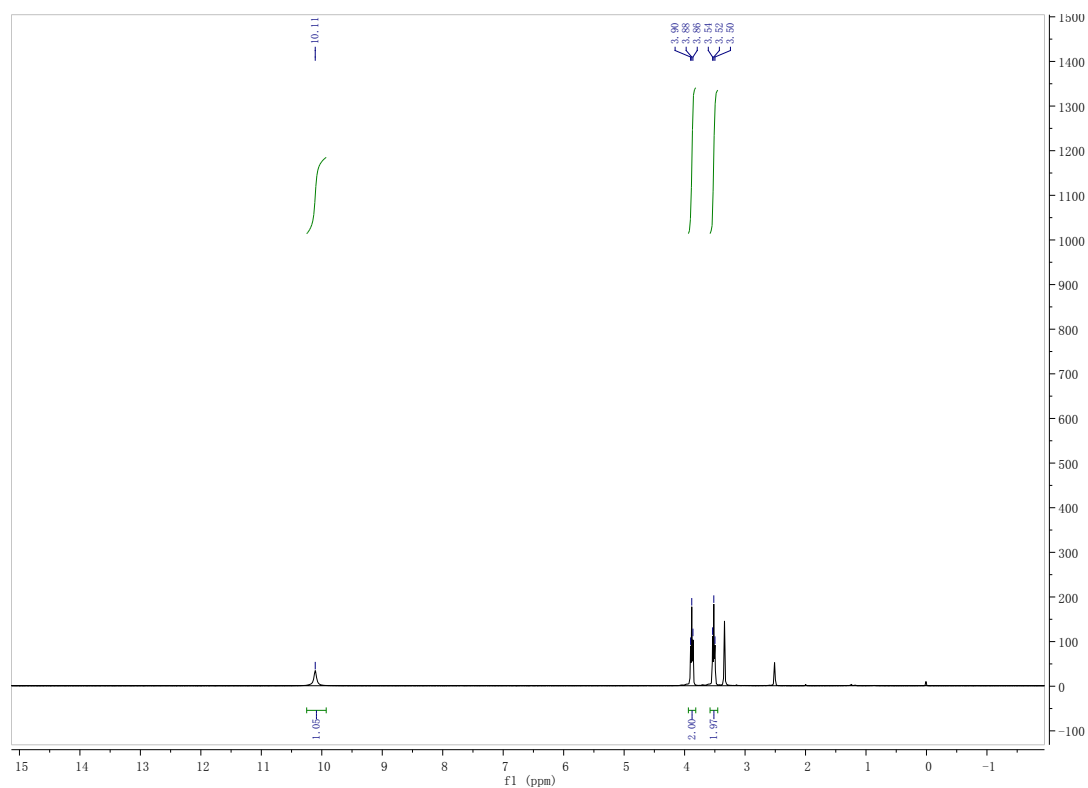
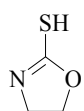
¹H NMR spectrum of compound **3n**



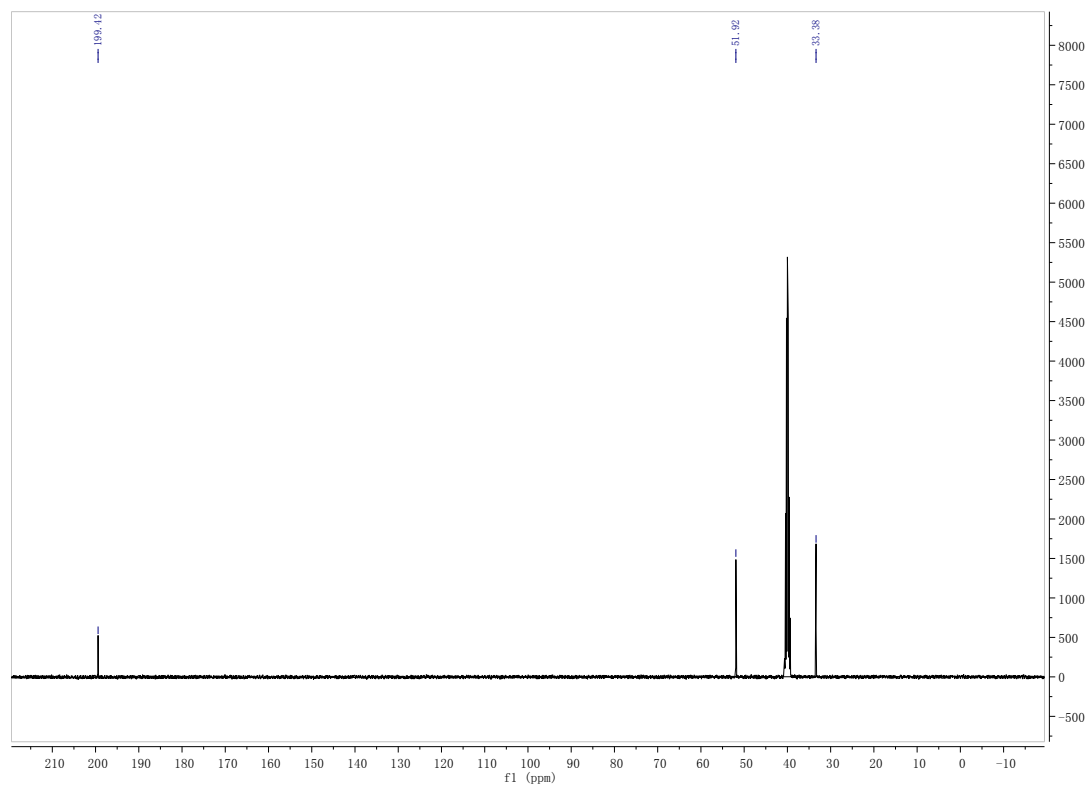
¹³C NMR spectrum of compound **3n**



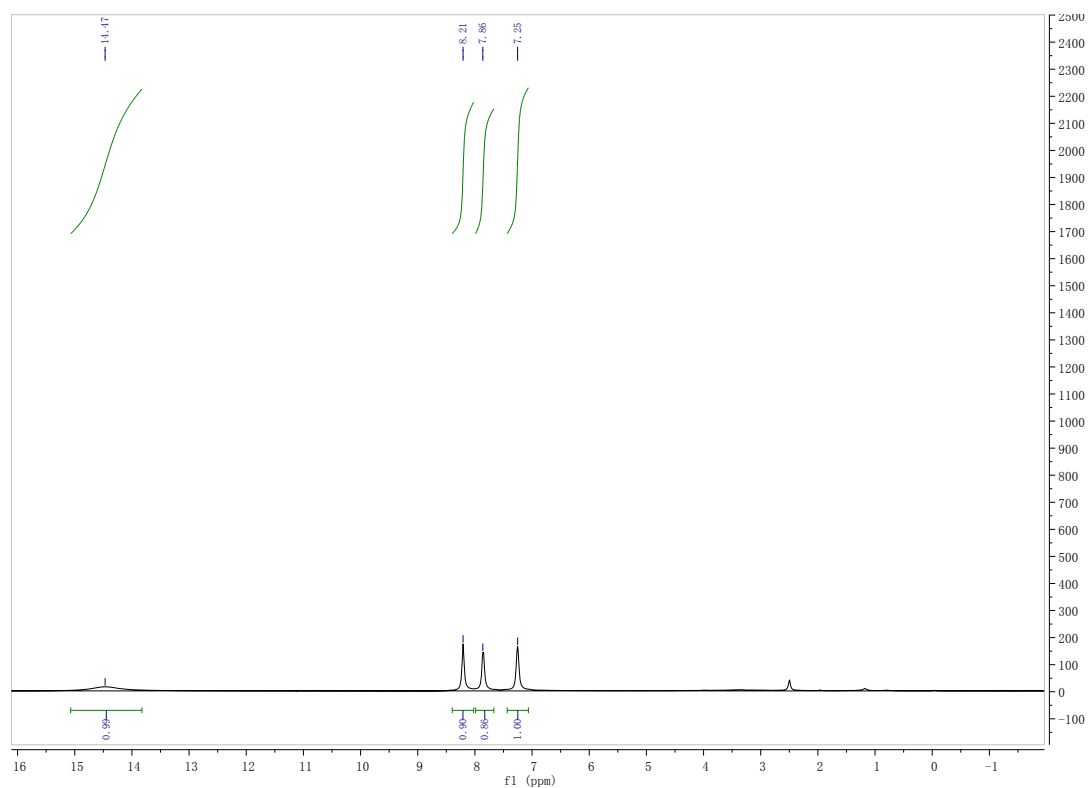
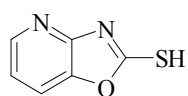
¹H NMR spectrum of compound **3o**



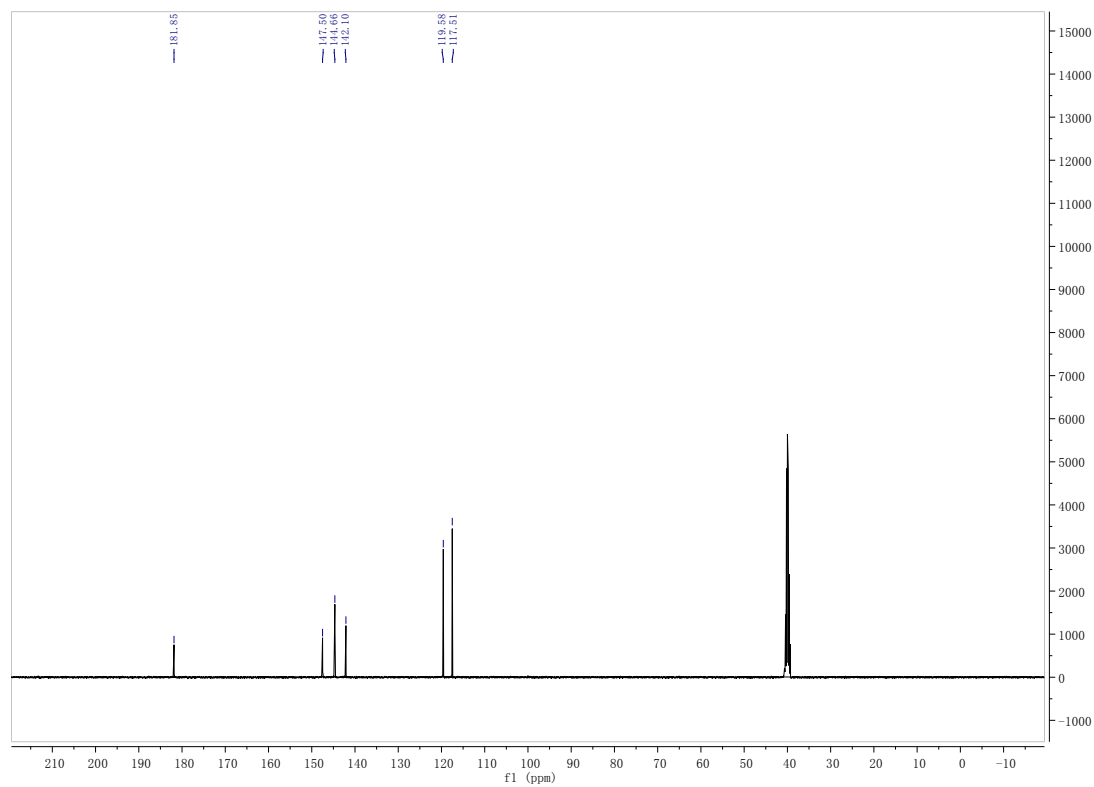
¹³C NMR spectrum of compound **3o**



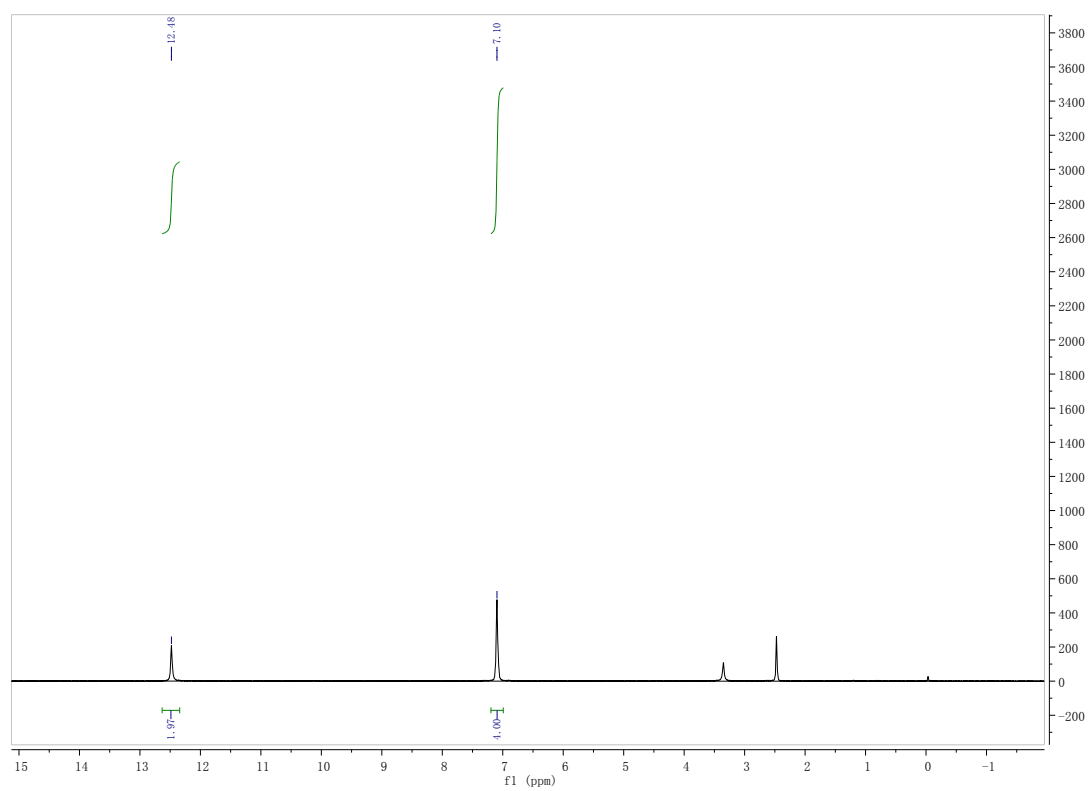
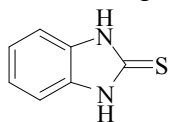
¹H NMR spectrum of compound **3p**



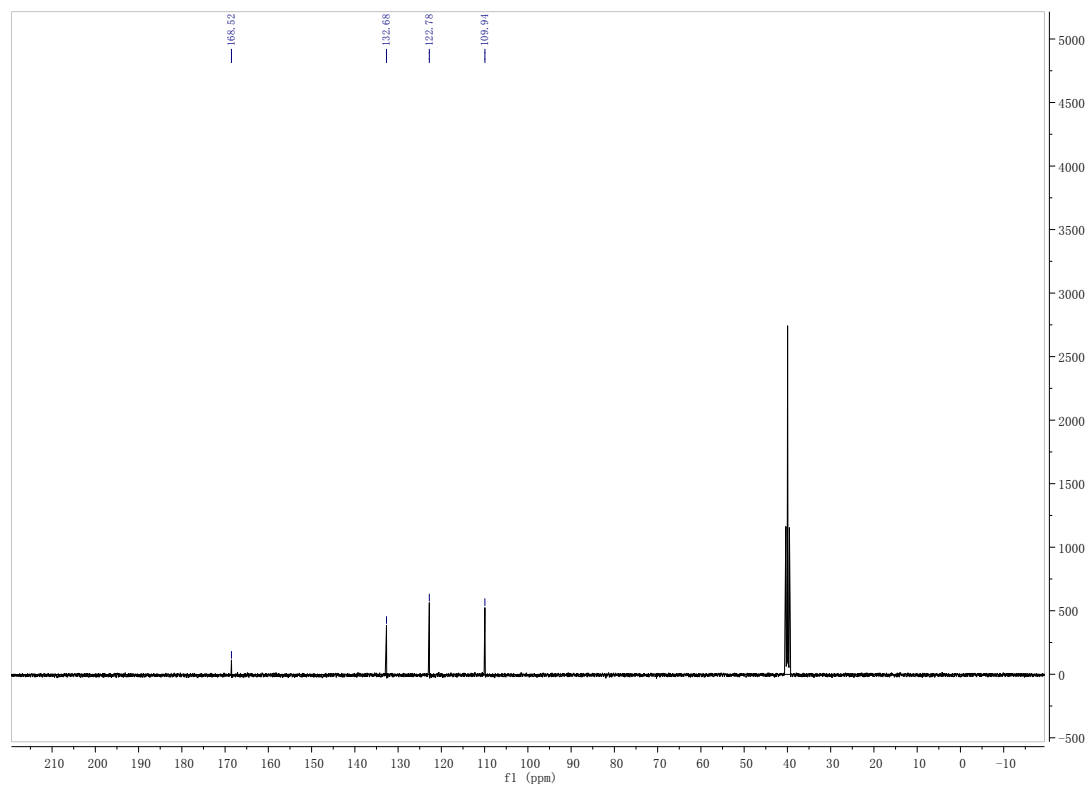
¹³C NMR spectrum of compound **3p**



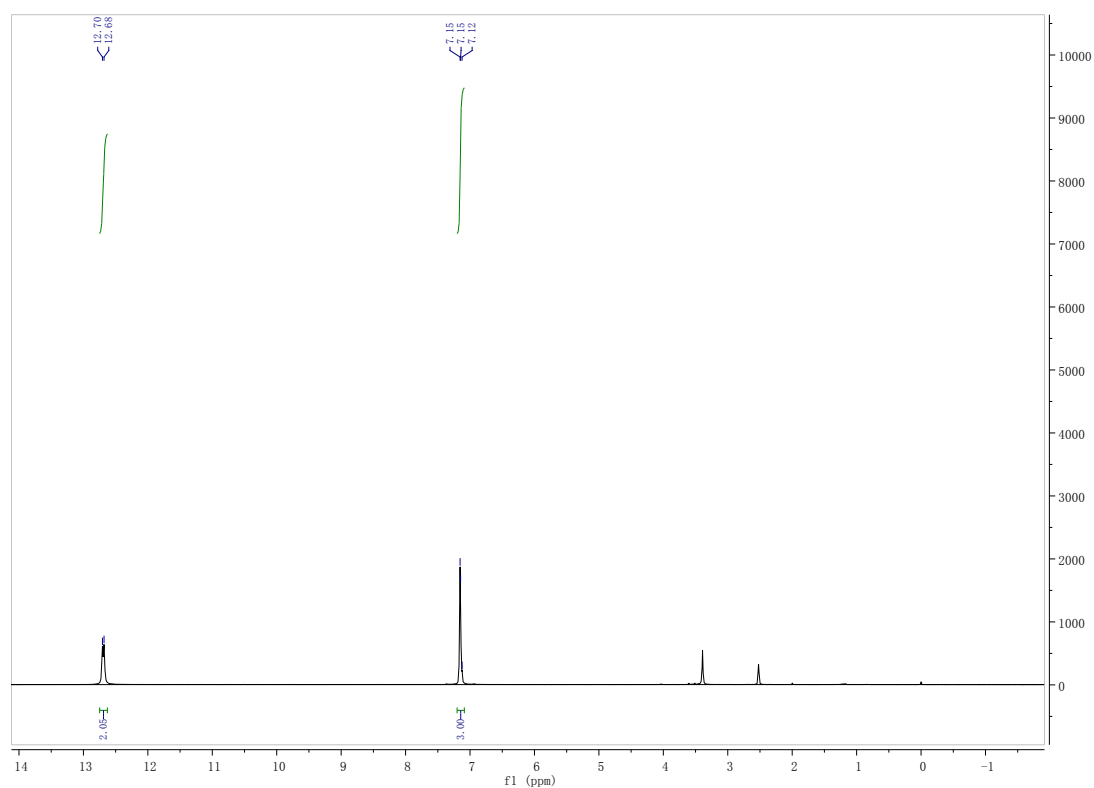
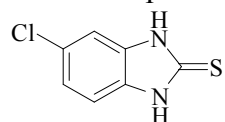
¹H NMR spectrum of compound **3q**



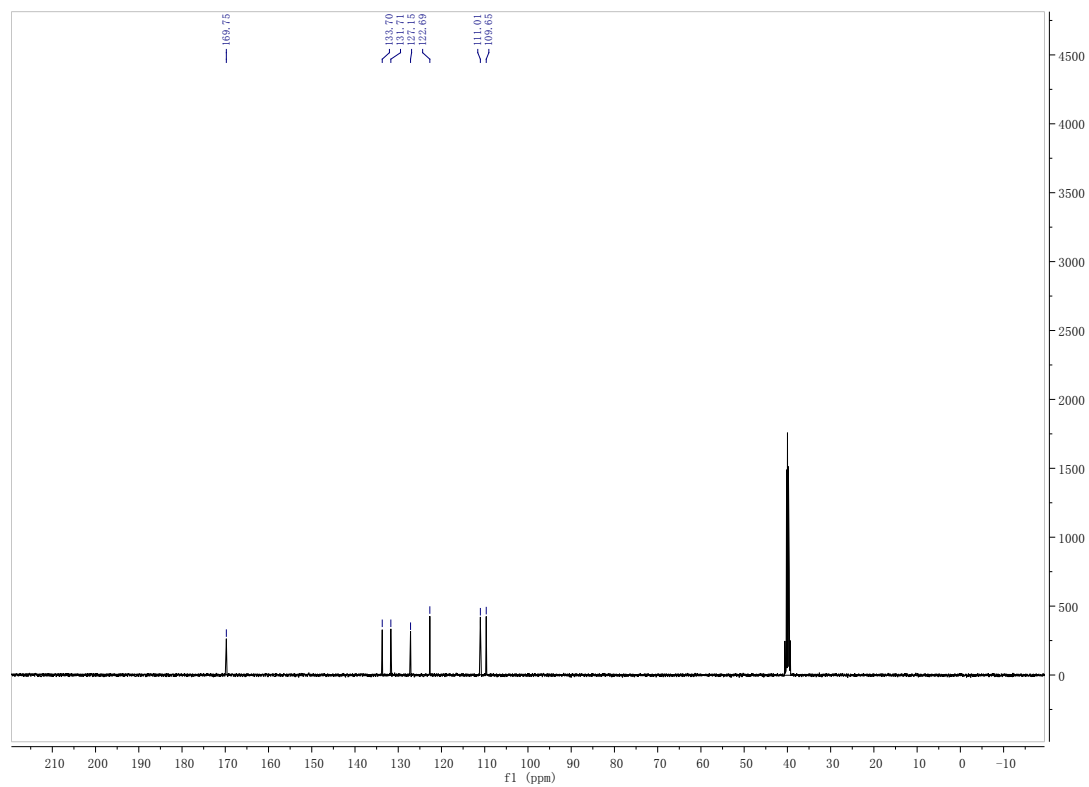
¹³C NMR spectrum of compound **3q**



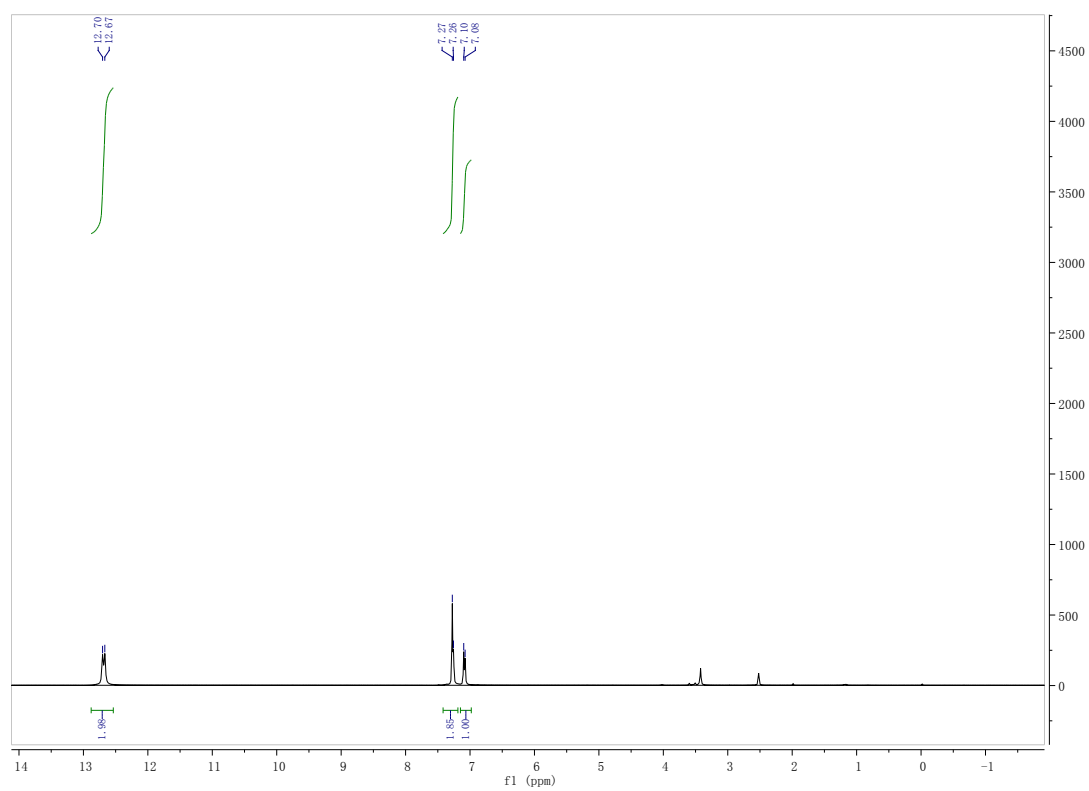
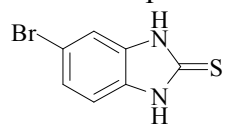
¹H NMR spectrum of compound **3r**



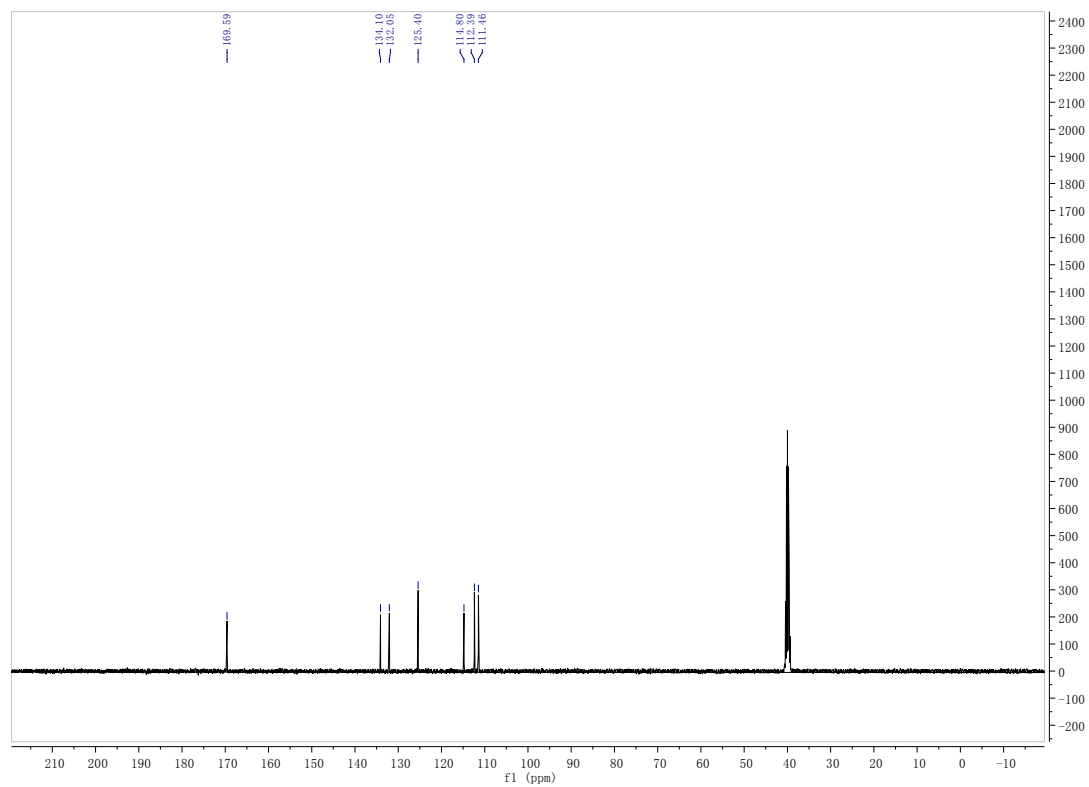
¹³C NMR spectrum of compound **3r**



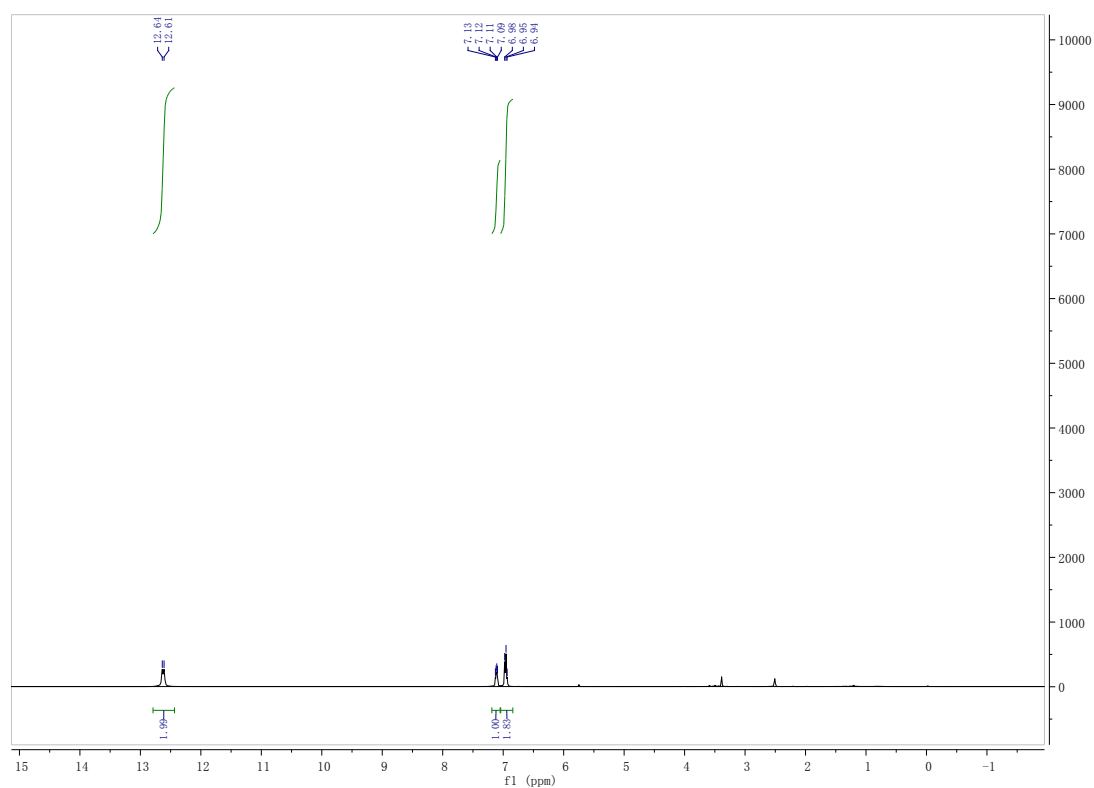
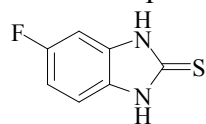
¹H NMR spectrum of compound **3s**



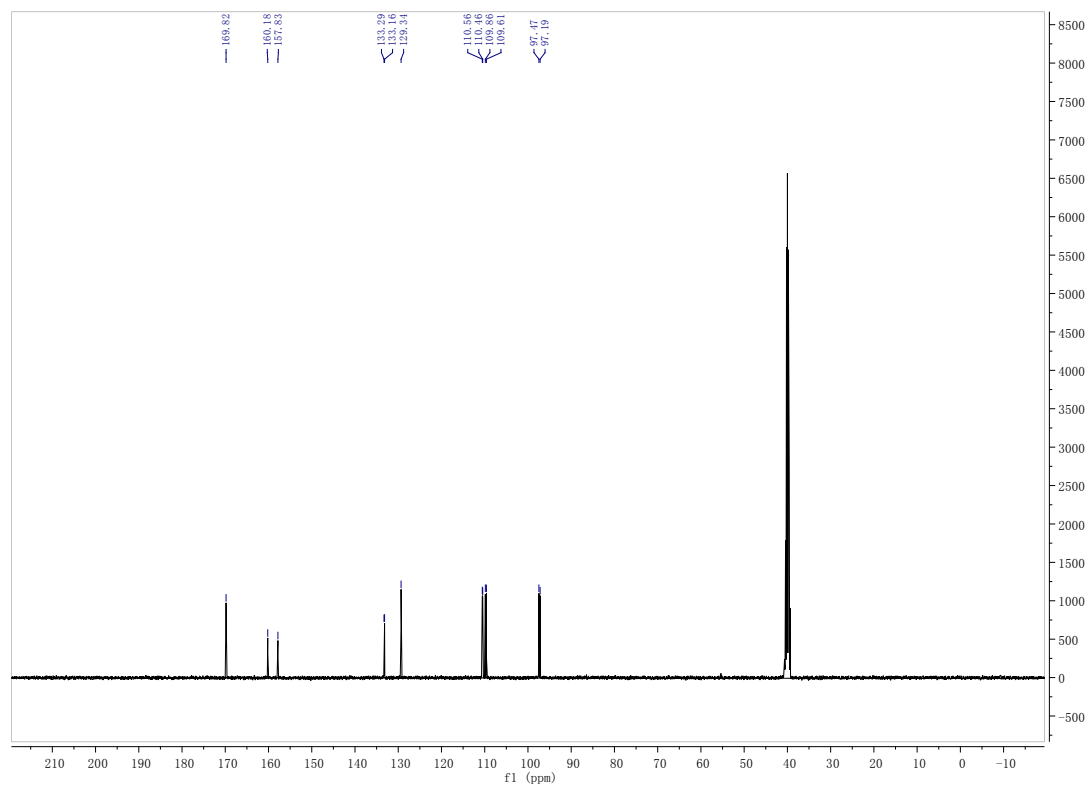
¹³C NMR spectrum of compound **3s**



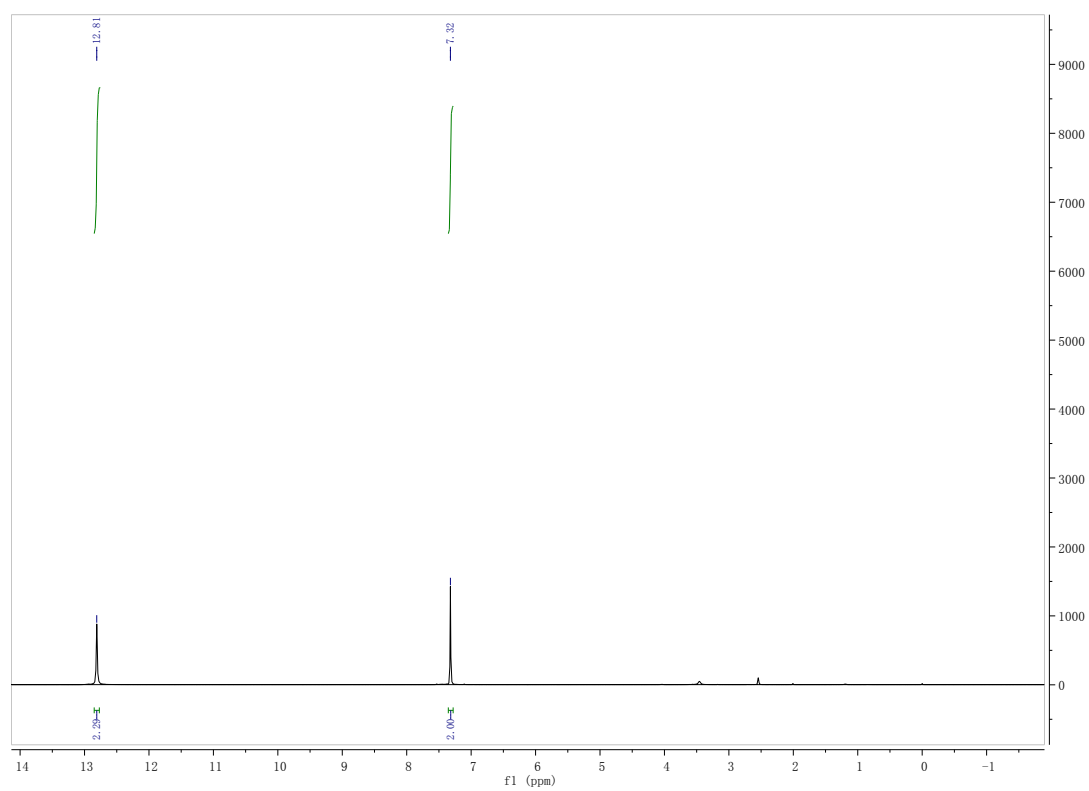
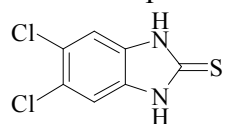
¹H NMR spectrum of compound **3t**



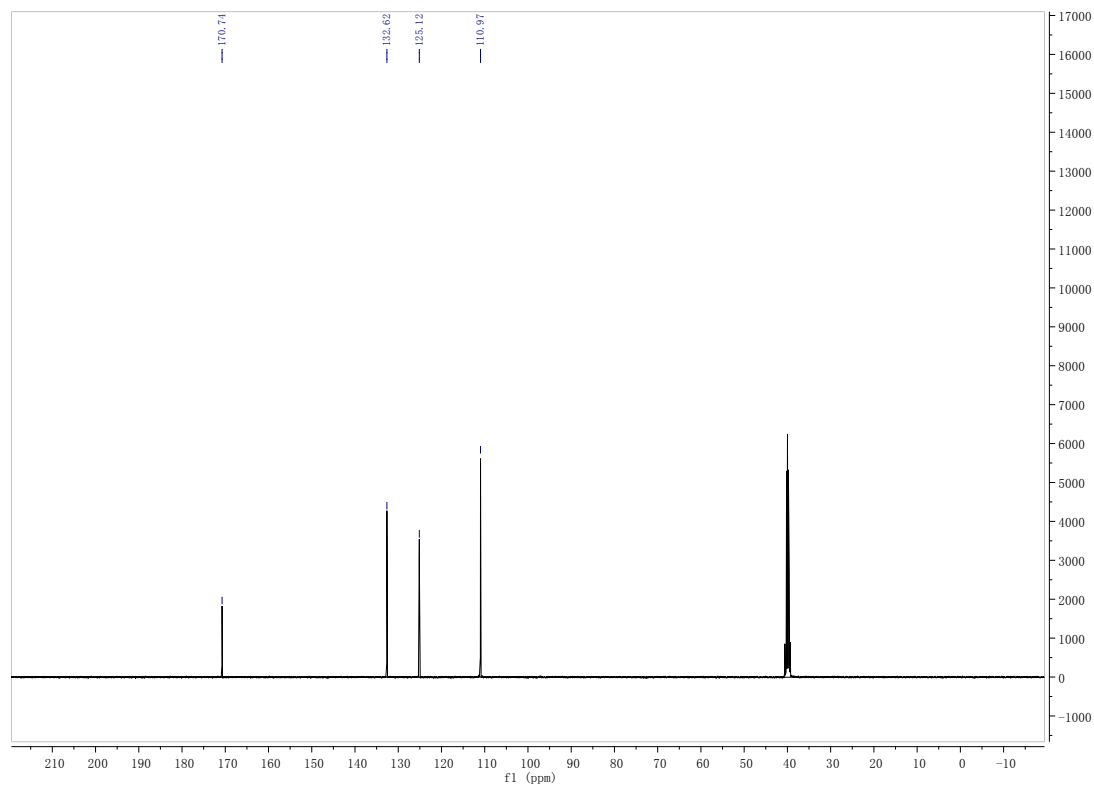
¹³C NMR spectrum of compound **3t**



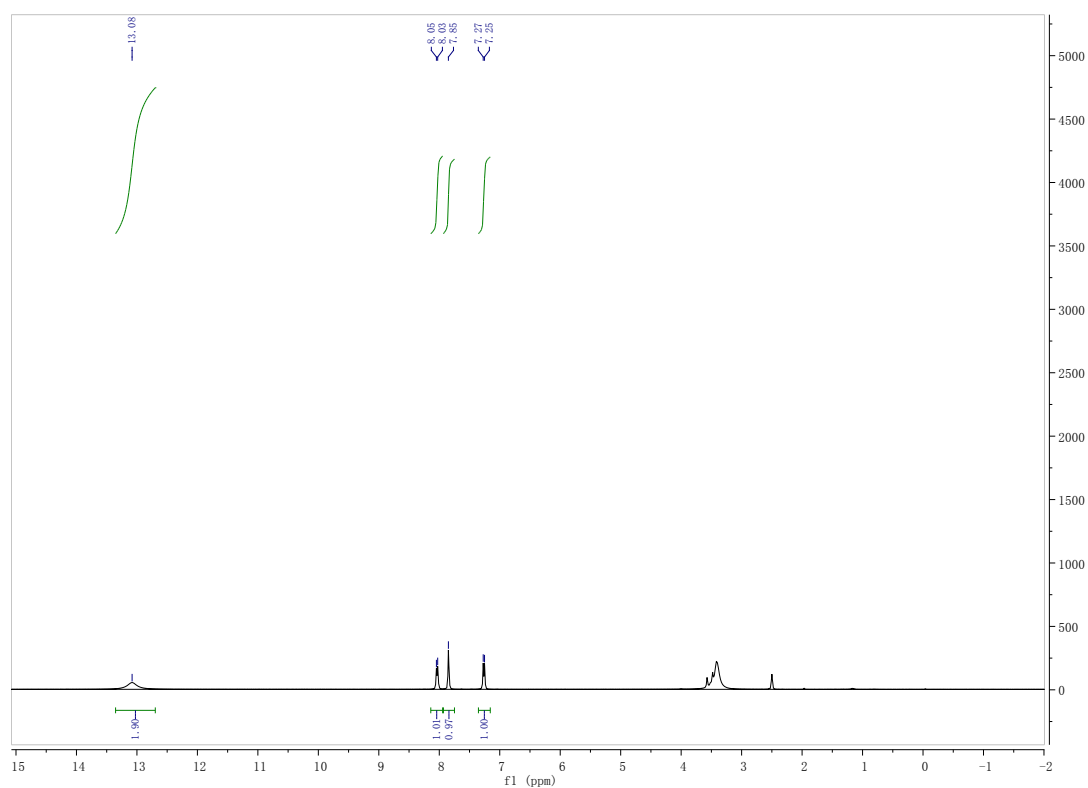
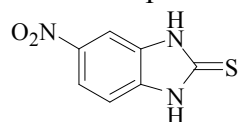
¹H NMR spectrum of compound **3u**



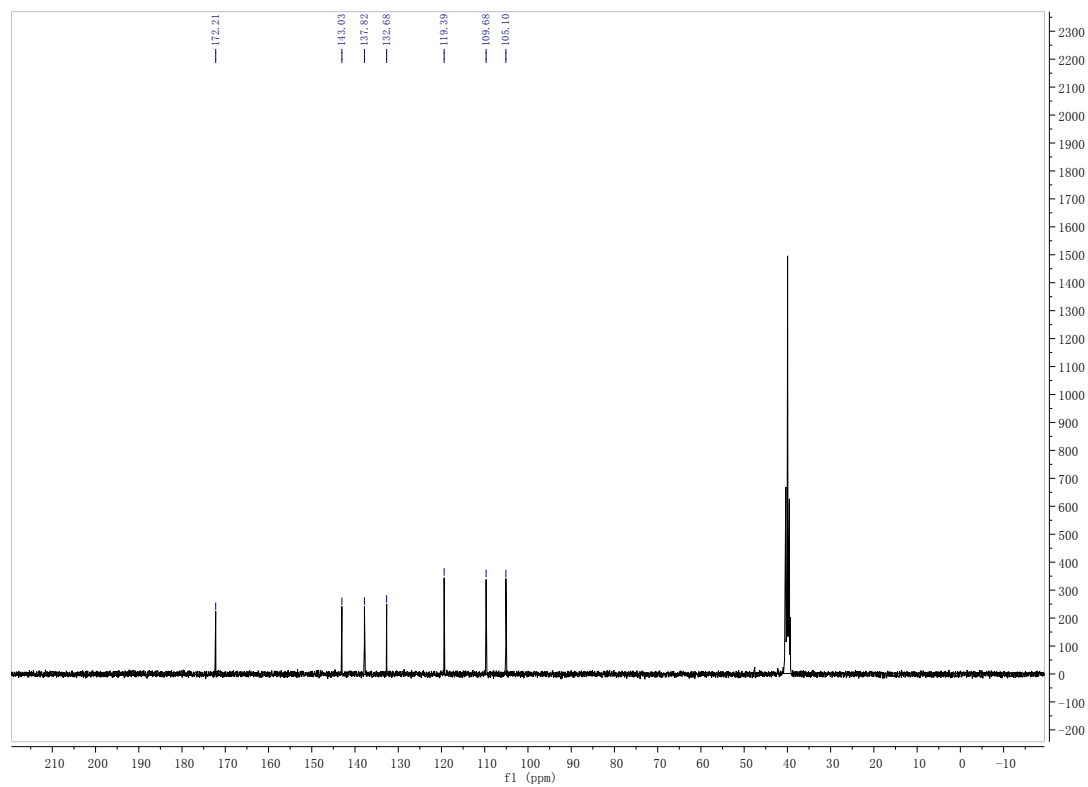
¹³C NMR spectrum of compound **3u**



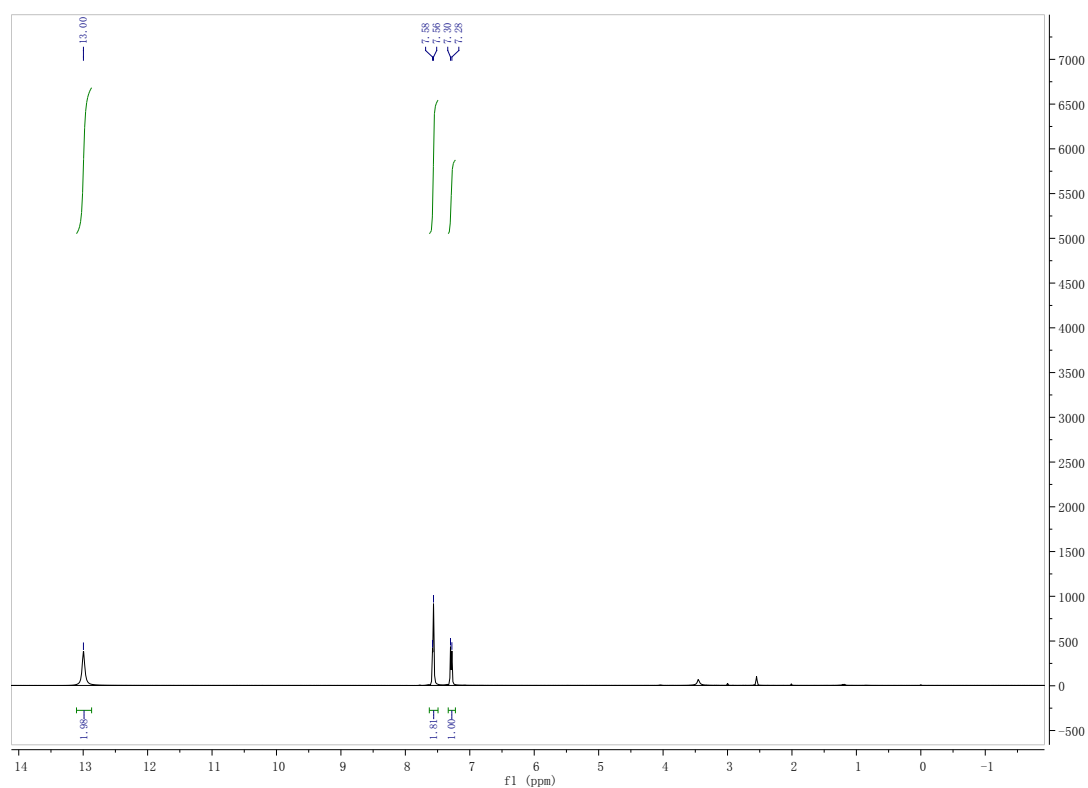
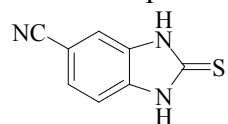
¹H NMR spectrum of compound **3v**



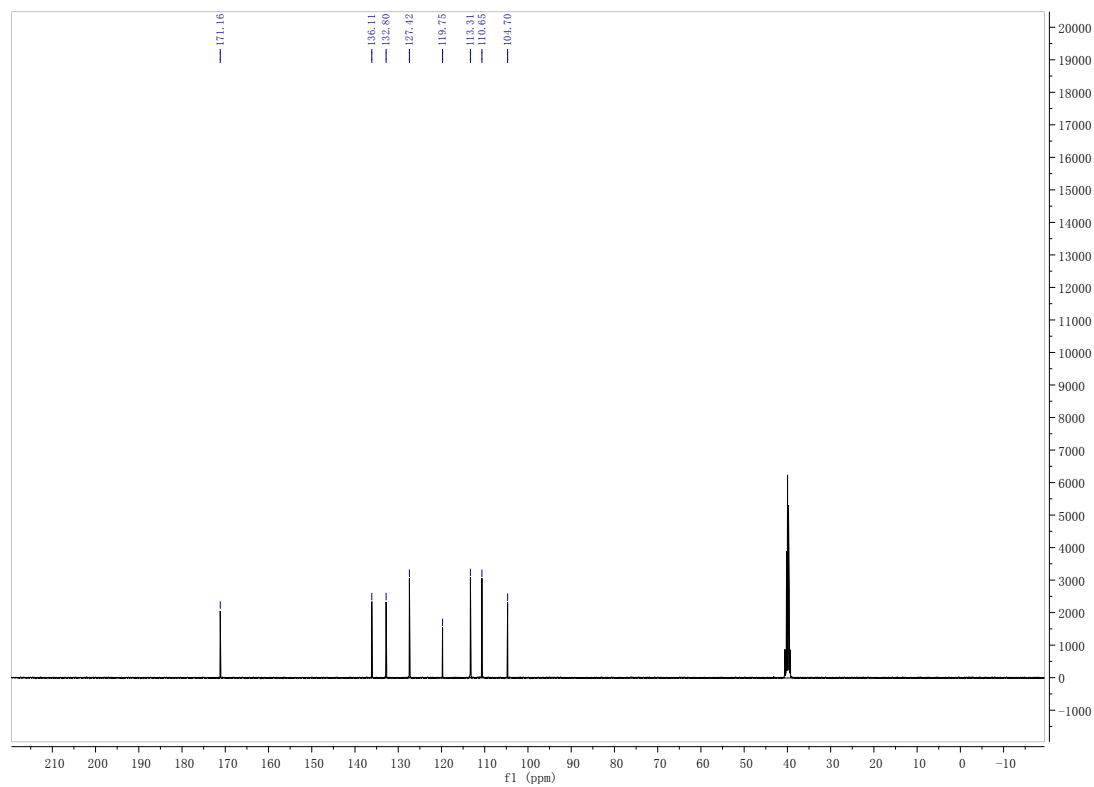
¹³C NMR spectrum of compound **3v**



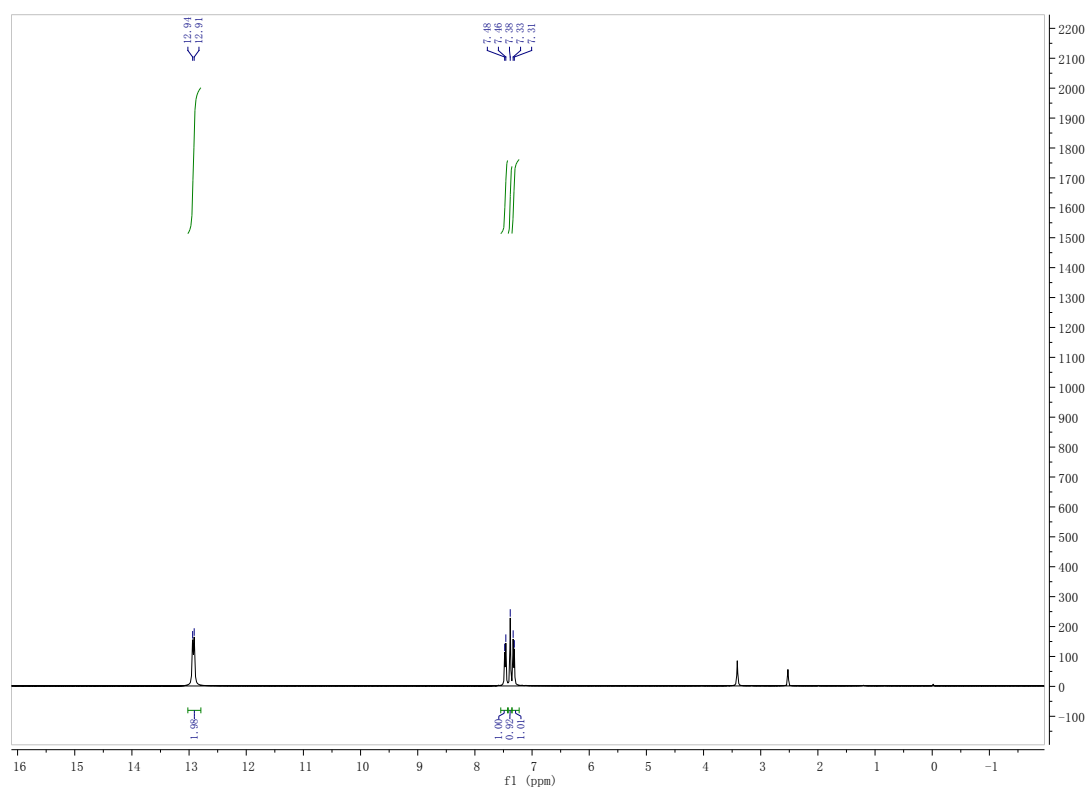
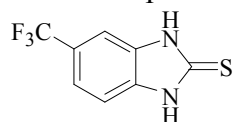
¹H NMR spectrum of compound **3w**



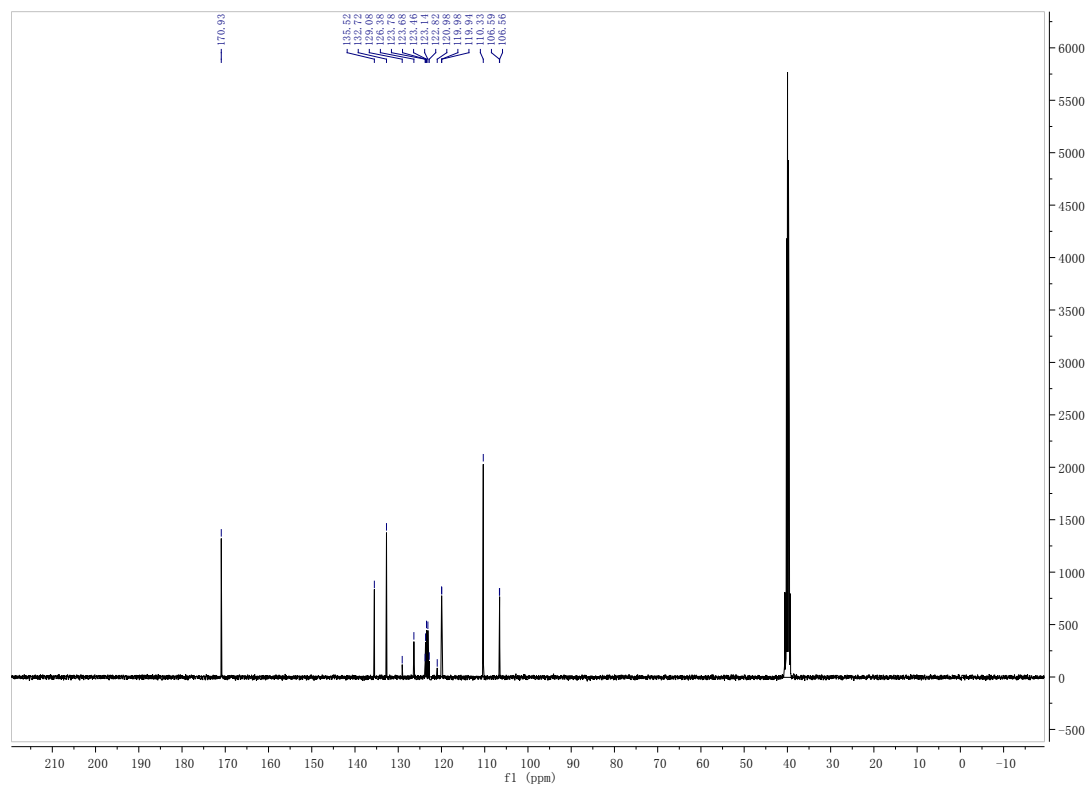
¹³C NMR spectrum of compound **3w**



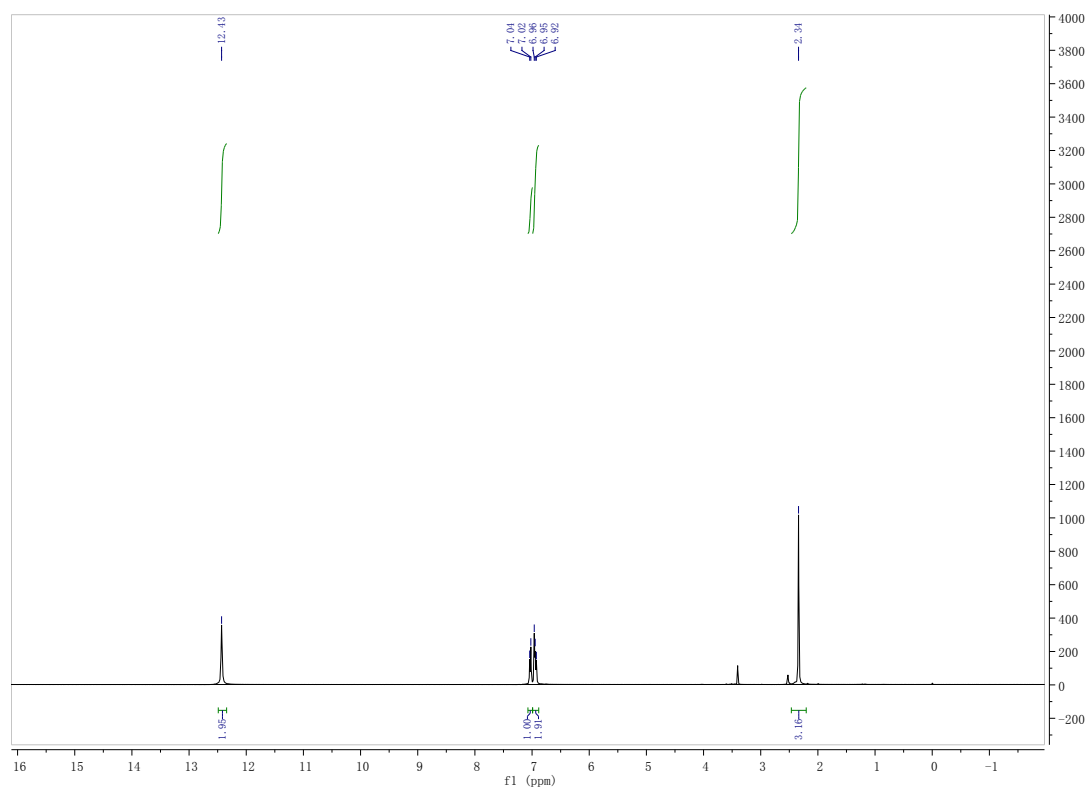
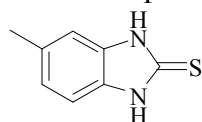
¹H NMR spectrum of compound **3x**



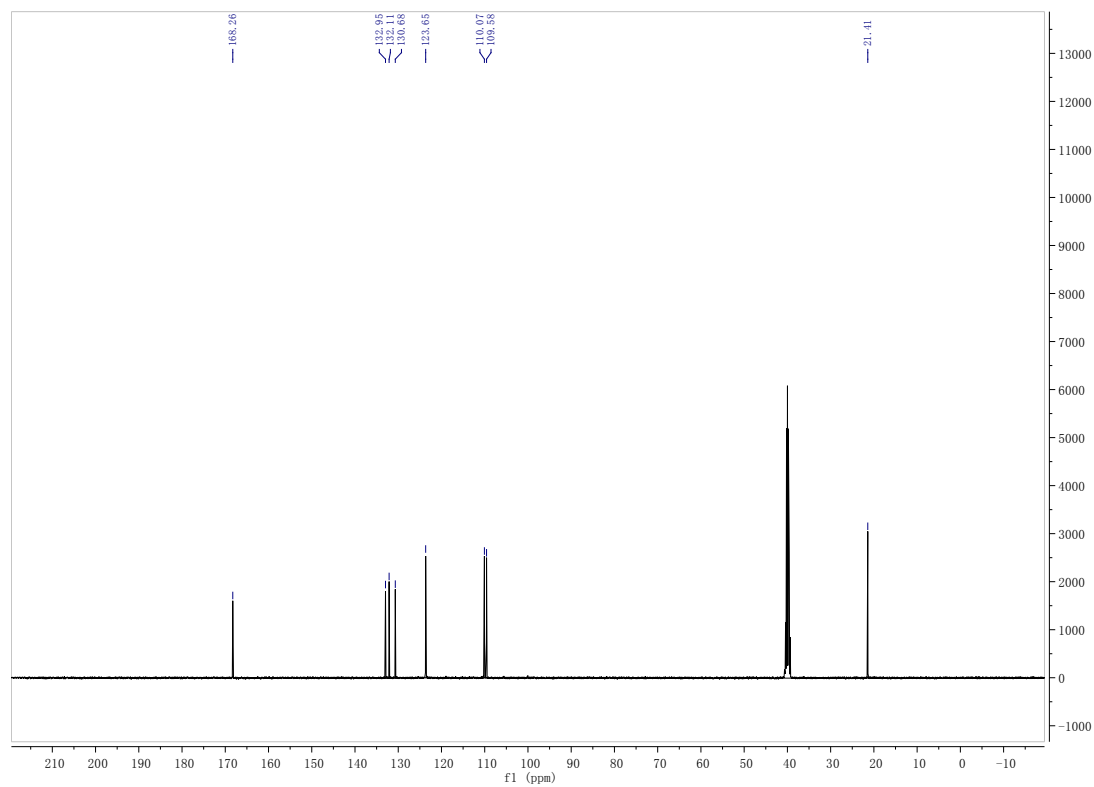
¹³C NMR spectrum of compound **3x**



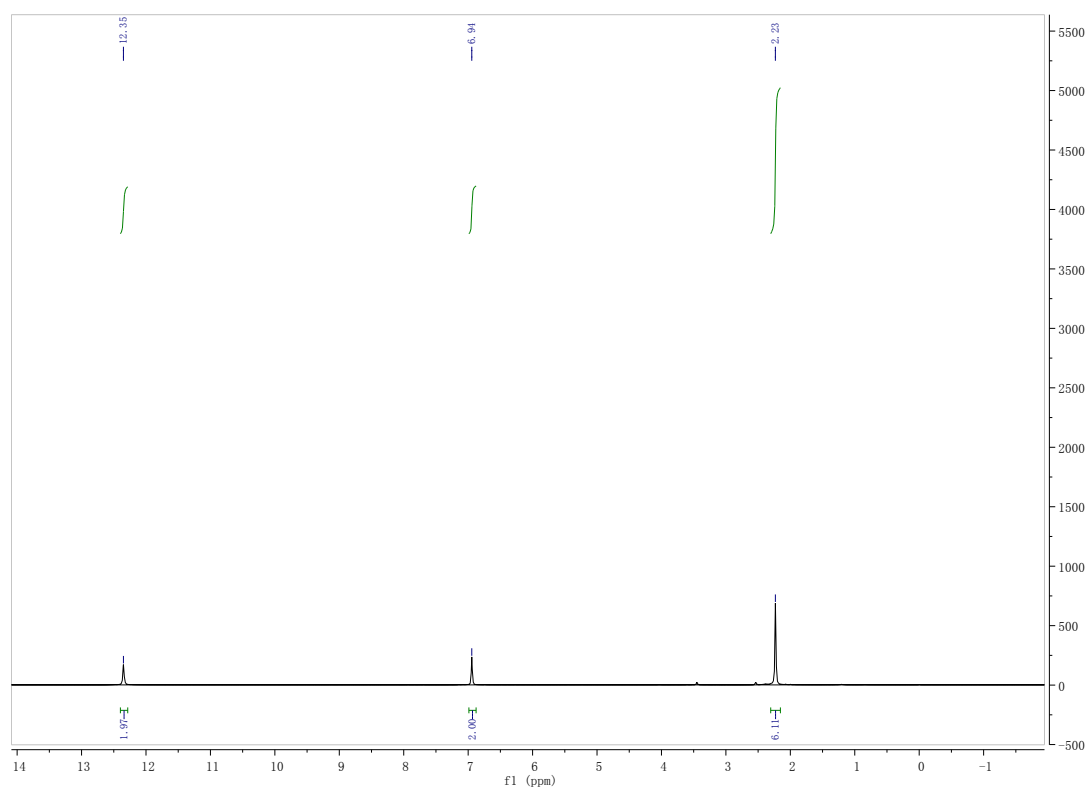
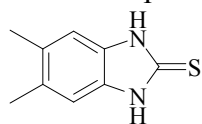
^1H NMR spectrum of compound **3y**



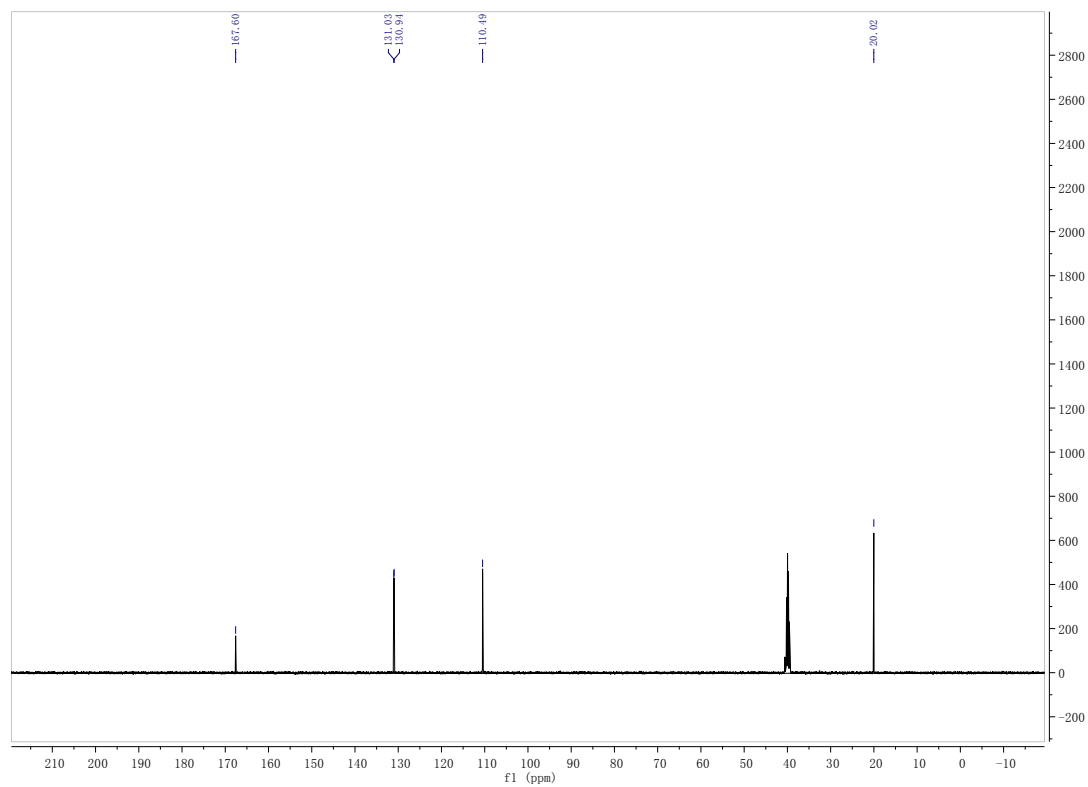
^{13}C NMR spectrum of compound **3y**



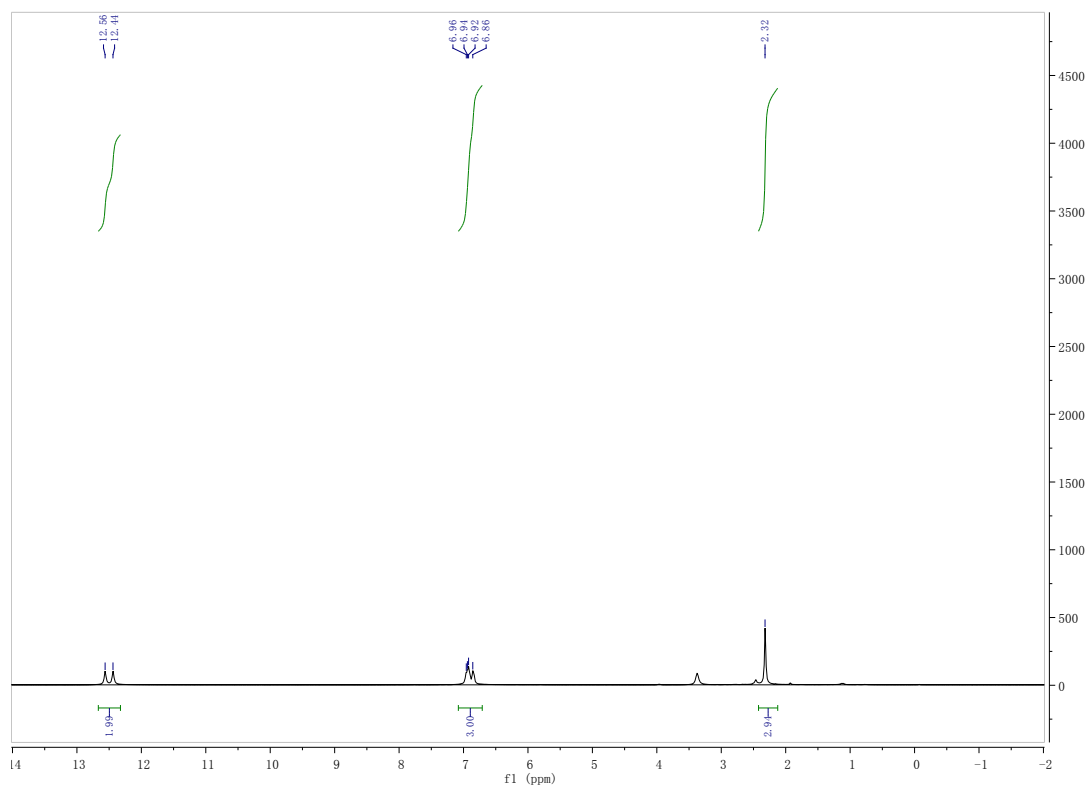
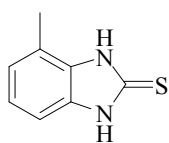
¹H NMR spectrum of compound **3z**



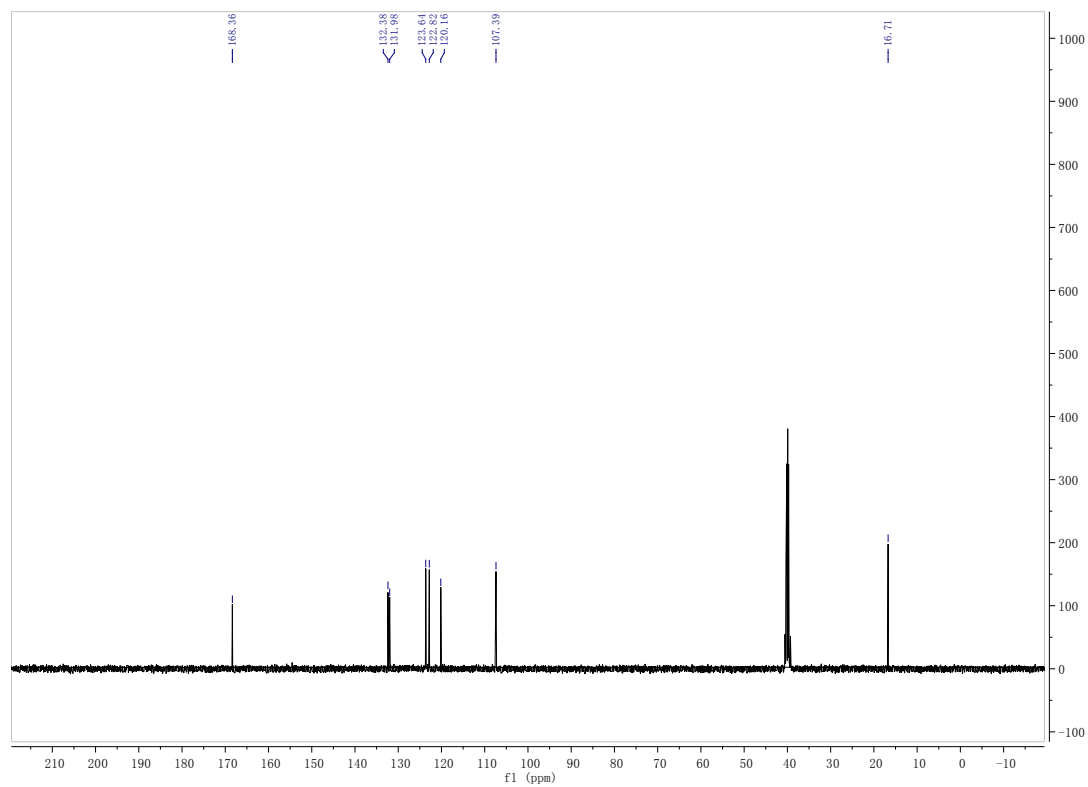
¹³C NMR spectrum of compound **3z**



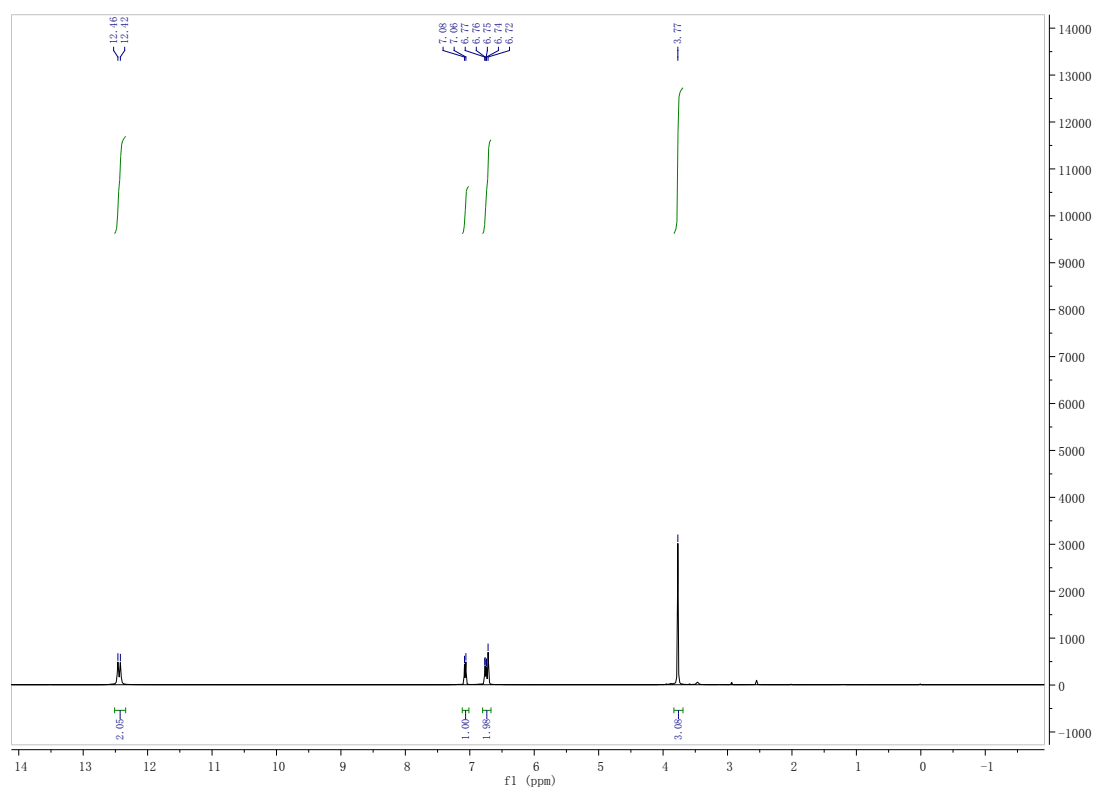
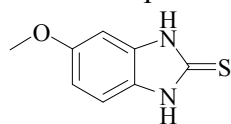
¹H NMR spectrum of compound **3za**



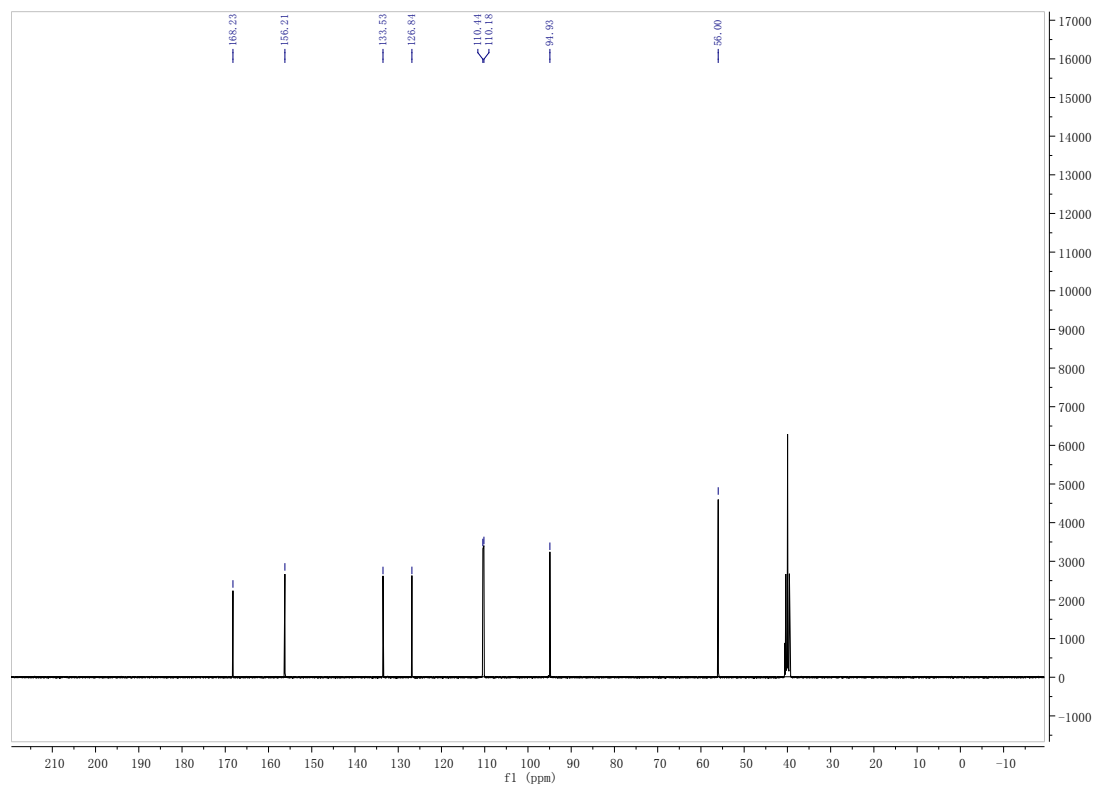
¹³C NMR spectrum of compound **3za**



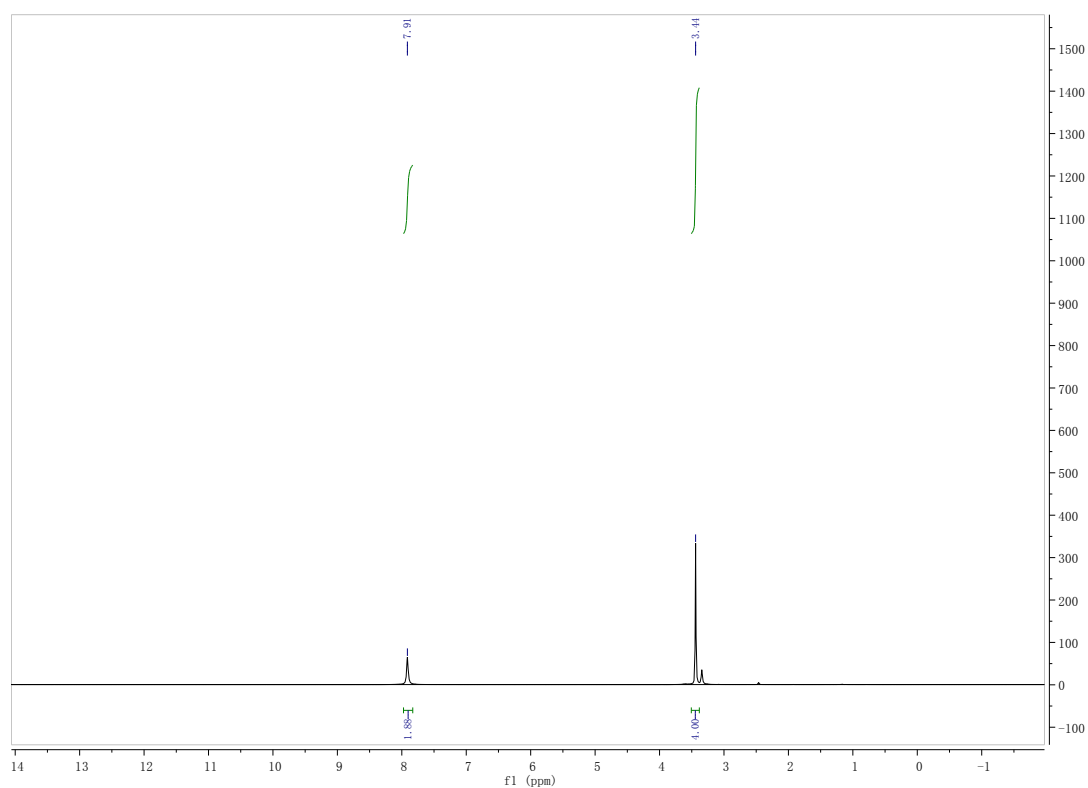
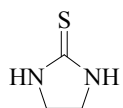
¹H NMR spectrum of compound **3zb**



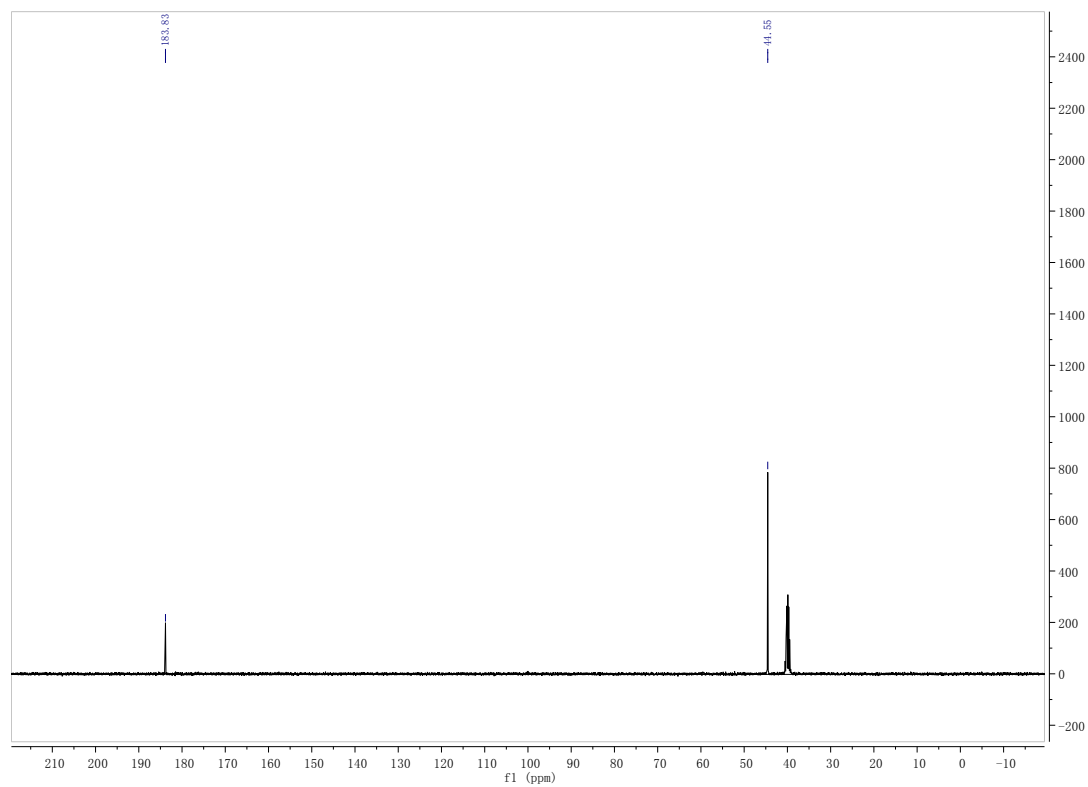
¹³C NMR spectrum of compound **3zb**



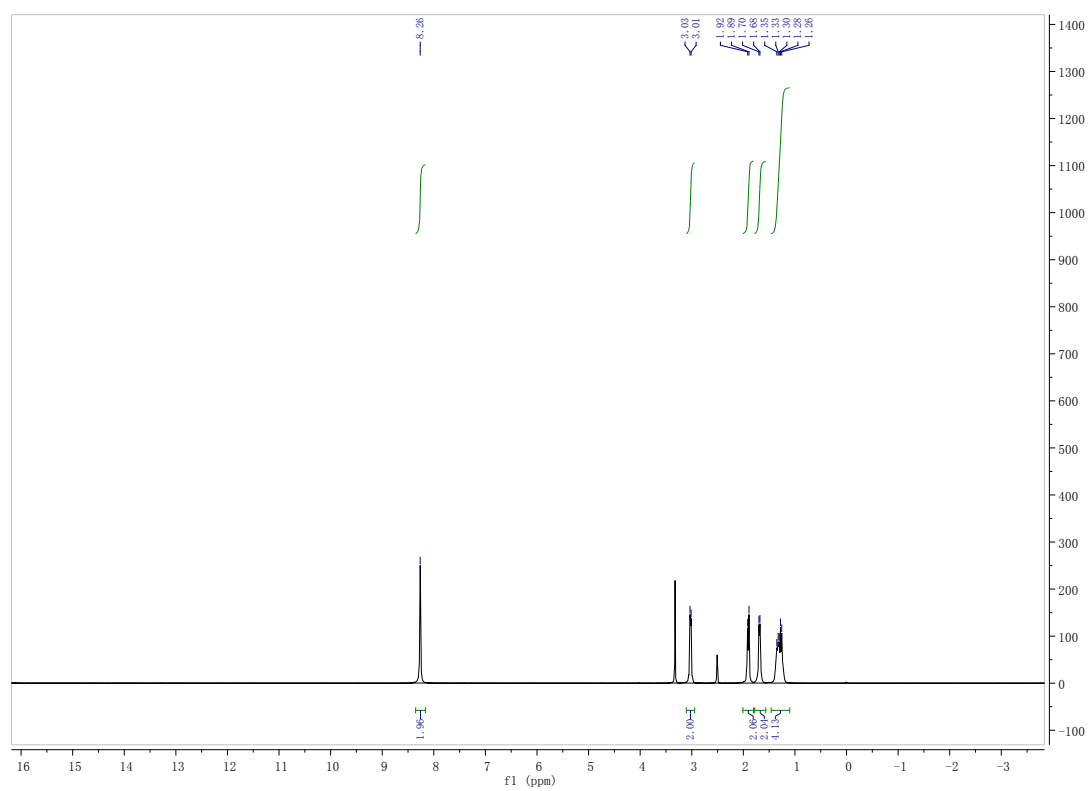
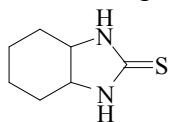
^1H NMR spectrum of compound **3zc**



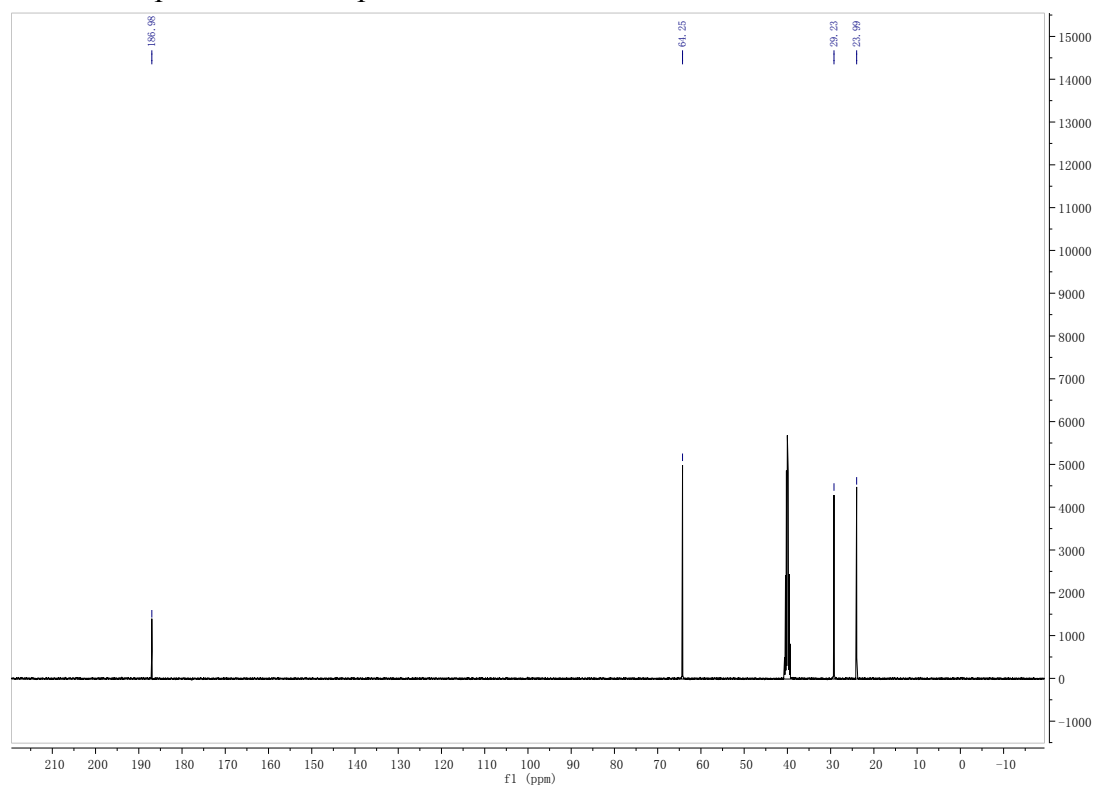
^{13}C NMR spectrum of compound **3zc**



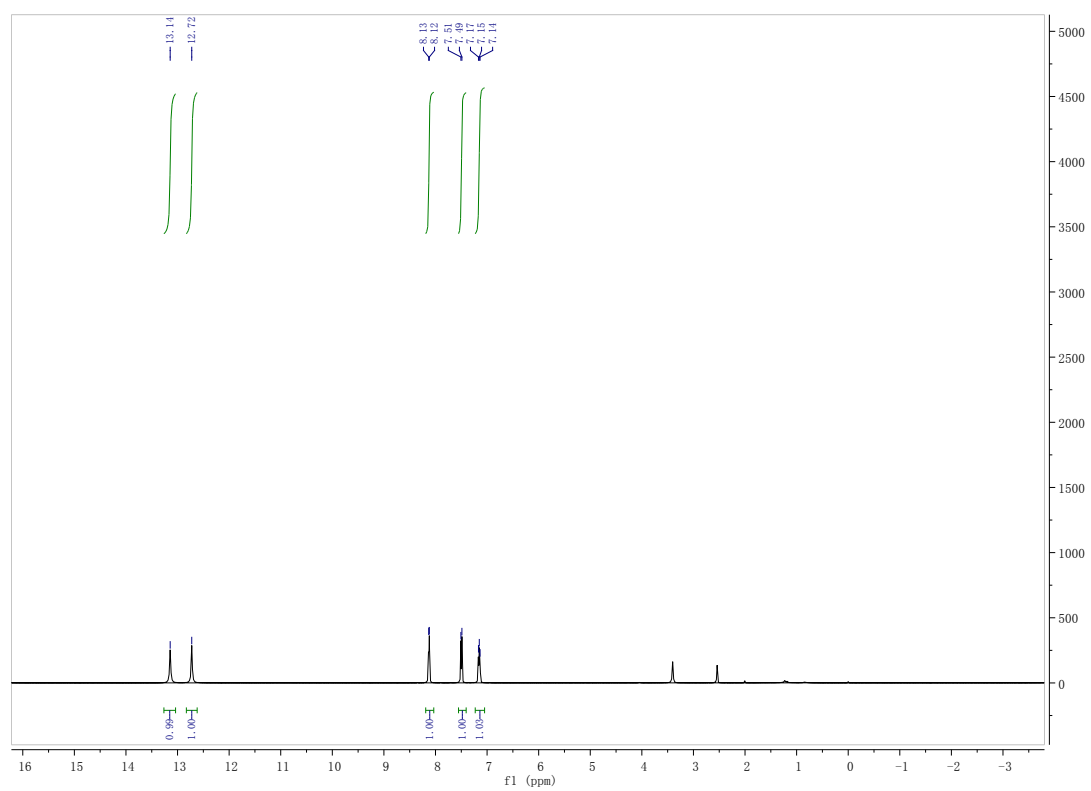
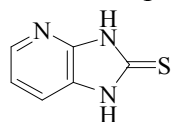
¹H NMR spectrum of compound **3zd**



¹³C NMR spectrum of compound **3zd**



¹H NMR spectrum of compound **3ze**



¹³C NMR spectrum of compound **3ze**

