

SUPPORTING INFORMATION

MICROWAVE-ASSISTED SYNTHESIS OF 2-AMINOTHIOPHENE DERIVATIVES VIA IMPROVED GEWALD REACTIONS

Bankang Ruan¹, Zhiyan Zhang², Chao Xu¹, Lei Huang³, Luolan Li^{2,3,*}

¹ Faculty of Light Industry and Chemical Engineering, Guangdong University of Technology, Guangzhou, 510006, China

² Shizhen College of Guizhou University of Traditional Chinese Medicine, Guiyang 550025, China

³ State Key Laboratory of Functions & Applications of Medicinal Plants, Guizhou Medical University, Guiyang 550014, China

E-mail: lill1206@163.com

Table of contents

NMR Spectra, IR Spectra, and Mass Spectra of 3a-3m
S1-S42	
NMR Spectra, IR Spectra, and Mass Spectra of 4a-4r
S43-S99	

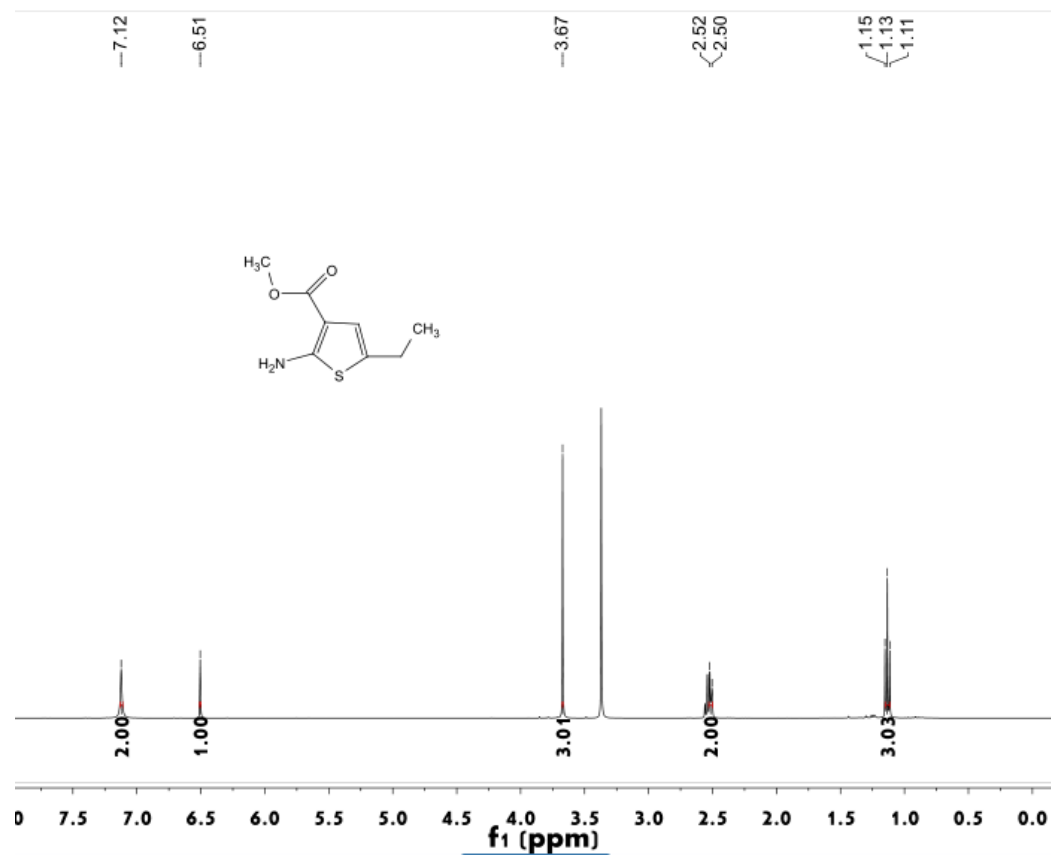


Figure S1 ¹H NMR spectrum of compound 3a

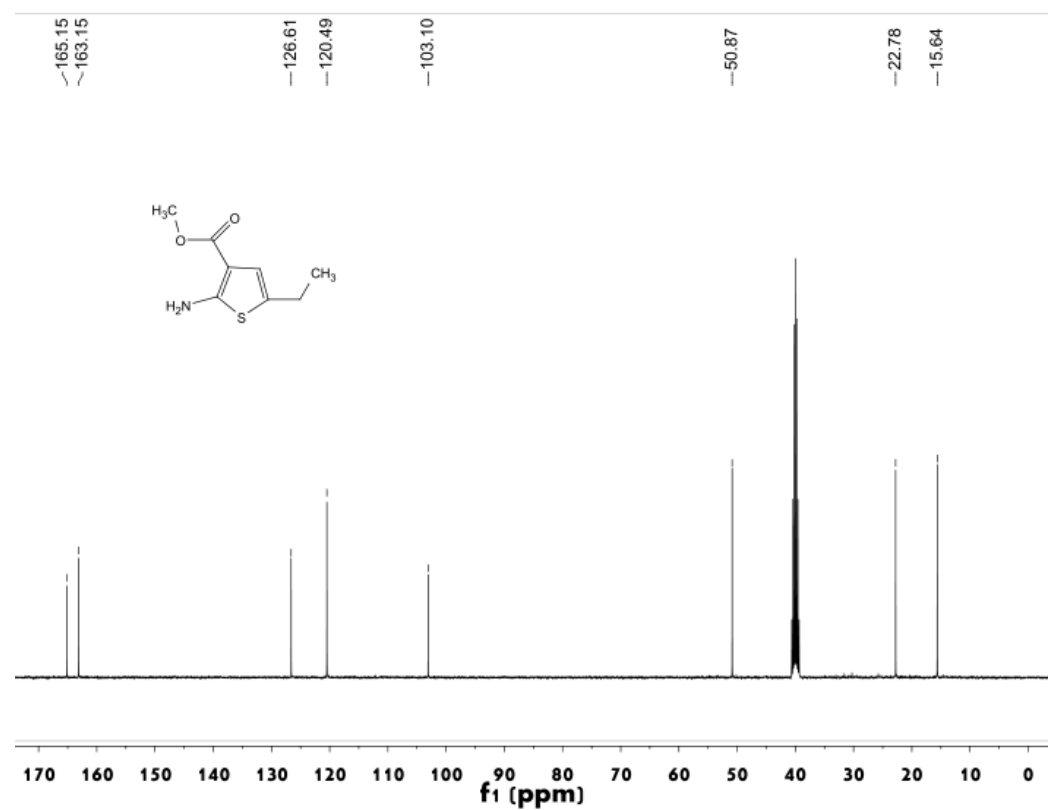


Figure S2 ¹³C NMR spectrum of compound 3a

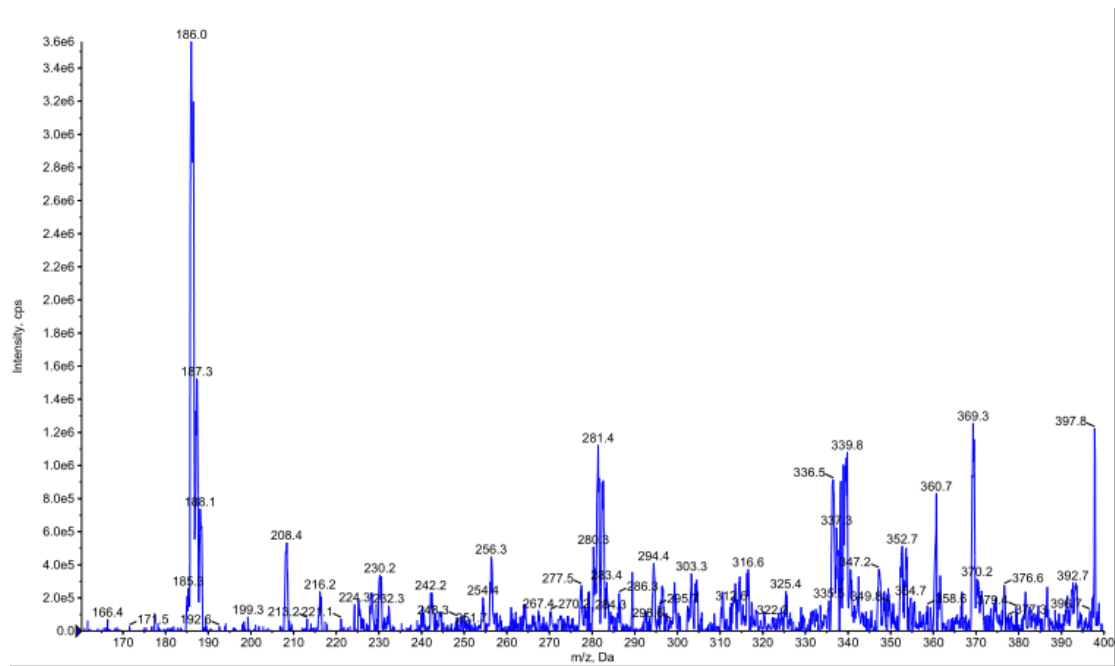


Figure S3 mass spectrum of compound 3a

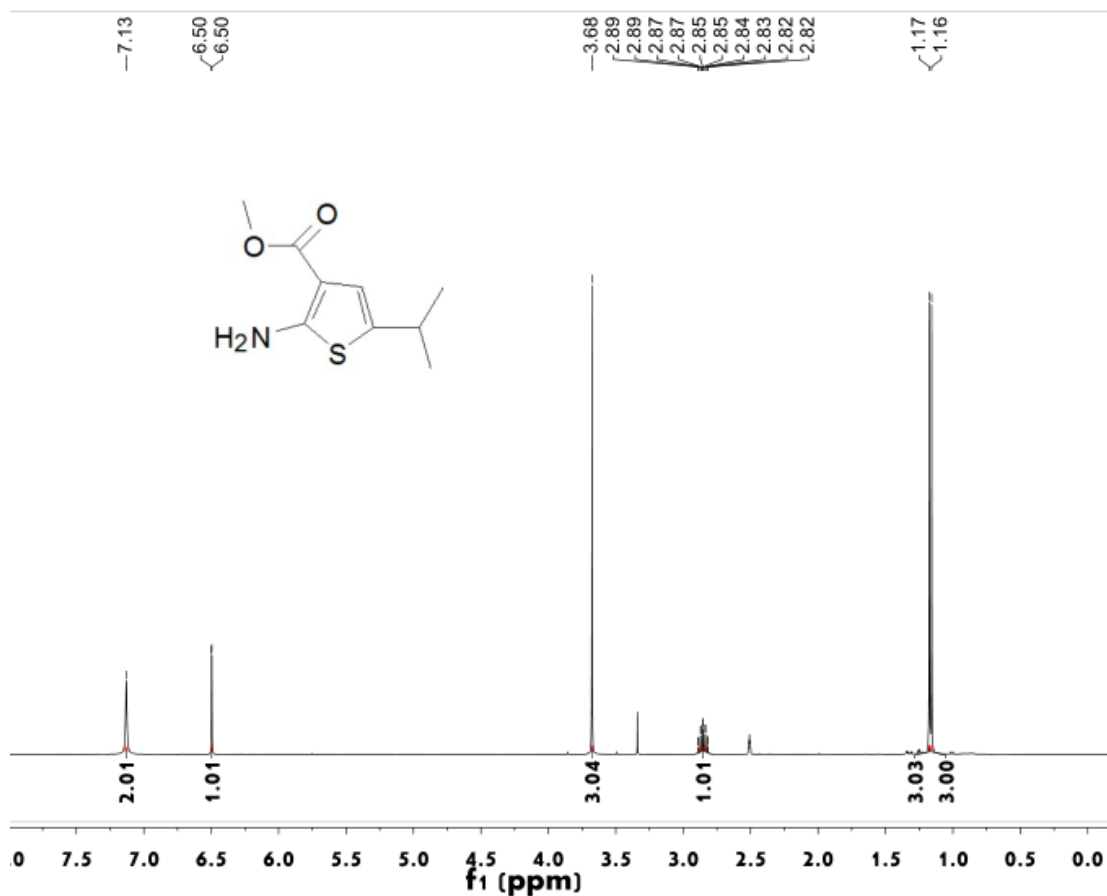


Figure S4 ^1H NMR spectrum of compound 3b

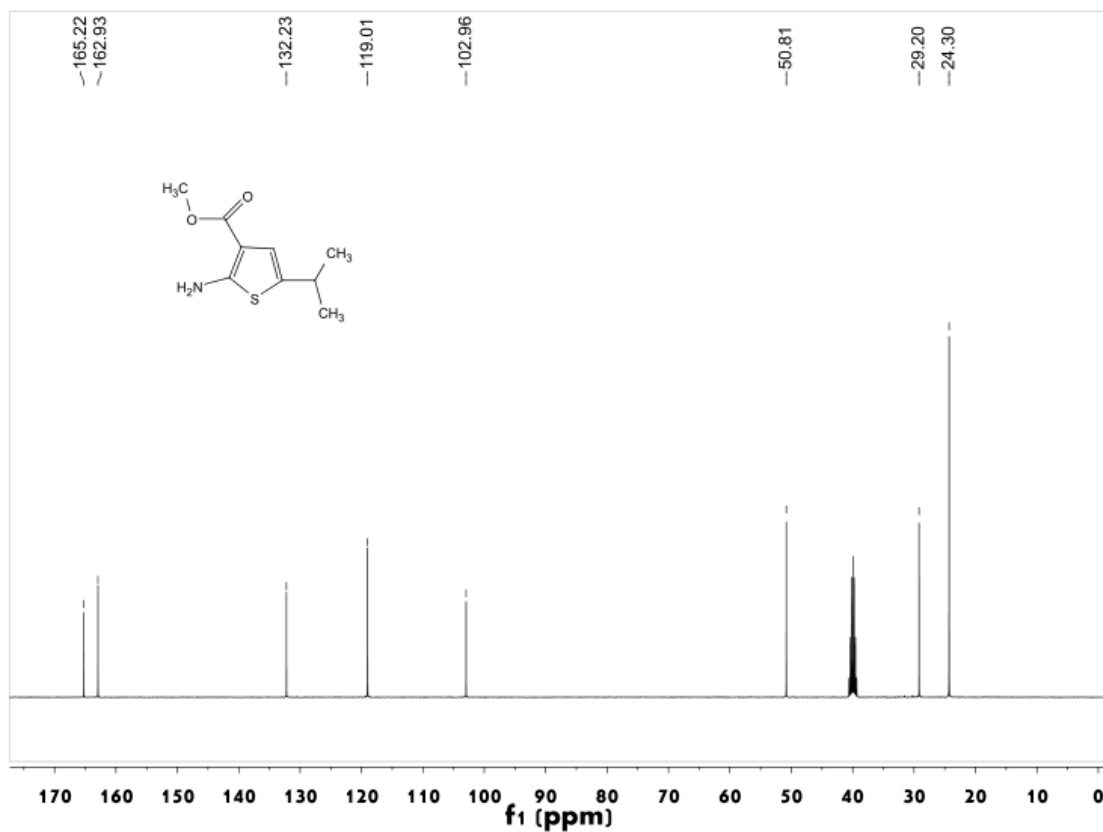


Figure S5 ^{13}C NMR spectrum of compound 3b

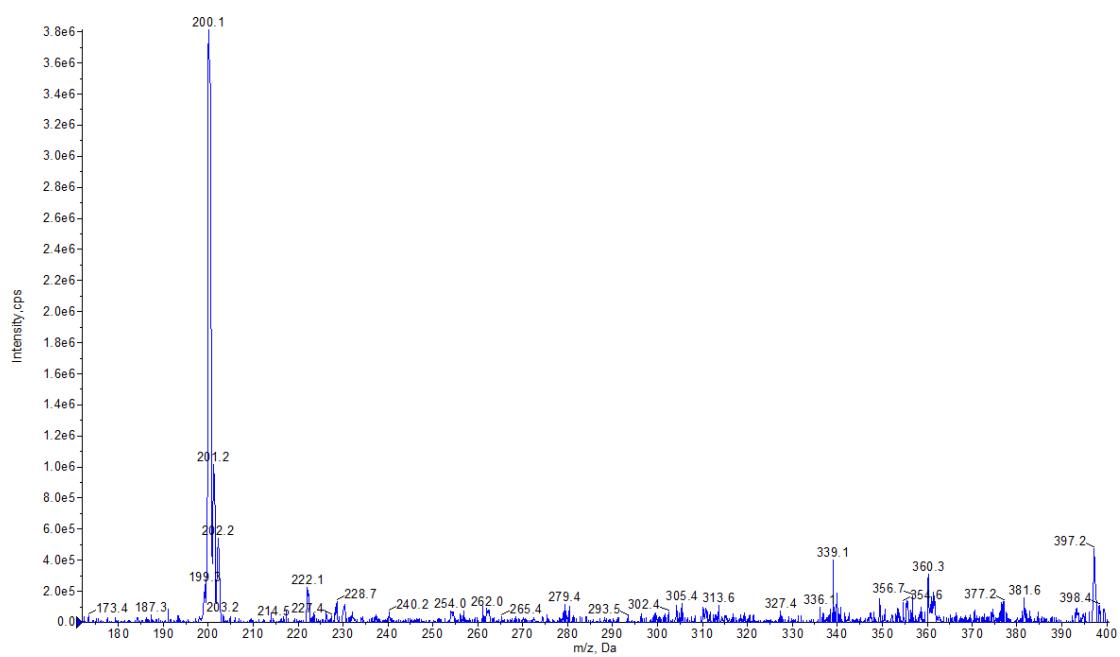


Figure S6 mass spectrum of compound 3b

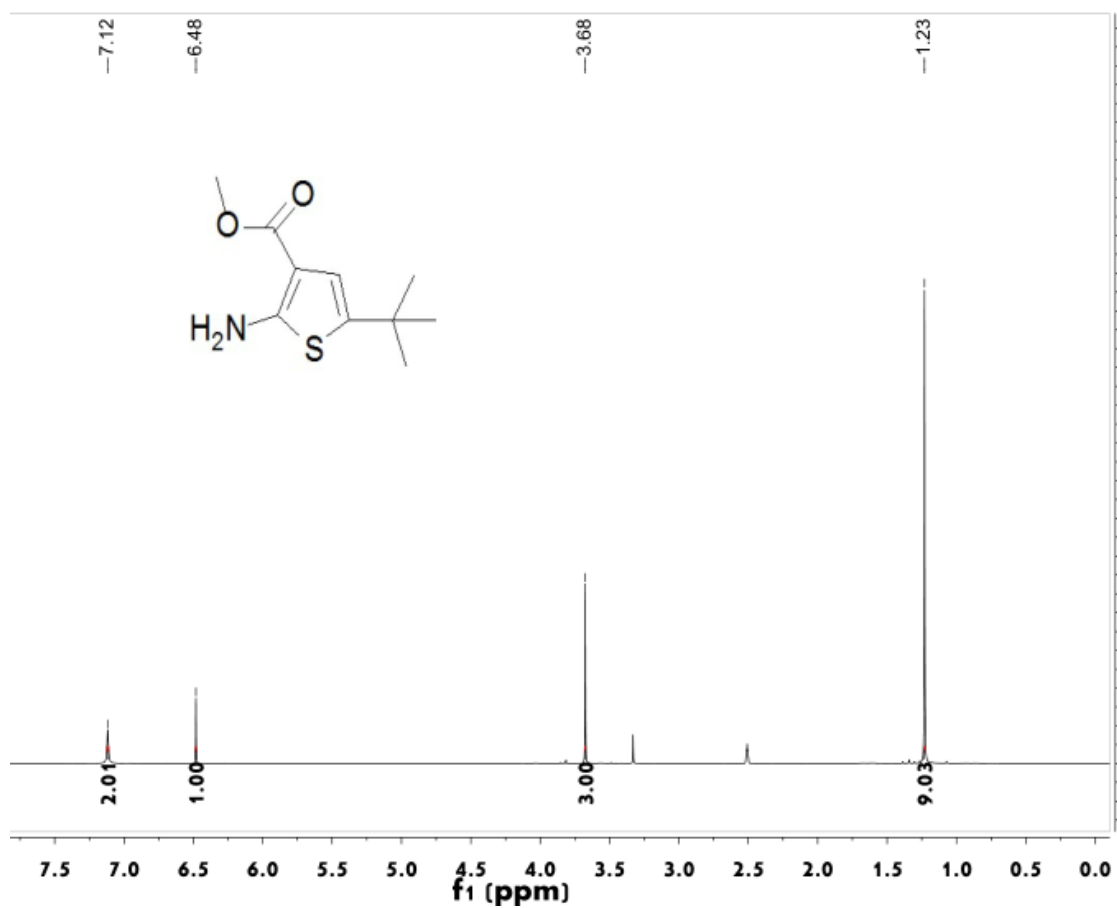


Figure S7 ^1H NMR spectrum of compound **3c**

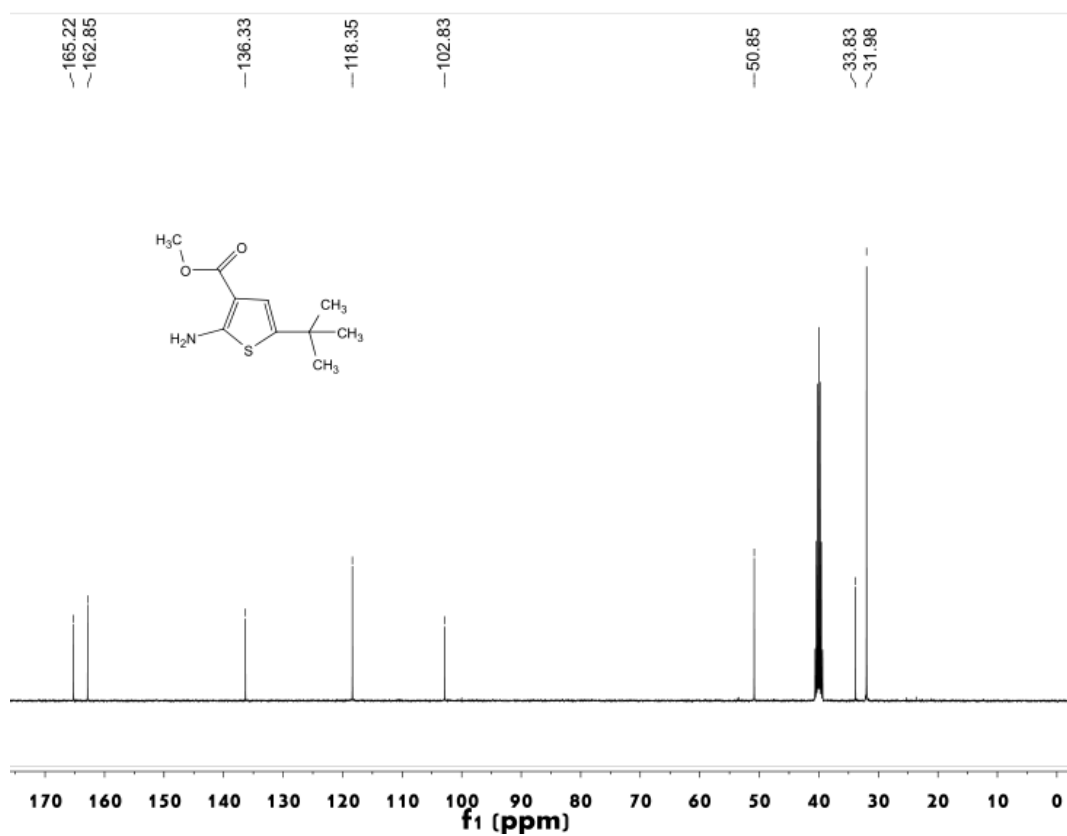


Figure S8 ^{13}C NMR spectrum of compound **3c**

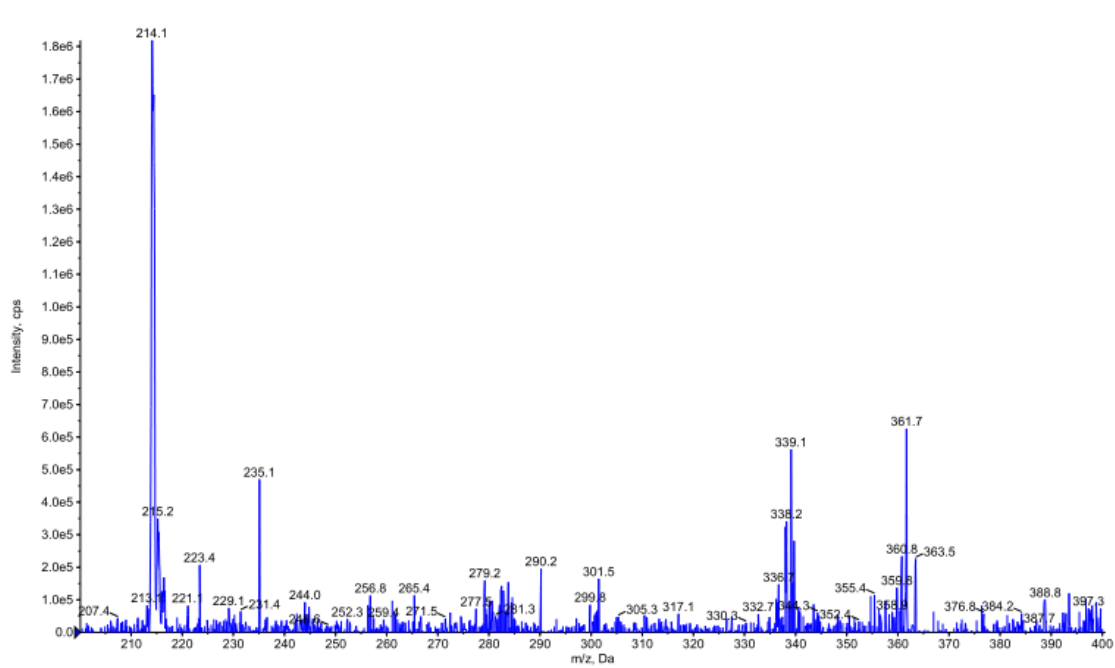


Figure S9 mass spectrum of compound 3c

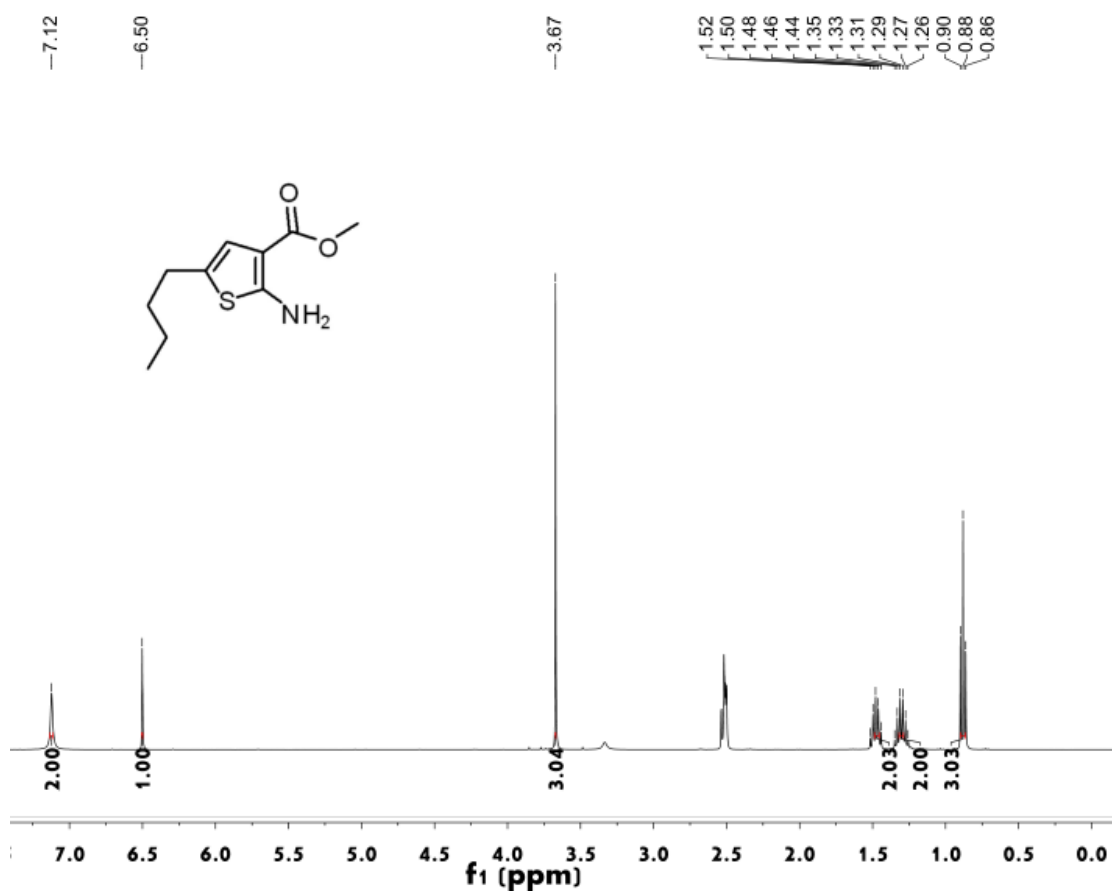


Figure S10 ^1H NMR spectrum of compound 3d

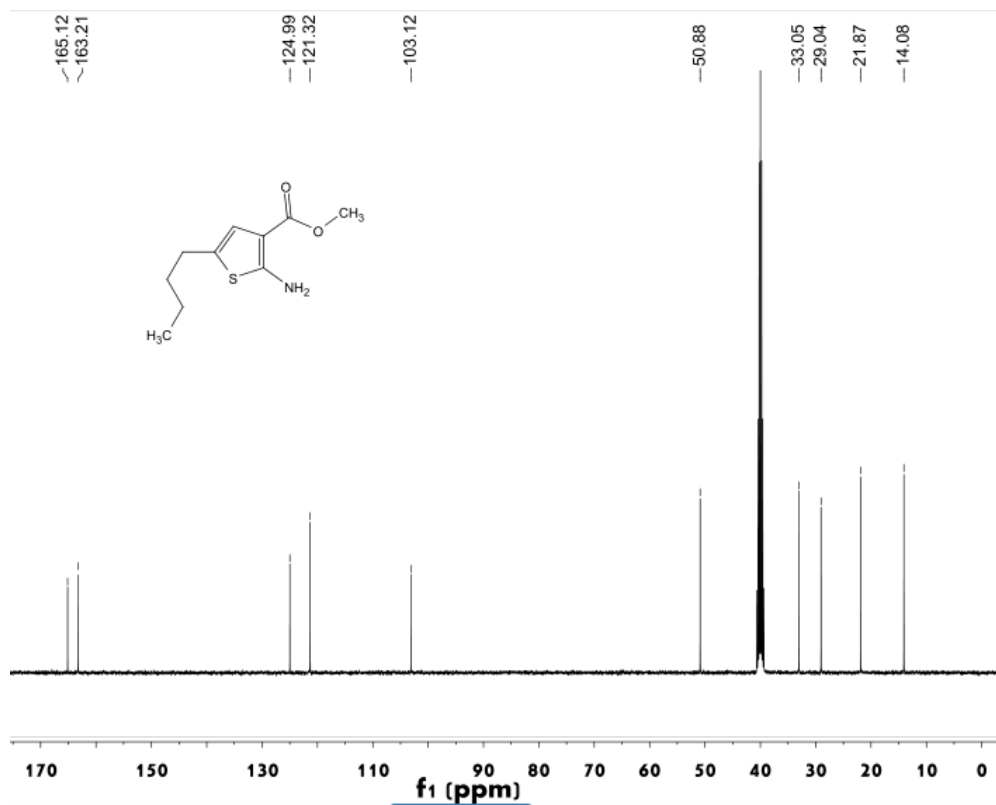


Figure S11 ^{13}C NMR spectrum of compound 3d

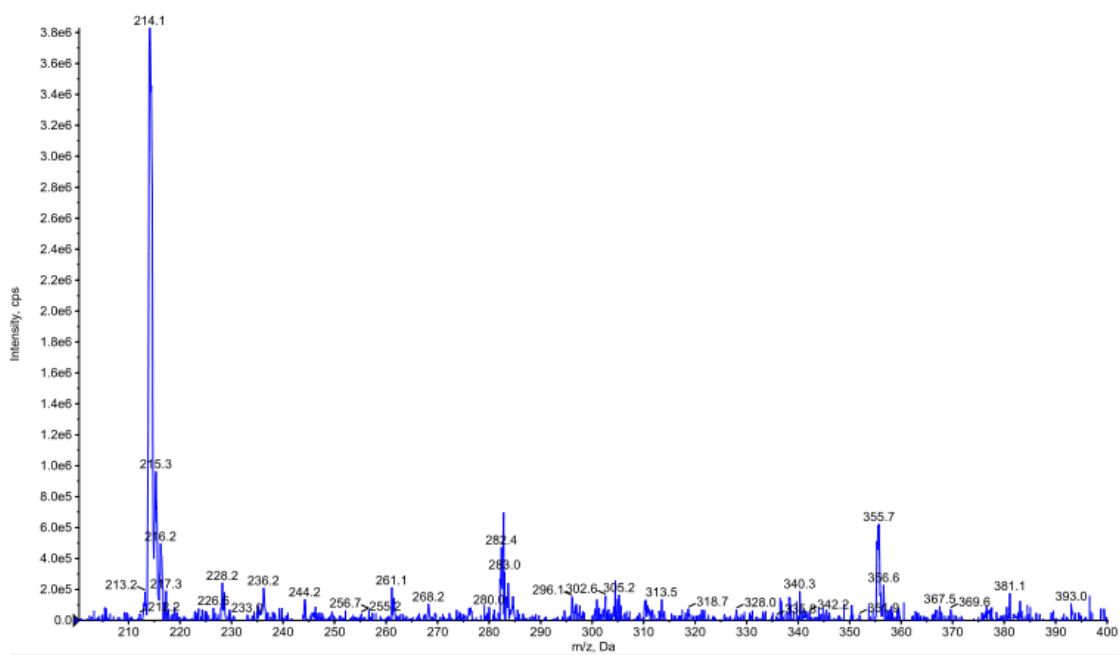


Figure S12 mass spectrum of compound 3d

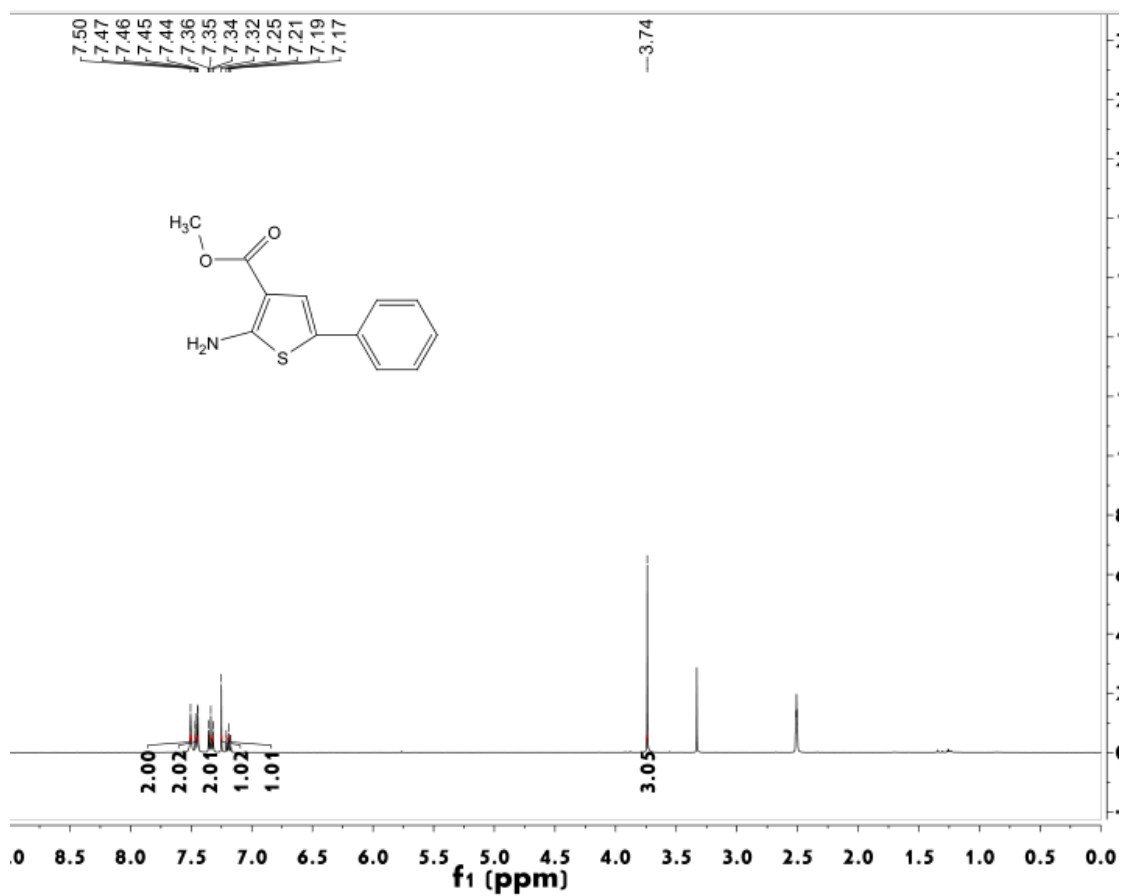


Figure S13 $^1\text{H NMR}$ spectrum of compound 3e

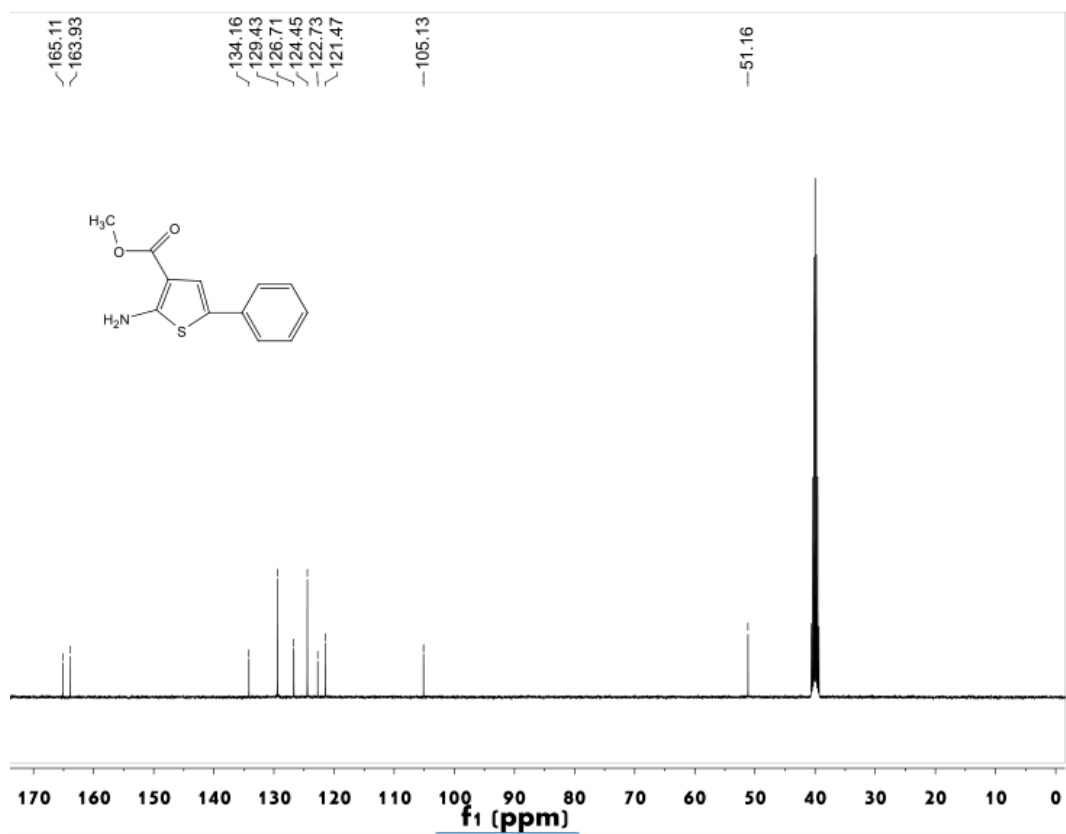


Figure S14 $^{13}\text{C NMR}$ spectrum of compound 3e

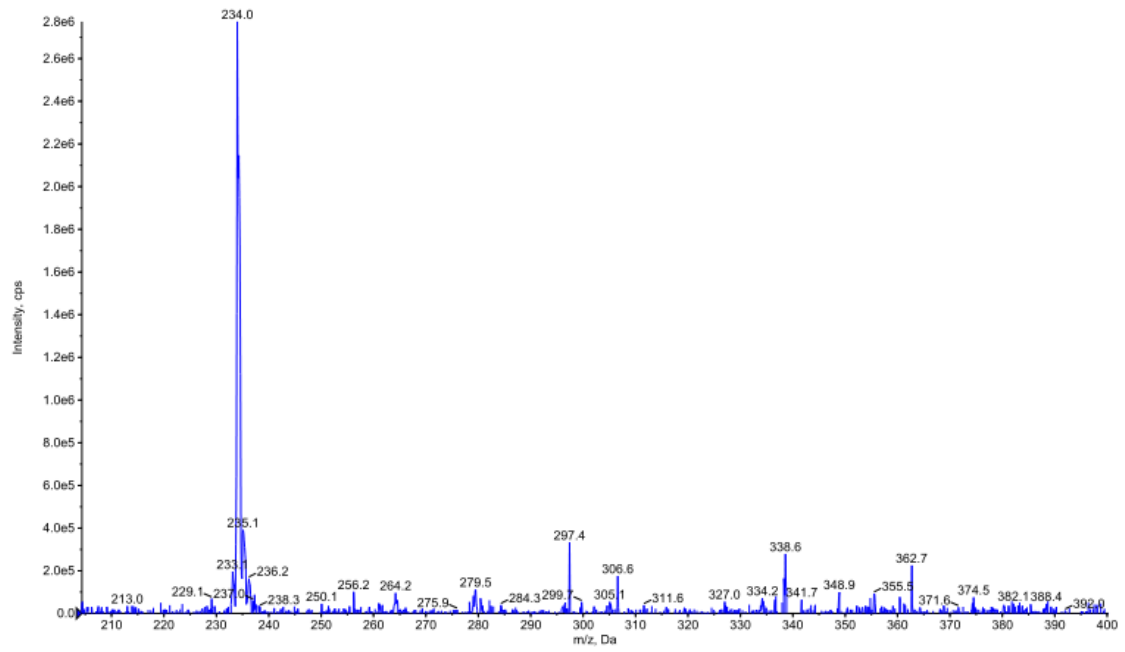


Figure S15 mass spectrum of compound 3e

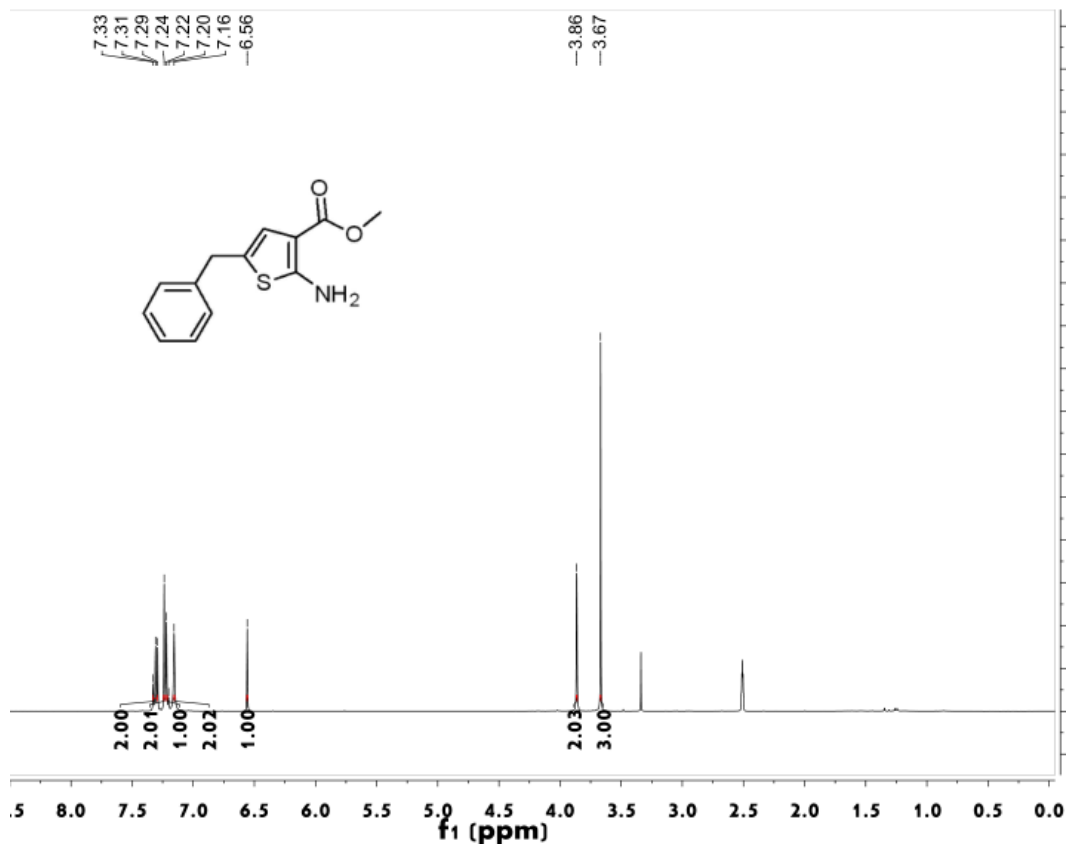


Figure S16 ¹H NMR spectrum of compound 3f

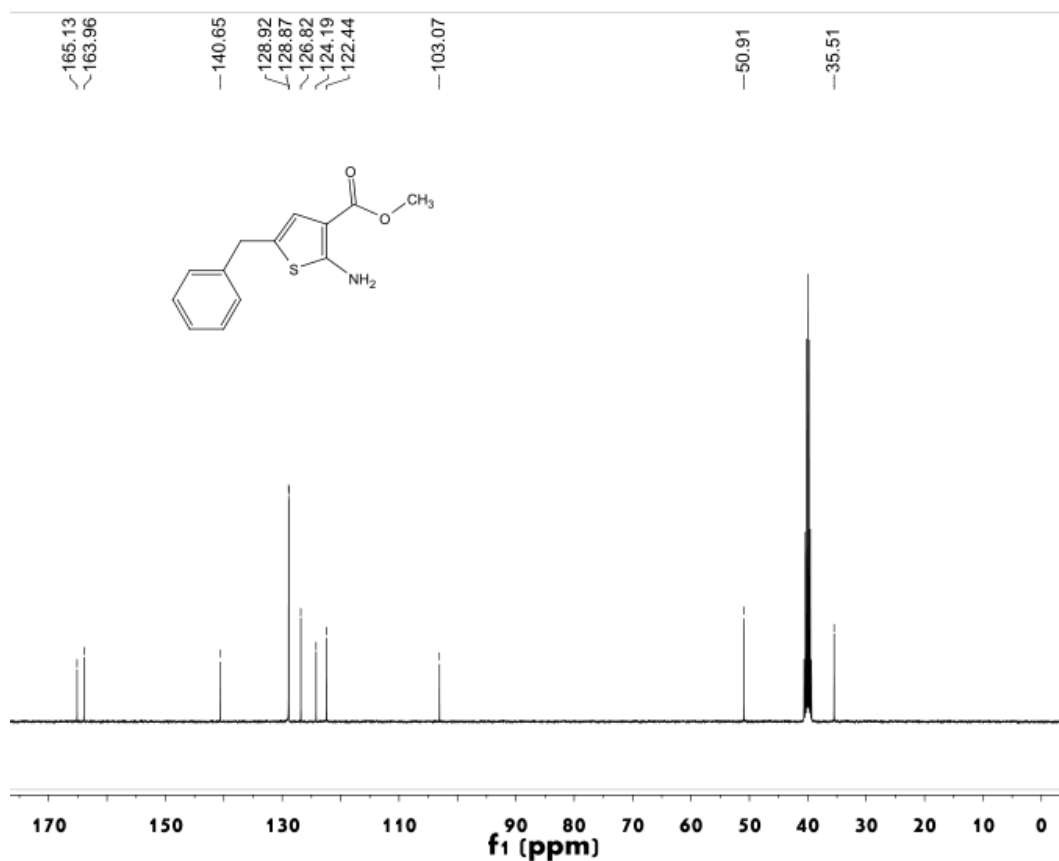


Figure S17 ¹³C NMR spectrum of compound 3f

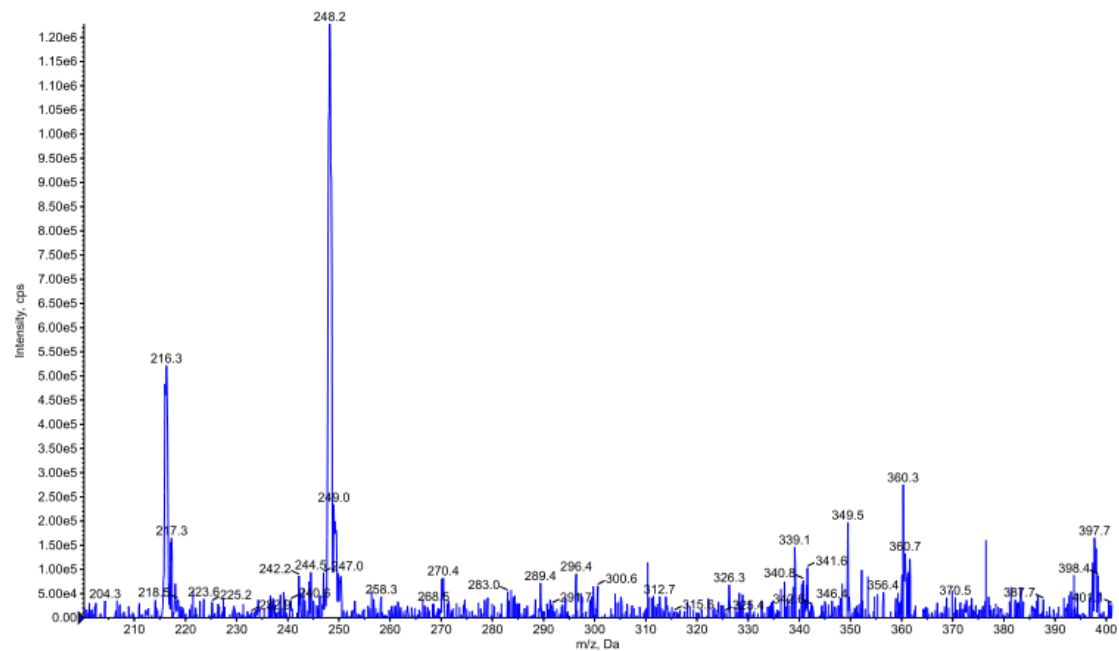


Figure S18 mass spectrum of compound 3f

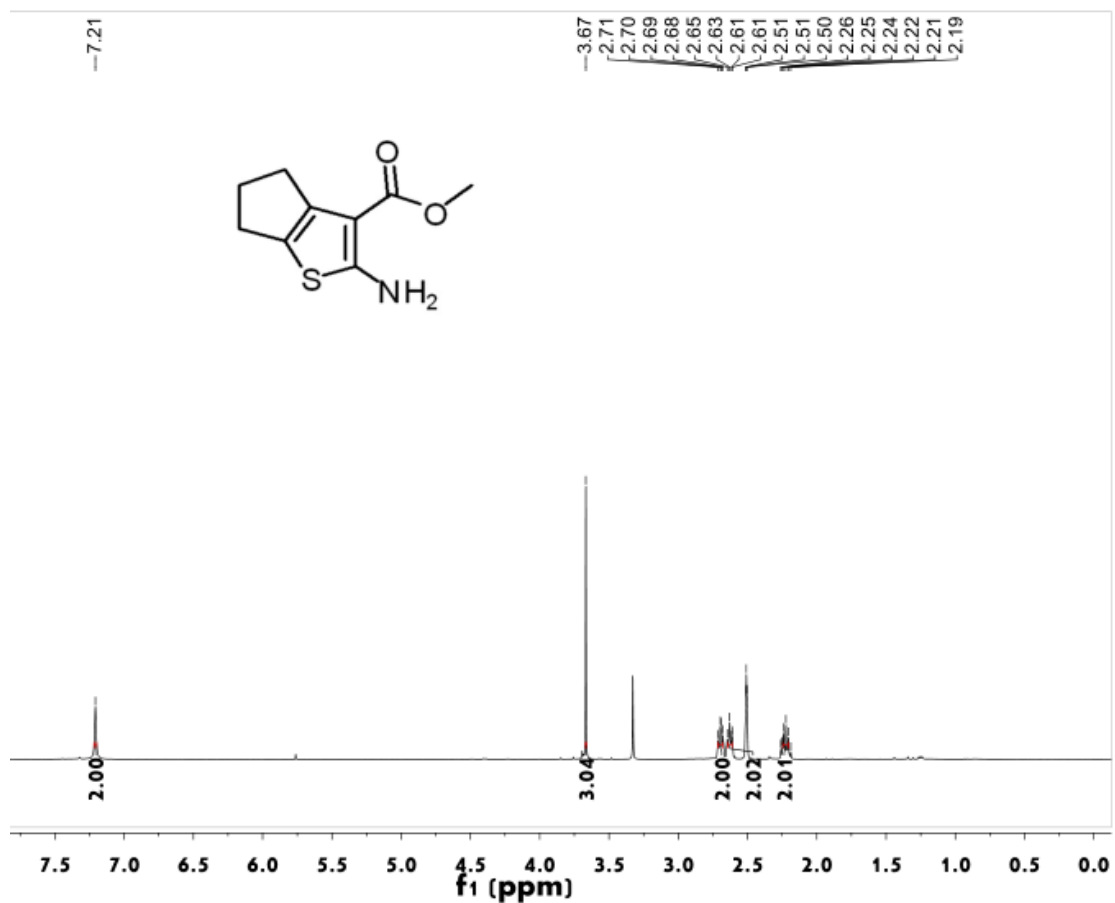


Figure S19 ^1H NMR spectrum of compound 3g

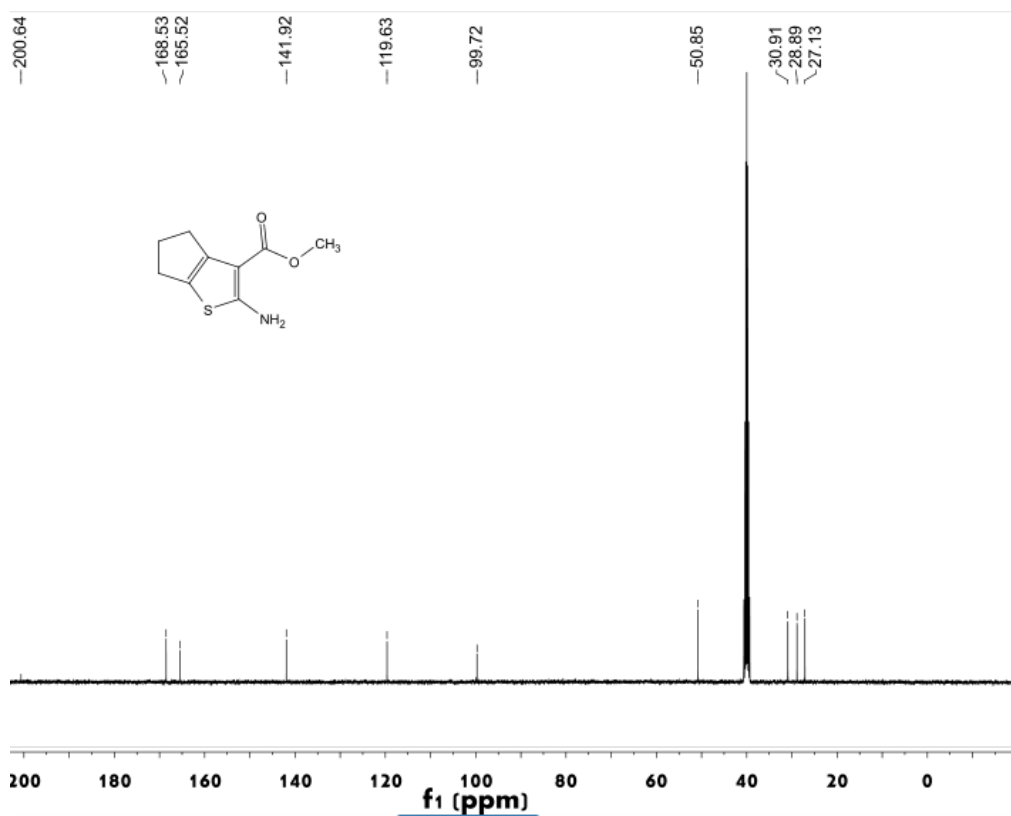


Figure S20 ^{13}C NMR spectrum of compound 3g

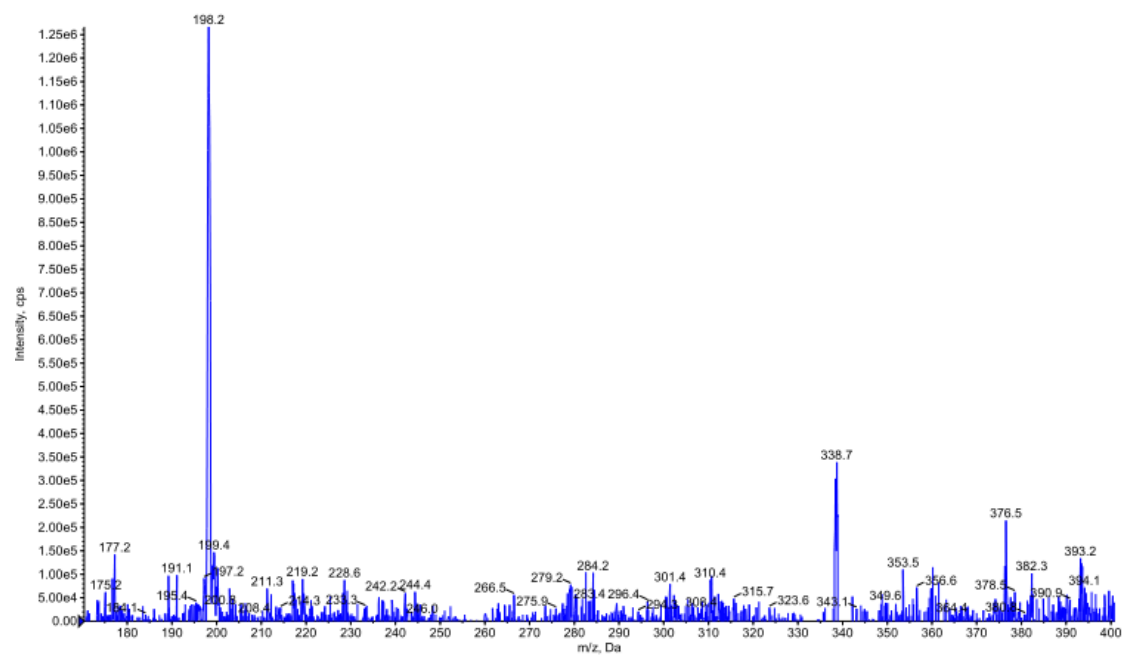


Figure S21 mass spectrum of compound 3g

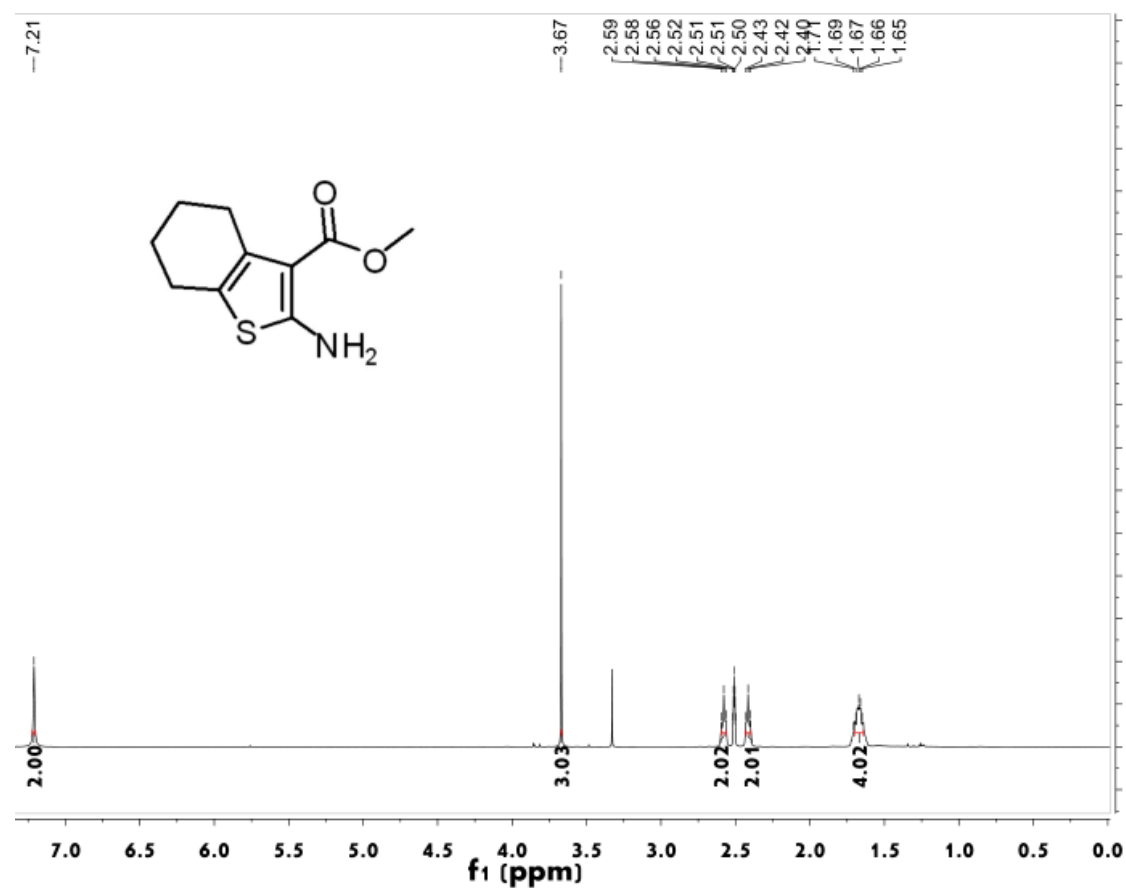


Figure S22 ¹H NMR spectrum of compound 3h

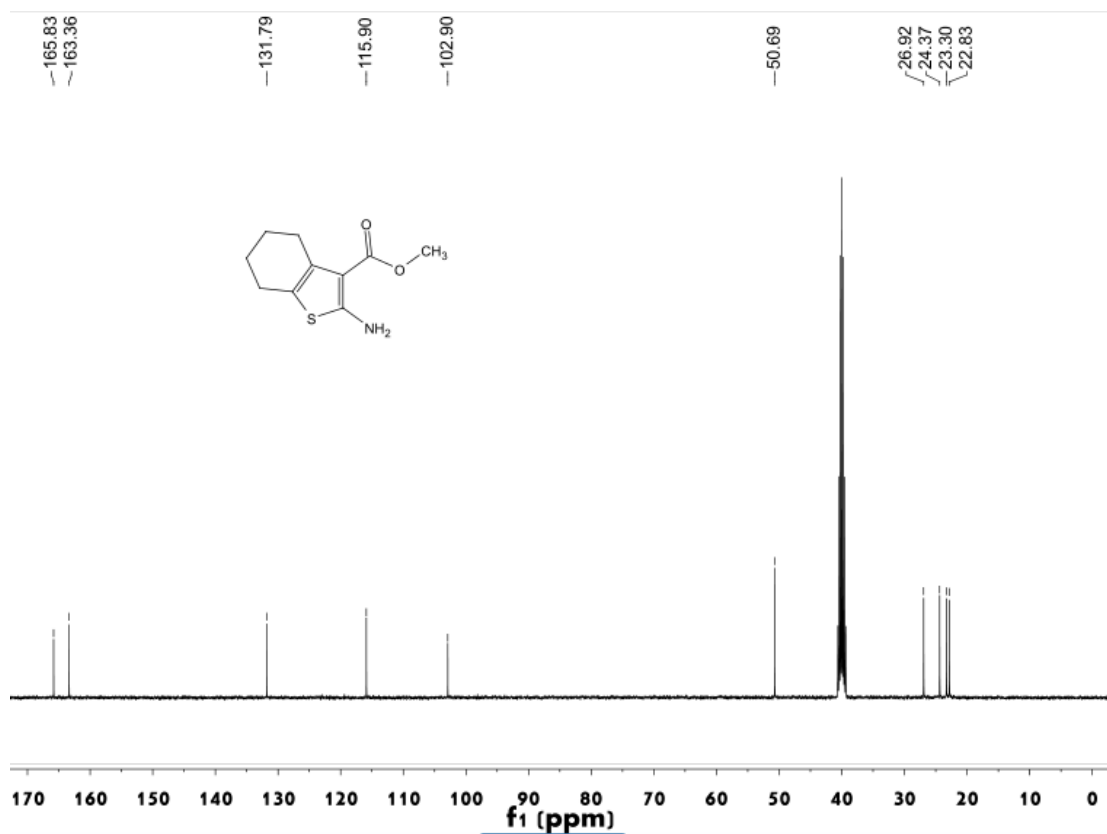


Figure S23 ^{13}C NMR spectrum of compound 3h

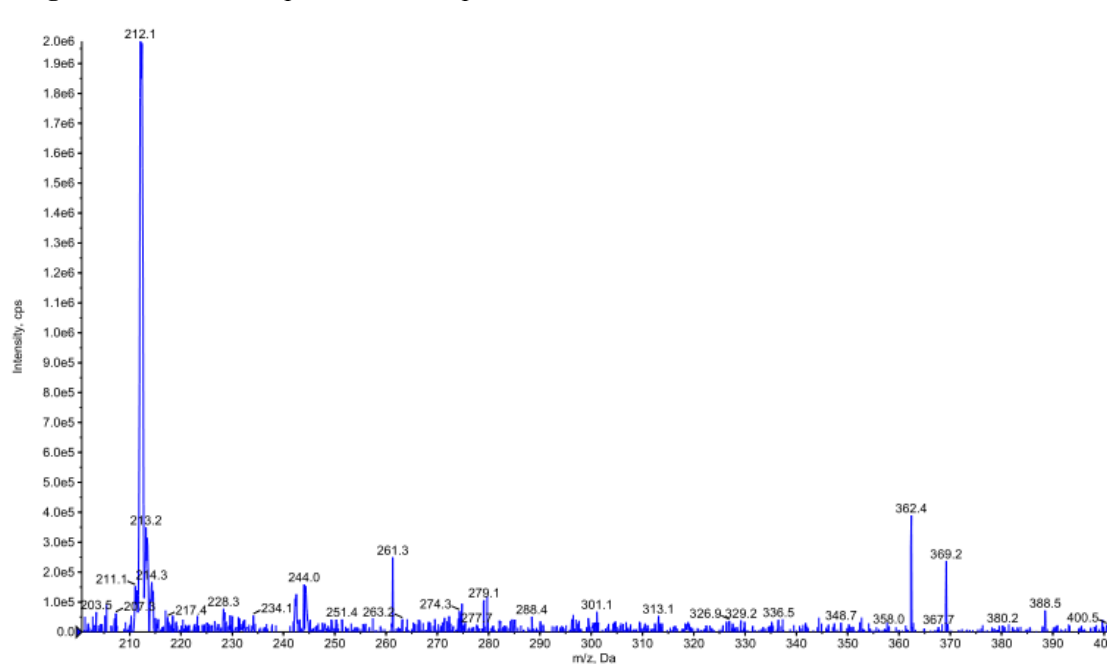


Figure S24 mass spectrum of compound 3h

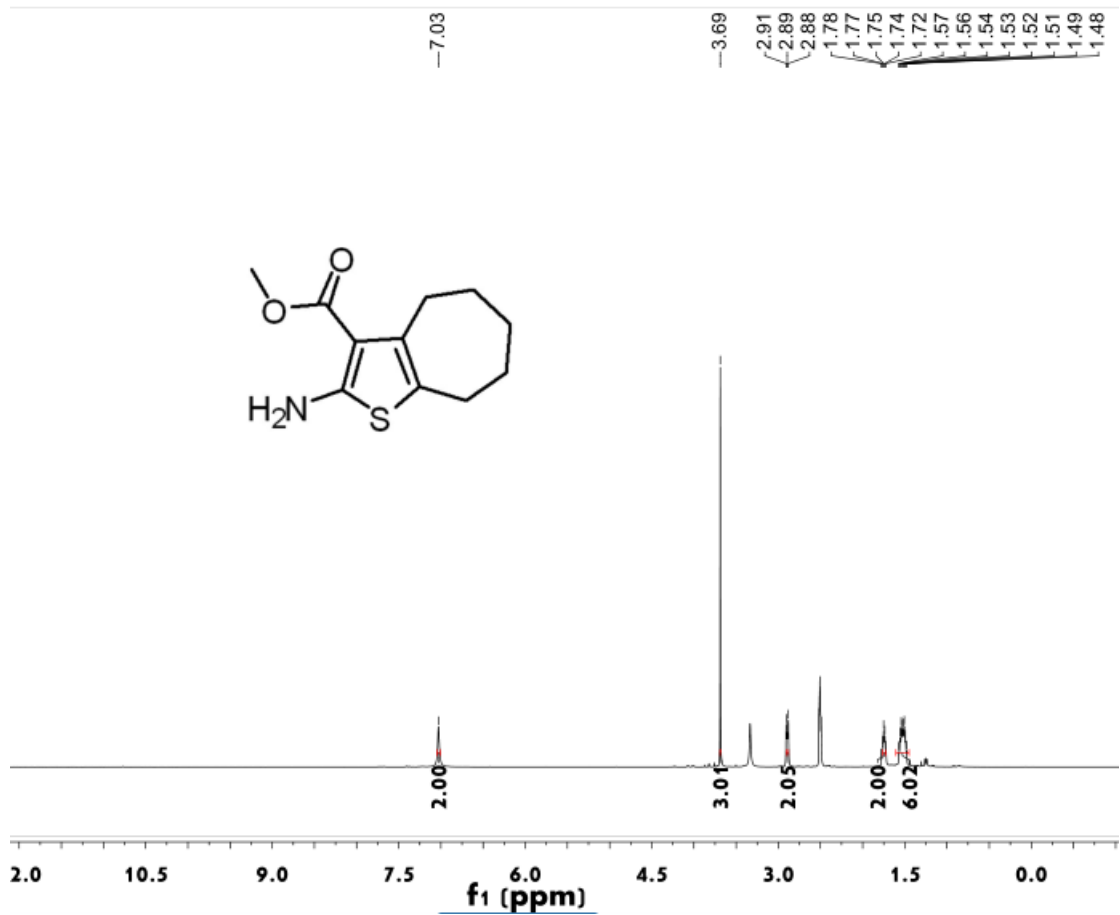


Figure S25 $^1\text{H NMR}$ spectrum of compound 3i

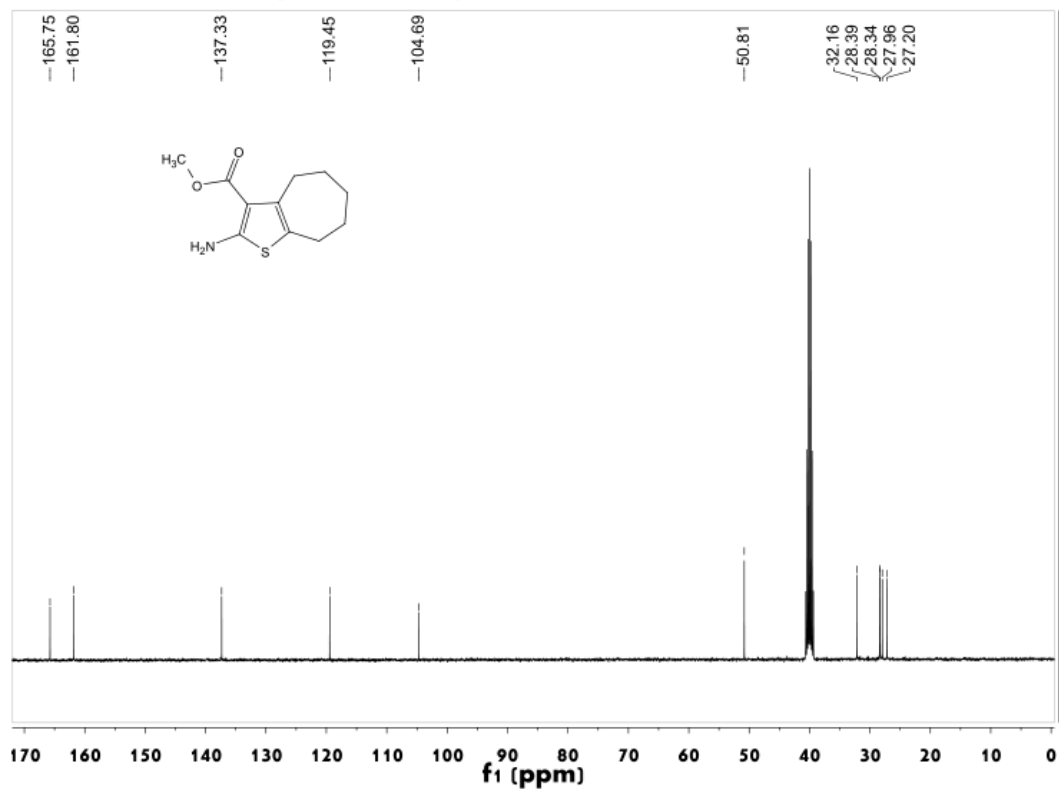


Figure S26 $^{13}\text{C NMR}$ spectrum of compound 3i

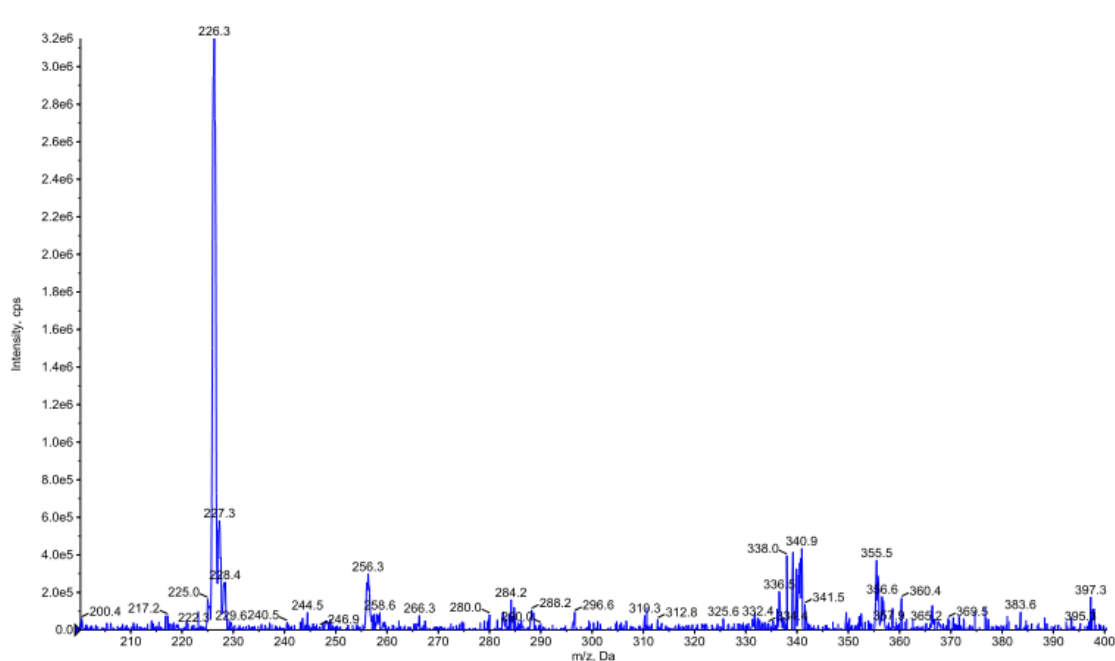


Figure S27 mass spectrum of compound 3i

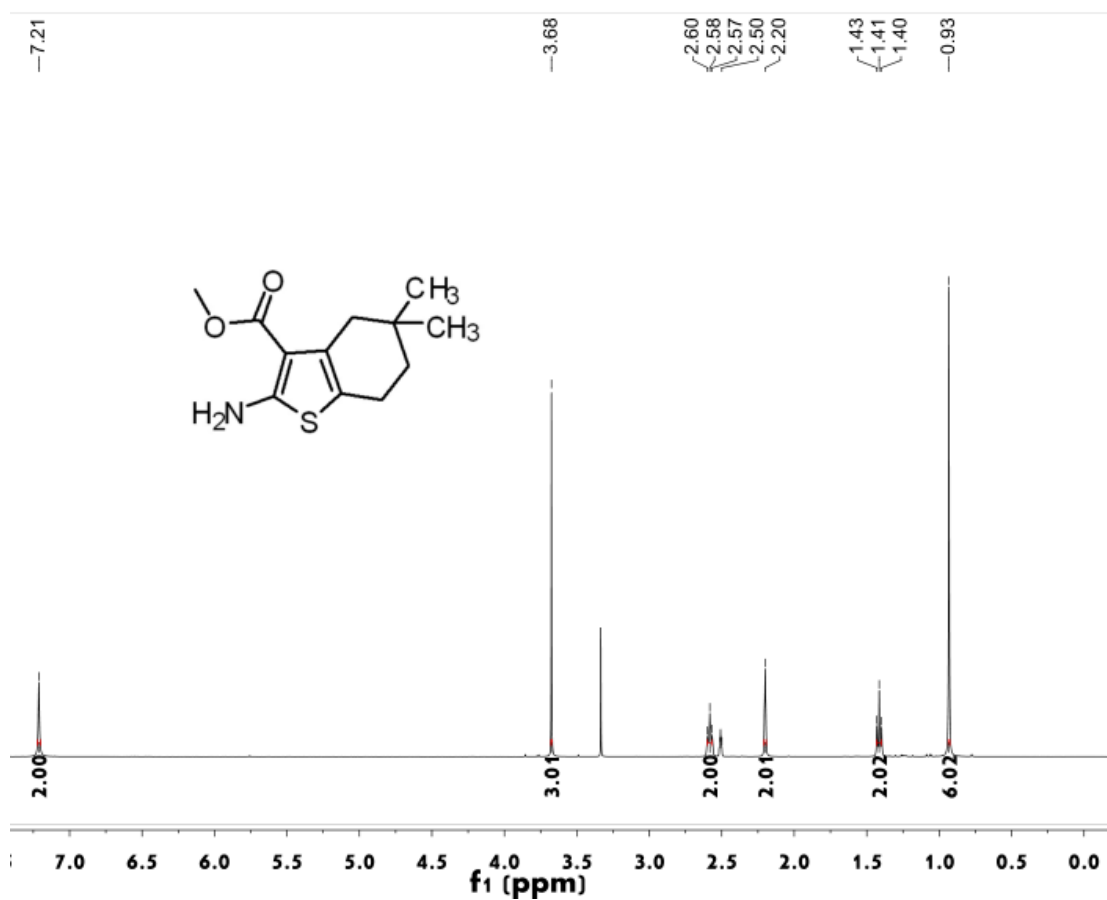


Figure S28 ^1H NMR spectrum of compound 3j

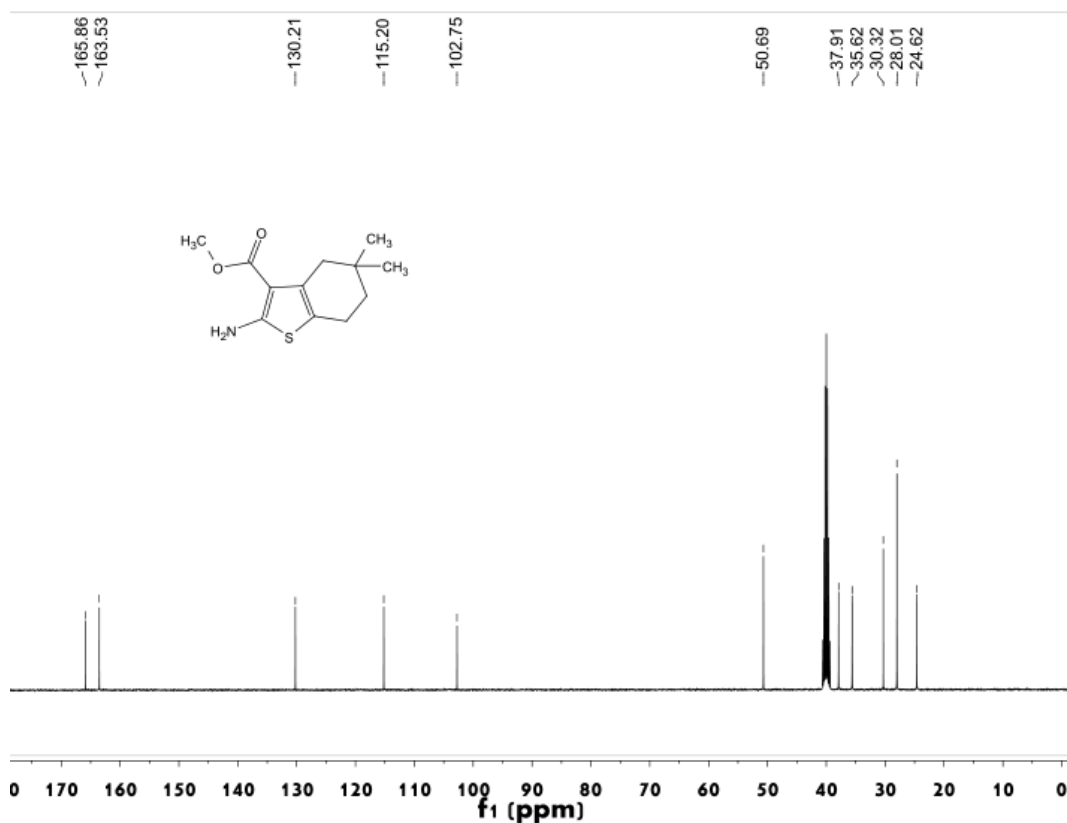


Figure S29 ¹³C NMR spectrum of compound 3j

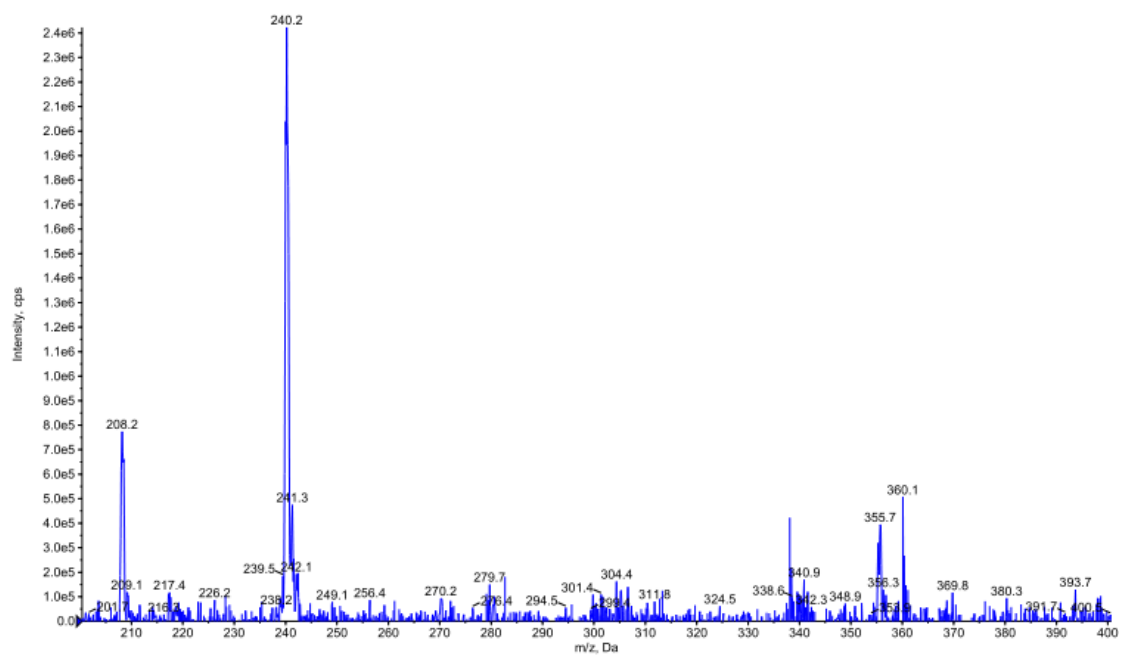


Figure S30 mass spectrum of compound 3j

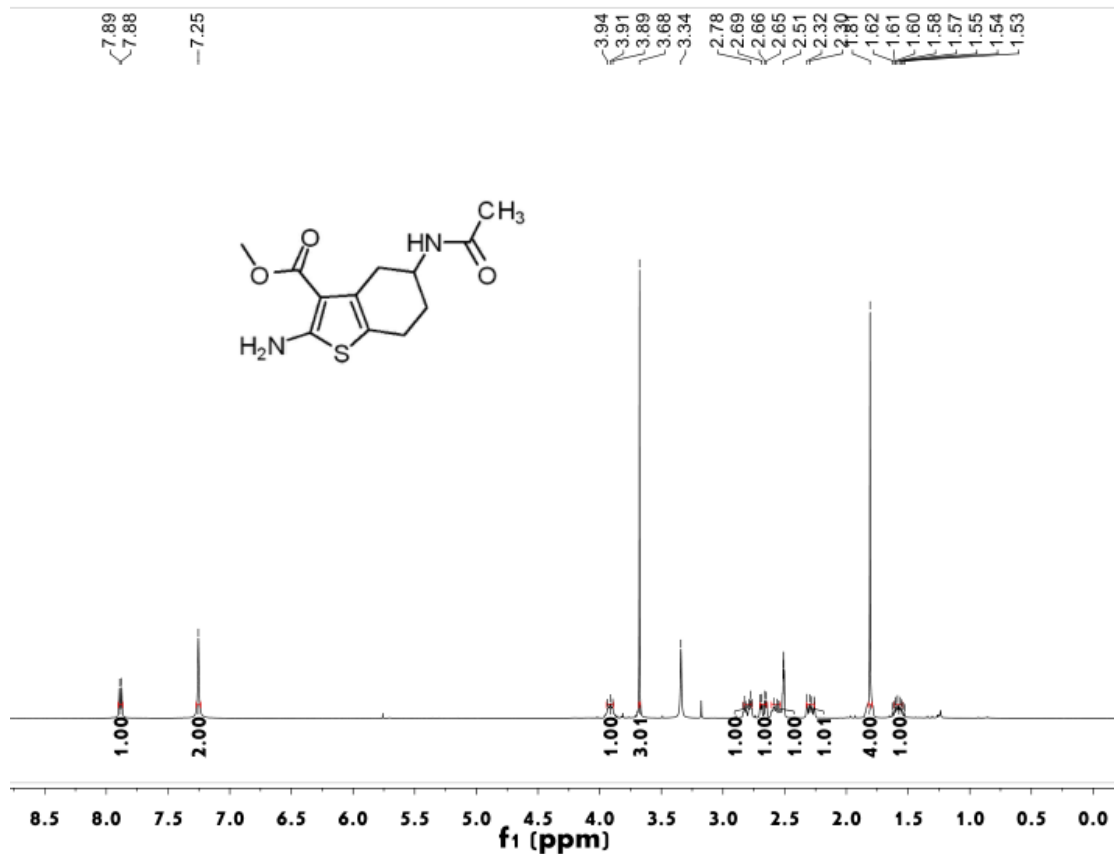


Figure S31 ^1H NMR spectrum of compound 3k

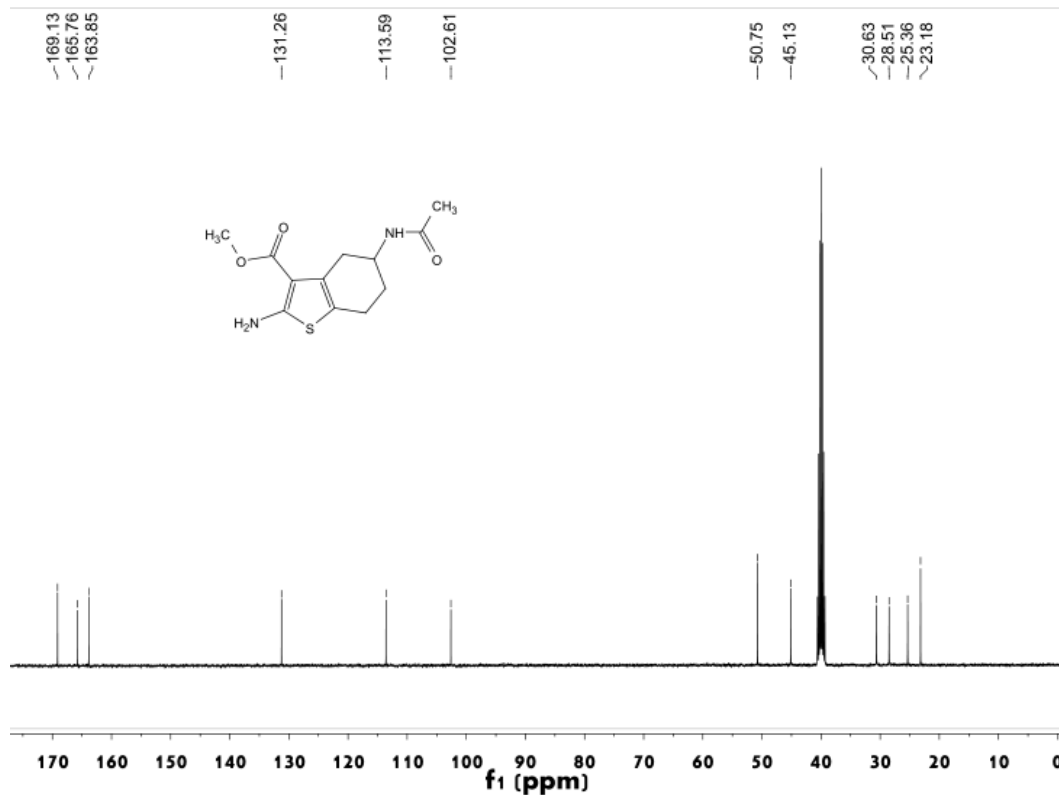


Figure S32 ^{13}C NMR spectrum of compound 3k

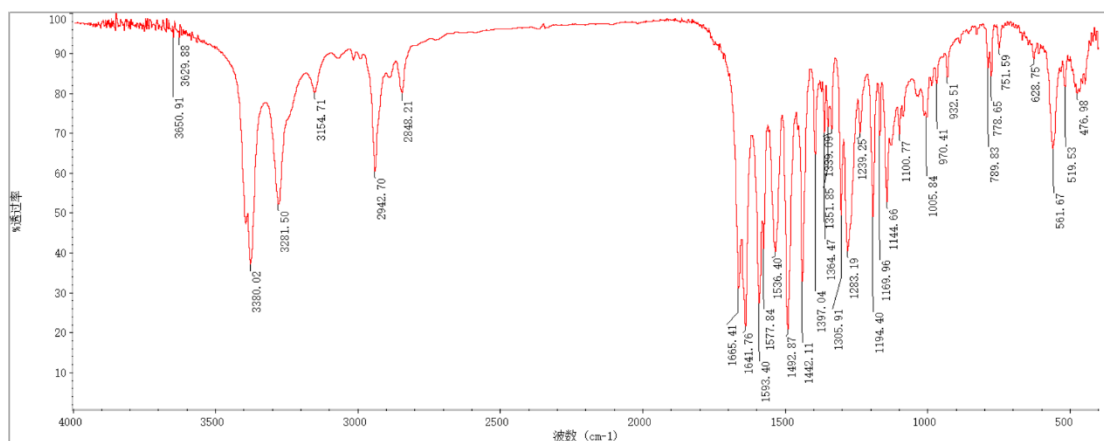


Figure S33 IR spectrum of compound **3k**

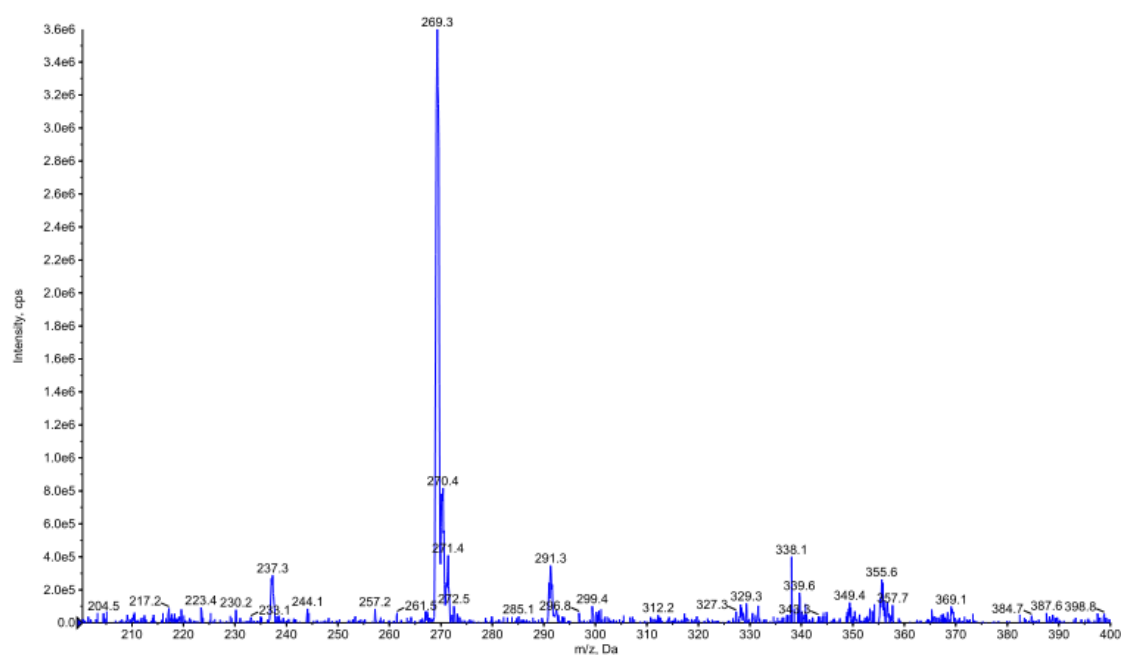


Figure S34 mass spectrum of compound **3k**

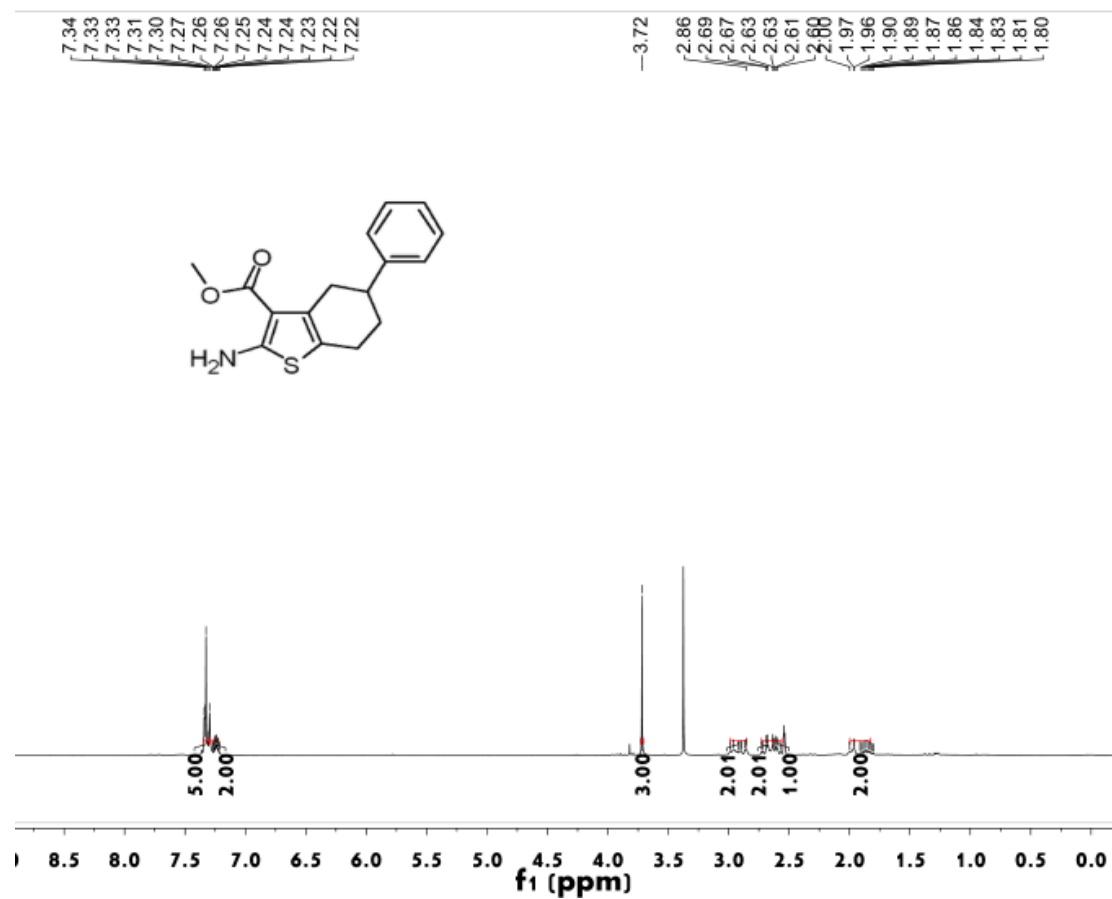


Figure S35 $^1\text{H NMR}$ spectrum of compound 31

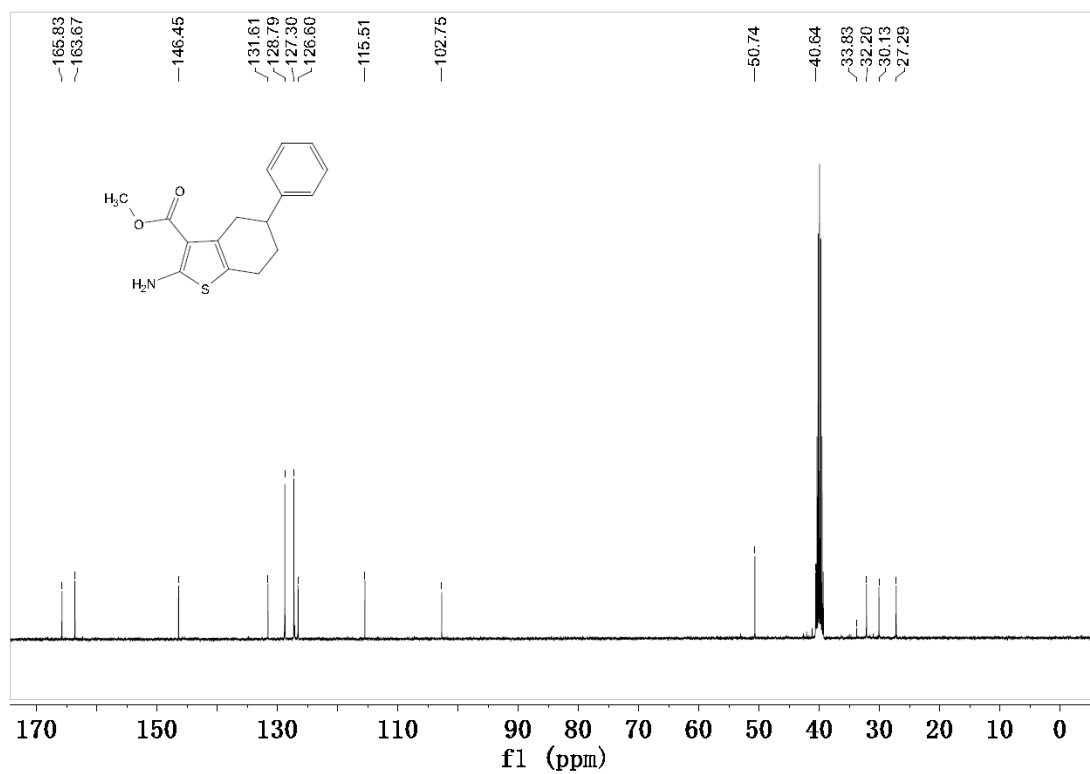


Figure S36 $^{13}\text{C NMR}$ spectrum of compound 31

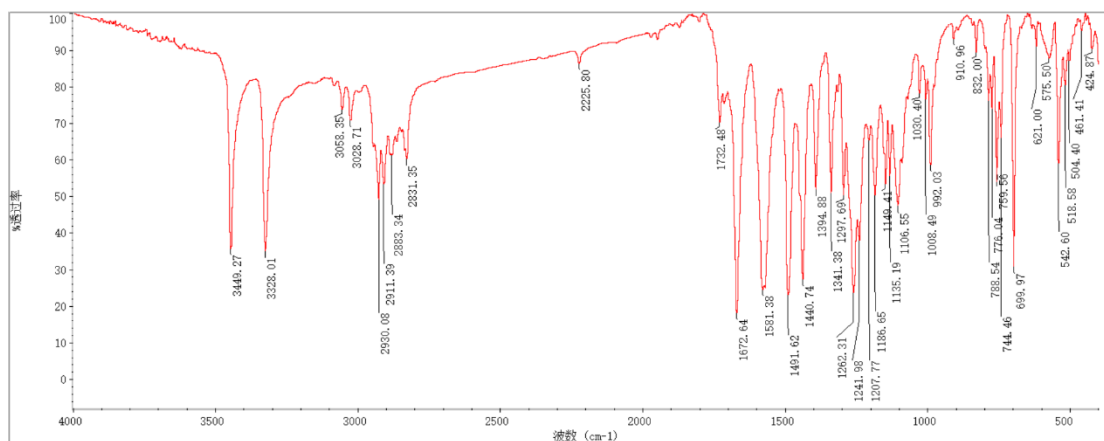


Figure S37 IR spectrum of compound 31

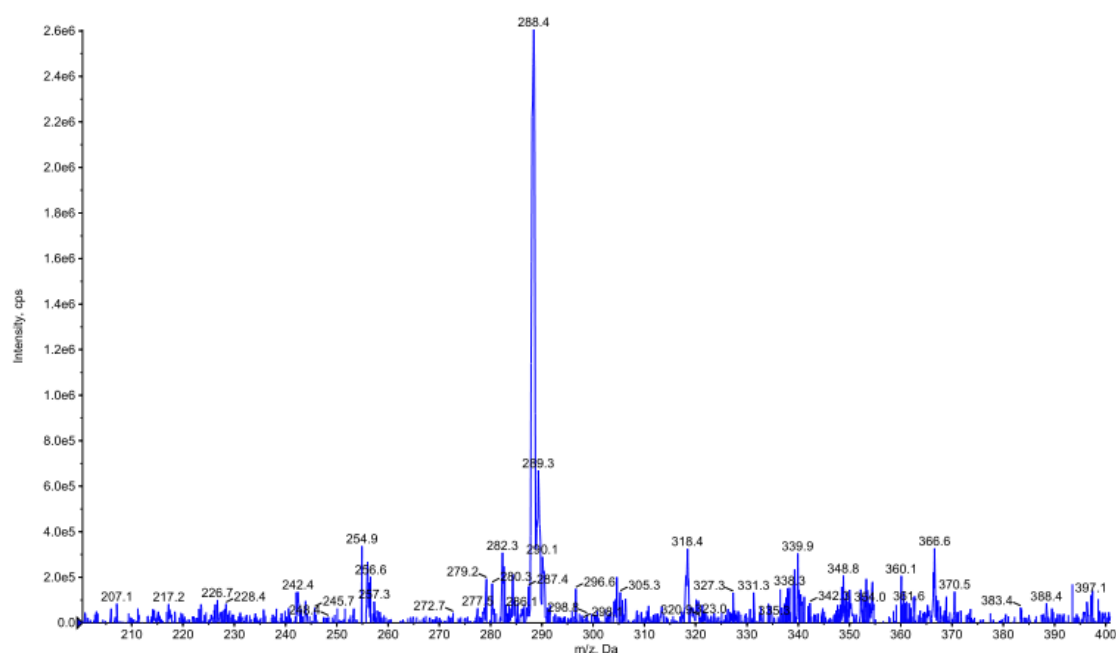


Figure S38 mass spectrum of compound 31

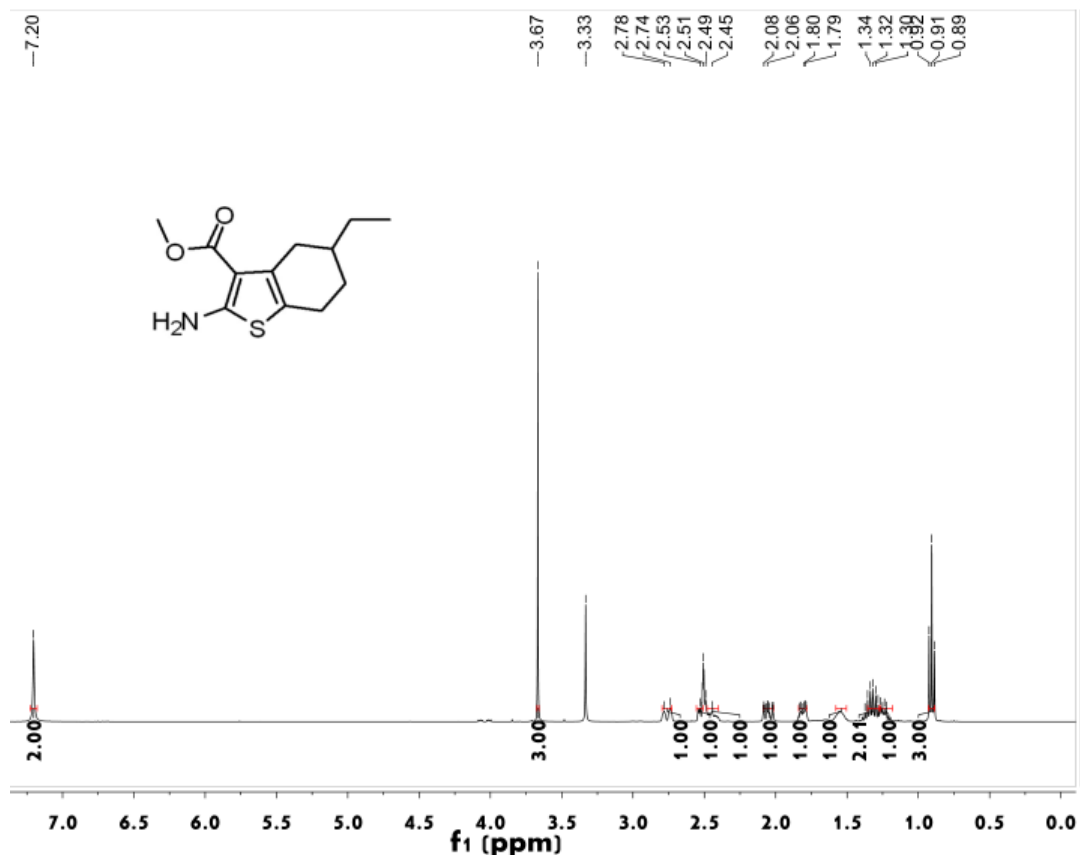


Figure S39 ^1H NMR spectrum of compound 3m

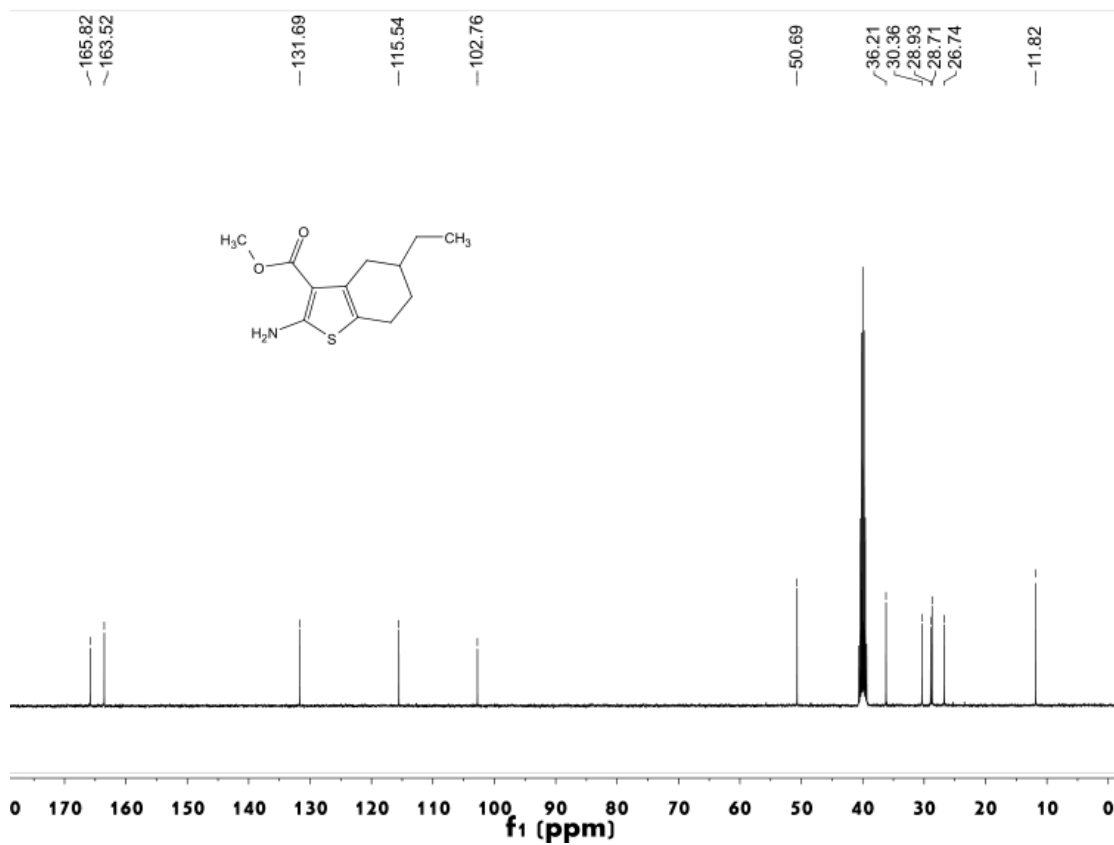


Figure S40 ^{13}C NMR spectrum of compound 3m

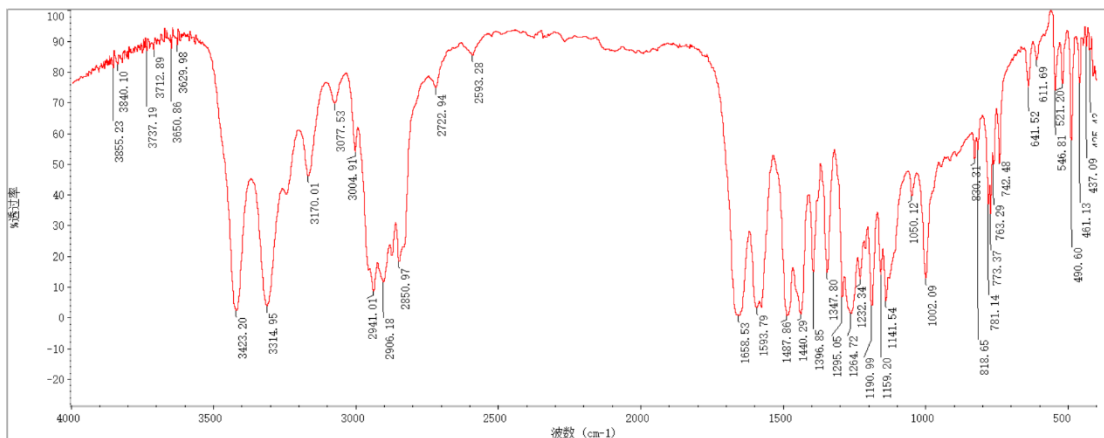


Figure S41 IR spectrum of compound **3m**

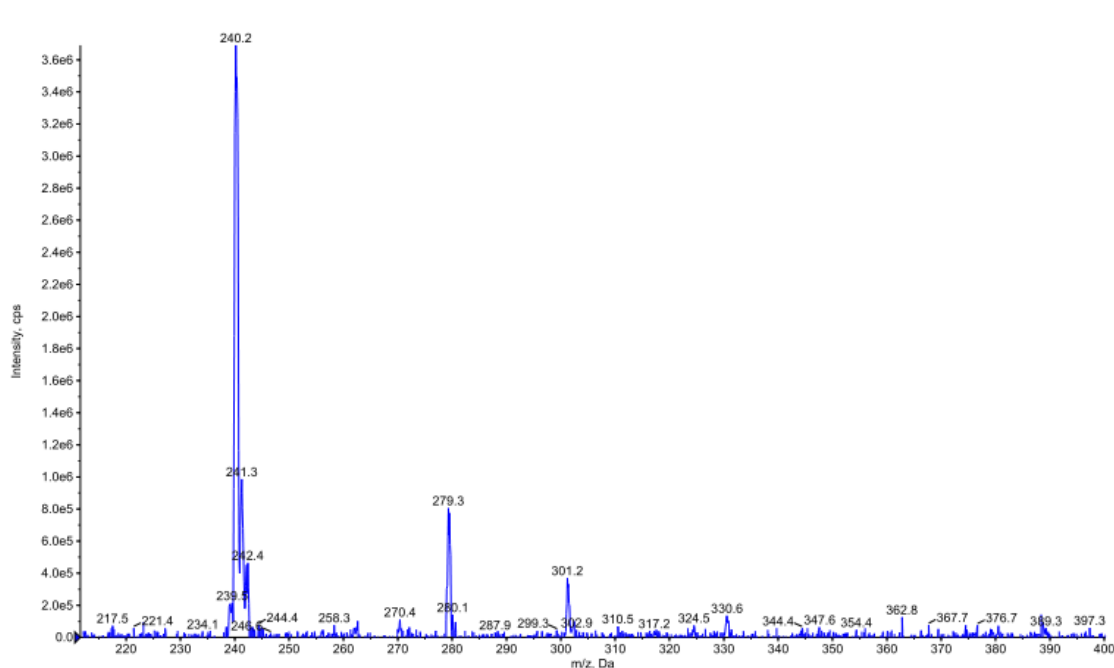


Figure S42 mass spectrum of compound **3m**

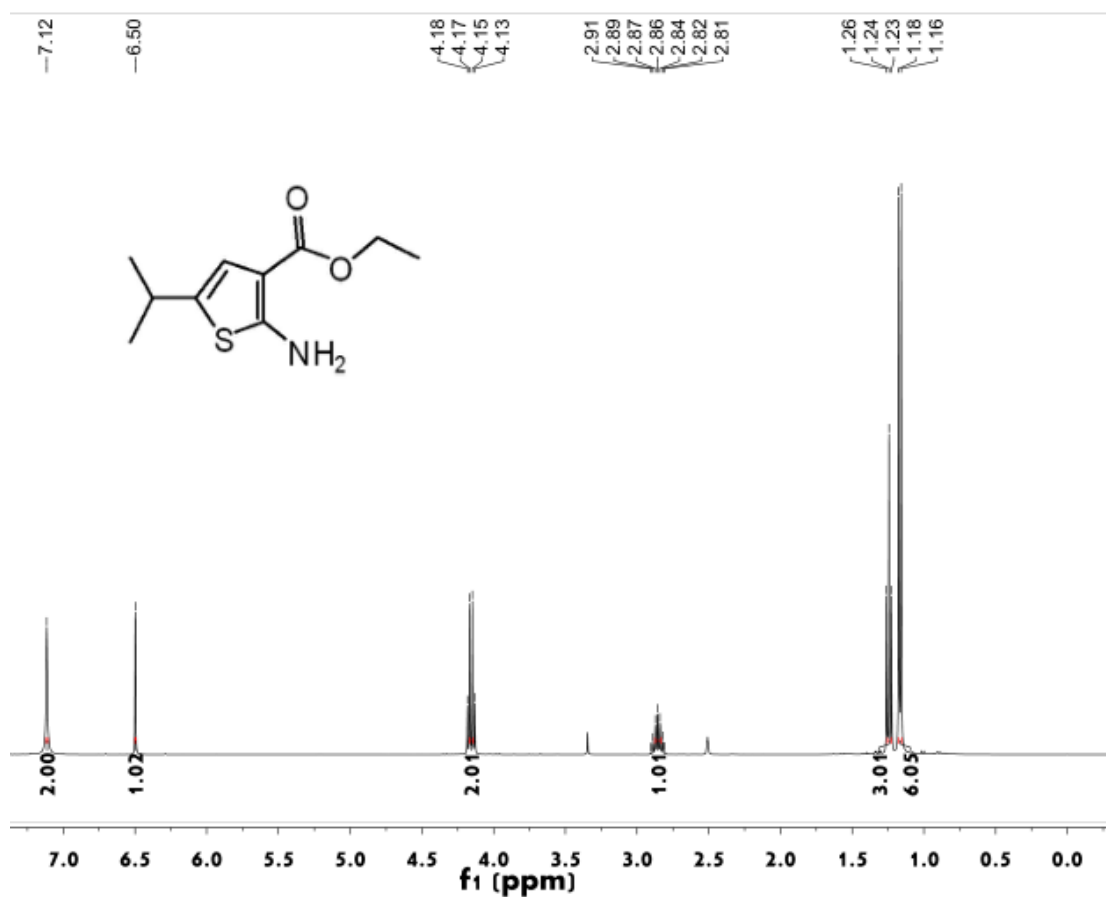


Figure S43 ¹H NMR spectrum of compound 4a

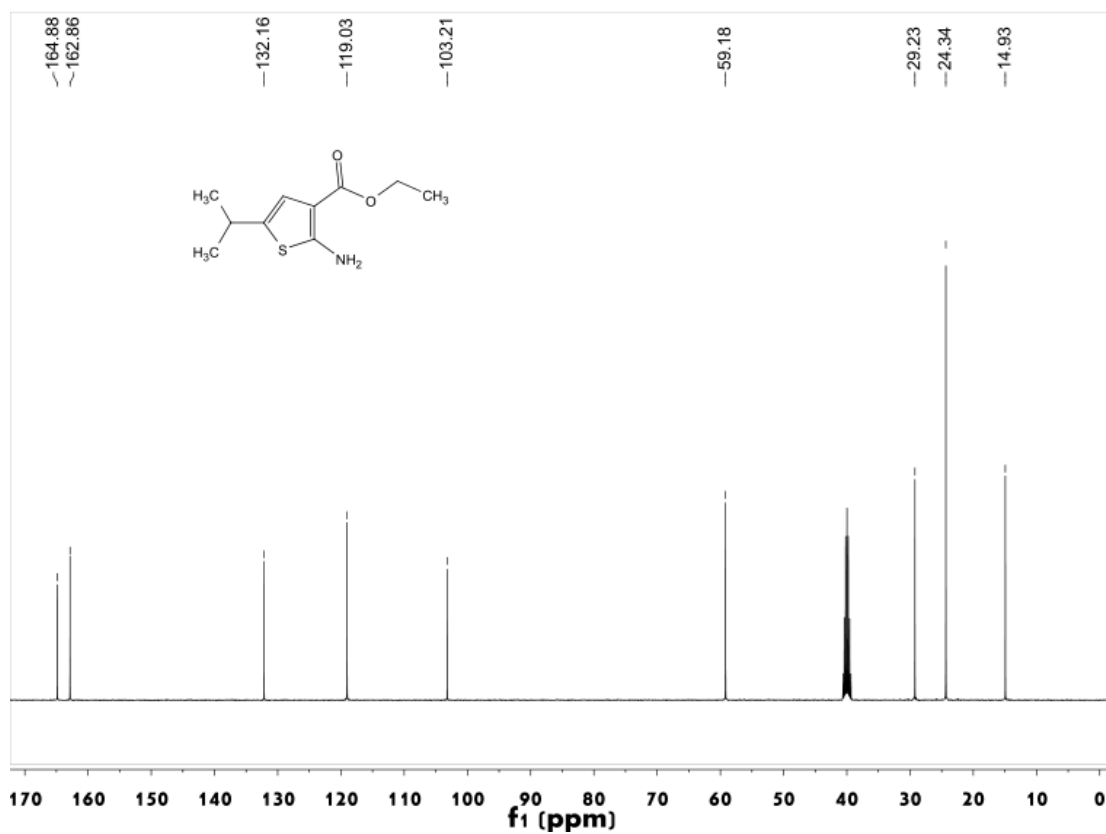


Figure S44 ¹³C NMR spectrum of compound 4a

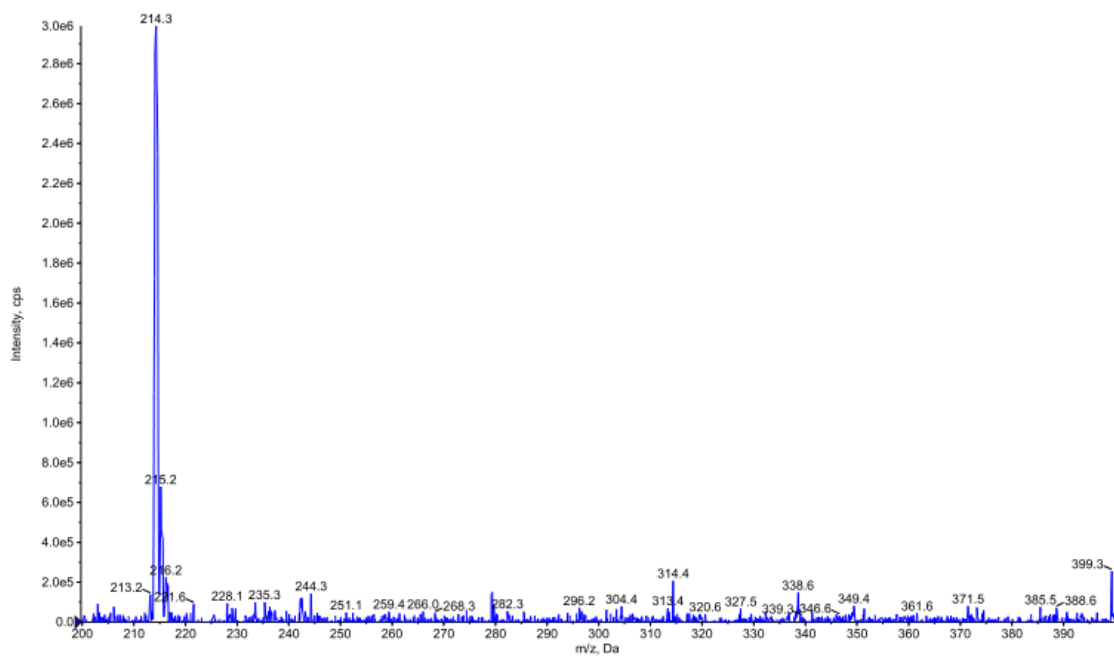


Figure S45 mass spectrum of compound 4a

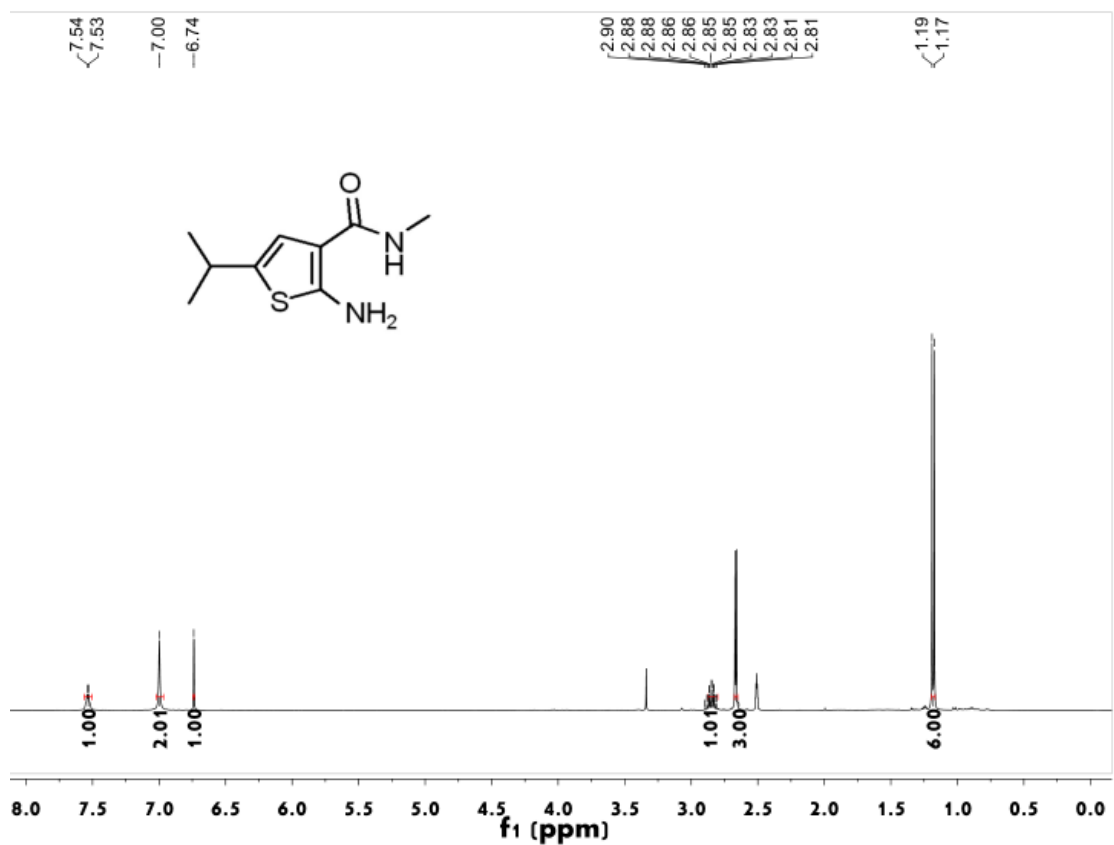


Figure S46 ¹H NMR spectrum of compound 4b

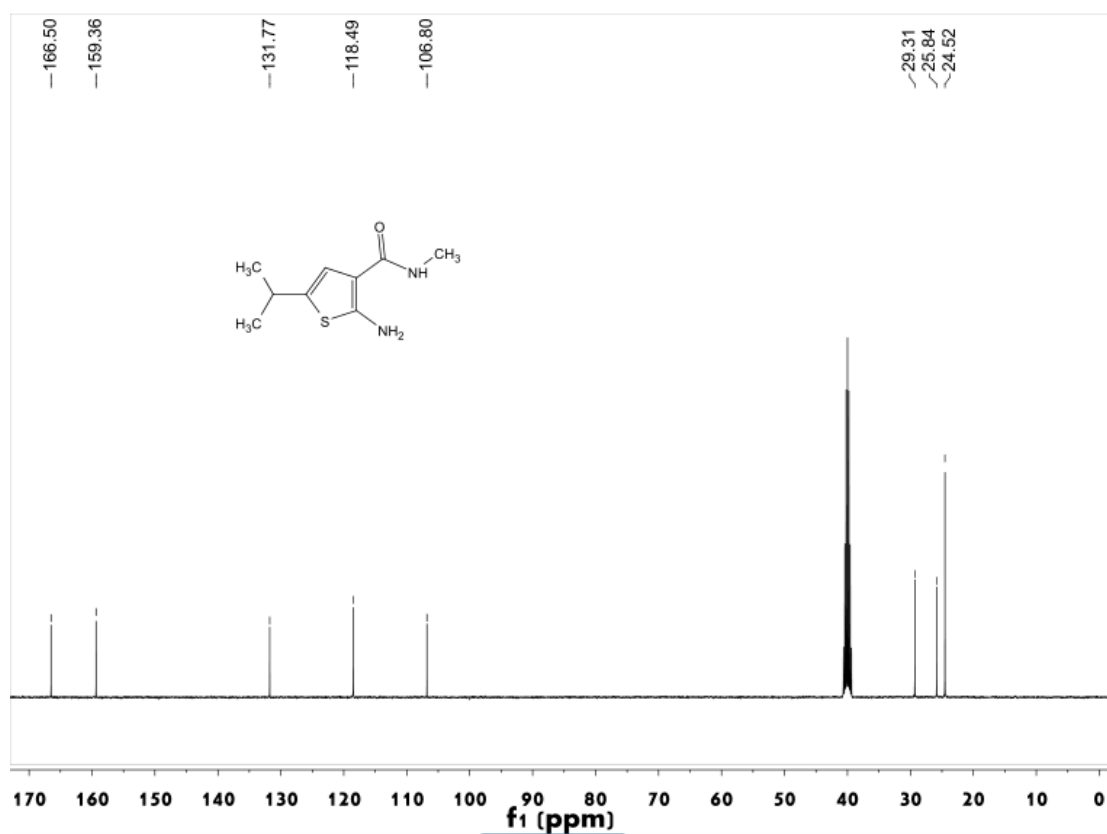


Figure S47 ^{13}C NMR spectrum of compound 4b

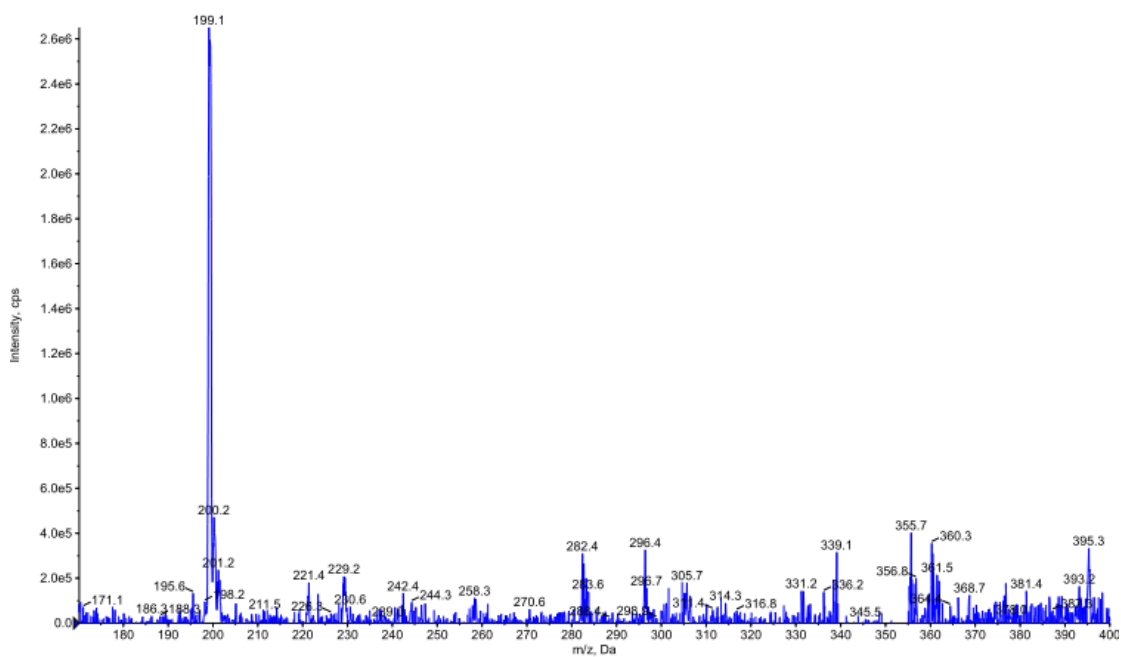


Figure S48 mass spectrum of compound 4b

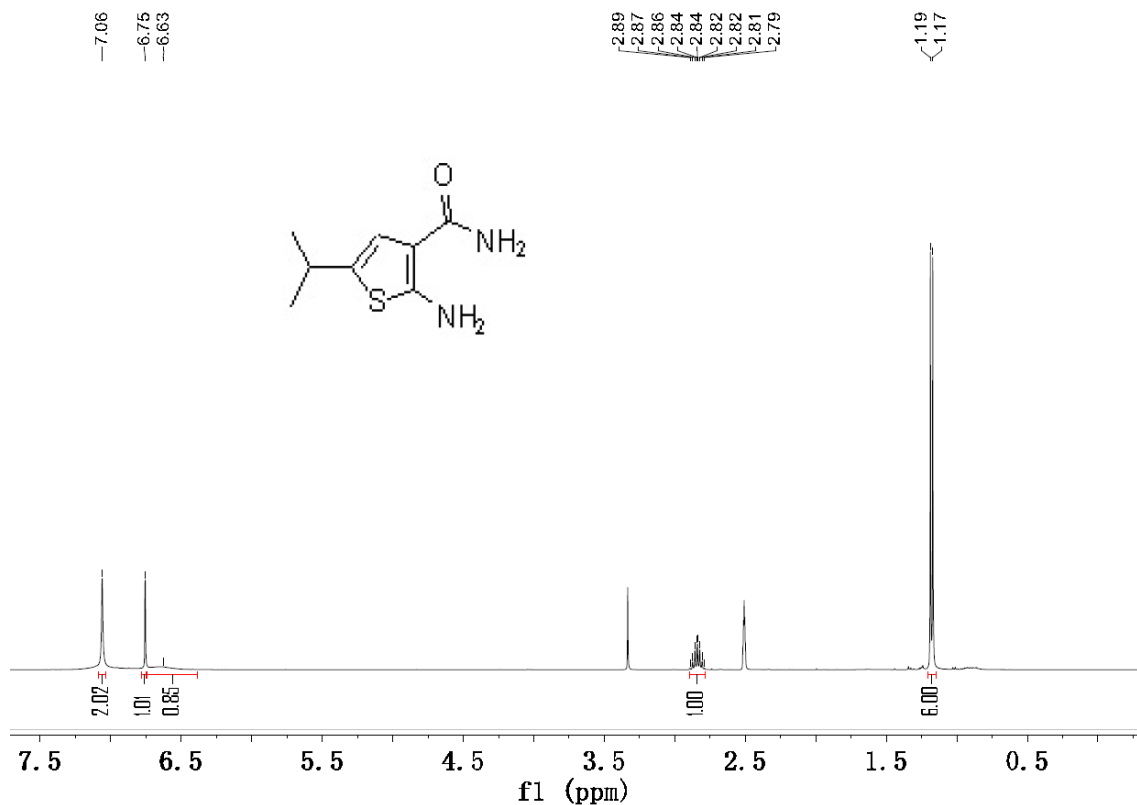


Figure S49 ^1H NMR spectrum of compound 4c

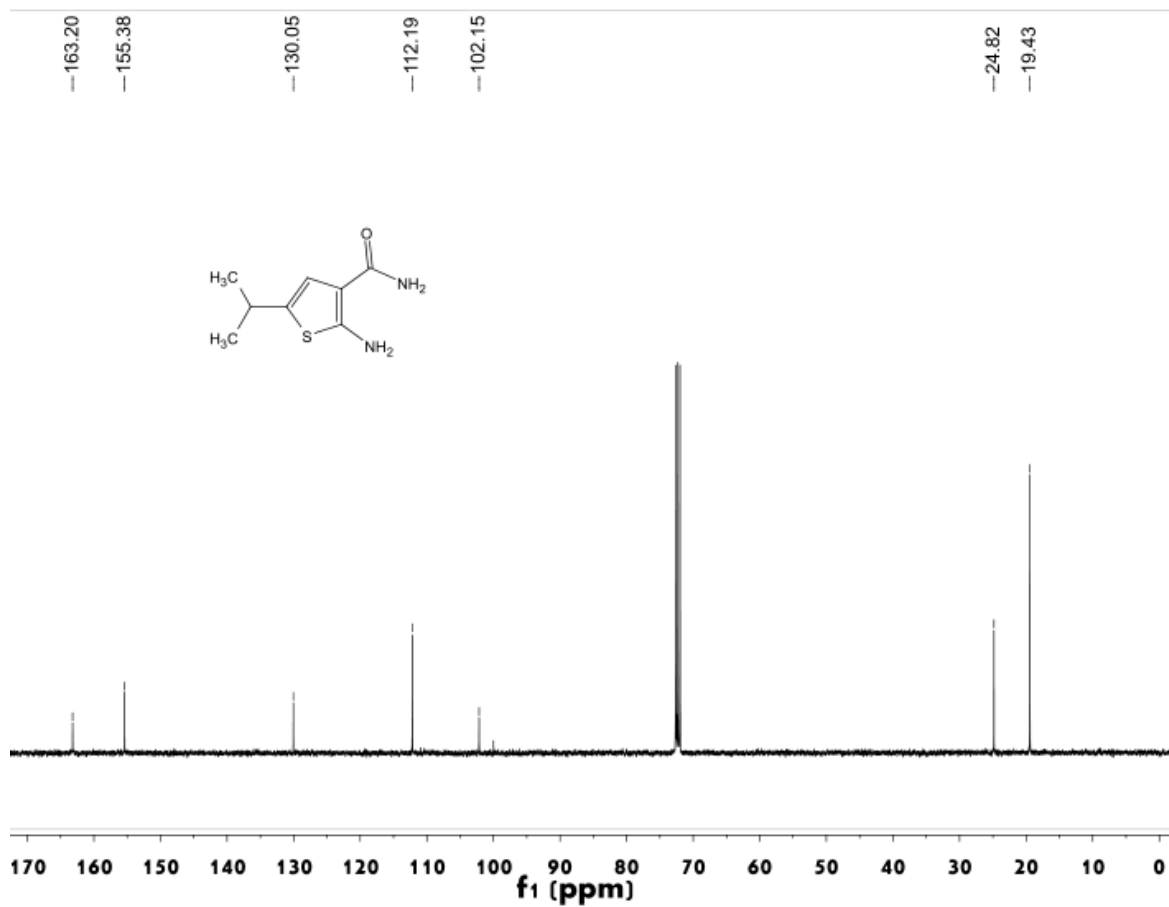


Figure S50 ^{13}C NMR spectrum of compound 4c

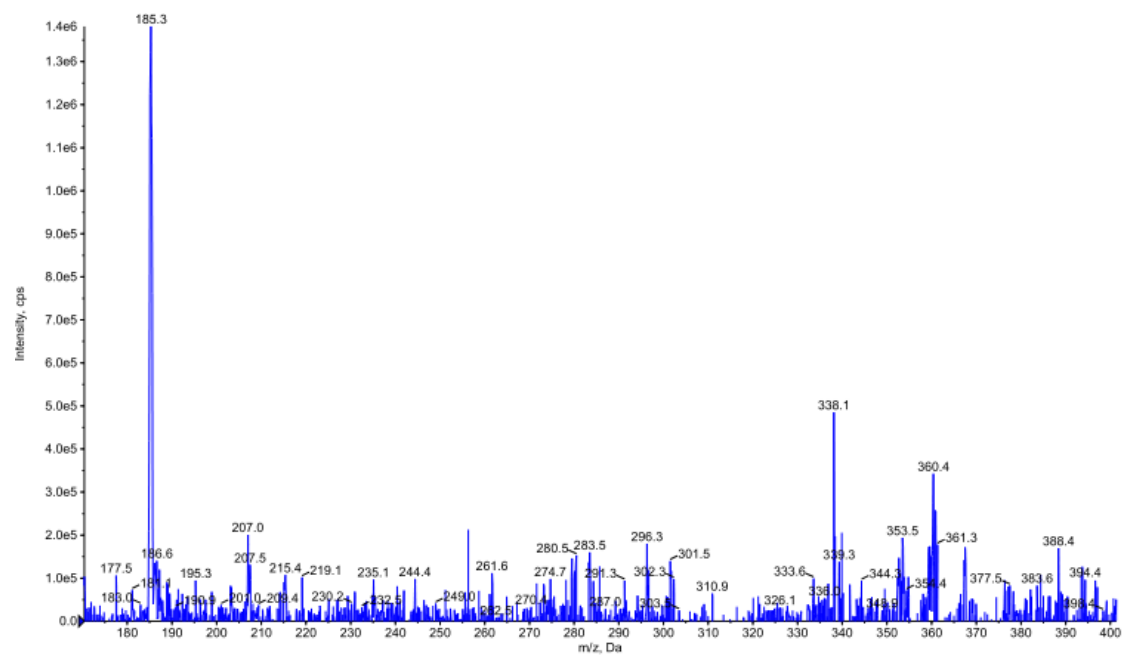


Figure S51 mass spectrum of compound 4c

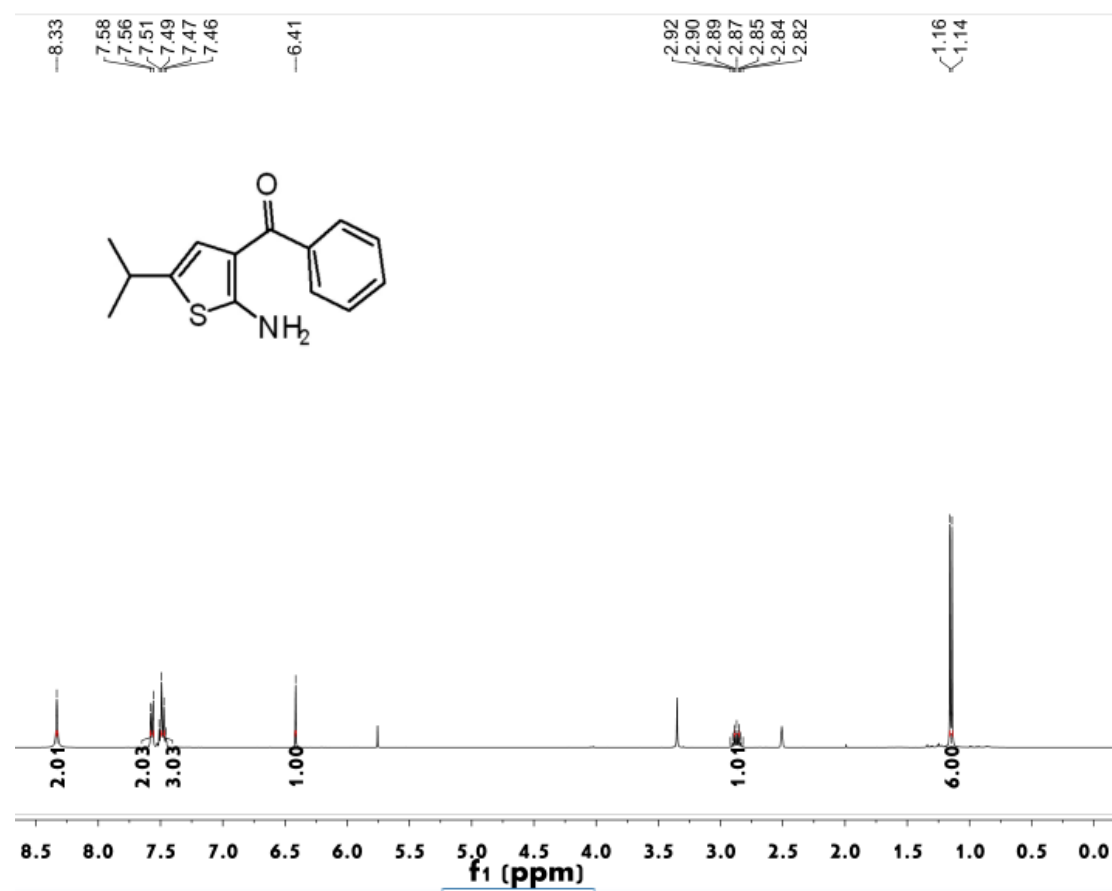


Figure S52 ¹H NMR spectrum of compound 4d

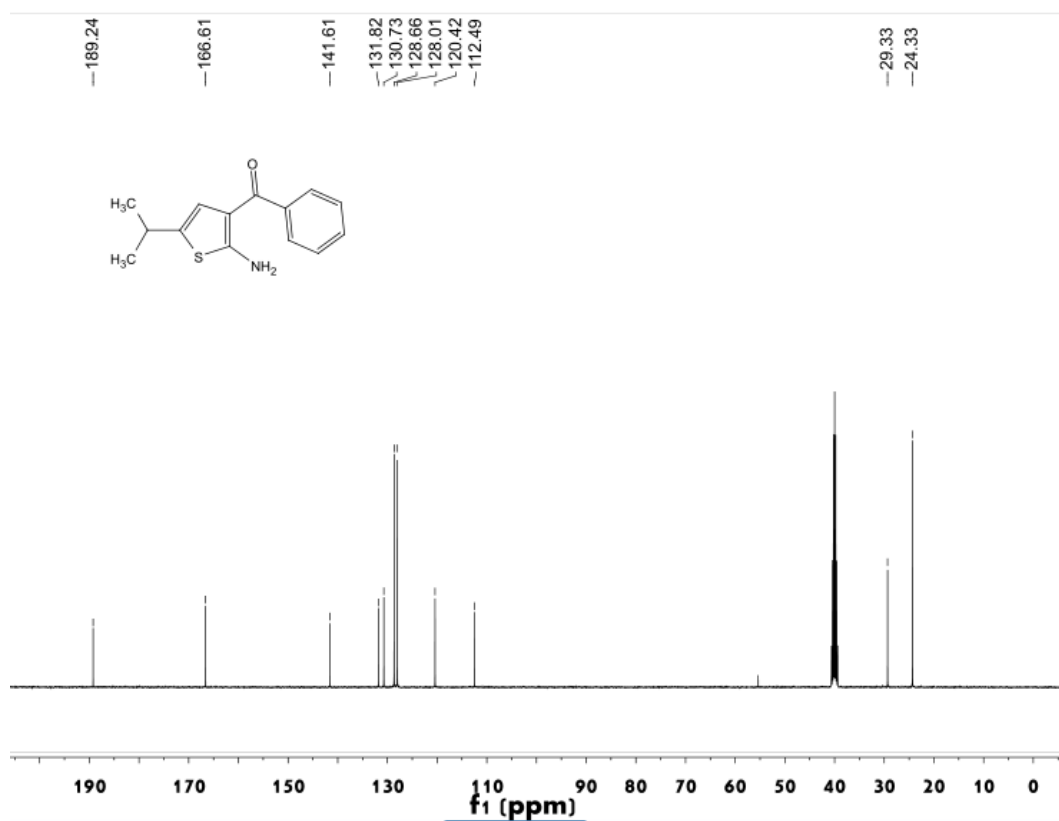


Figure S53 ¹³C NMR spectrum of compound 4d

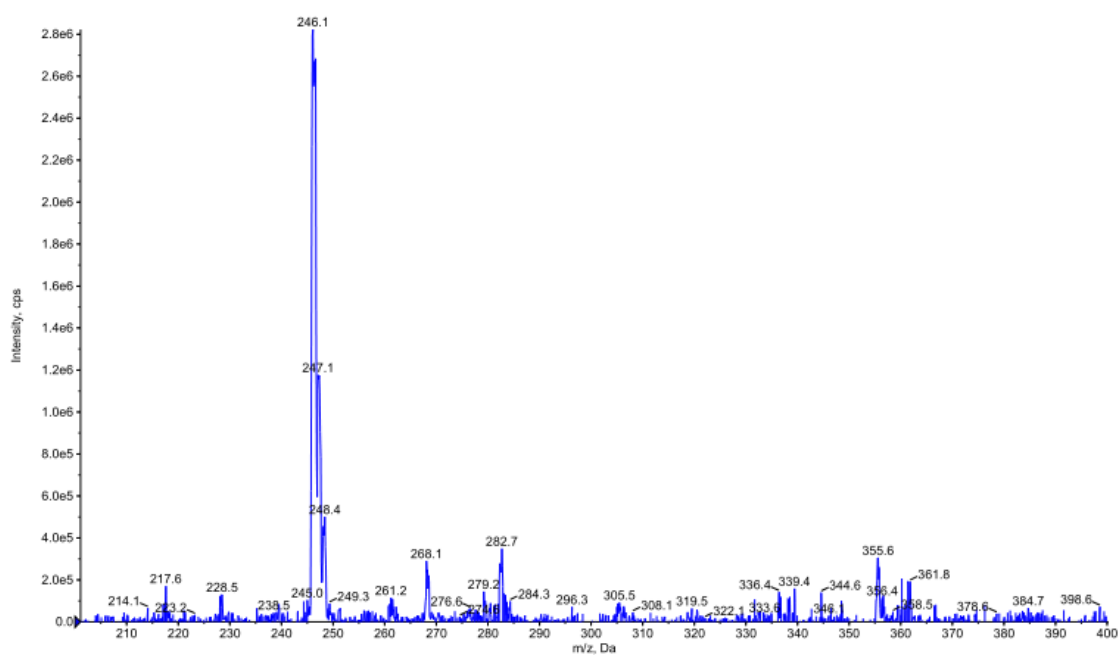


Figure S54 mass spectrum of compound 4d

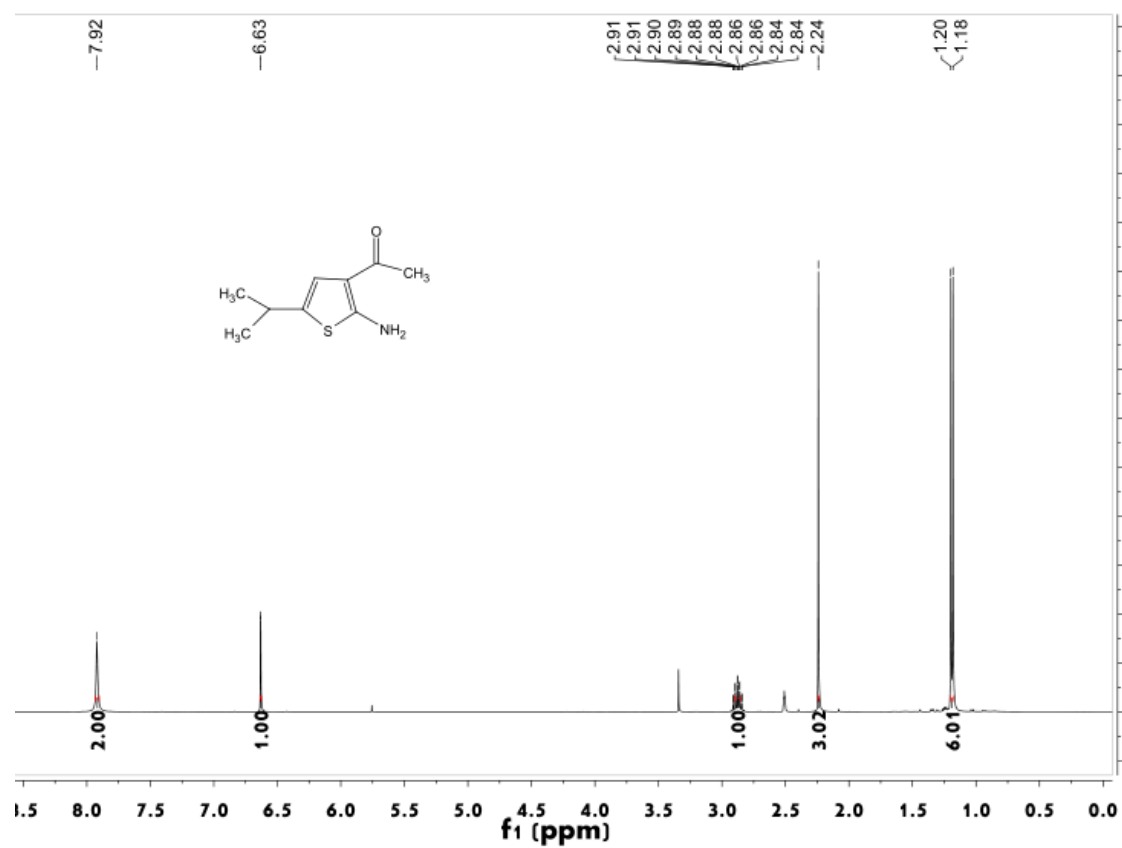


Figure S55 ¹H NMR spectrum of compound 4e

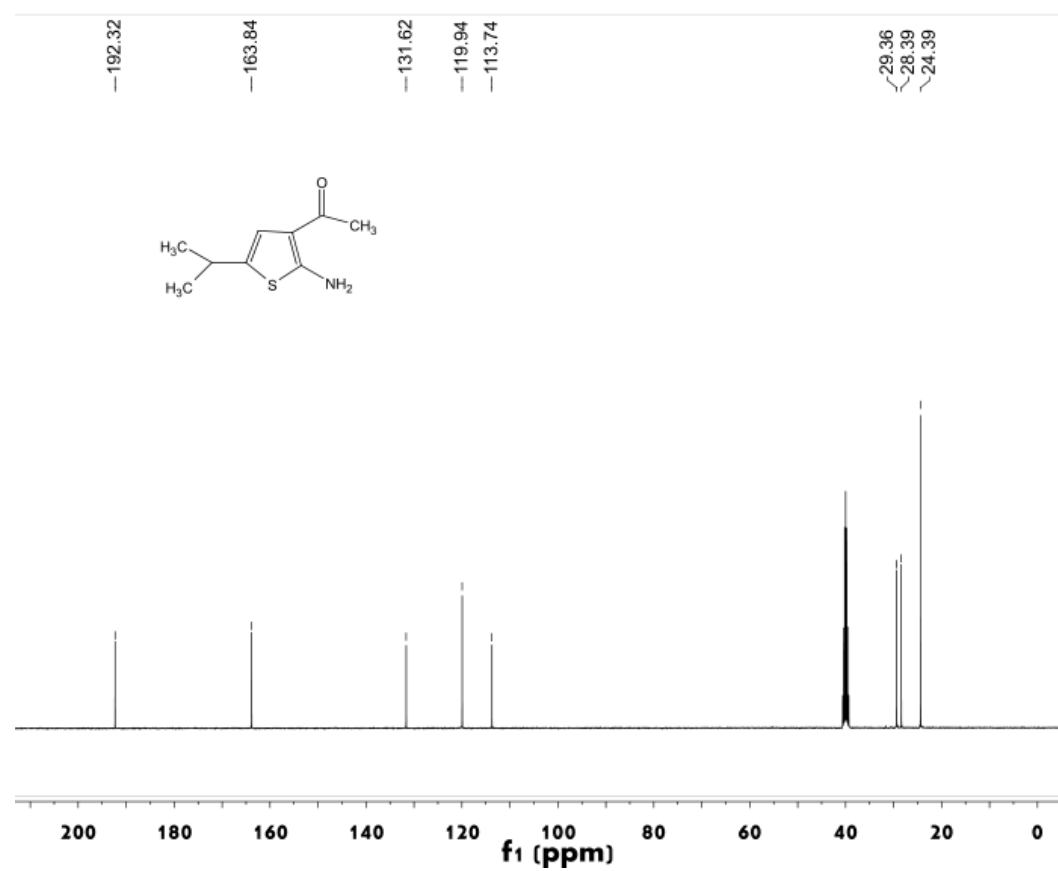


Figure S56 ¹³C NMR spectrum of compound 4e

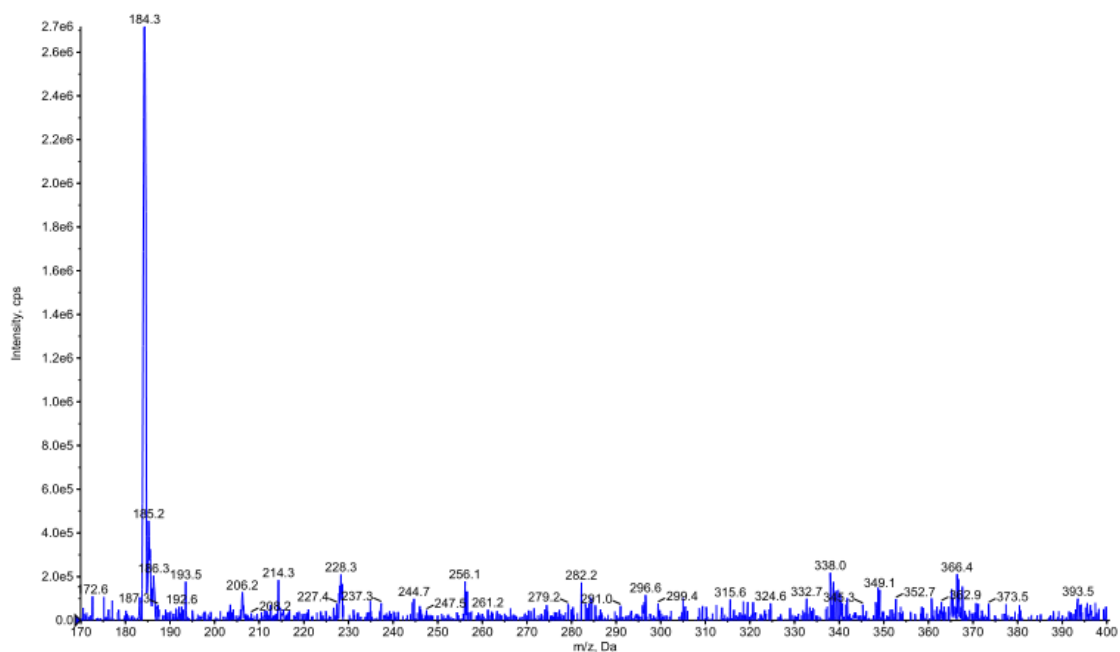


Figure S57 mass spectrum of compound 4e

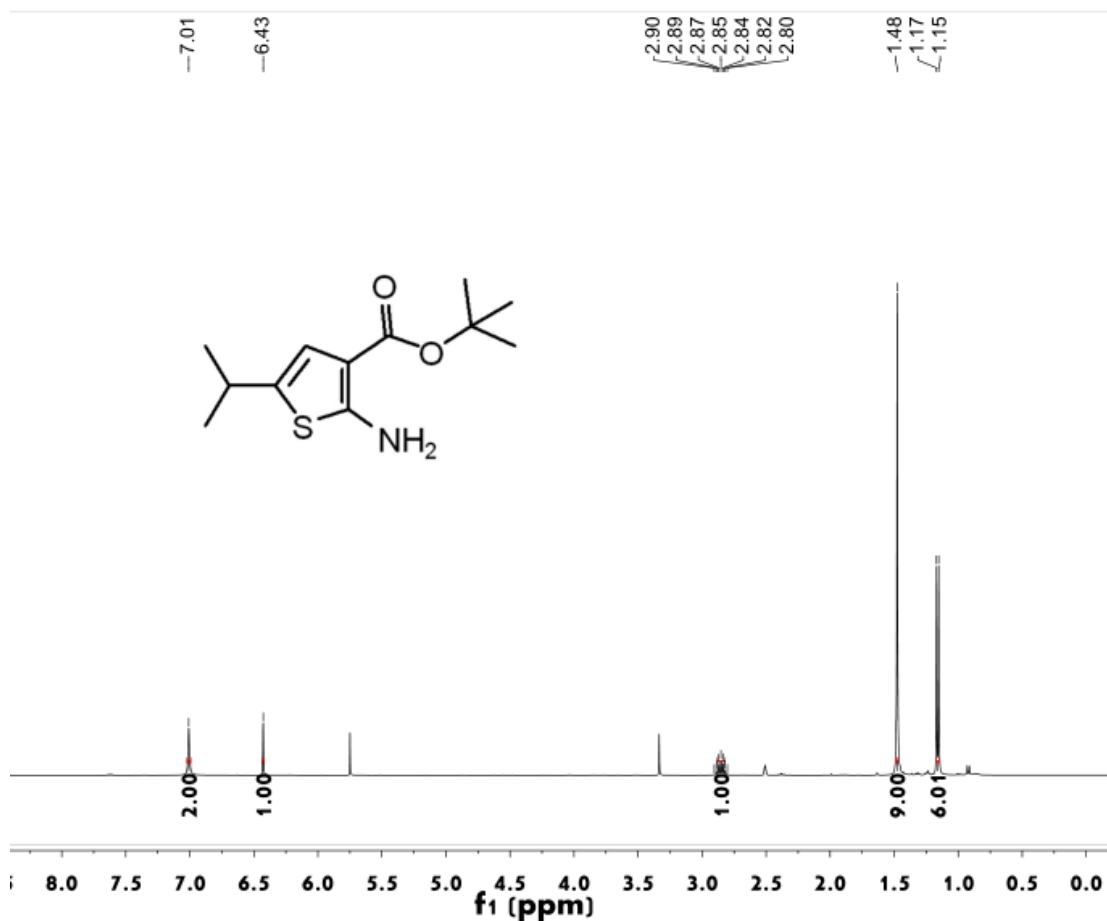


Figure S58 ¹H NMR spectrum of compound 4f

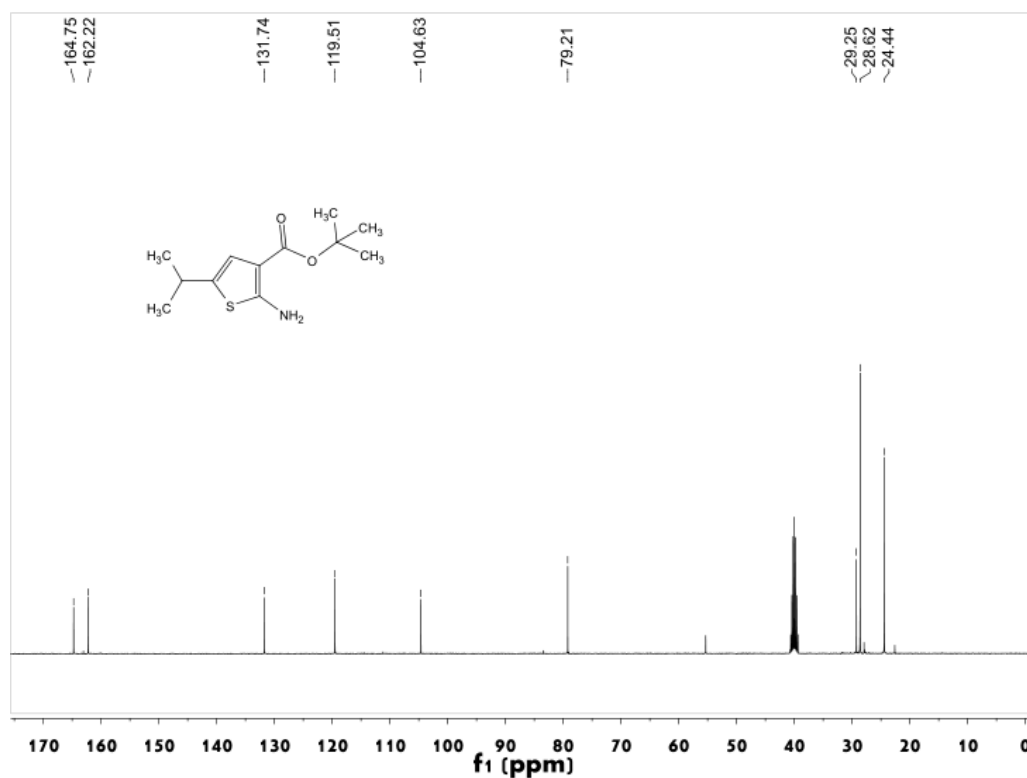


Figure S59 ^{13}C NMR spectrum of compound 4f

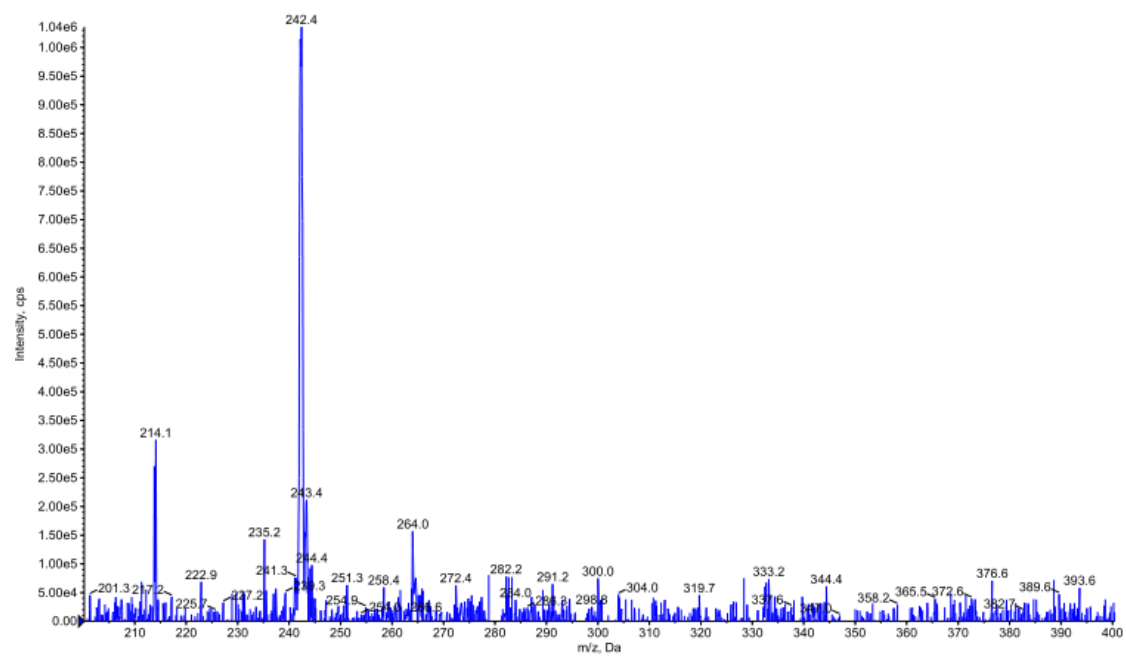


Figure S60 mass spectrum of compound 4f

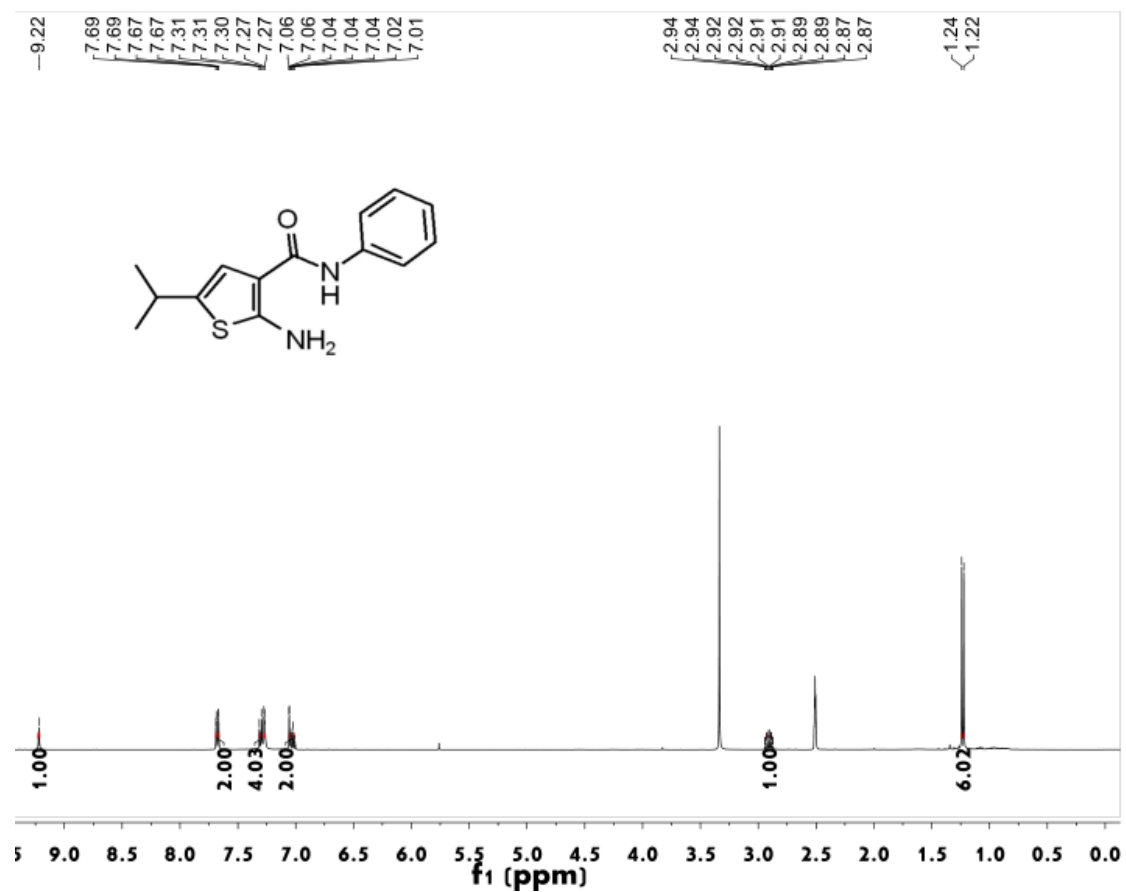


Figure S61 ¹H NMR spectrum of compound 4g

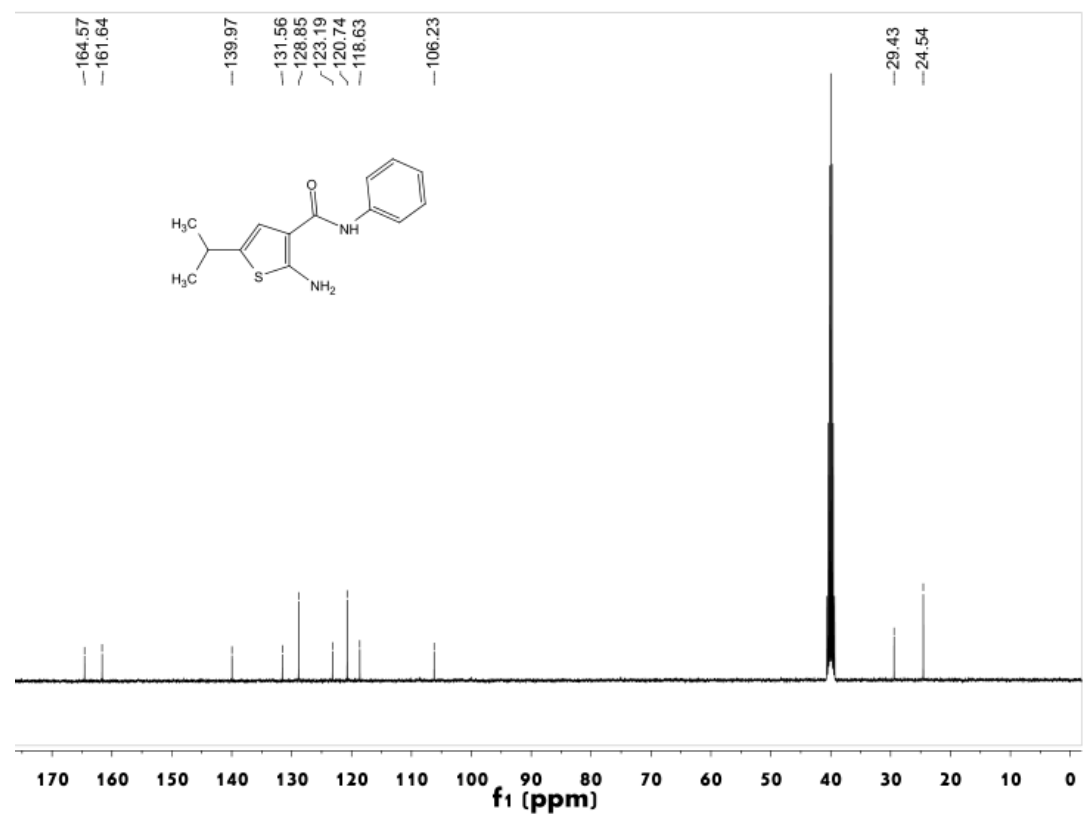


Figure S62 ¹³C NMR spectrum of compound 4g

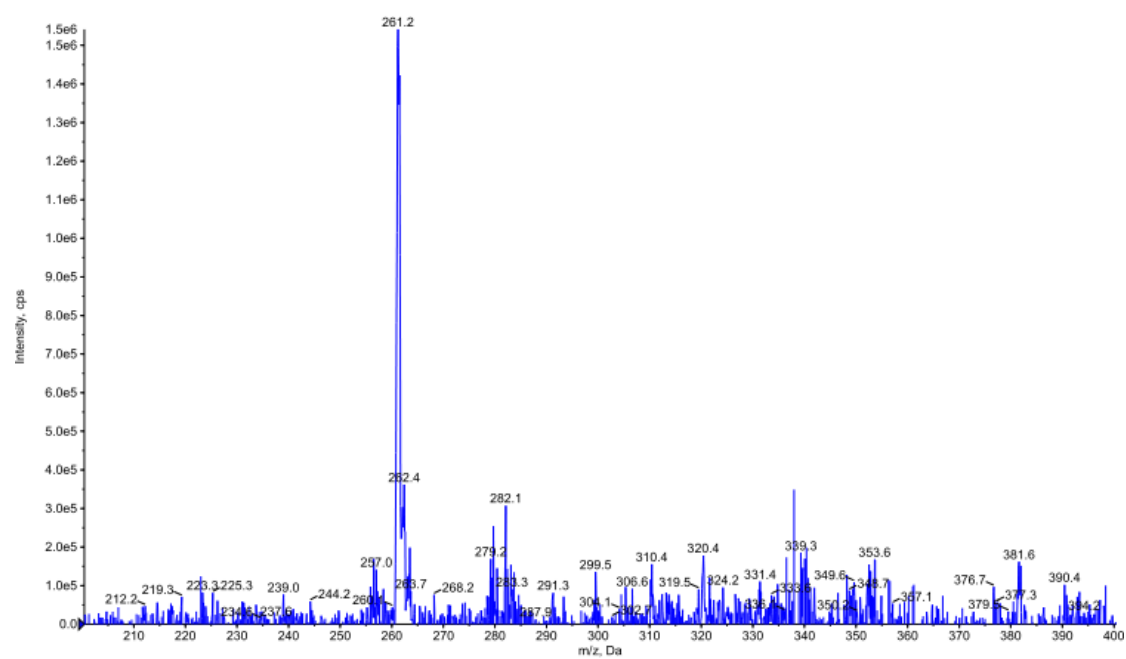


Figure S63 mass spectrum of compound 4g

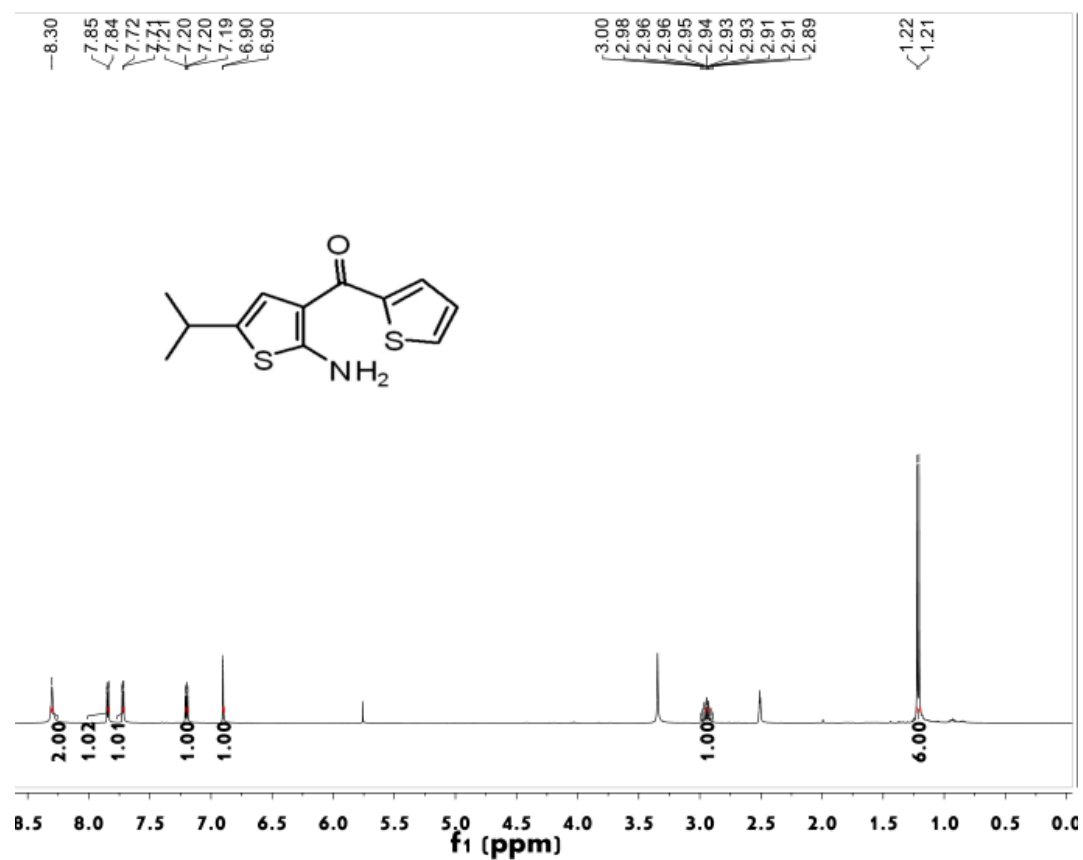


Figure S64 ¹H NMR spectrum of compound 4h

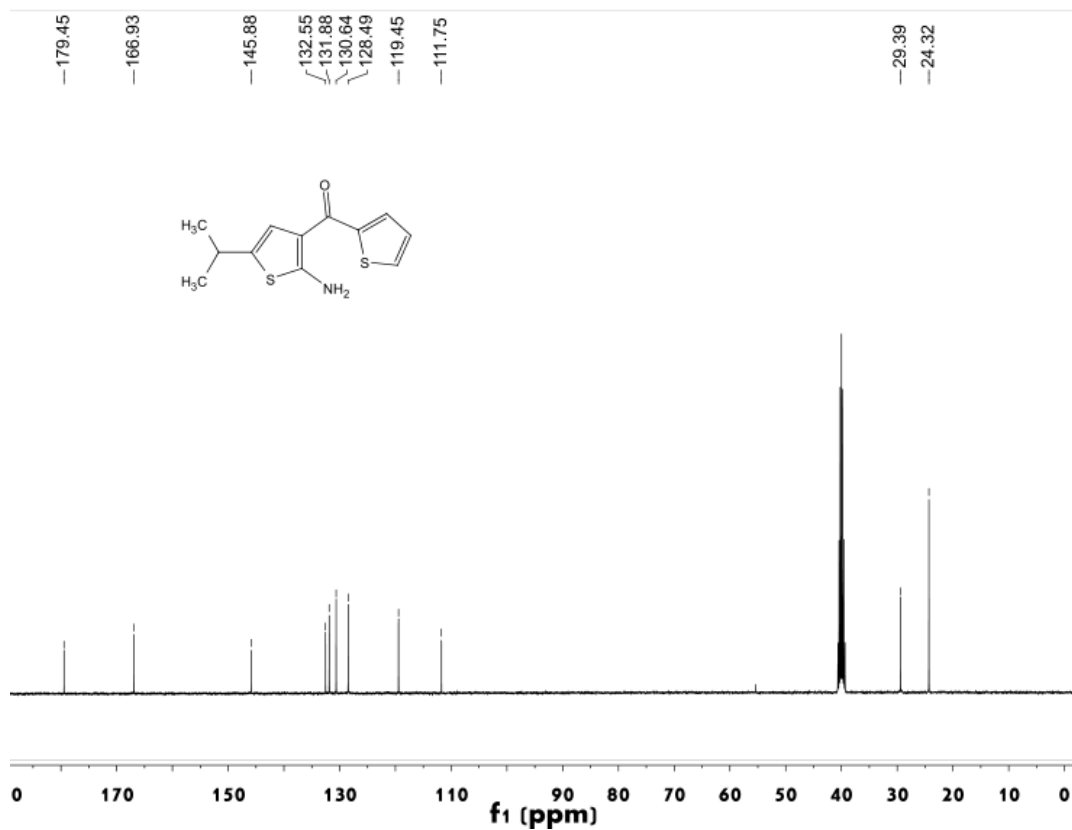


Figure S65 ^{13}C NMR spectrum of compound 4h

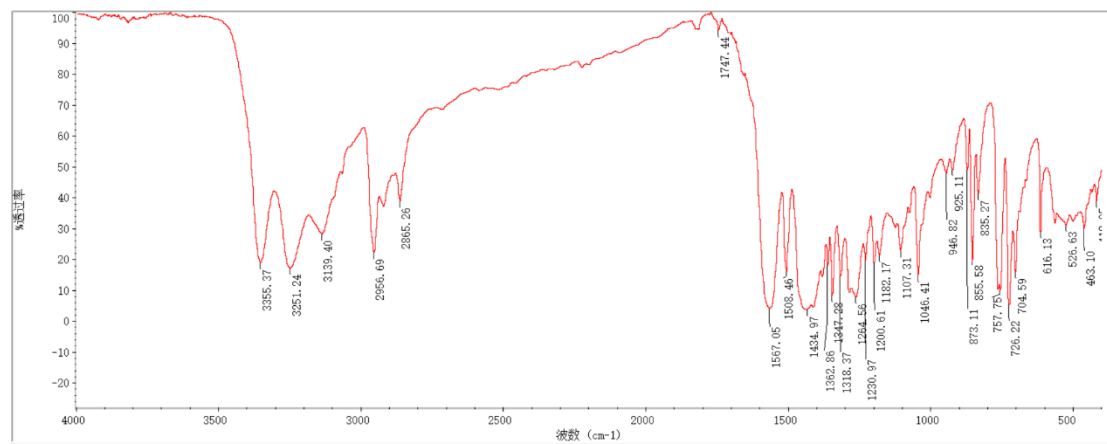


Figure S66 IR spectrum of compound 4h

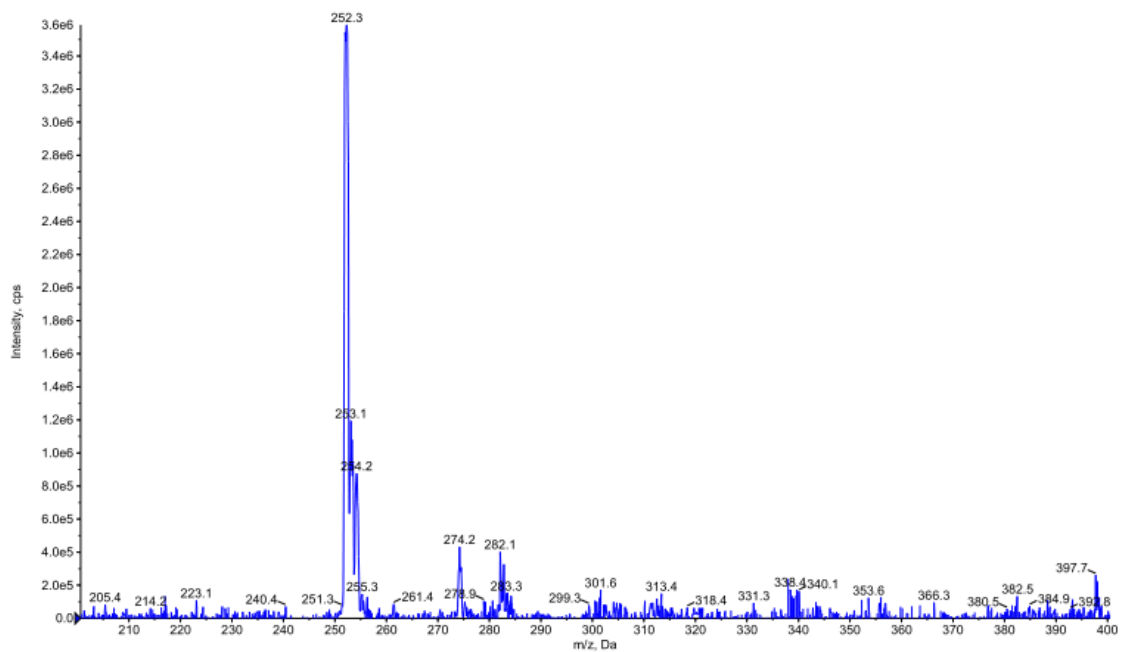


Figure S67 mass spectrum of compound 4h

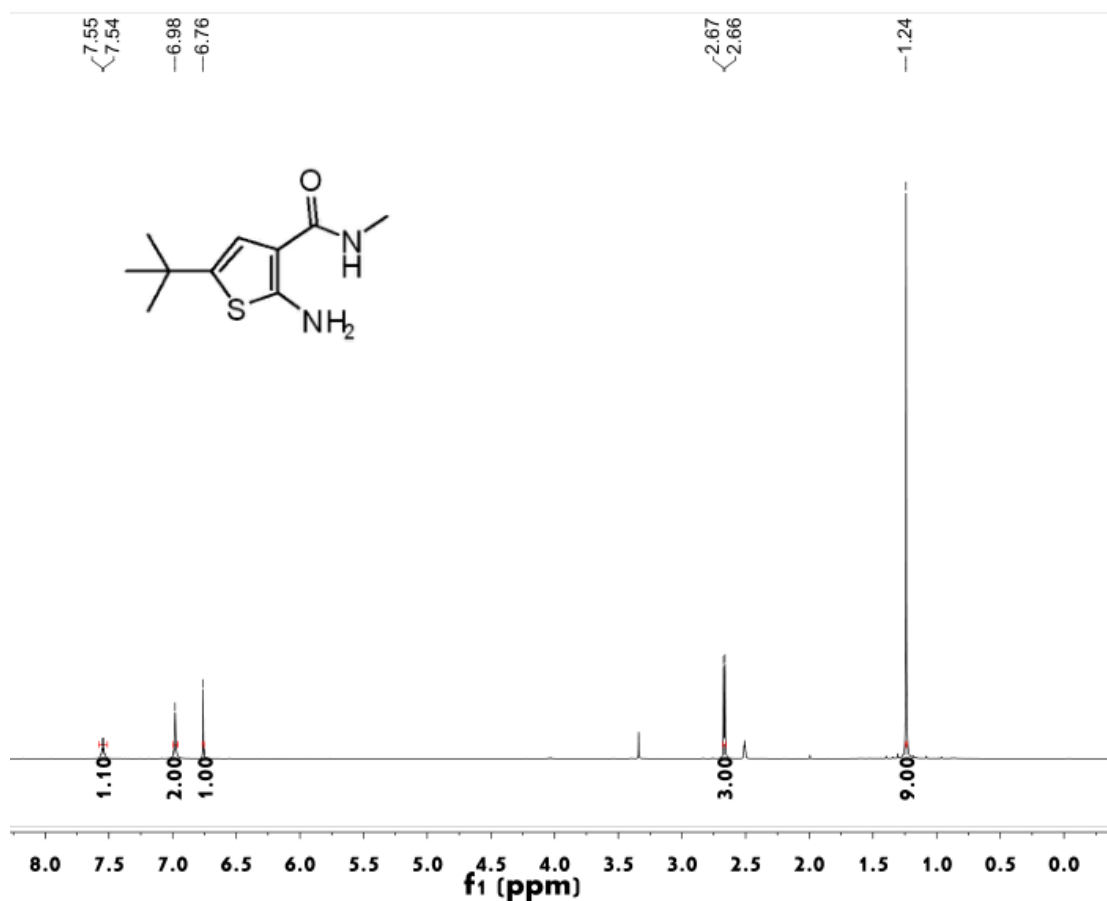


Figure S68 ¹H NMR spectrum of compound 4i

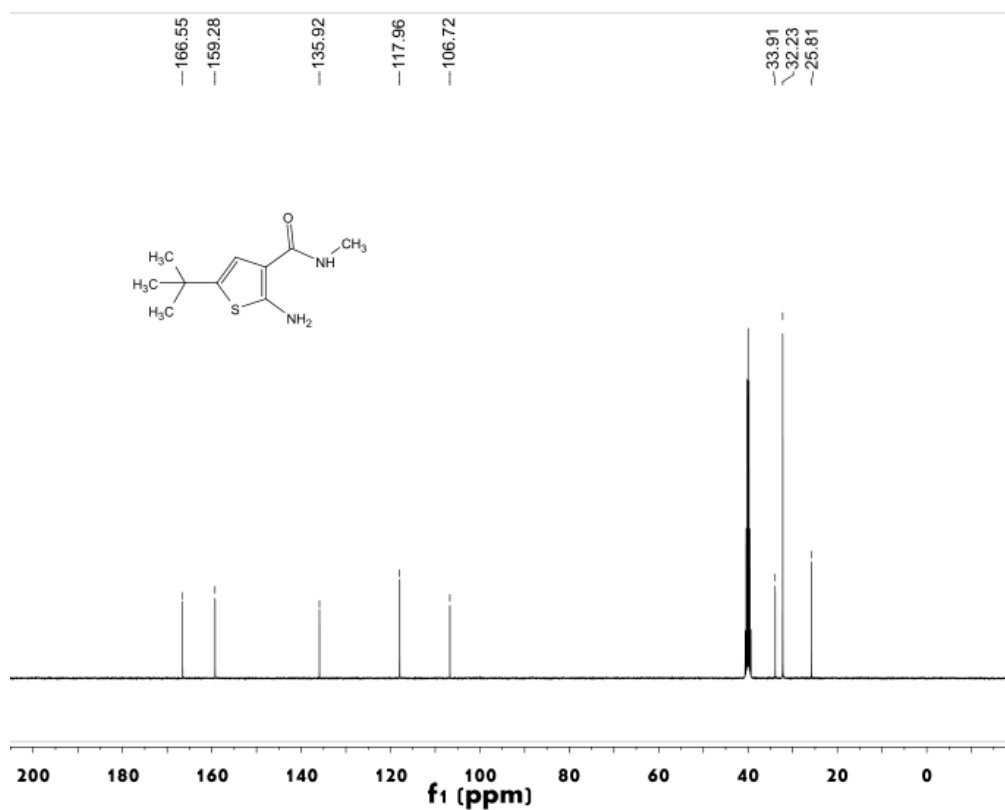


Figure S69 ¹³C NMR spectrum of compound 4i

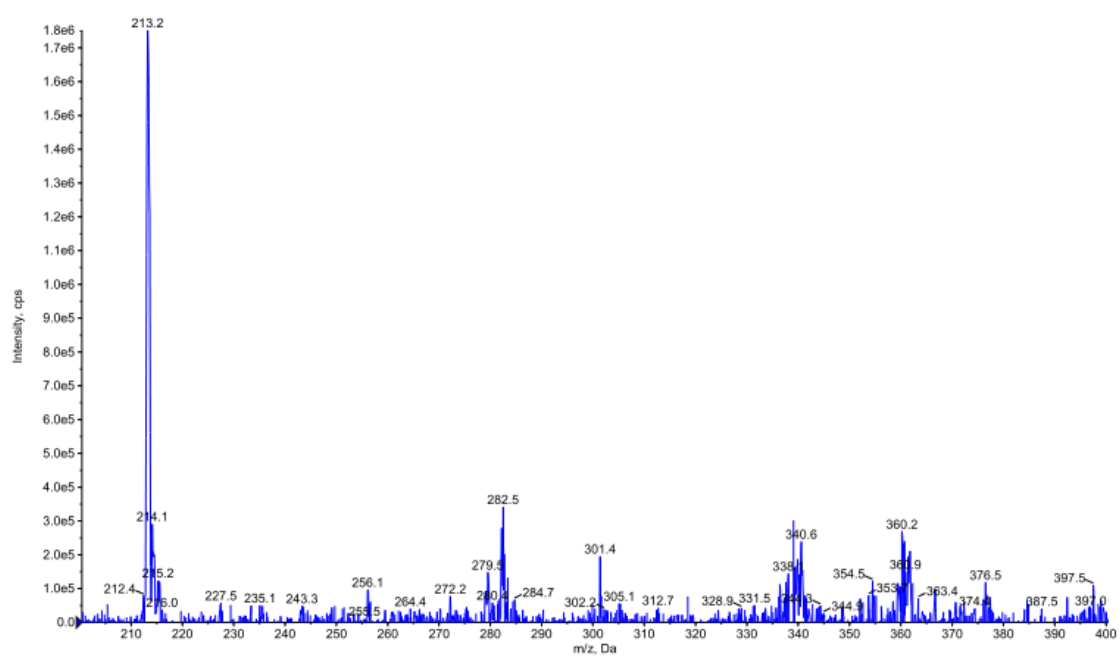


Figure S70 mass spectrum of compound 4i

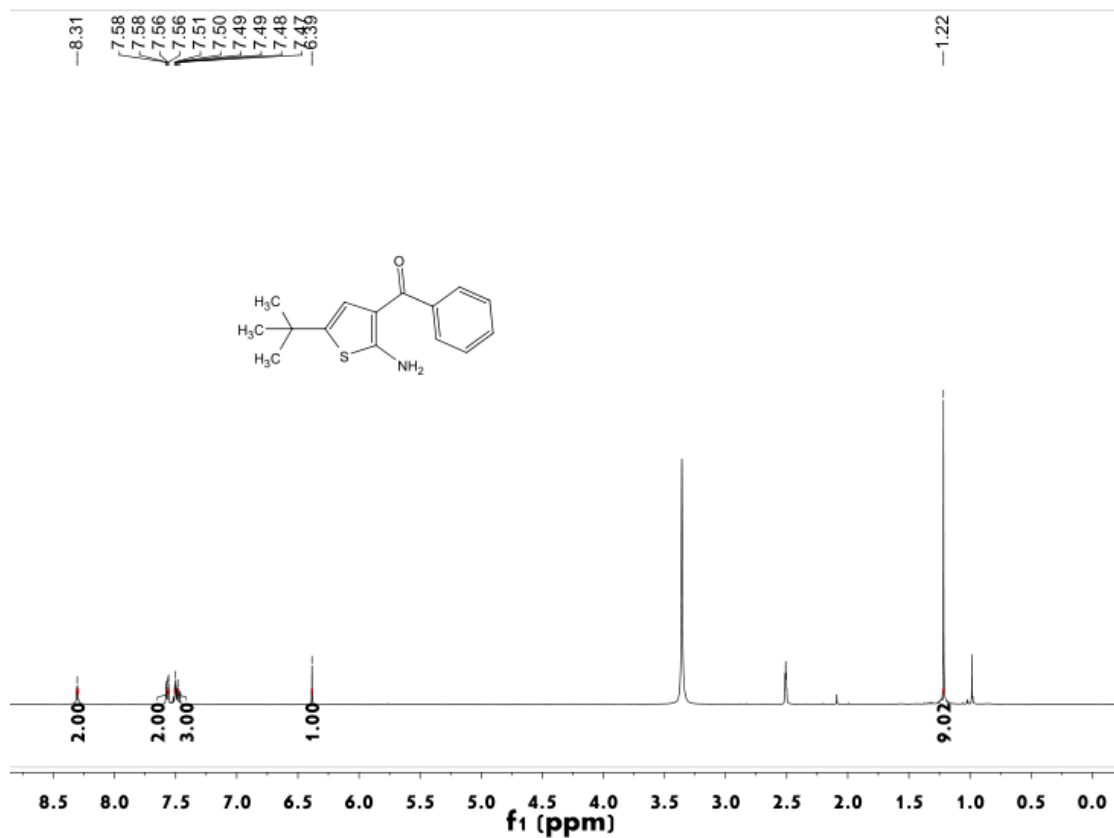


Figure S71 ^1H NMR spectrum of compound 4j

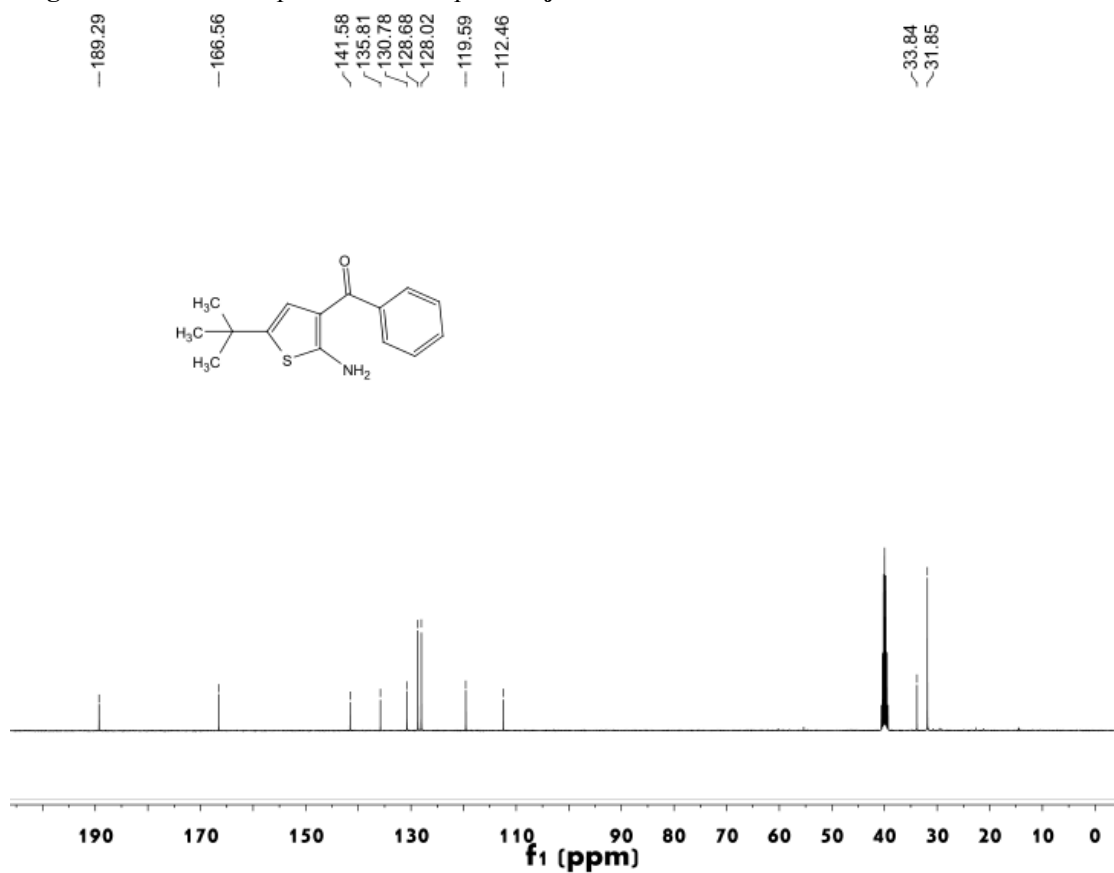


Figure S72 ^{13}C NMR spectrum of compound 4j

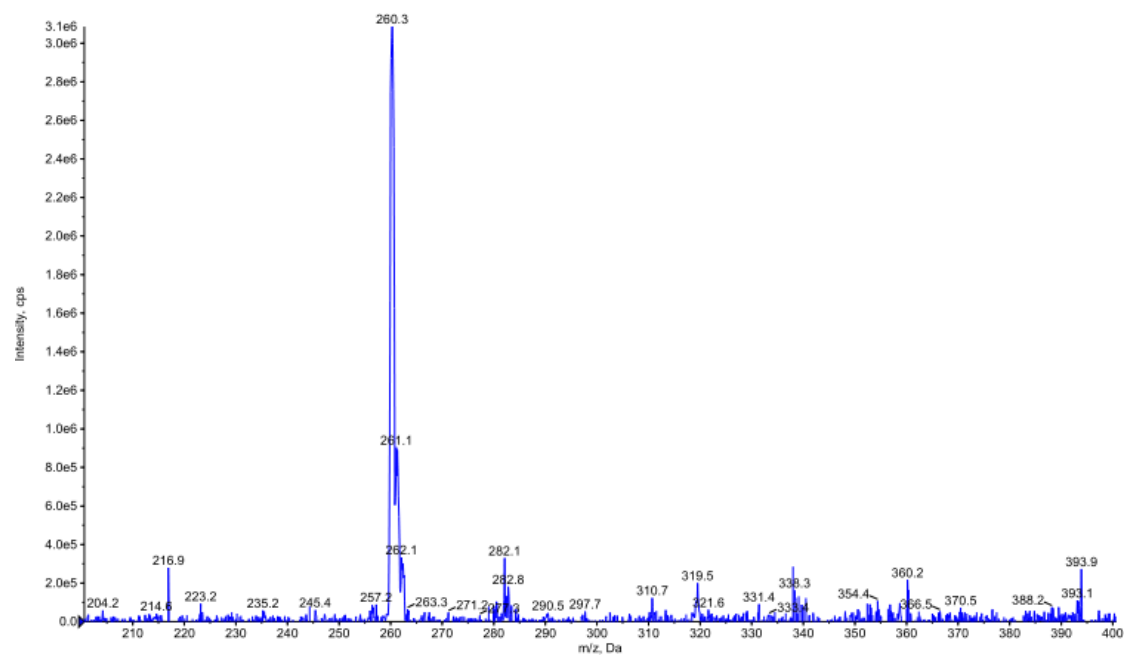


Figure S73 mass spectrum of compound 4j

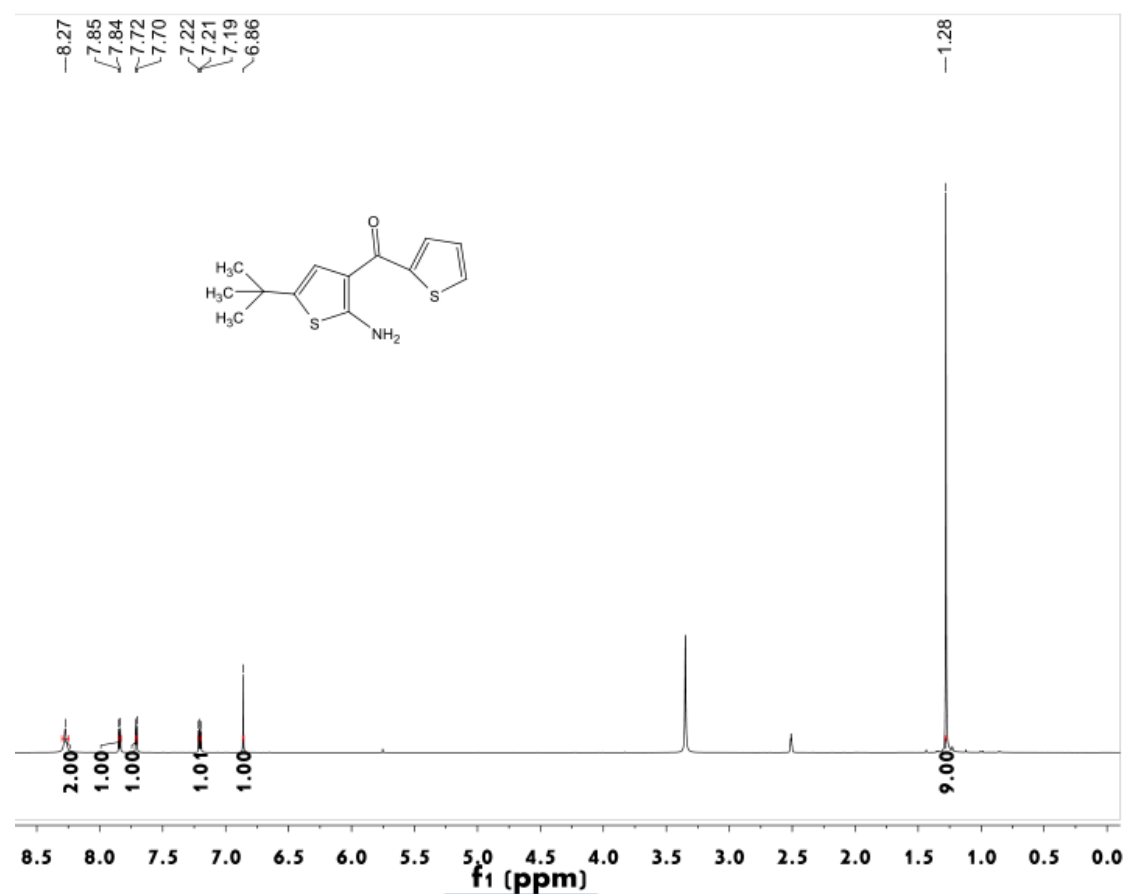


Figure S74 ¹H NMR spectrum of compound 4k

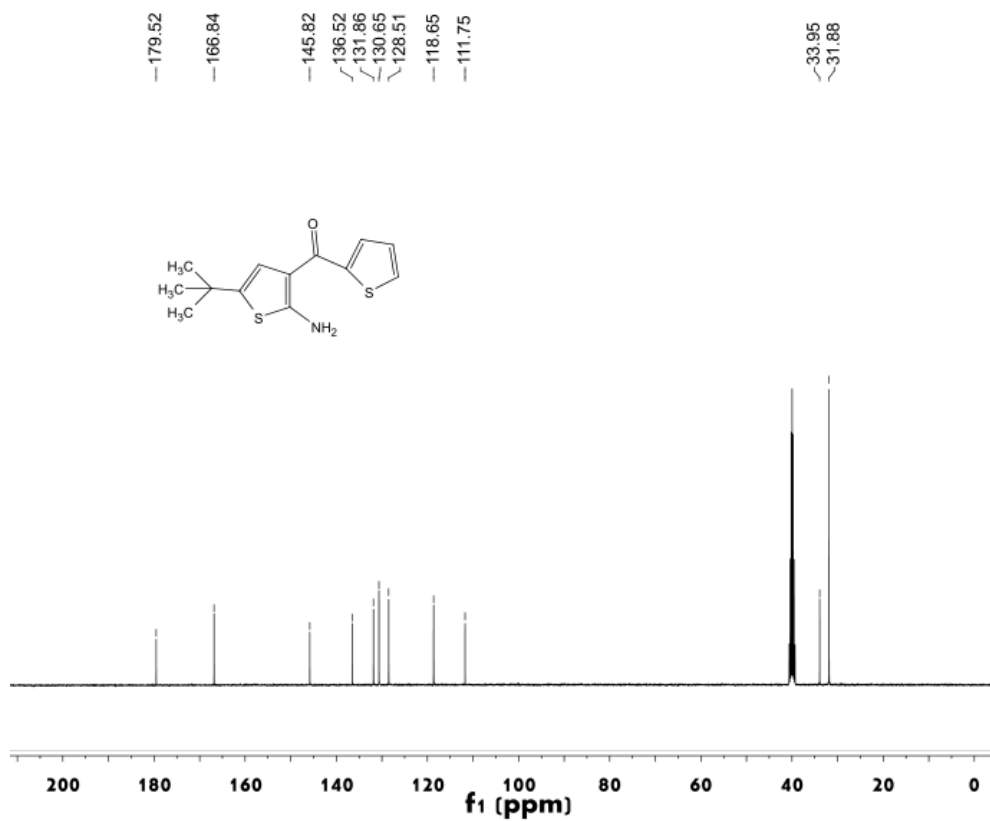


Figure S75 ^{13}C NMR spectrum of compound 4k

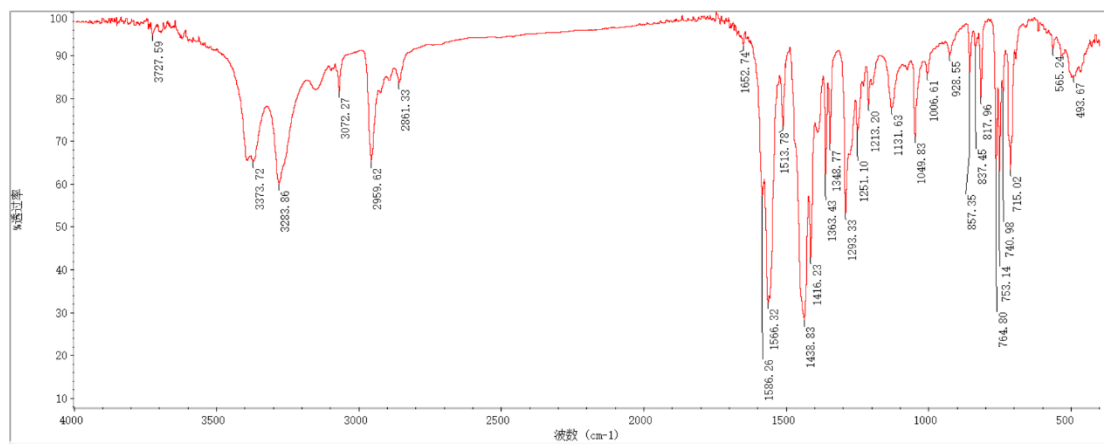


Figure S76 IR spectrum of compound 4k

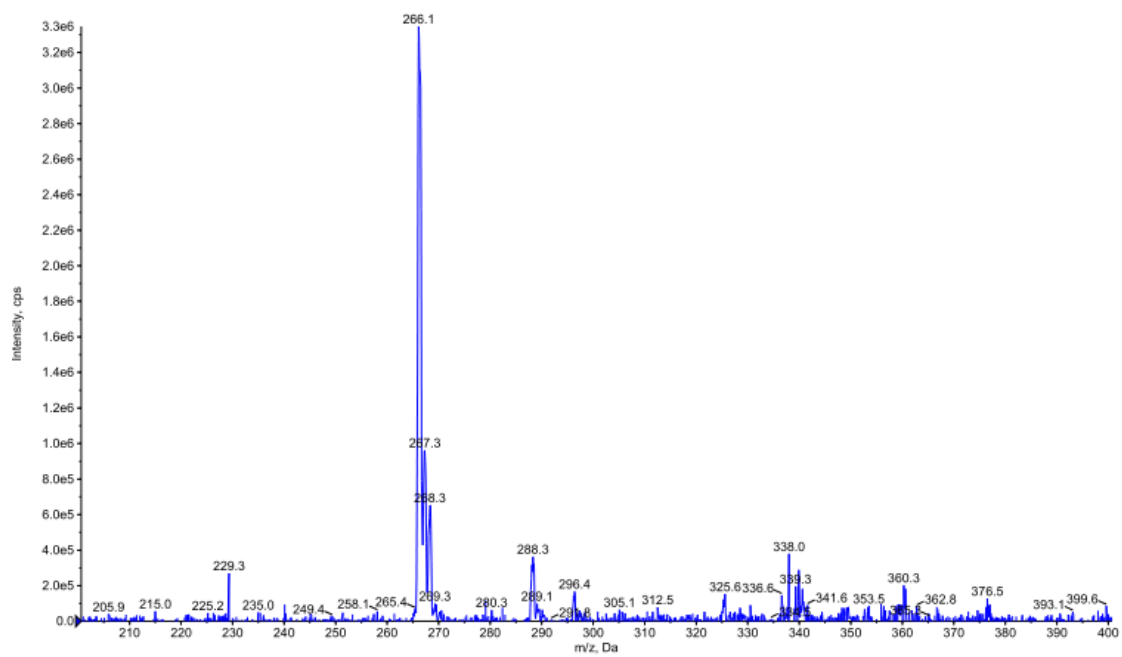


Figure S77 mass spectrum of compound 4k

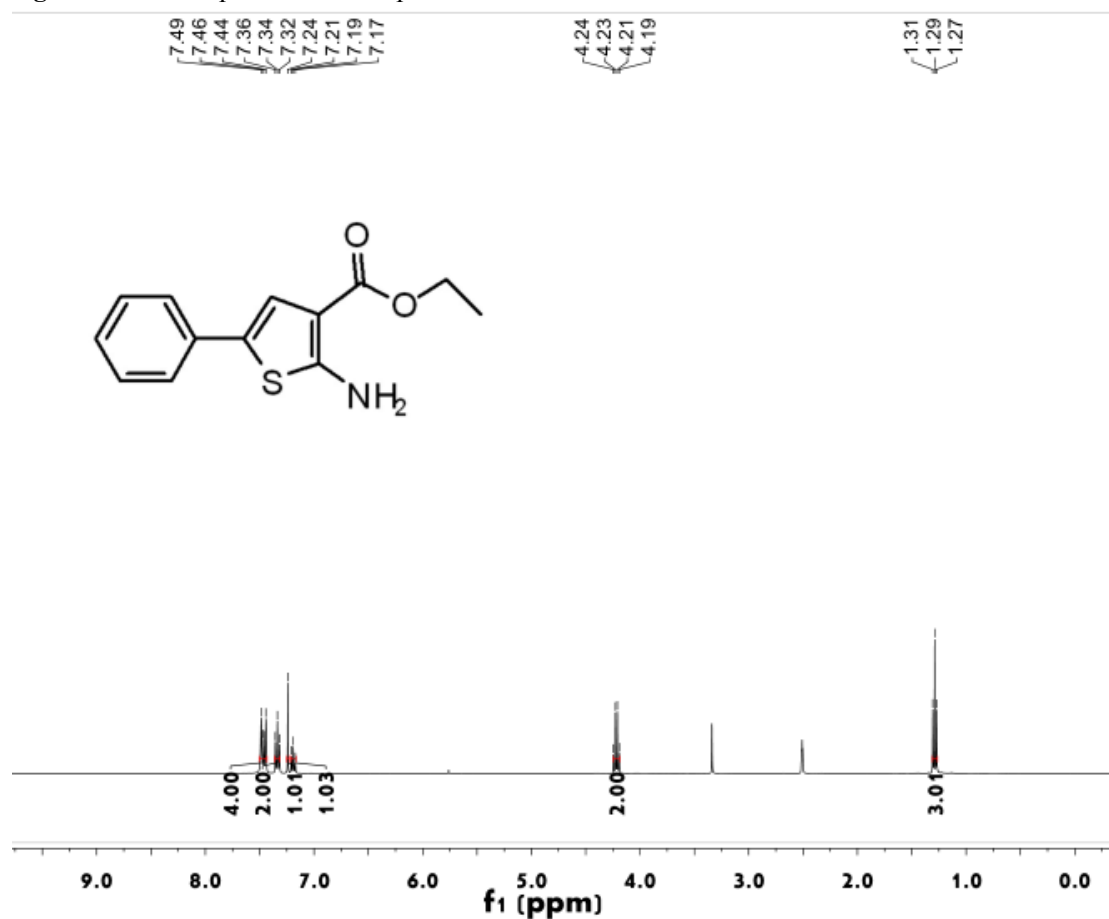


Figure S78 ¹H NMR spectrum of compound 4l

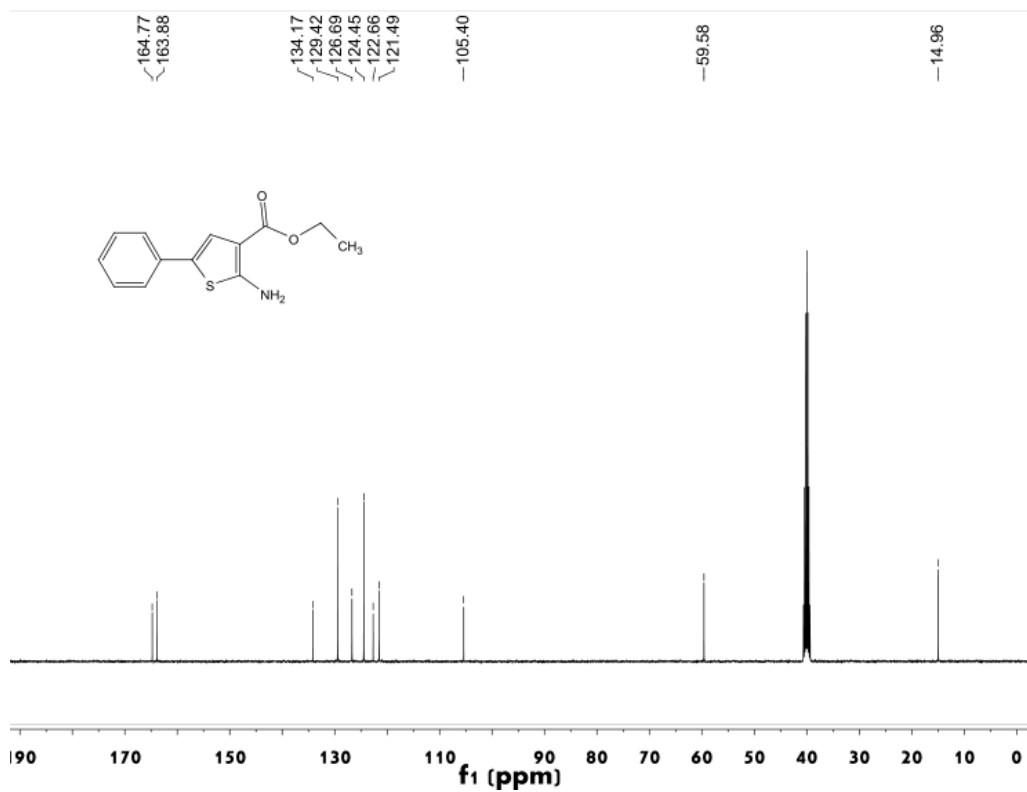


Figure S79 ¹³C NMR spectrum of compound 4l

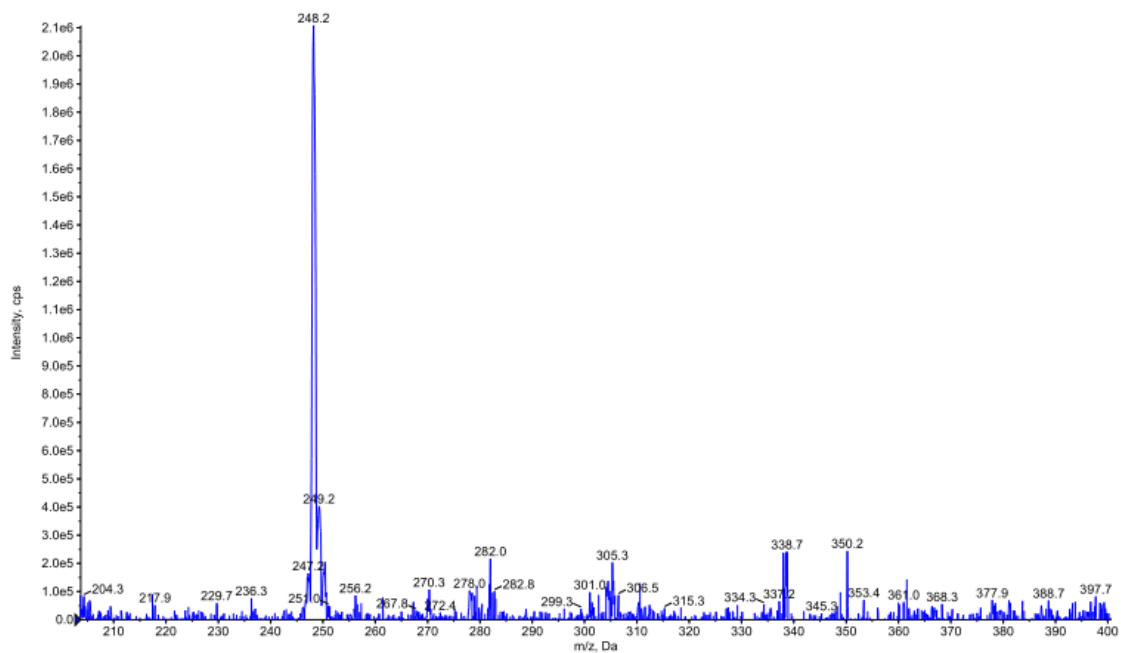


Figure S80 mass spectrum of compound 4l

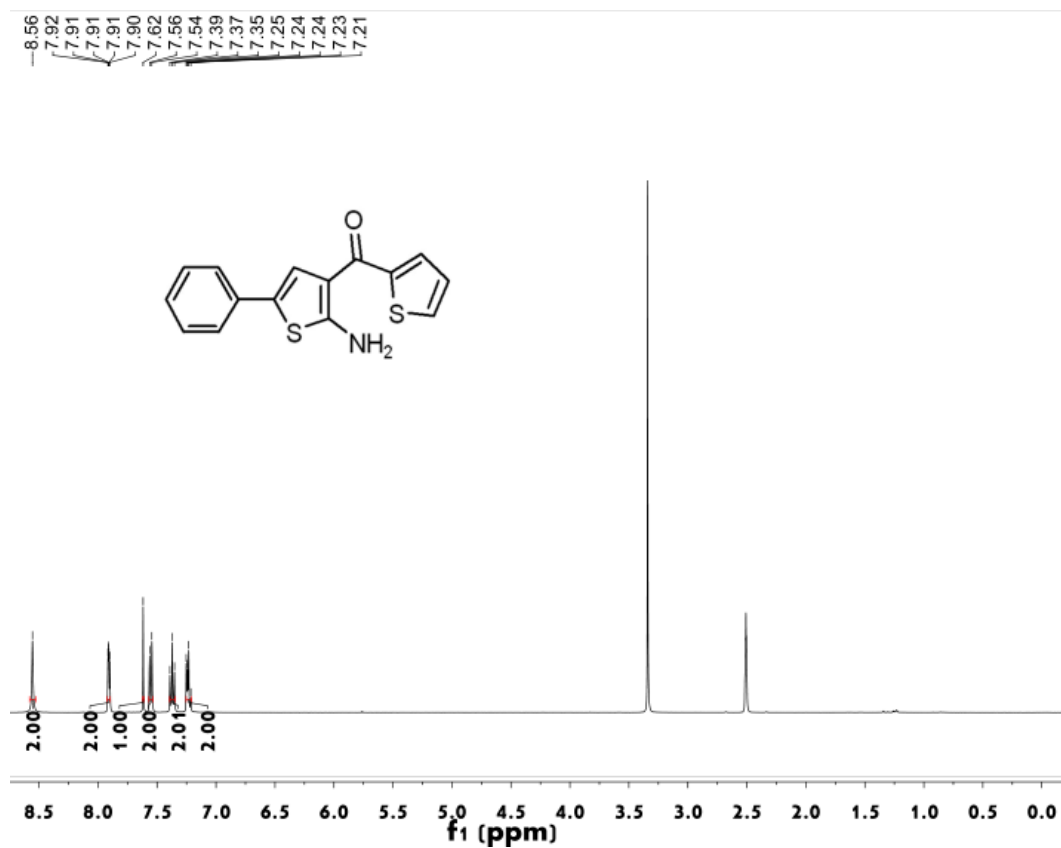


Figure S81 ^1H NMR spectrum of compound 4m

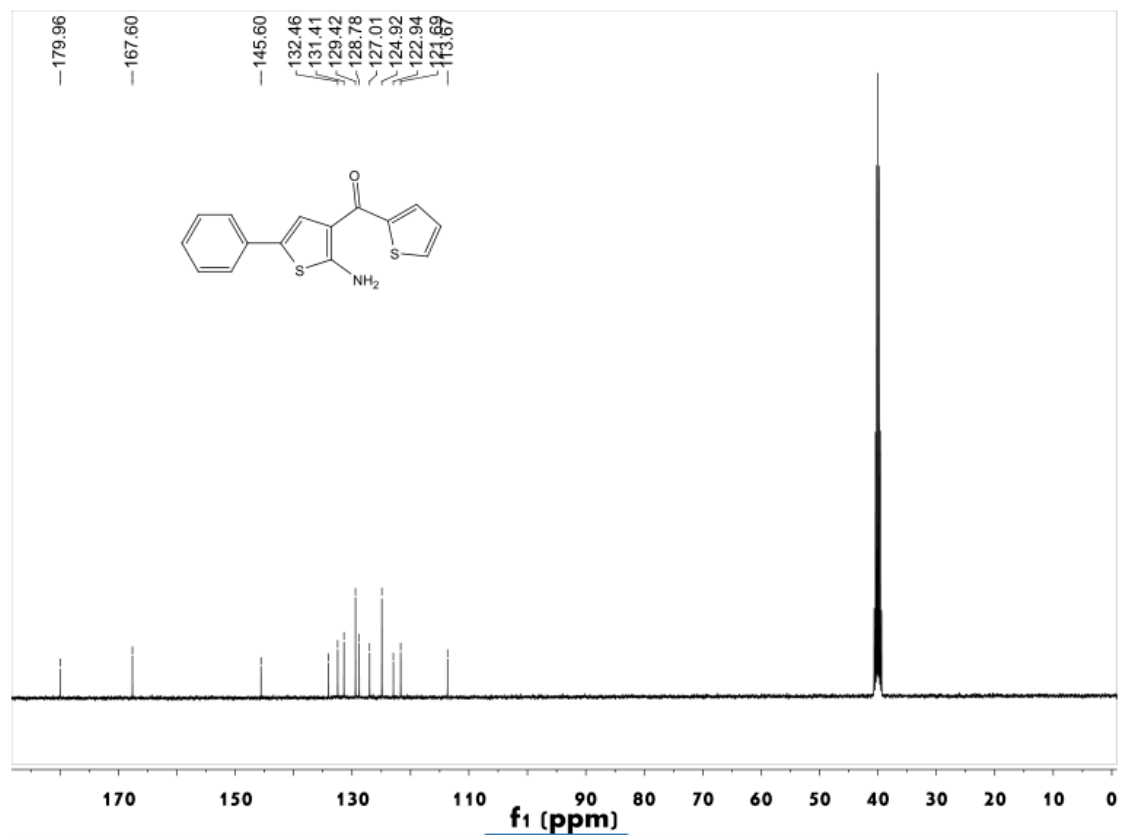


Figure S82 ^{13}C NMR spectrum of compound 4m

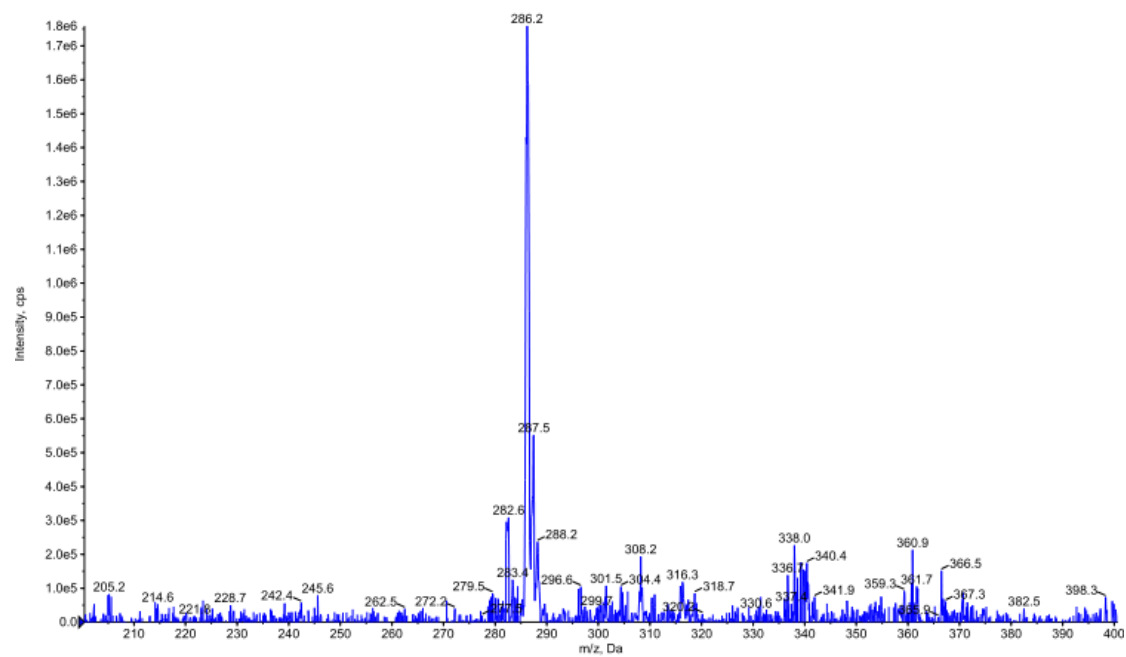


Figure S83 mass spectrum of compound 4m

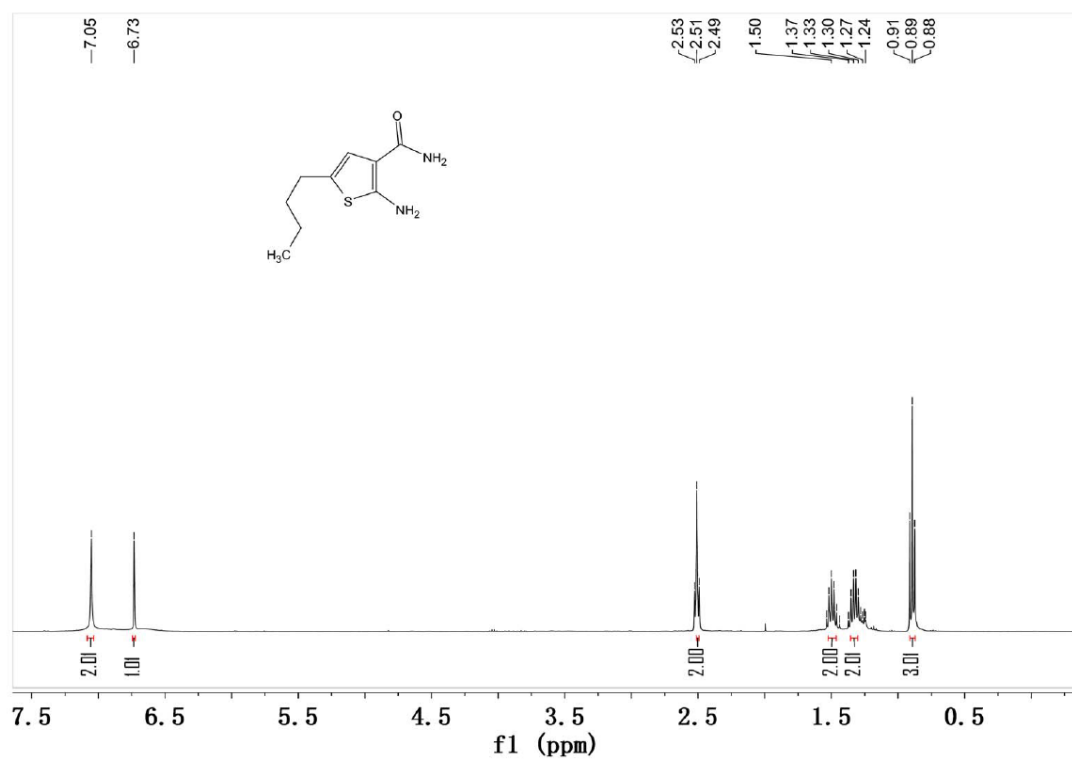


Figure S84 ¹H NMR spectrum of compound 4n

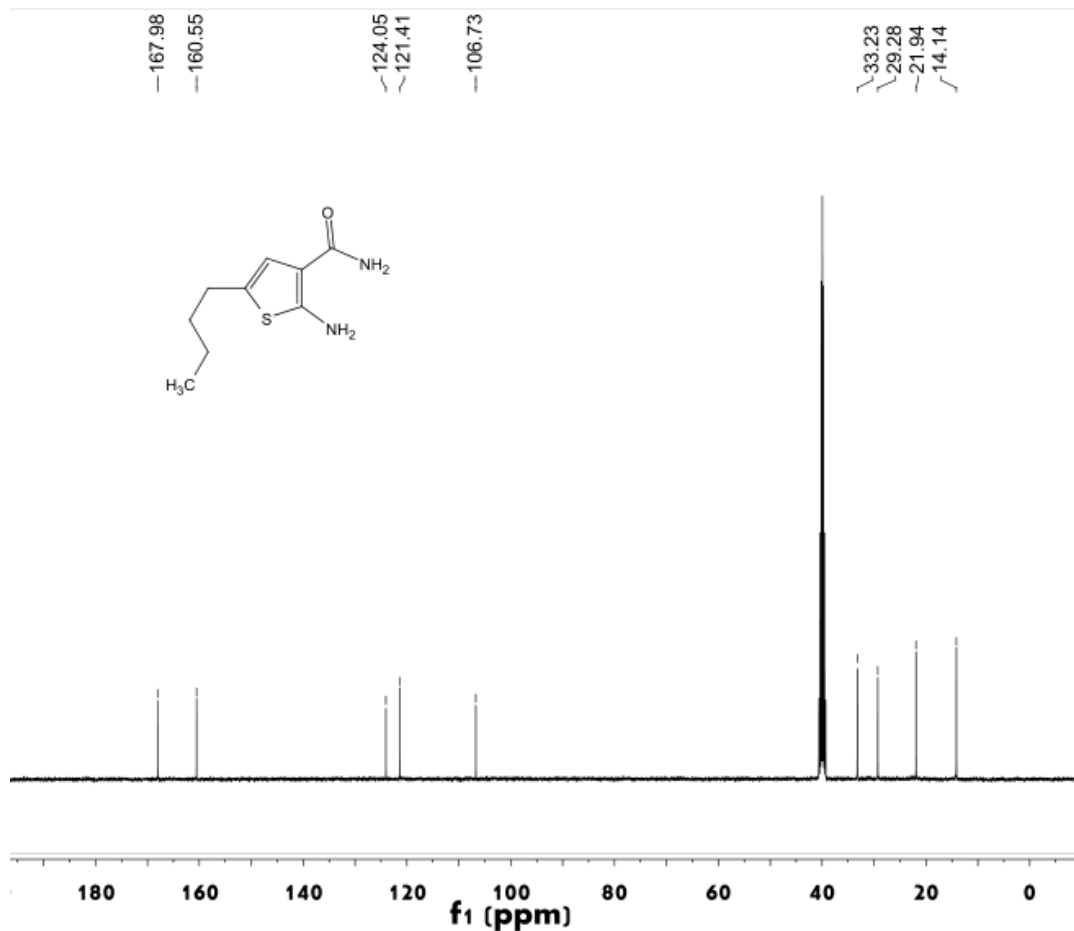


Figure S85 ^{13}C NMR spectrum of compound 4n

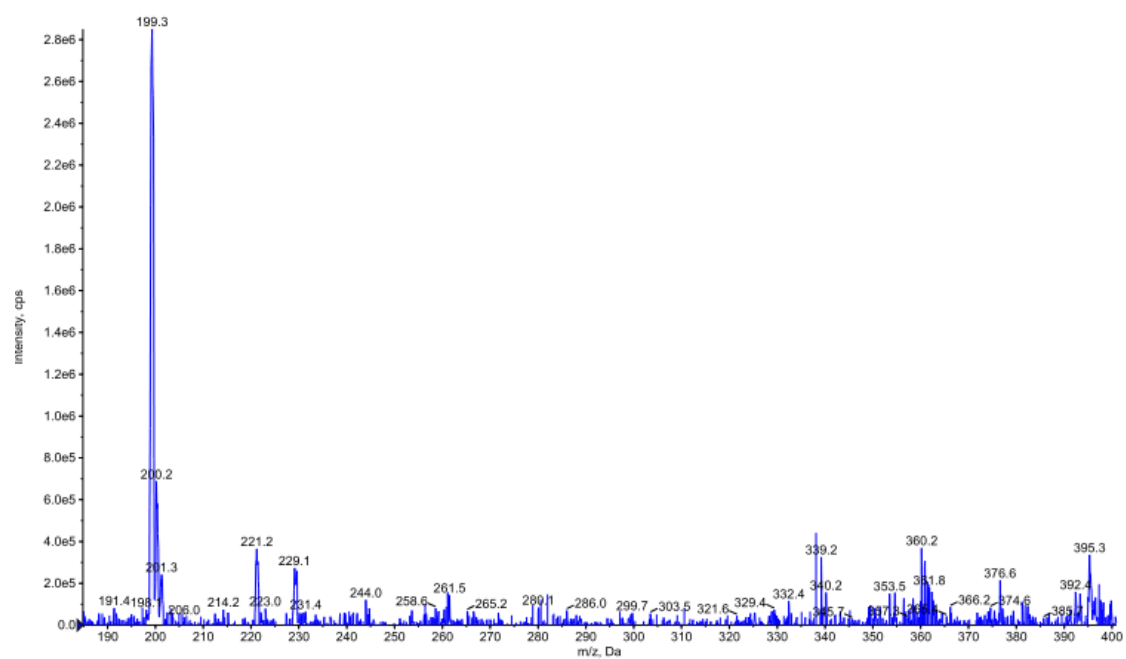


Figure S86 mass spectrum of compound 4n

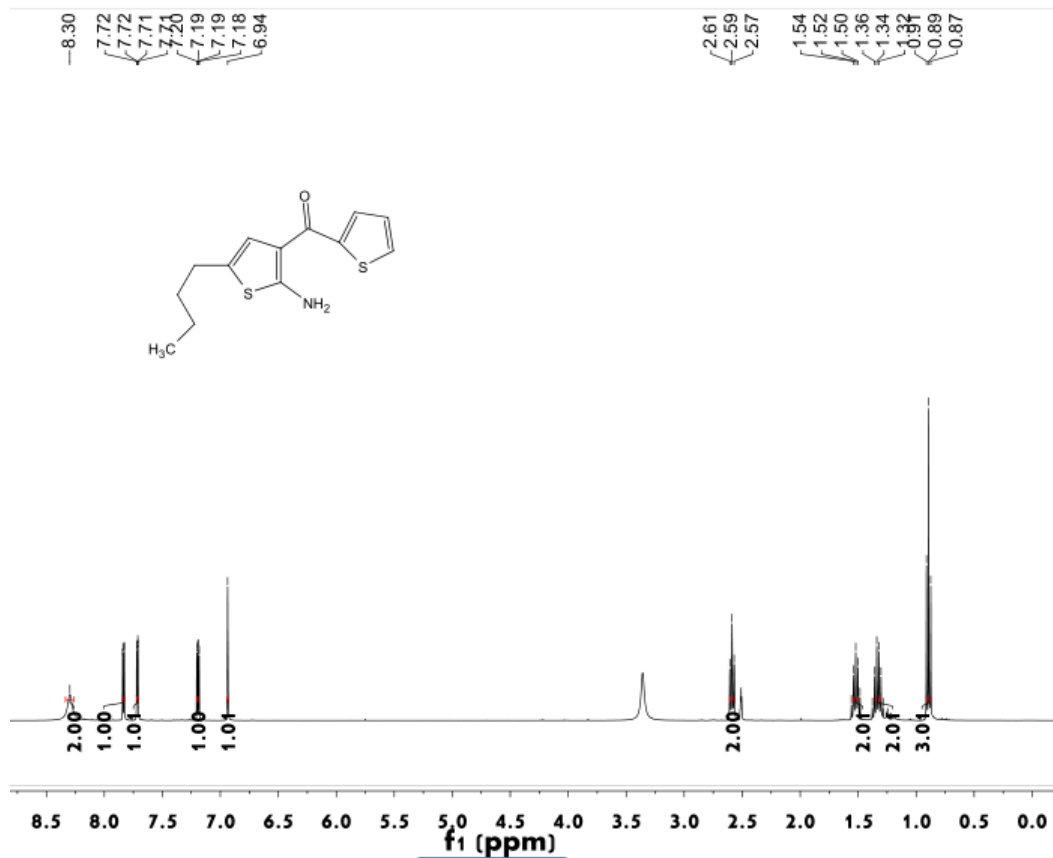


Figure S87 ¹H NMR spectrum of compound 4o

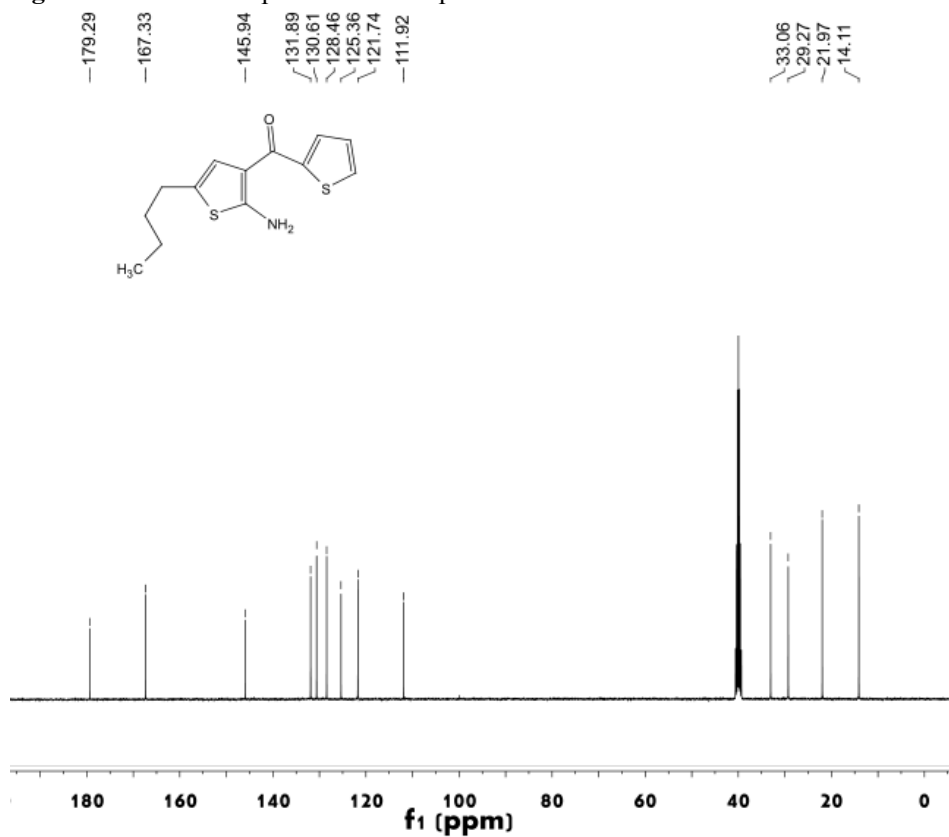


Figure S88 ¹³C NMR spectrum of compound 4o

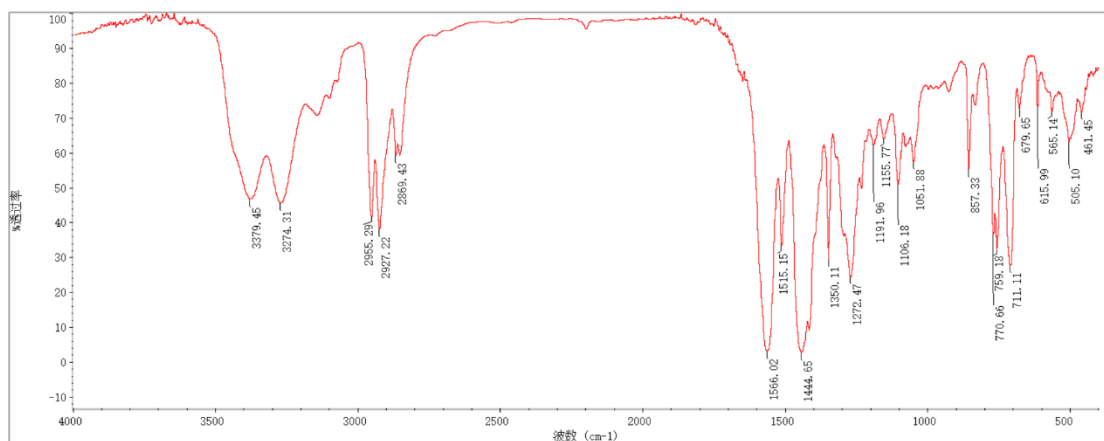


Figure S89 IR spectrum of compound 4o

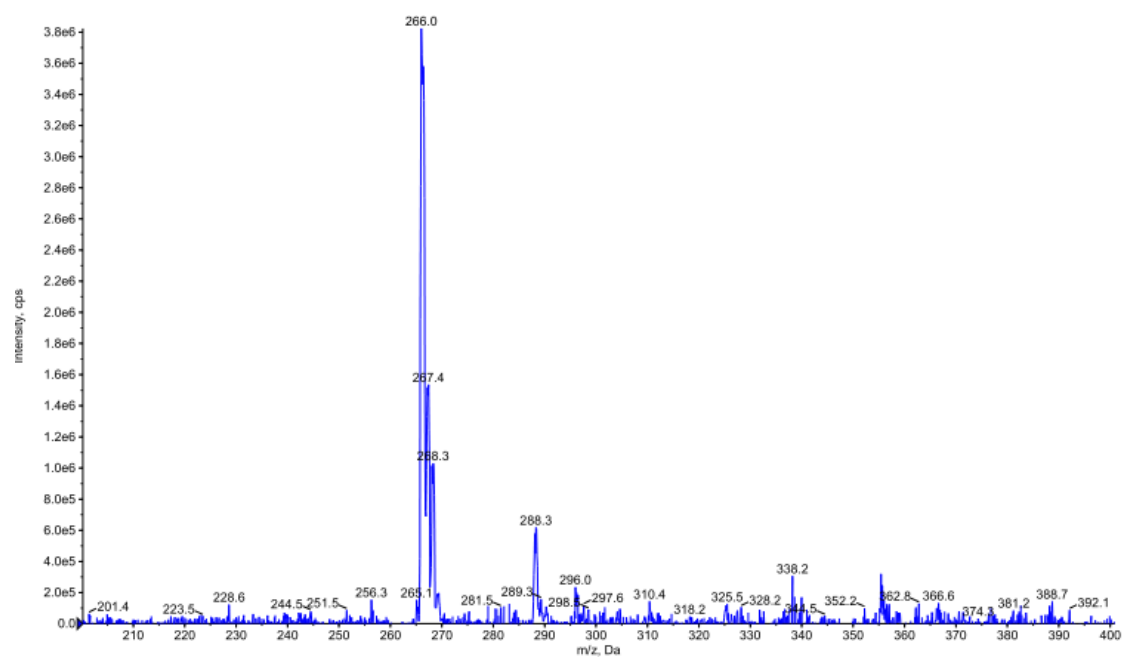


Figure S90 mass spectrum of compound 4o

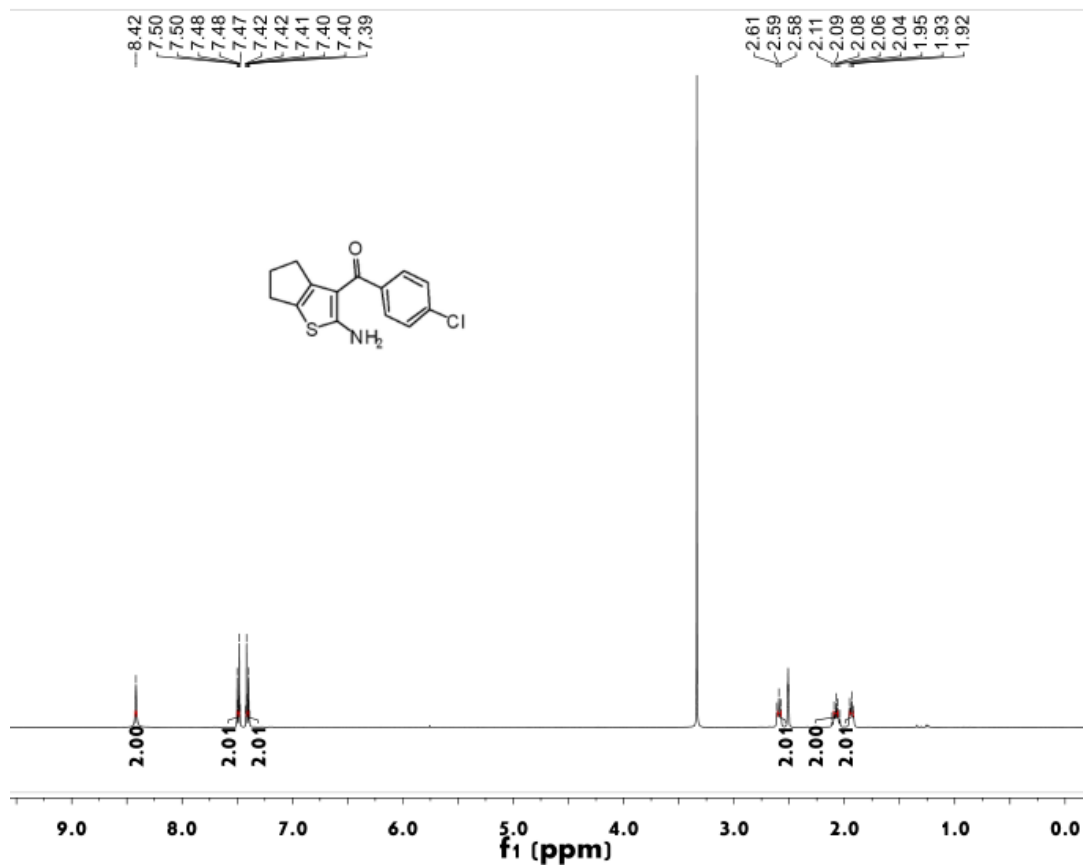


Figure S91 ^1H NMR spectrum of compound 4p

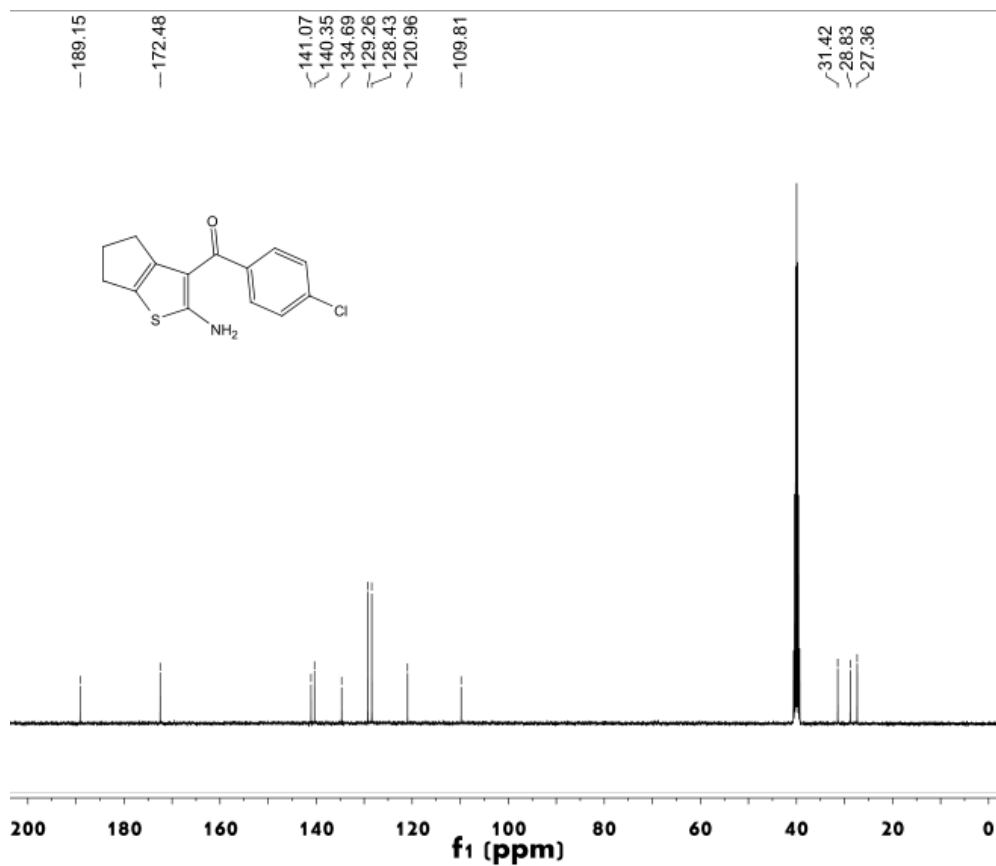


Figure S92 ^{13}C NMR spectrum of compound 4p

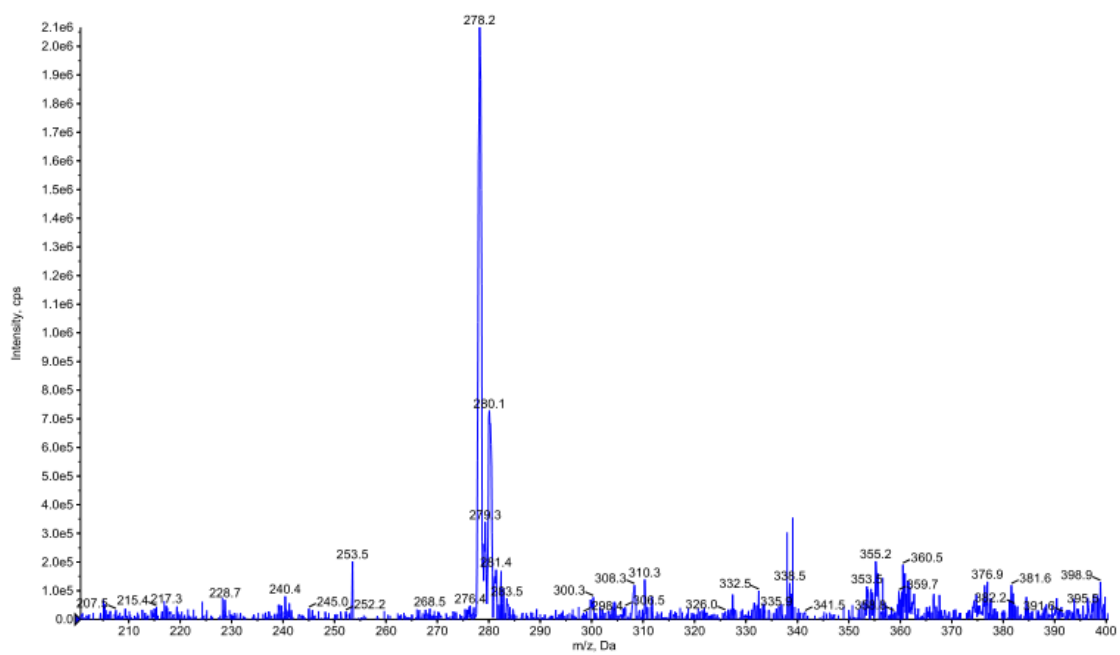


Figure S93 mass spectrum of compound 4p

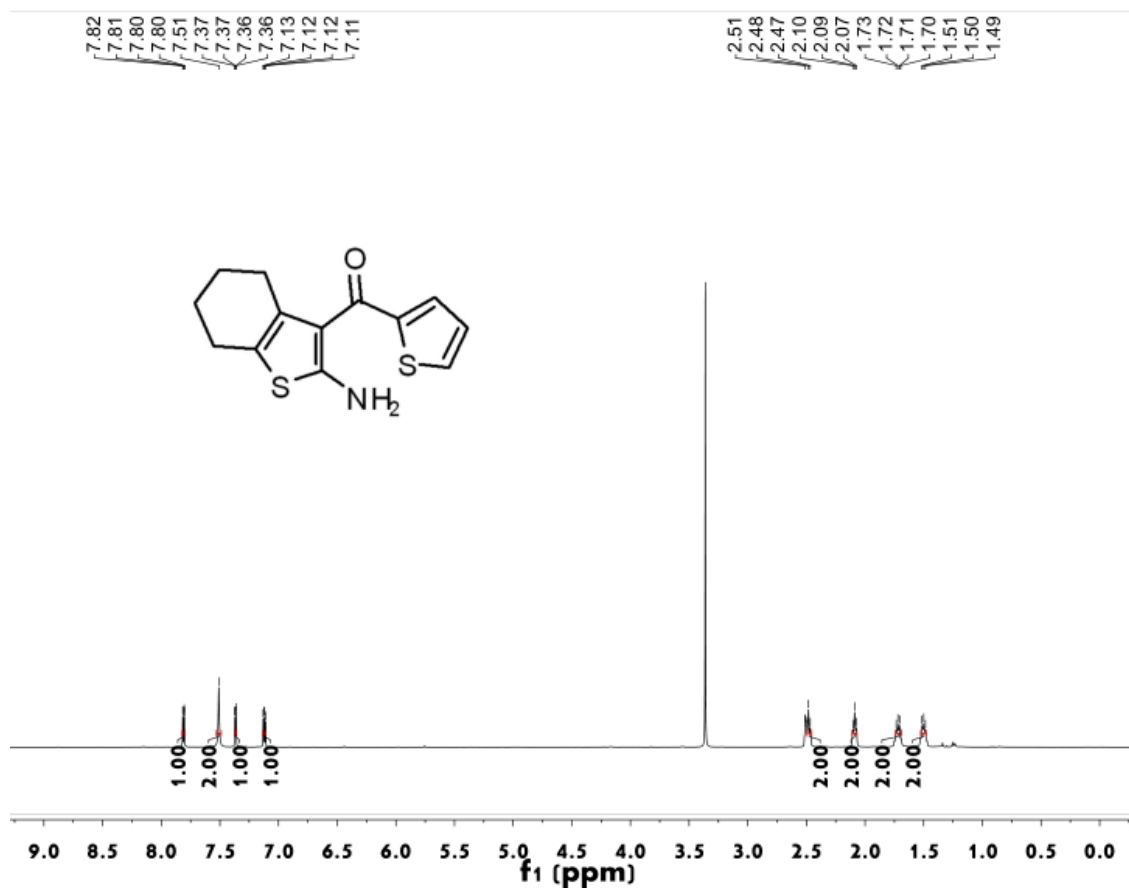


Figure S94 ¹H NMR spectrum of compound 4q

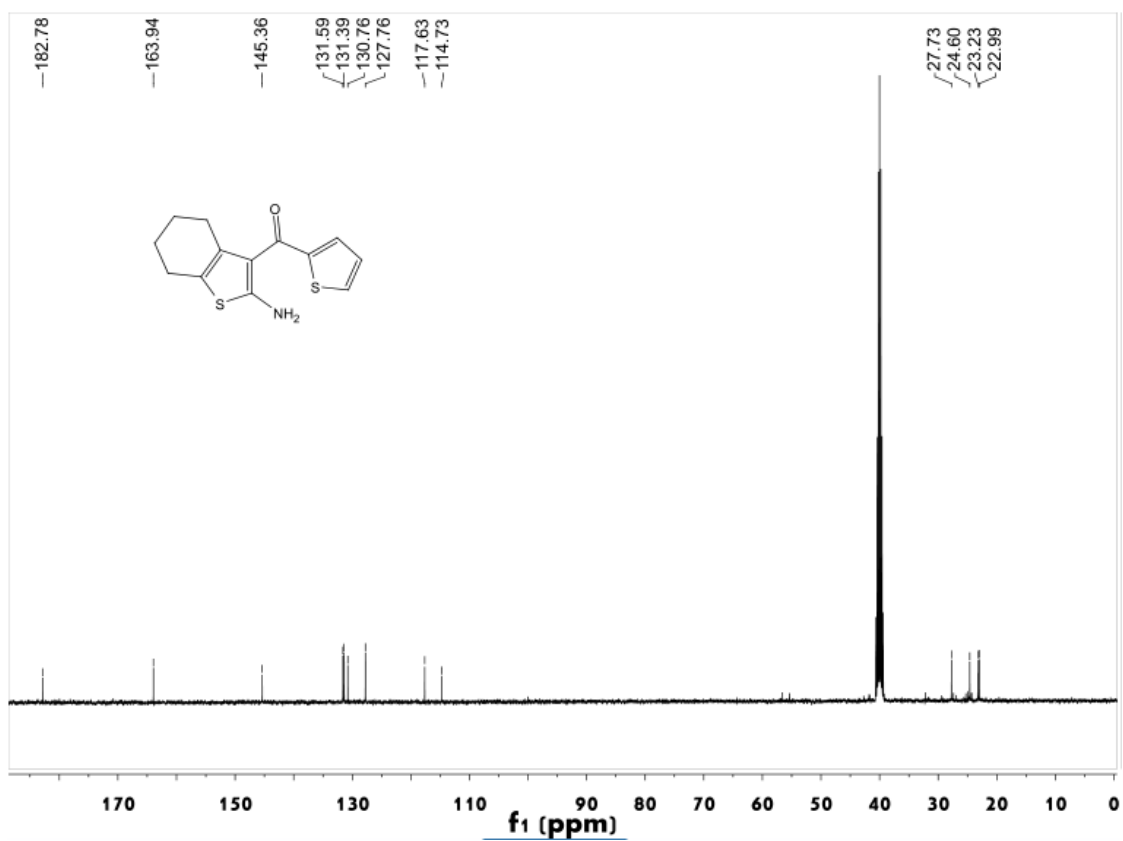


Figure S95 ^{13}C NMR spectrum of compound 4q

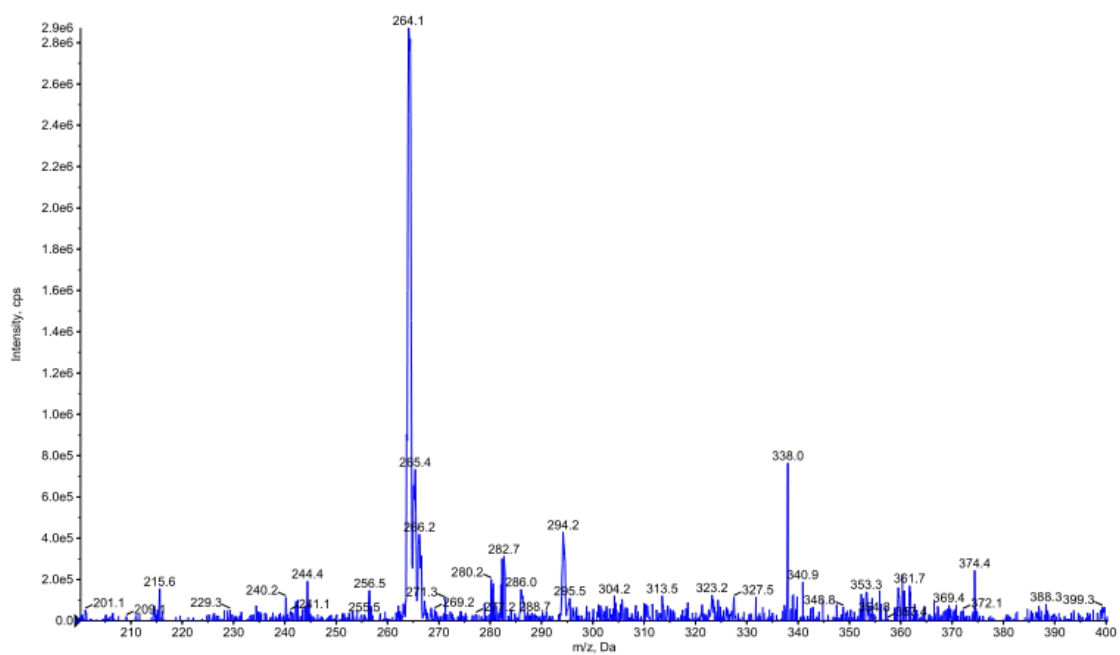


Figure S96 mass spectrum of compound 4q

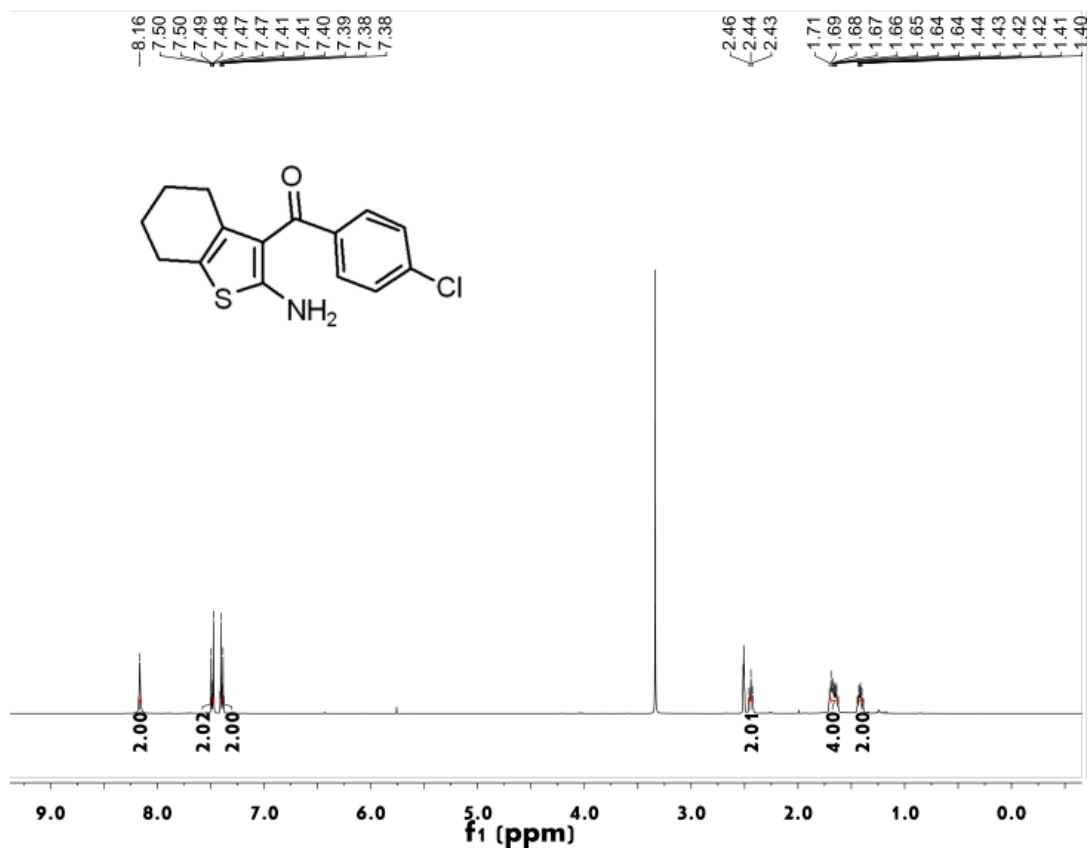


Figure S97 $^1\text{H NMR}$ spectrum of compound 4r

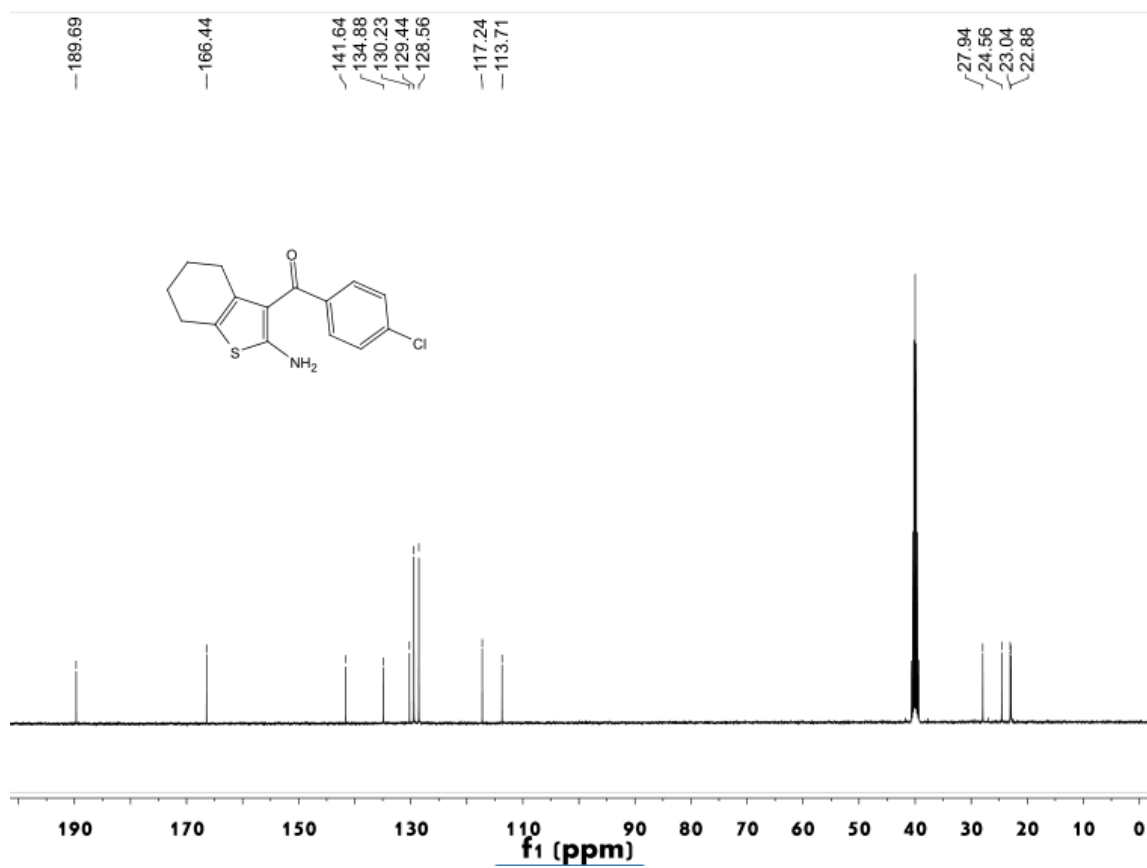


Figure S98 $^{13}\text{C NMR}$ spectrum of compound 4r

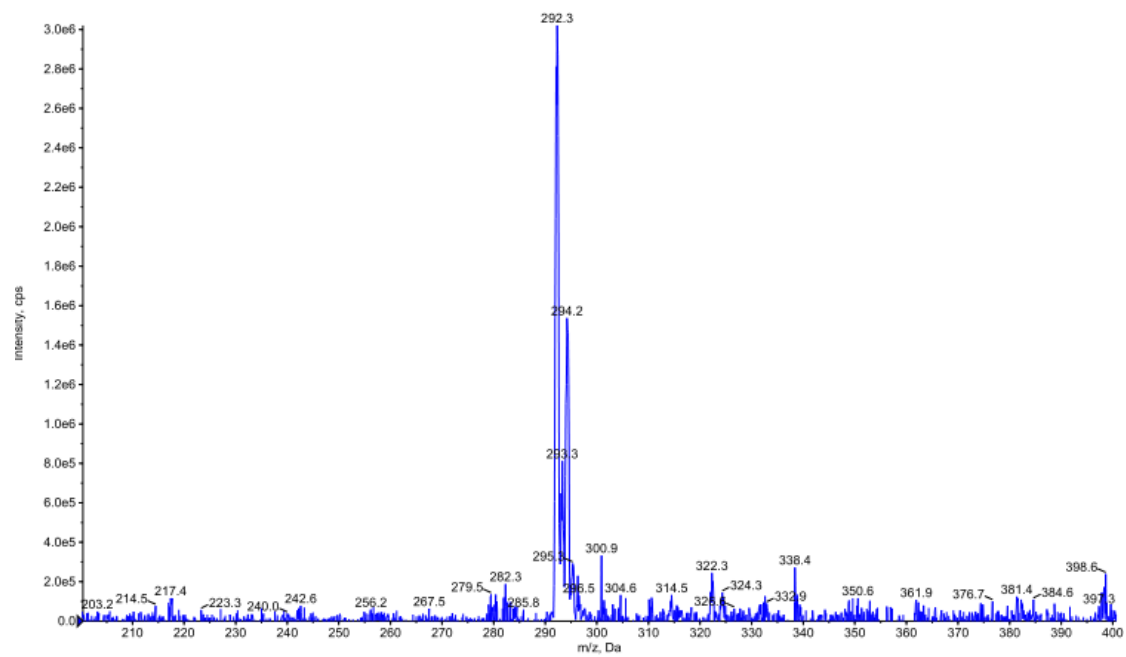


Figure S99 mass spectrum of compound 4r