

Supplementary Material

**Convenient multicomponent reaction synthesis of novel
pyrano[4,3-*b*]pyran derivatives via a domino reaction under
microwave irradiation**

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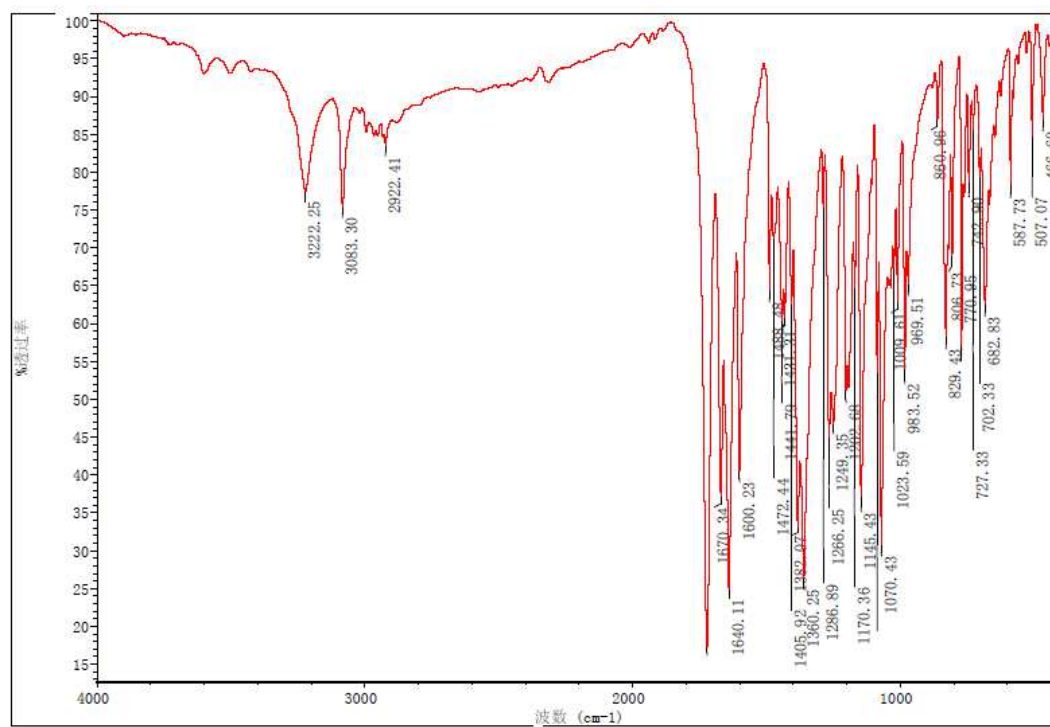
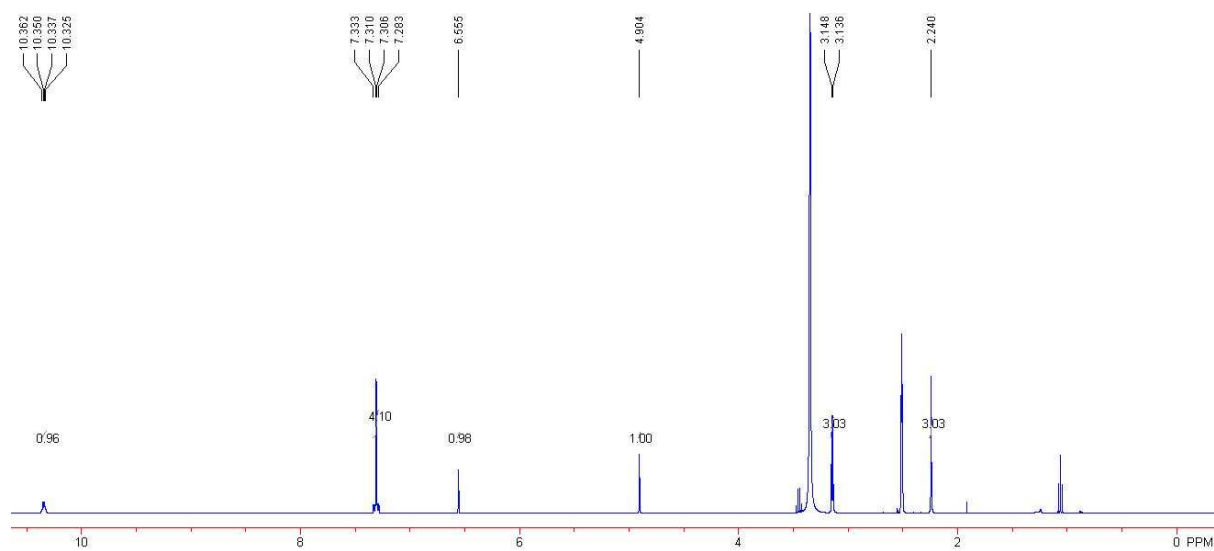


Figure S1 IR spectrum of compound 4a

Figure S2 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4a

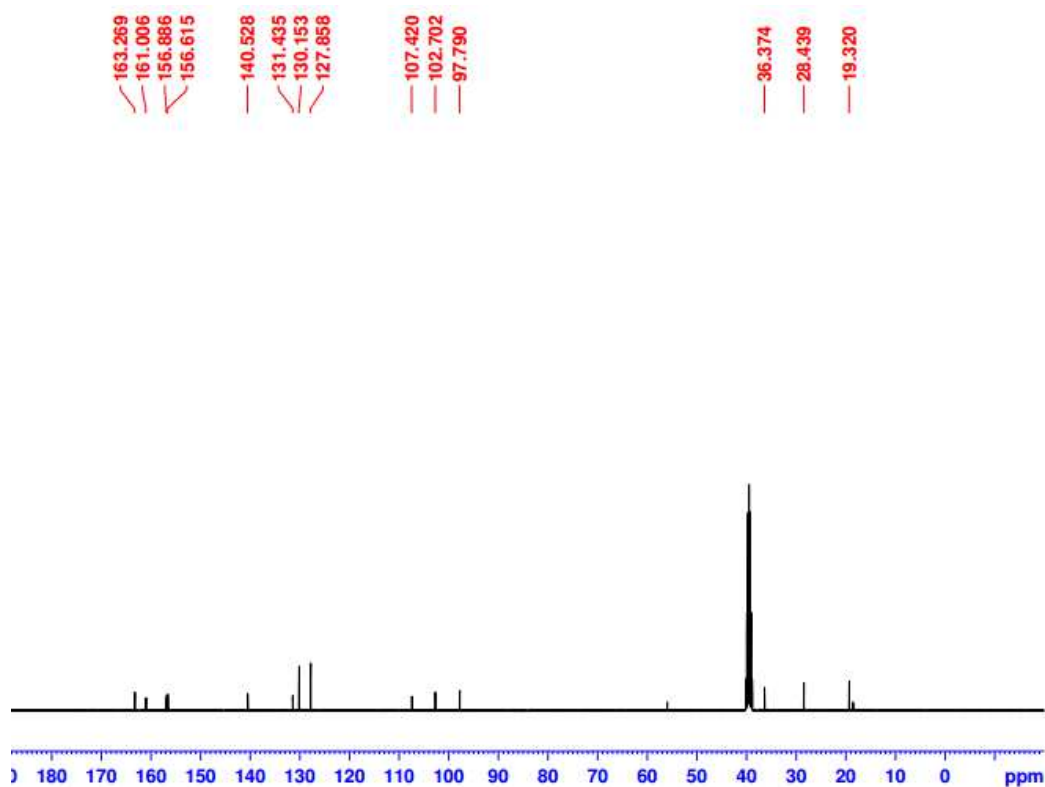


Figure S3 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 4a

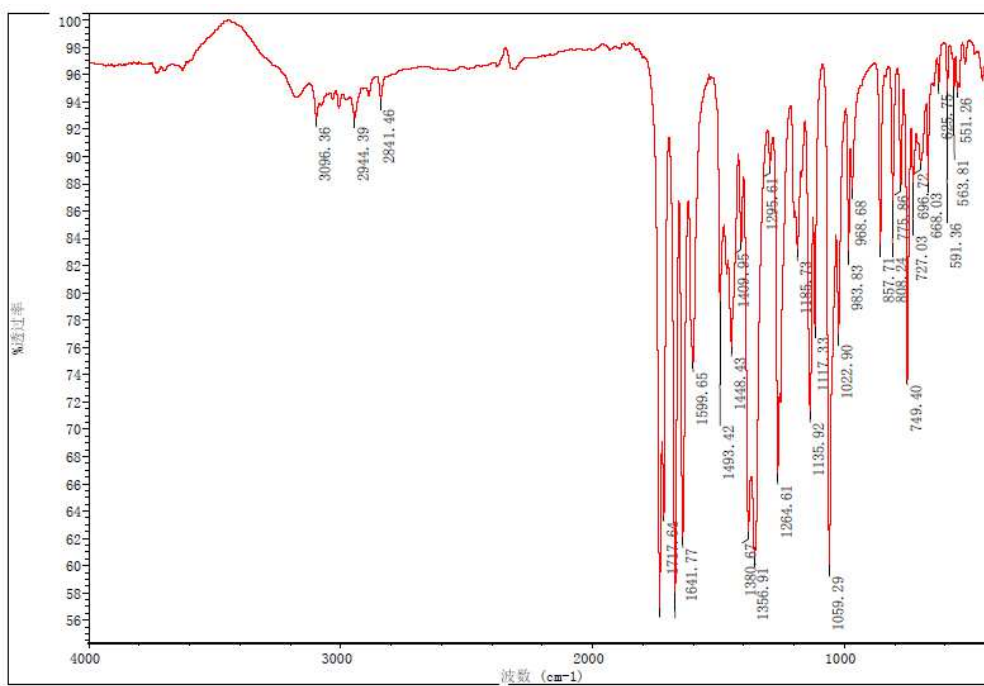


Figure S4 IR spectrum of compound 4b

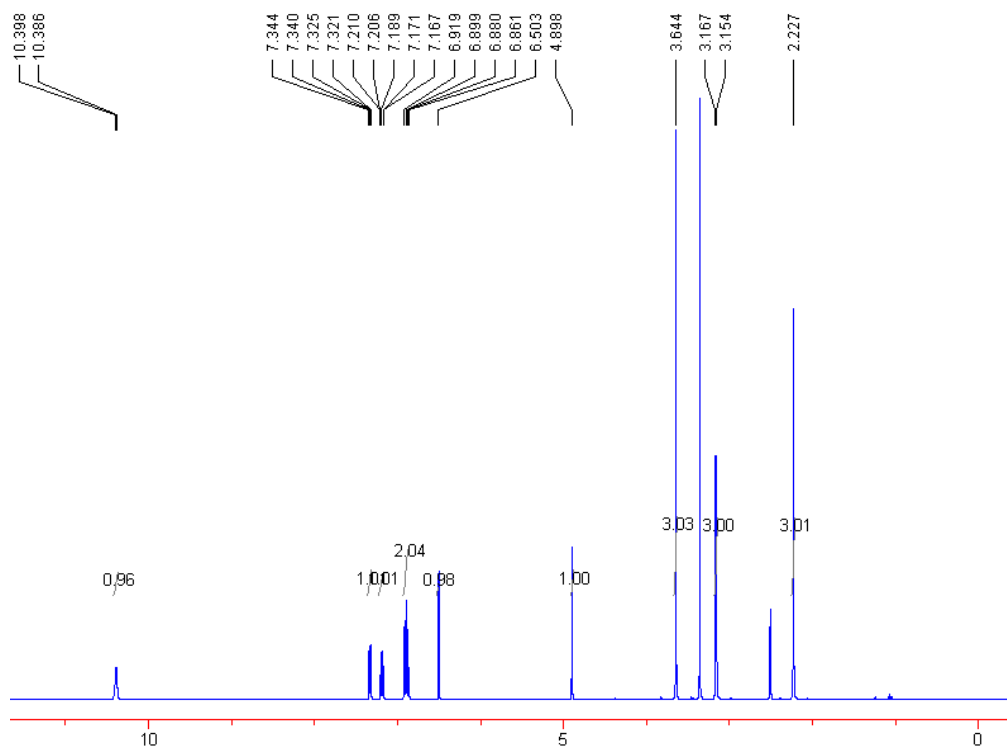


Figure S5 ^1H NMR Spectrum (400 MHz, $\text{DMSO-}d_6$) of Compound 4b

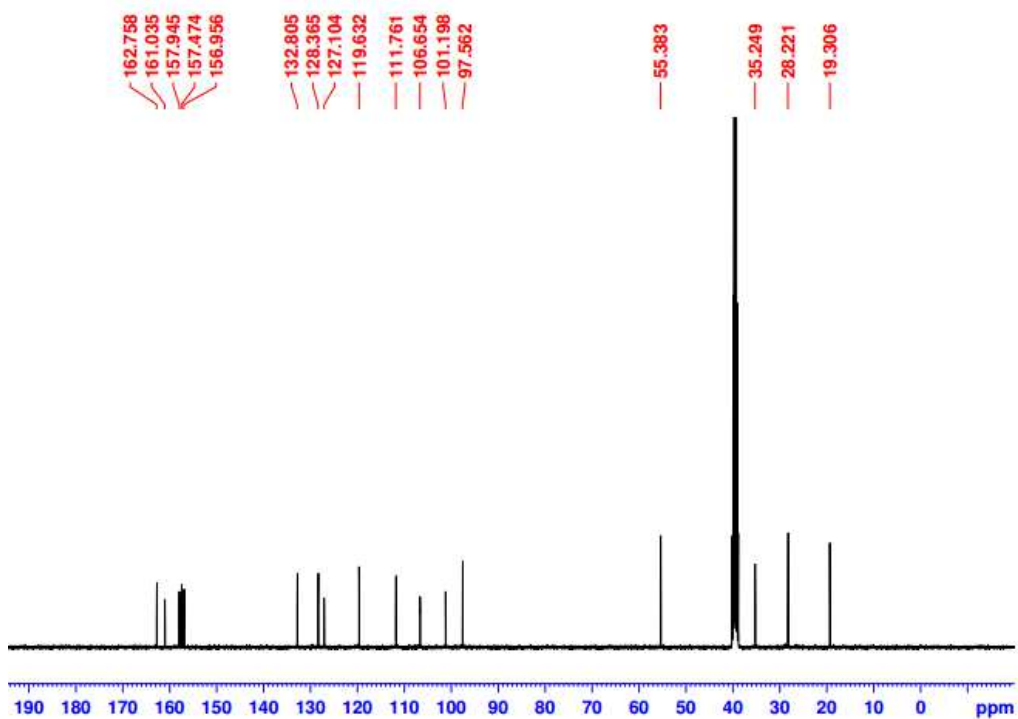


Figure S6 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 4b

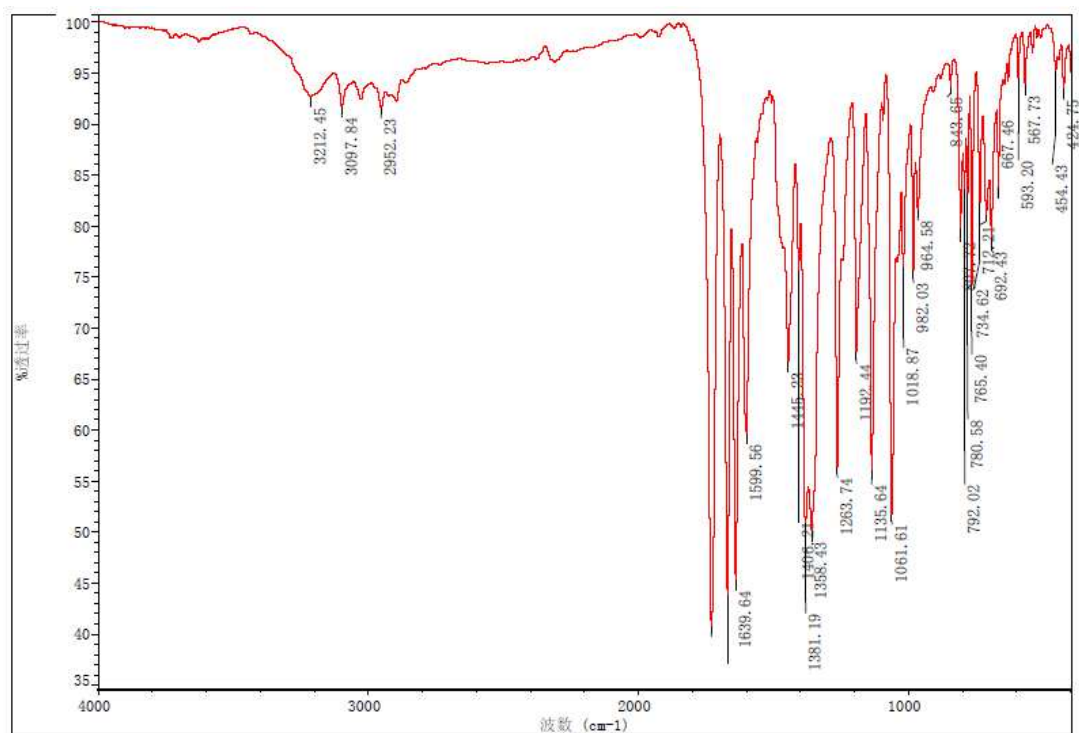
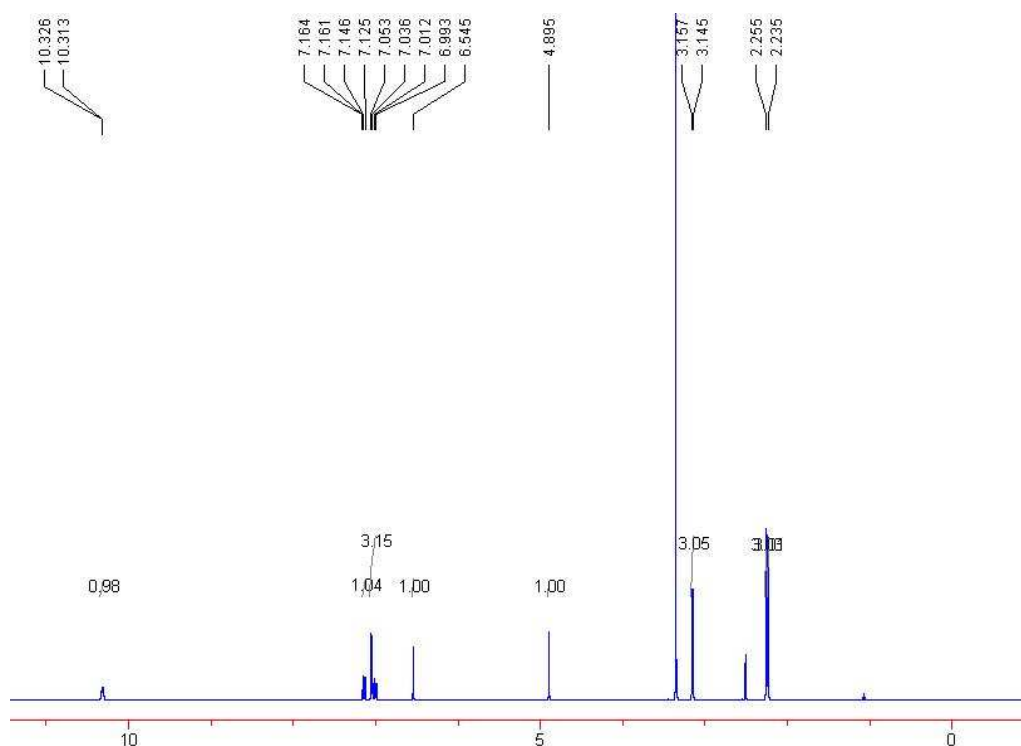


Figure S7 IR spectrum of compound 4c

Figure S8 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4c

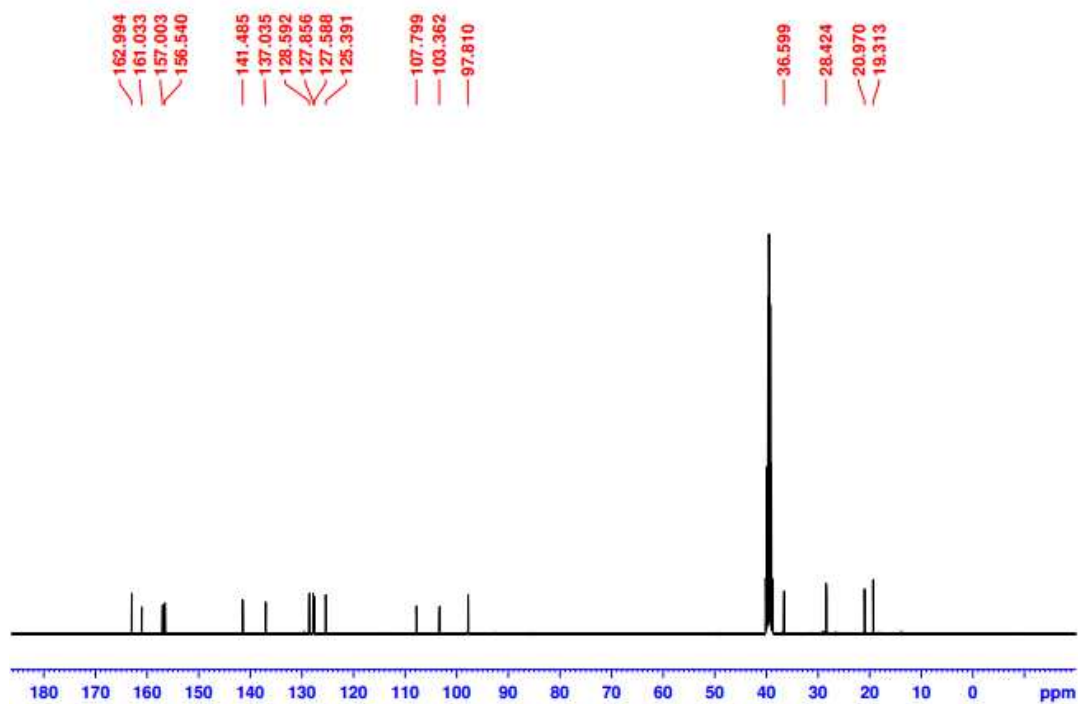


Figure S9 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 4c

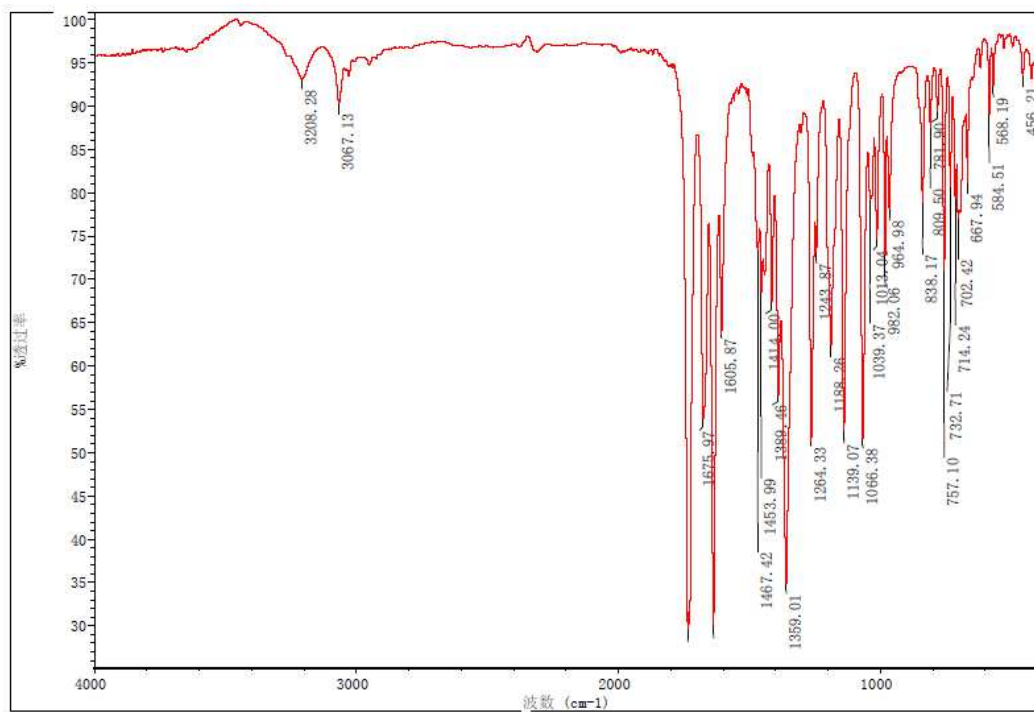


Figure S10 IR spectrum of compound 4d

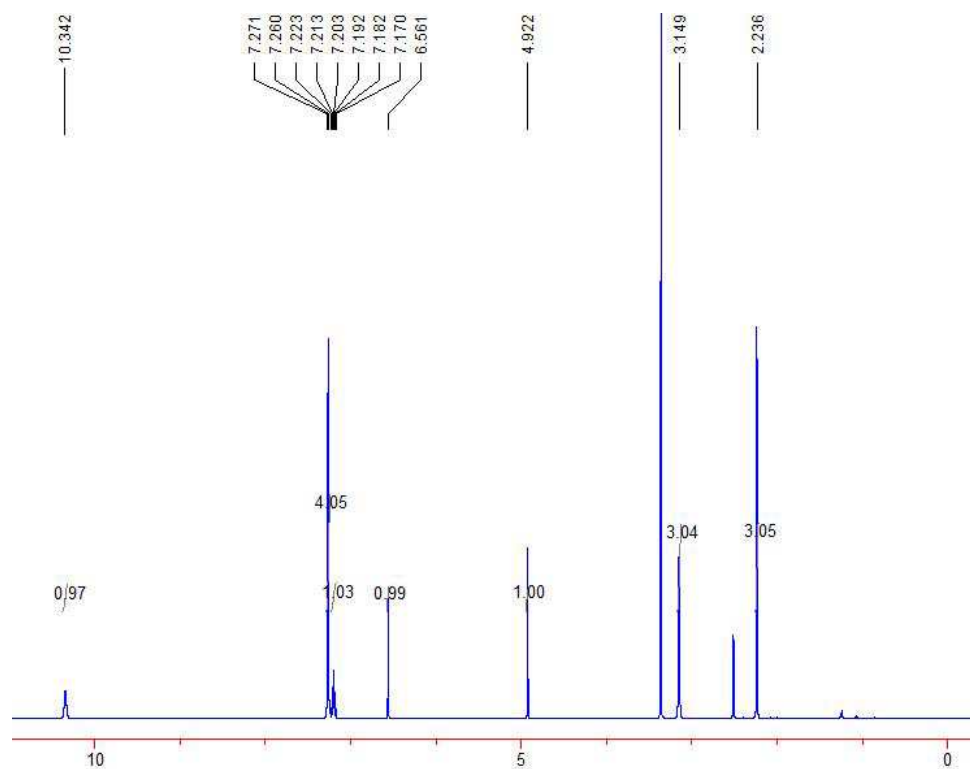


Figure S11 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4d

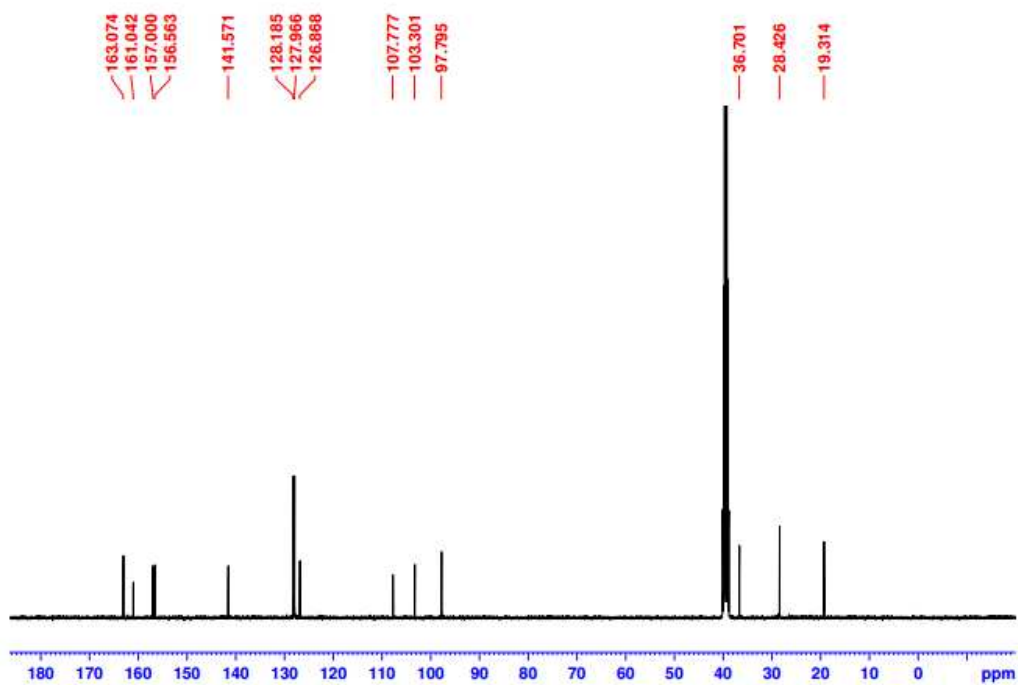


Figure S12 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 4d

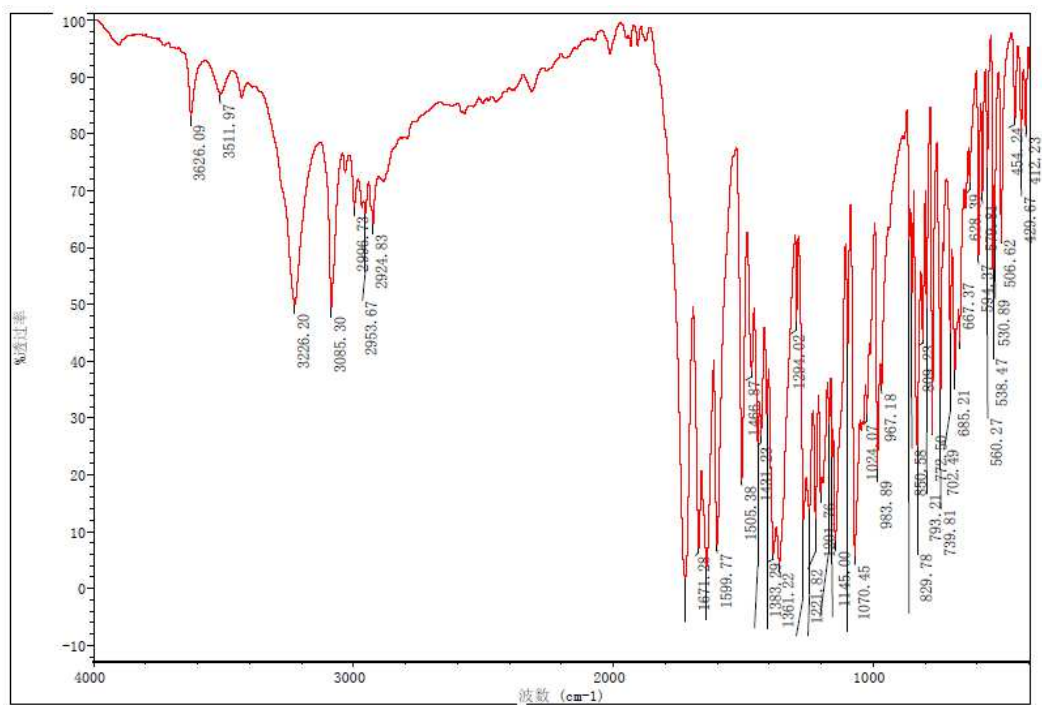
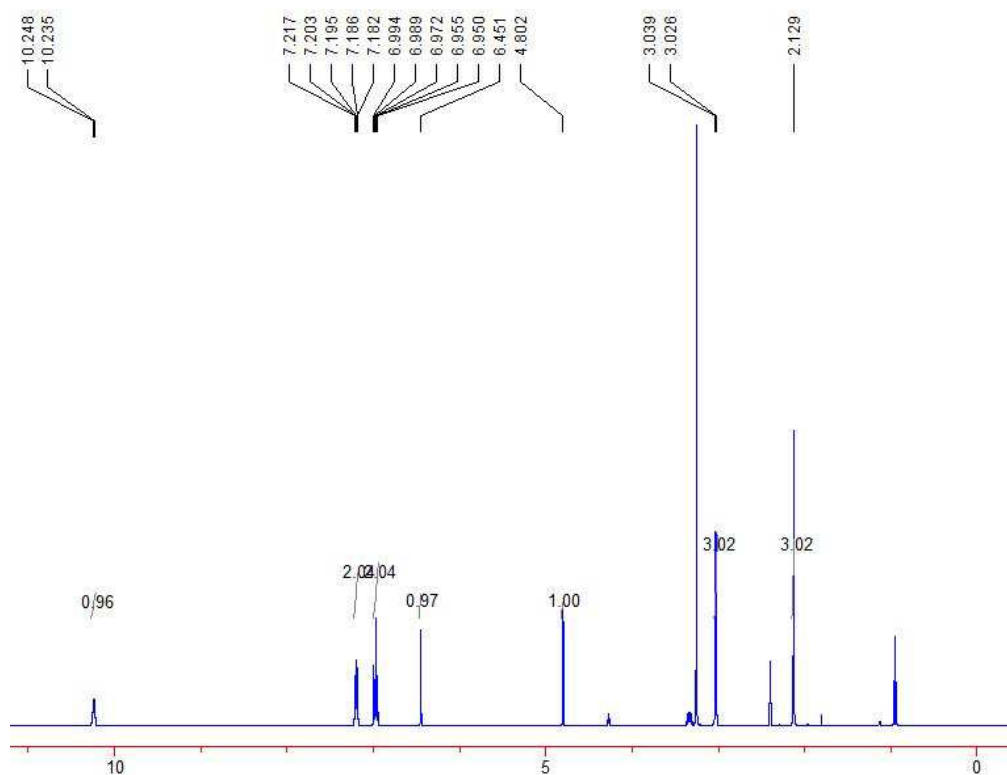


Figure S13 IR spectrum of compound 4e

Figure S14 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4e

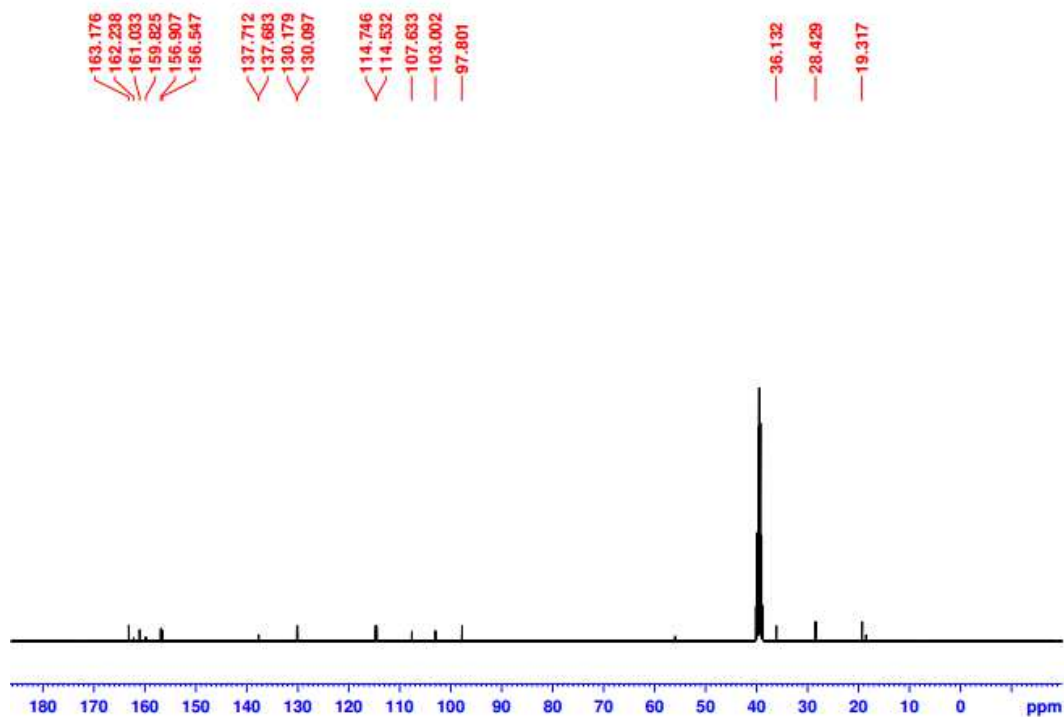


Figure S15 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 4e

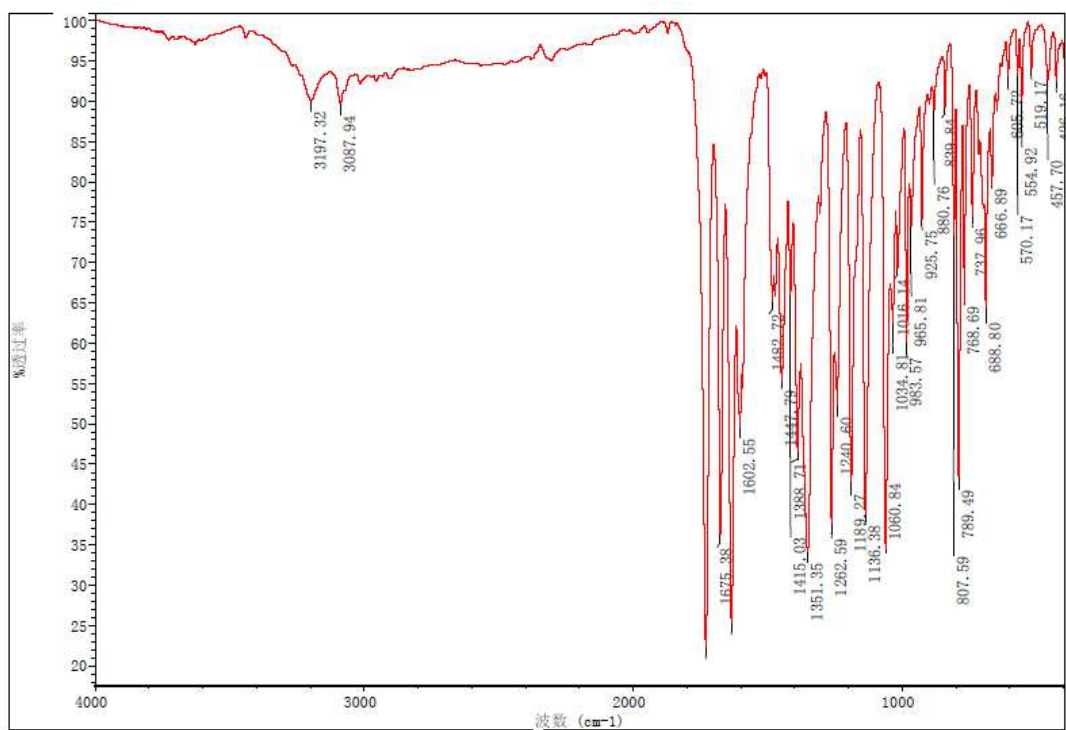


Figure S16 IR spectrum of compound 4f

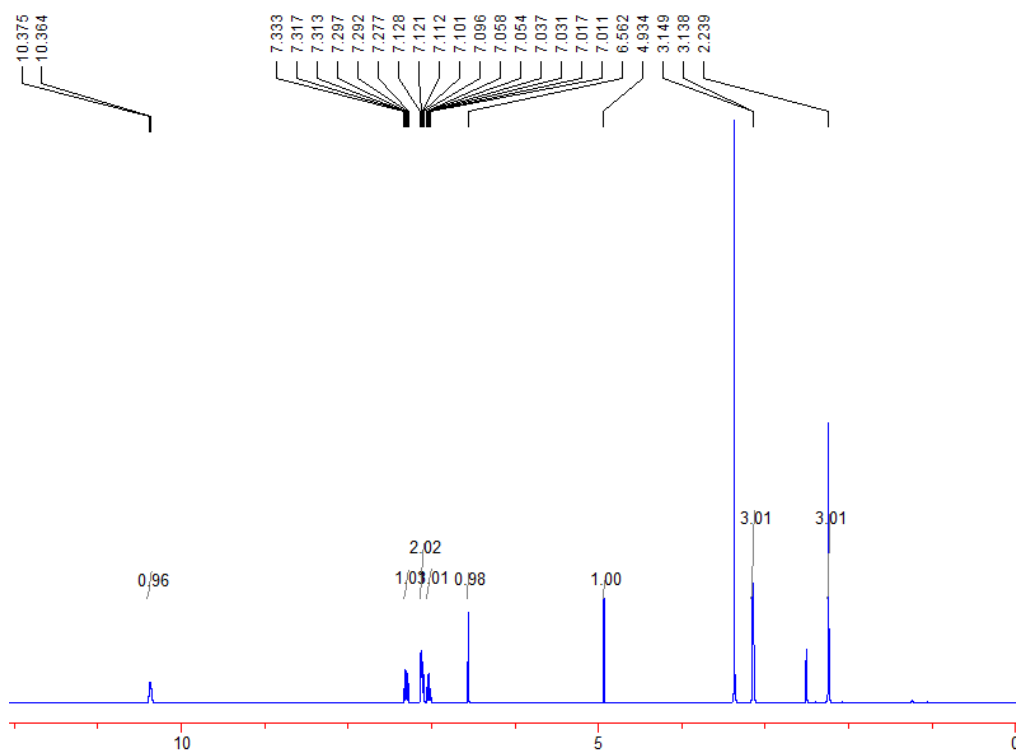


Figure S17 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4f

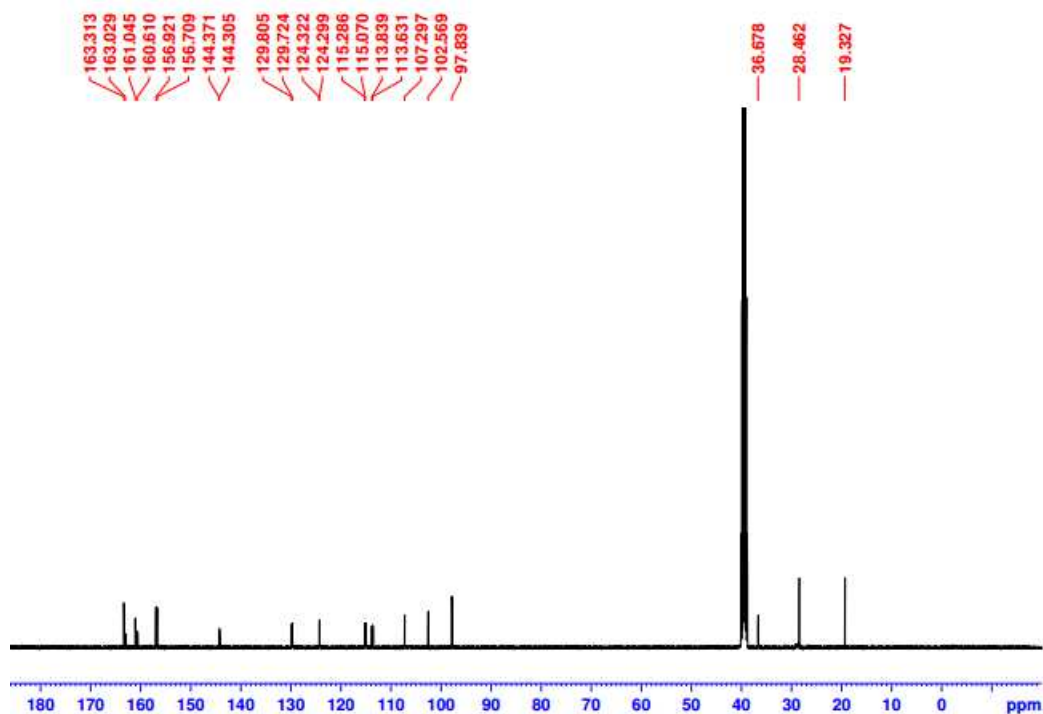


Figure S18 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 4f

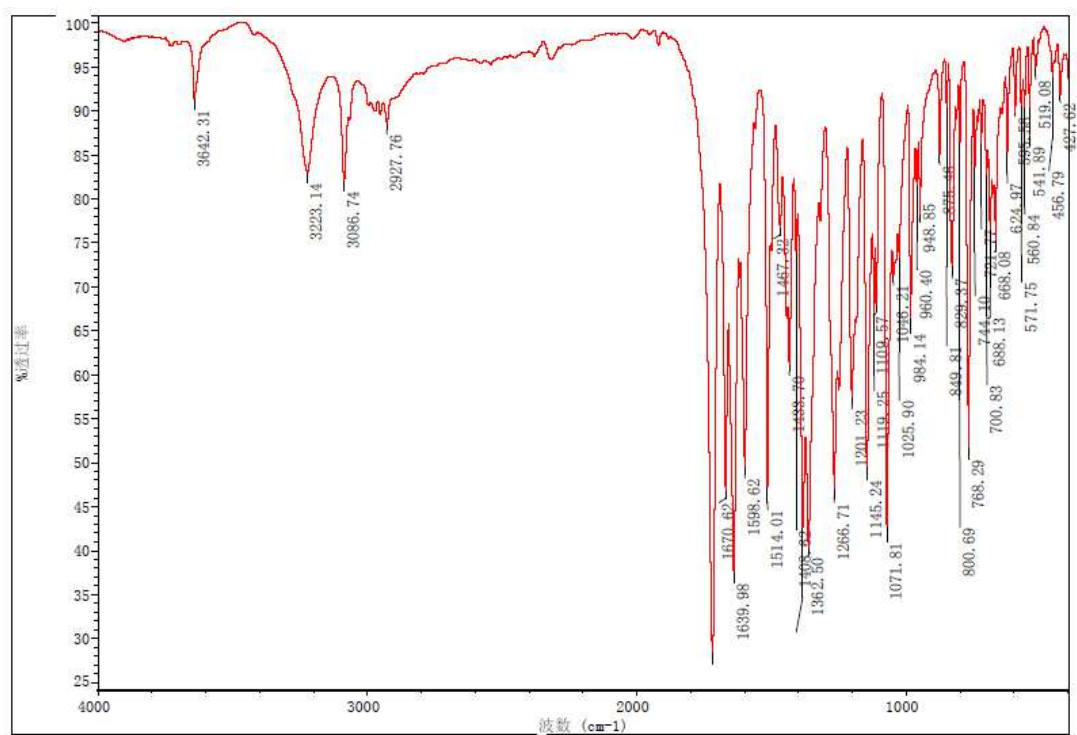


Figure S19 IR spectrum of compound 4g

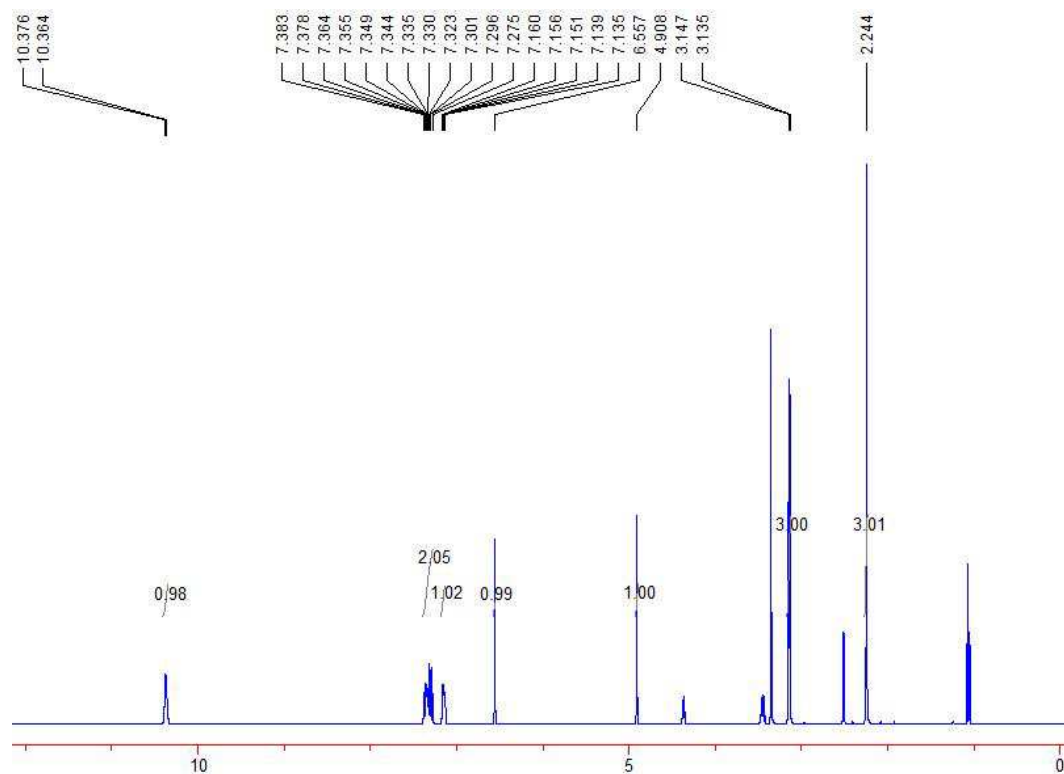


Figure S20 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4g

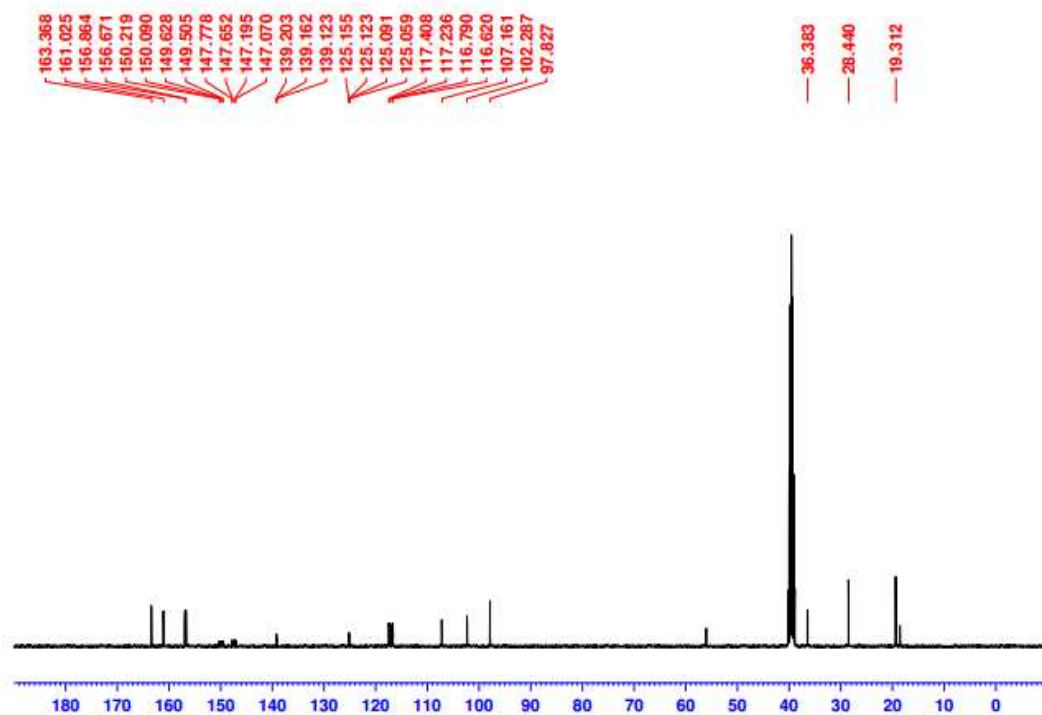


Figure S21 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 4g

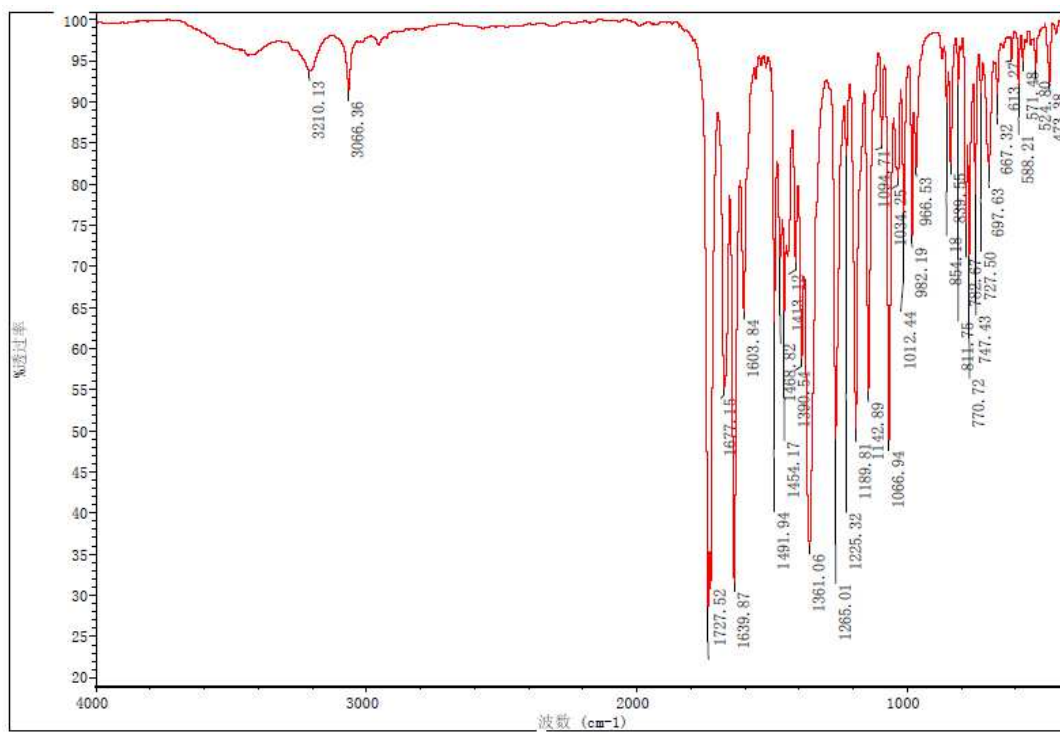


Figure S22 IR spectrum of compound 4h

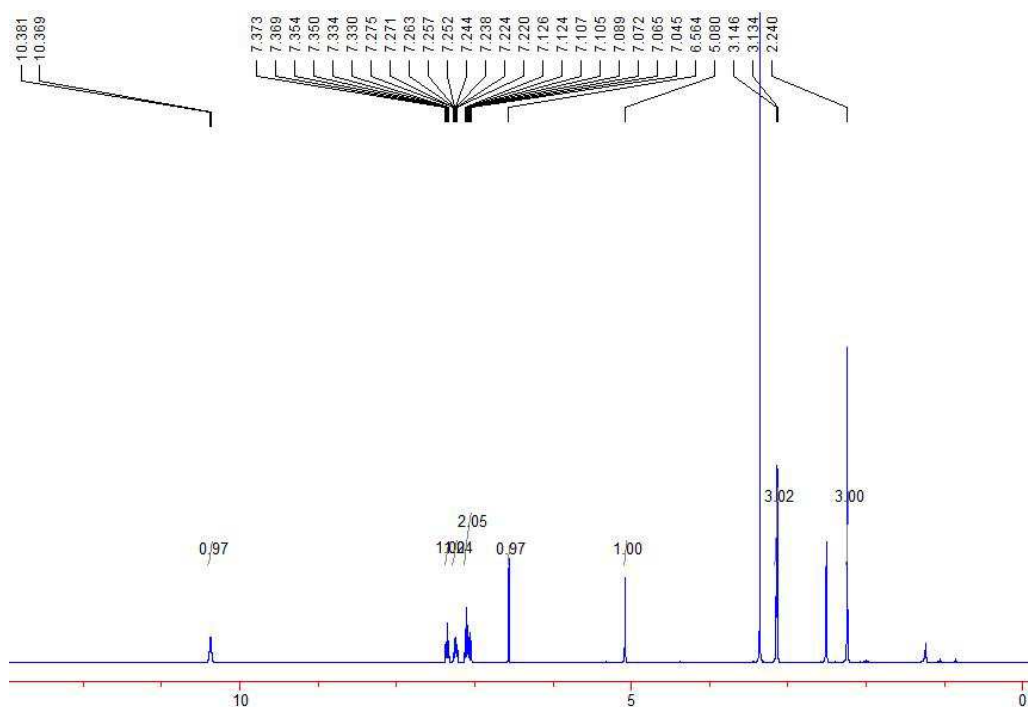


Figure S23 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4h

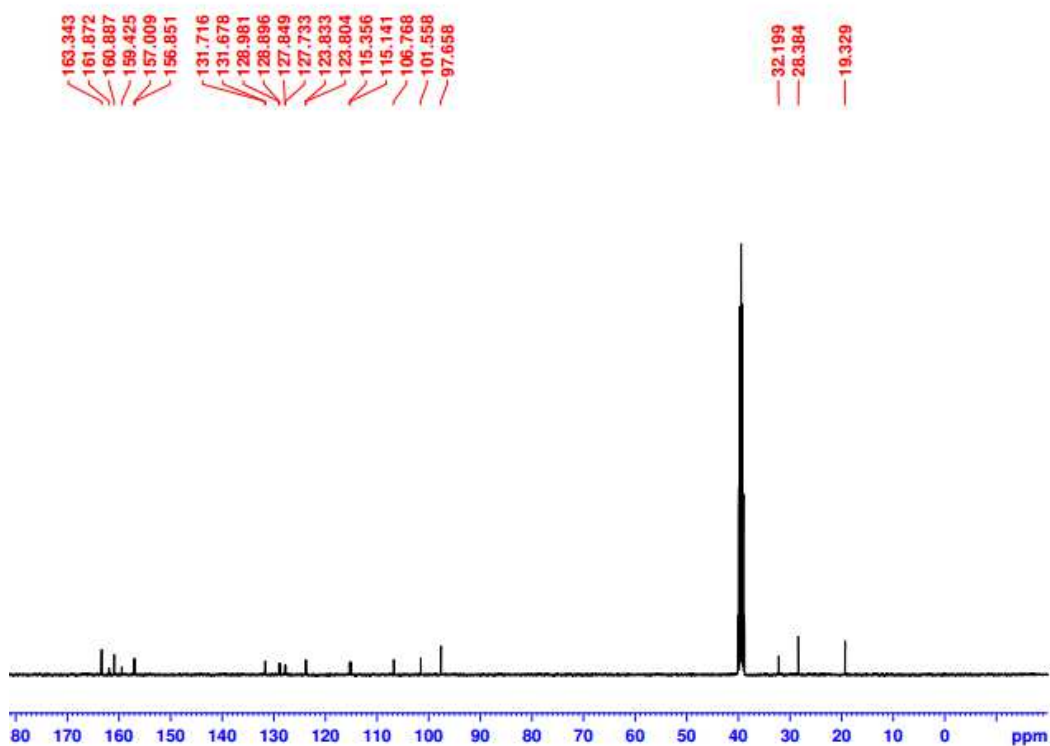


Figure S24 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 4h

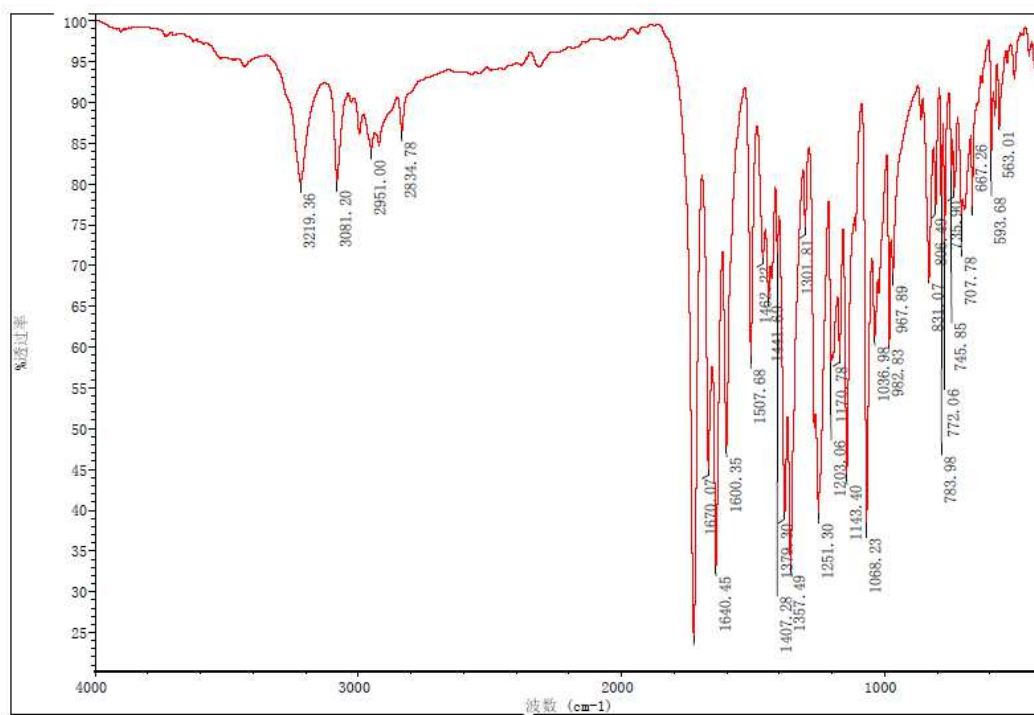
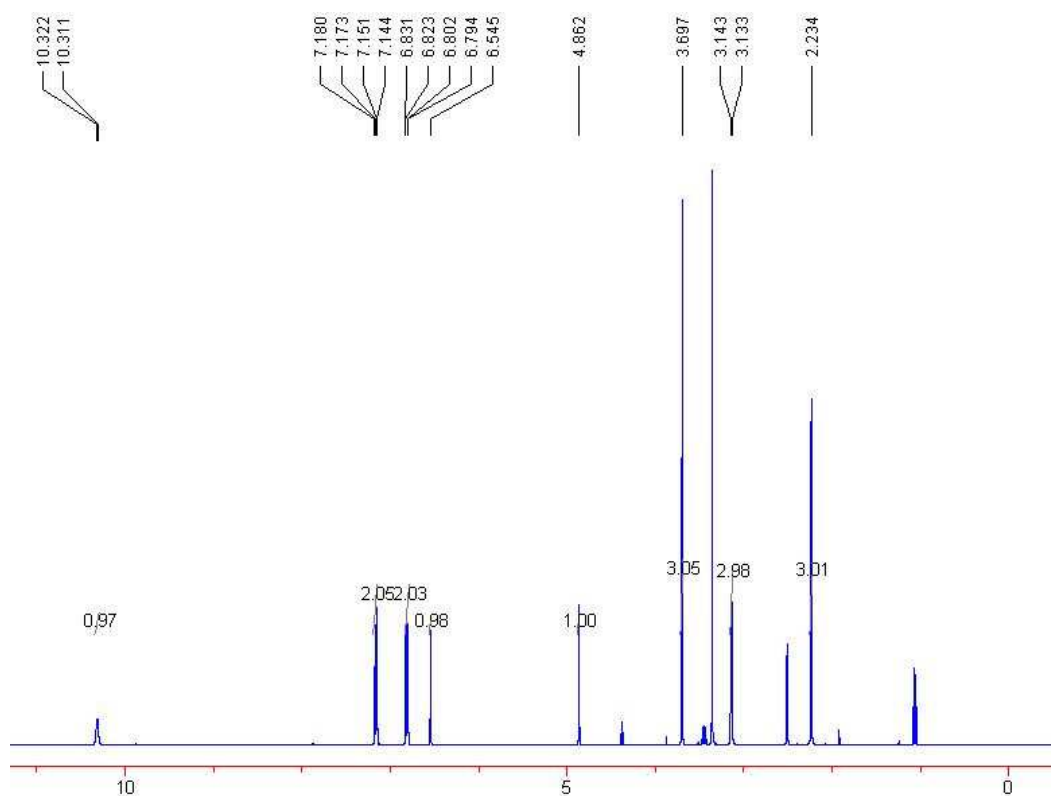


Figure S25 IR spectrum of compound 4i

Figure S26 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4i

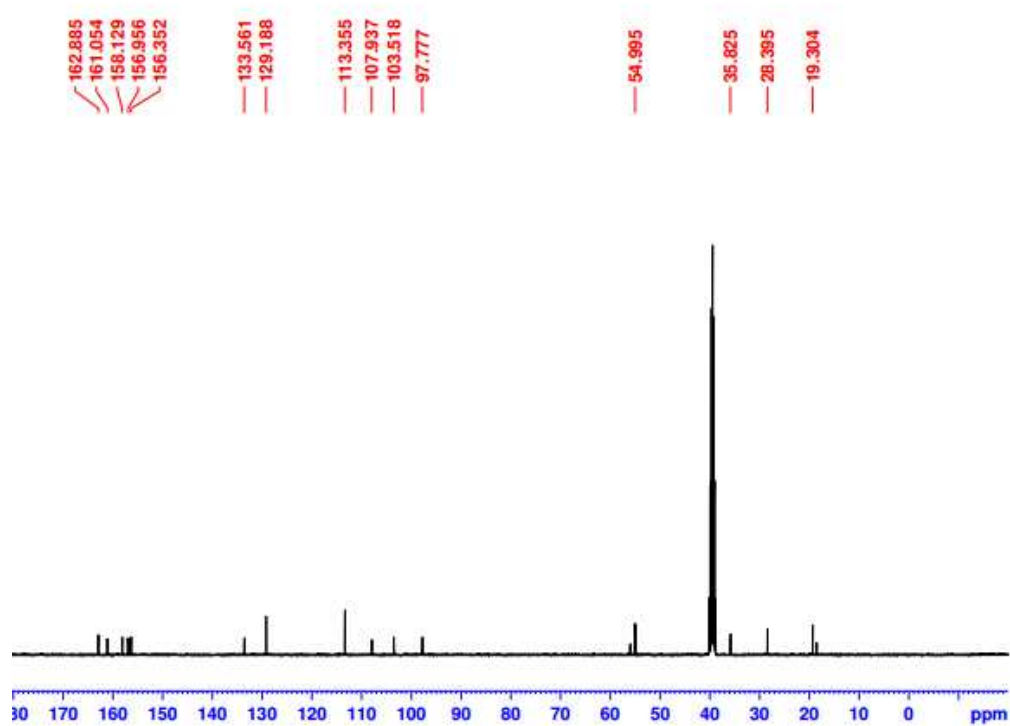


Figure S27 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 4i

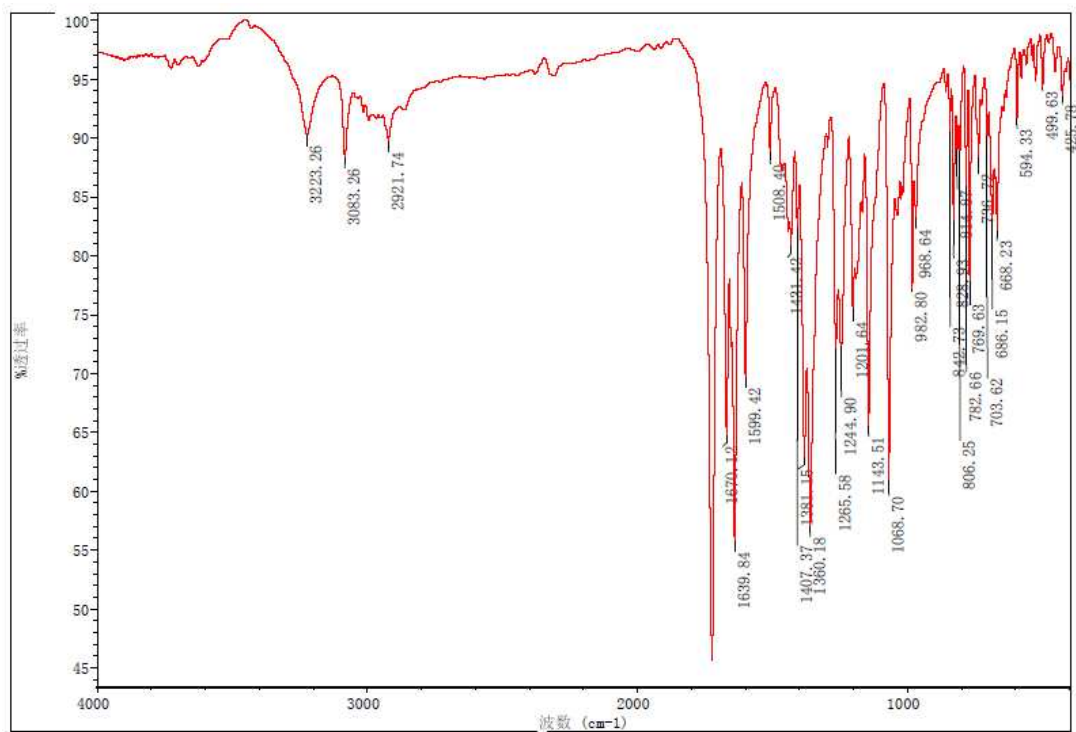


Figure S28 IR spectrum of compound 4j

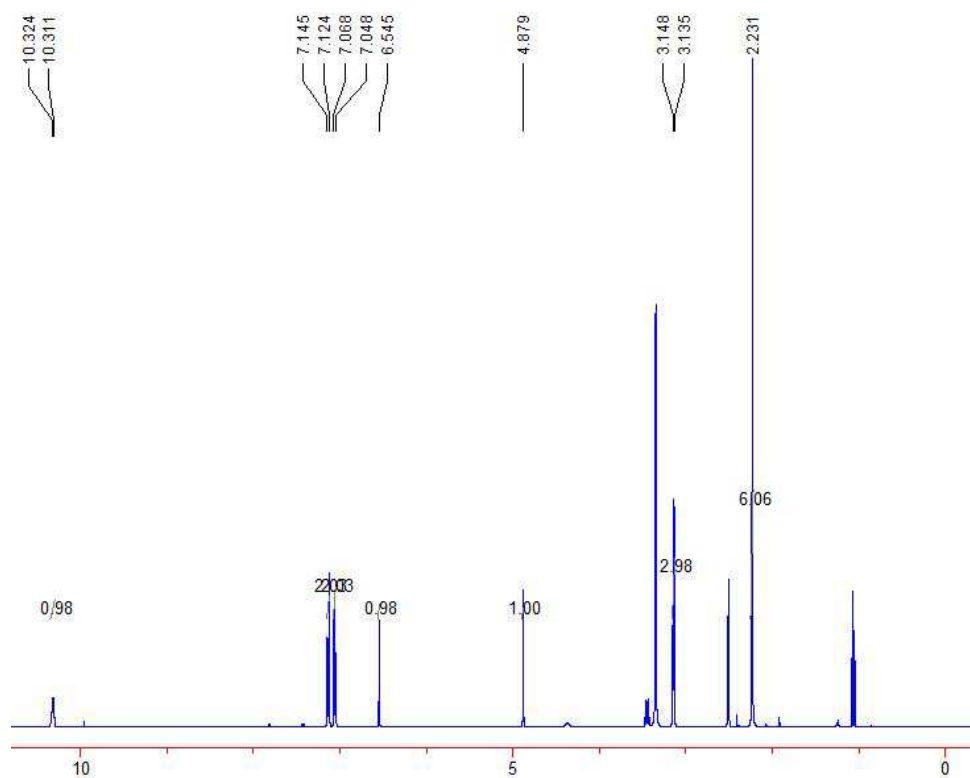


Figure S29 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4j

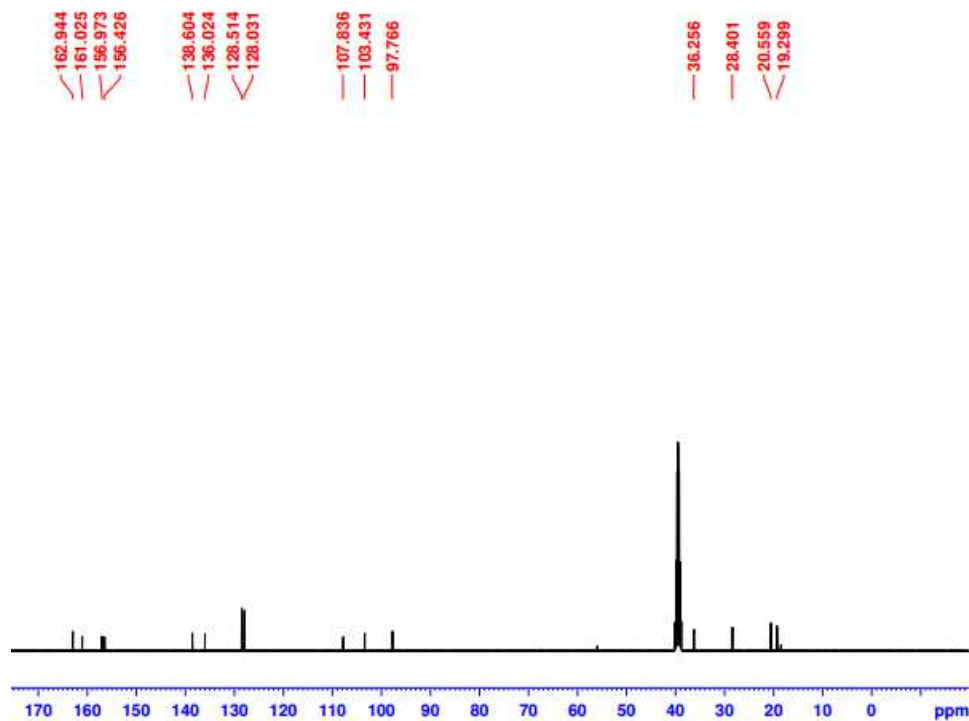


Figure S30 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 4j

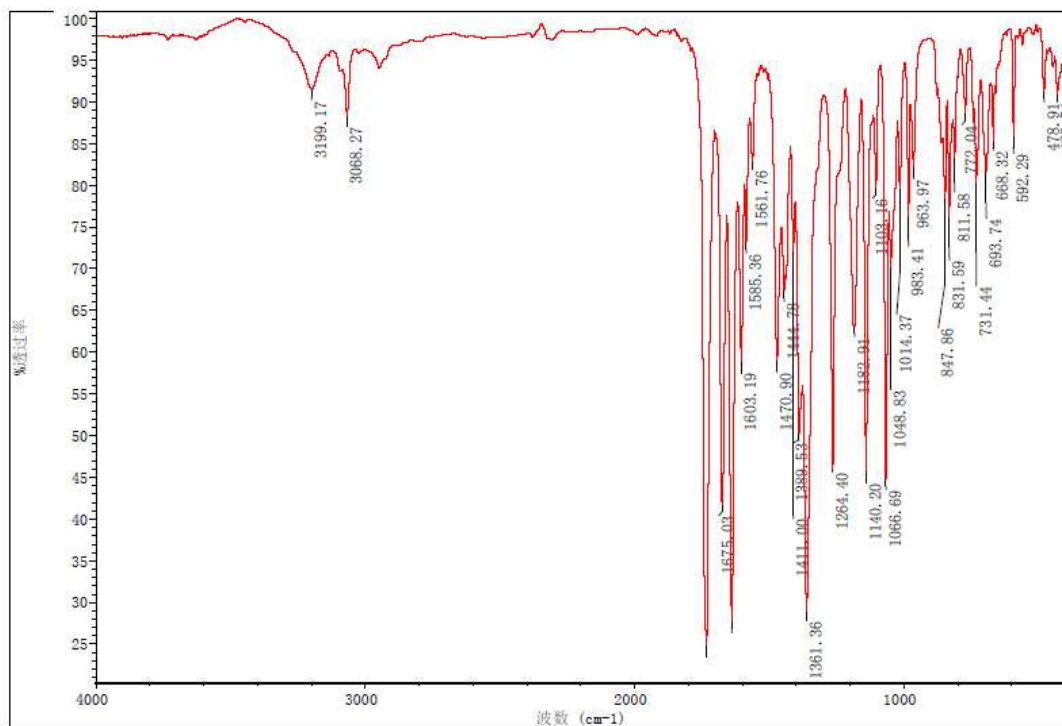
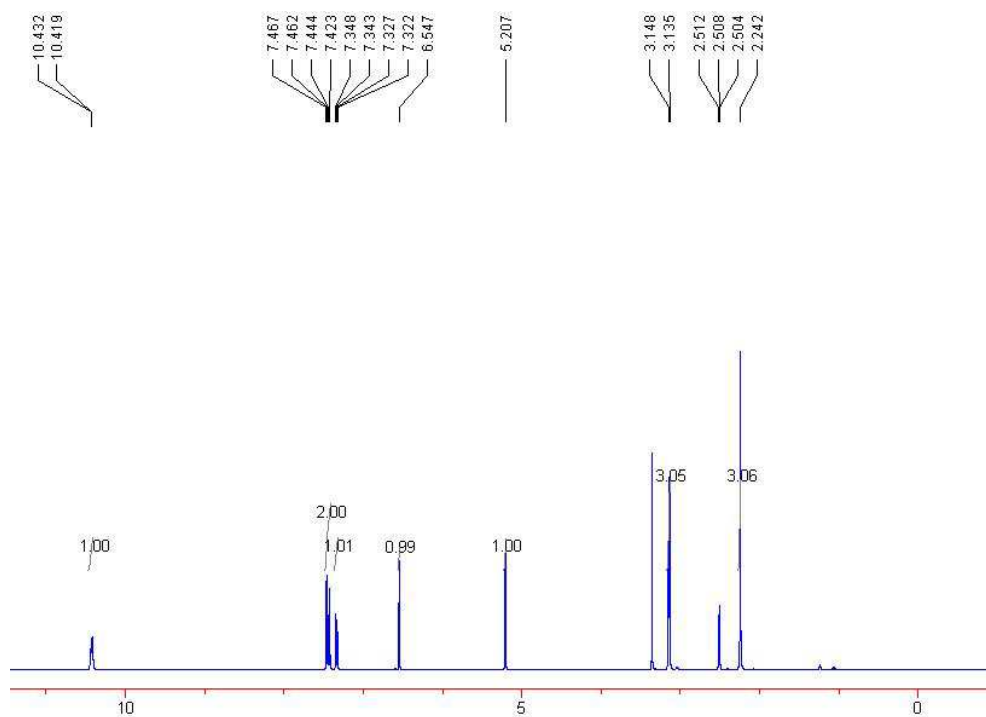


Figure S31 IR spectrum of compound 4k

Figure S32 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4k

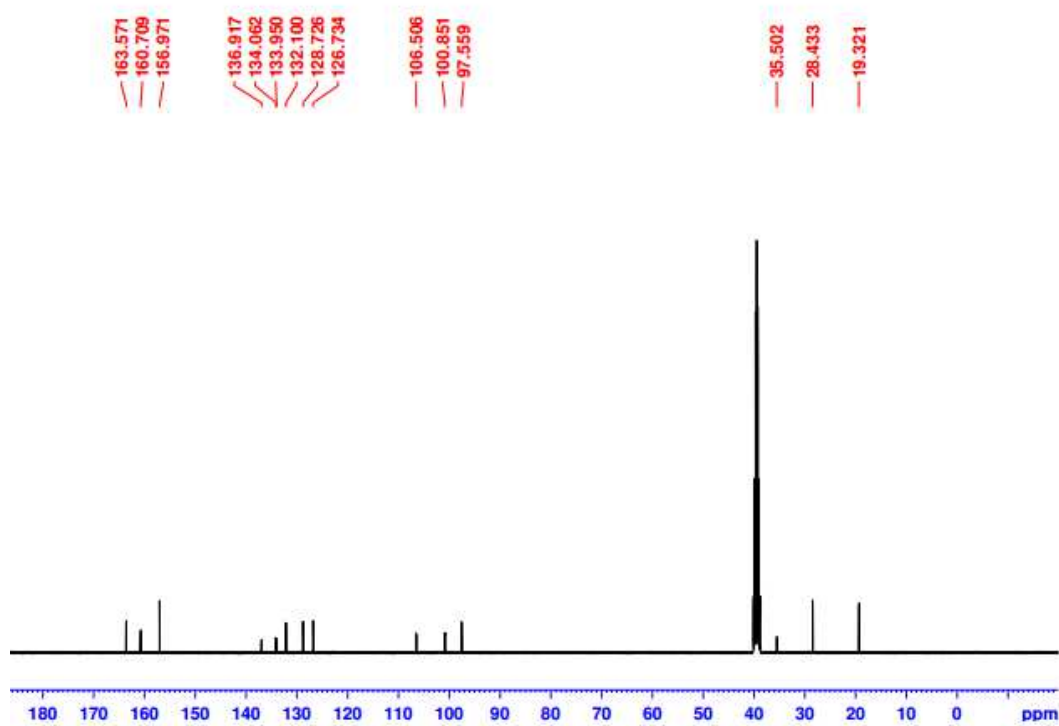


Figure S33 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 4k

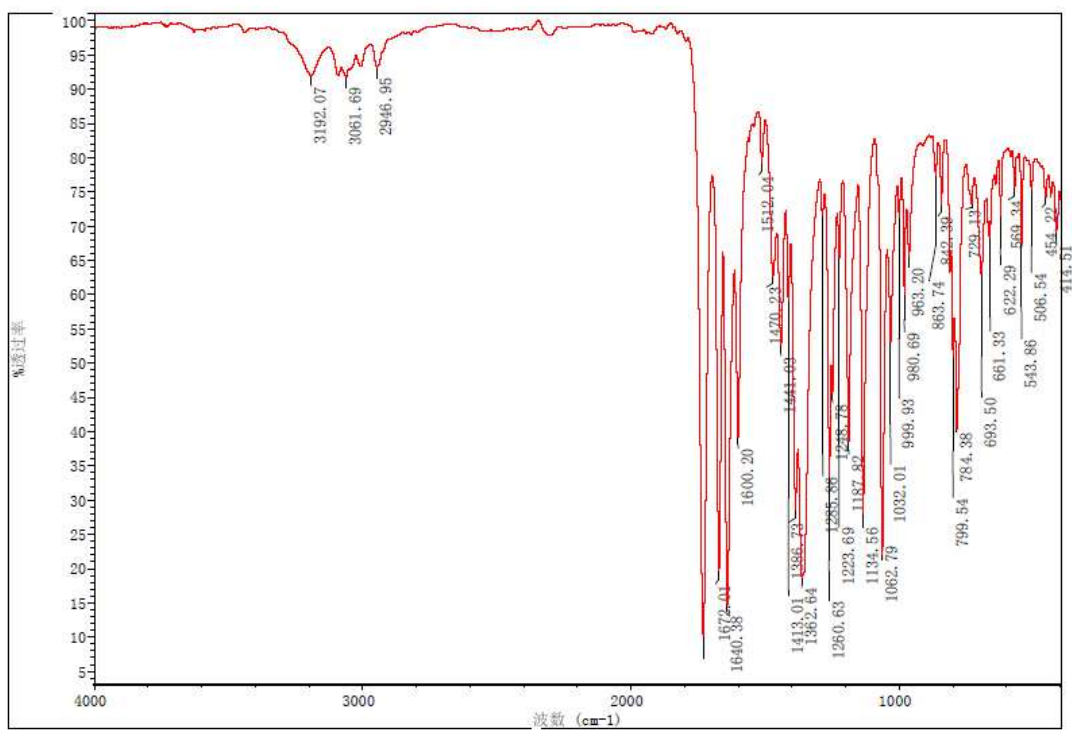


Figure S34 IR spectrum of compound 4l

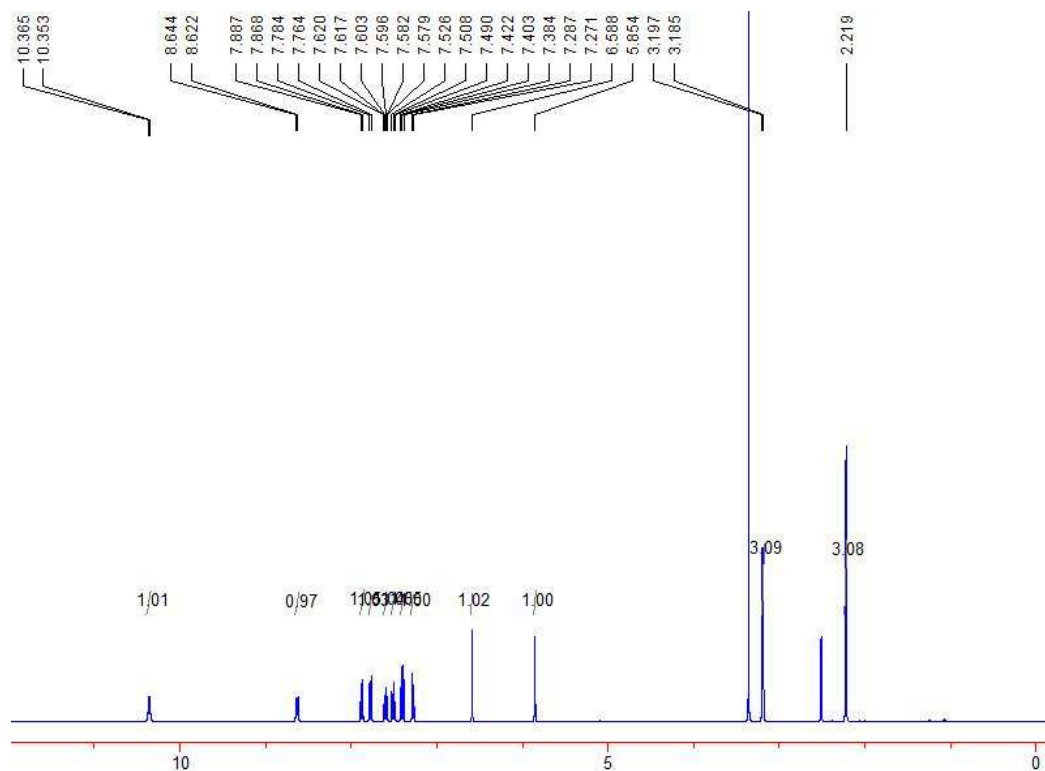


Figure S35 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4l

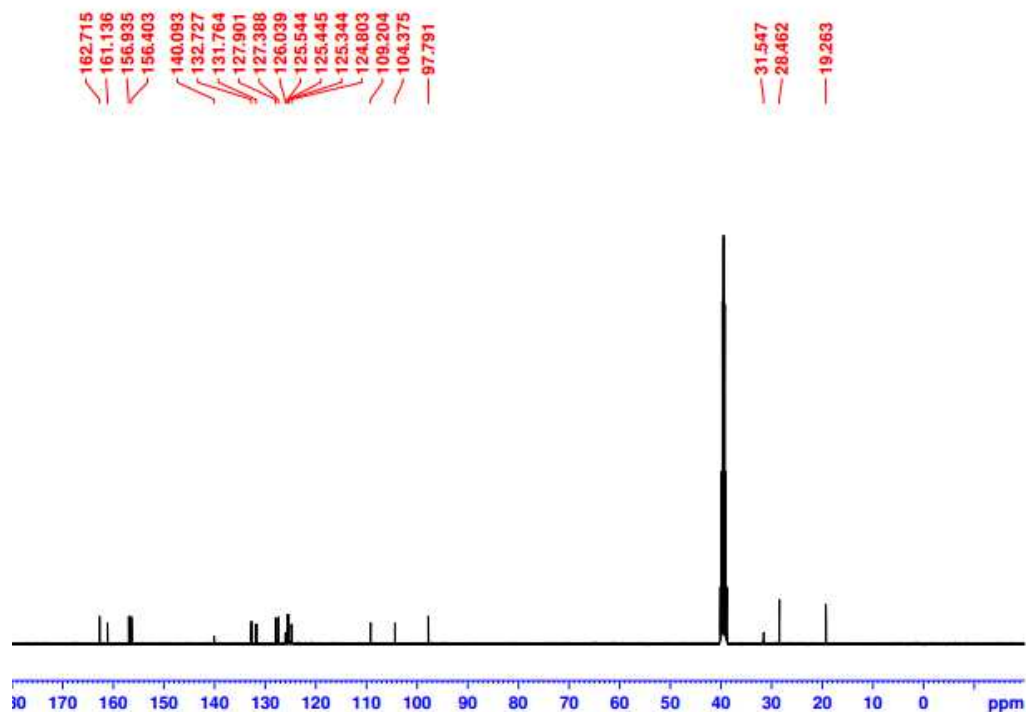


Figure S36 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 4l

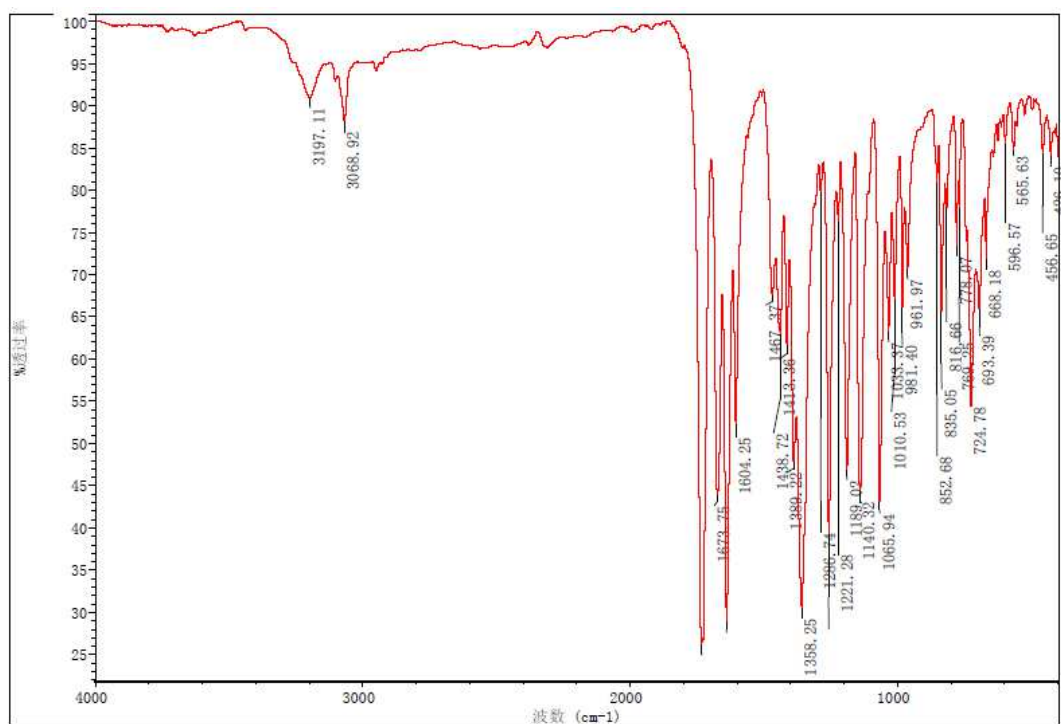
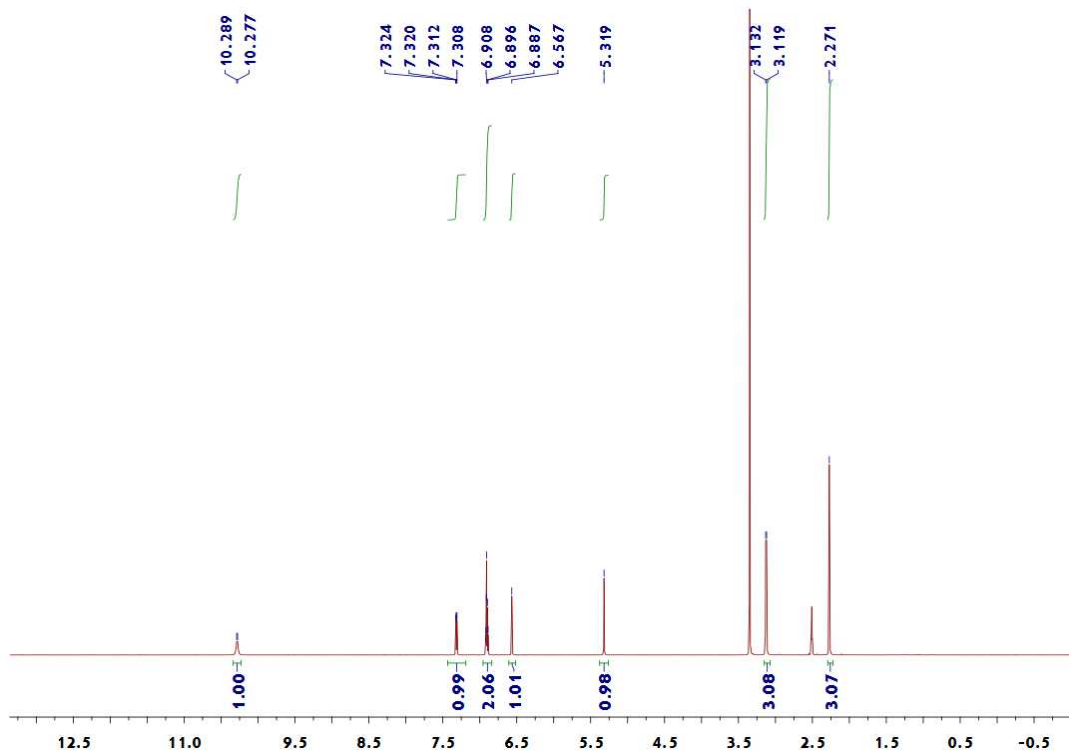


Figure S37 IR spectrum of compound 4m

Figure S38 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4m

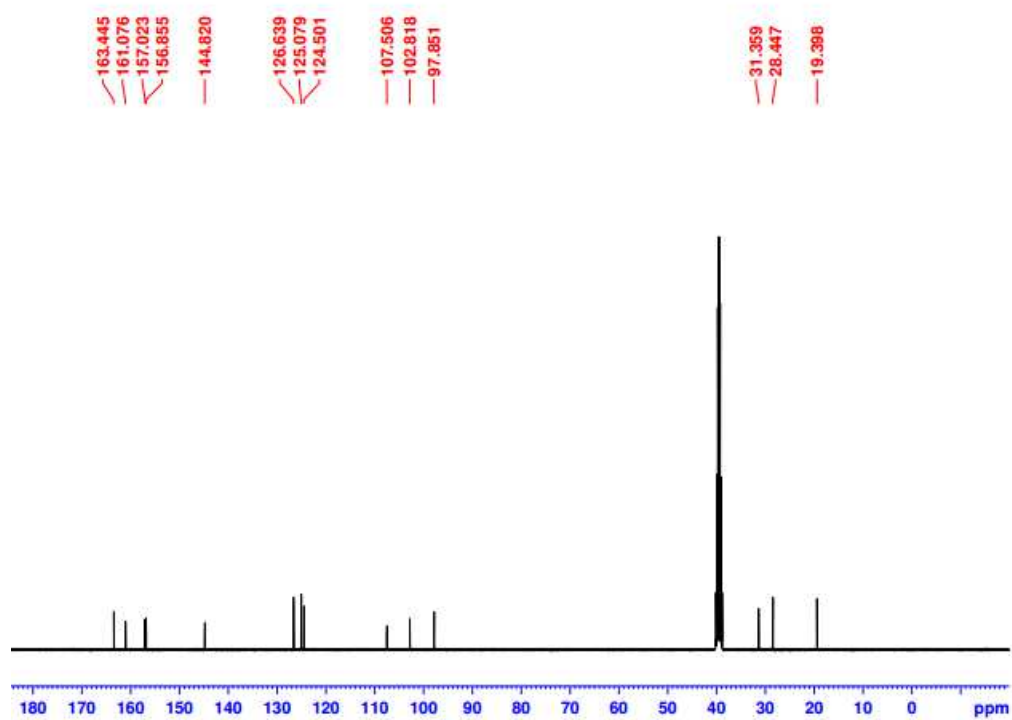


Figure S39 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 4m

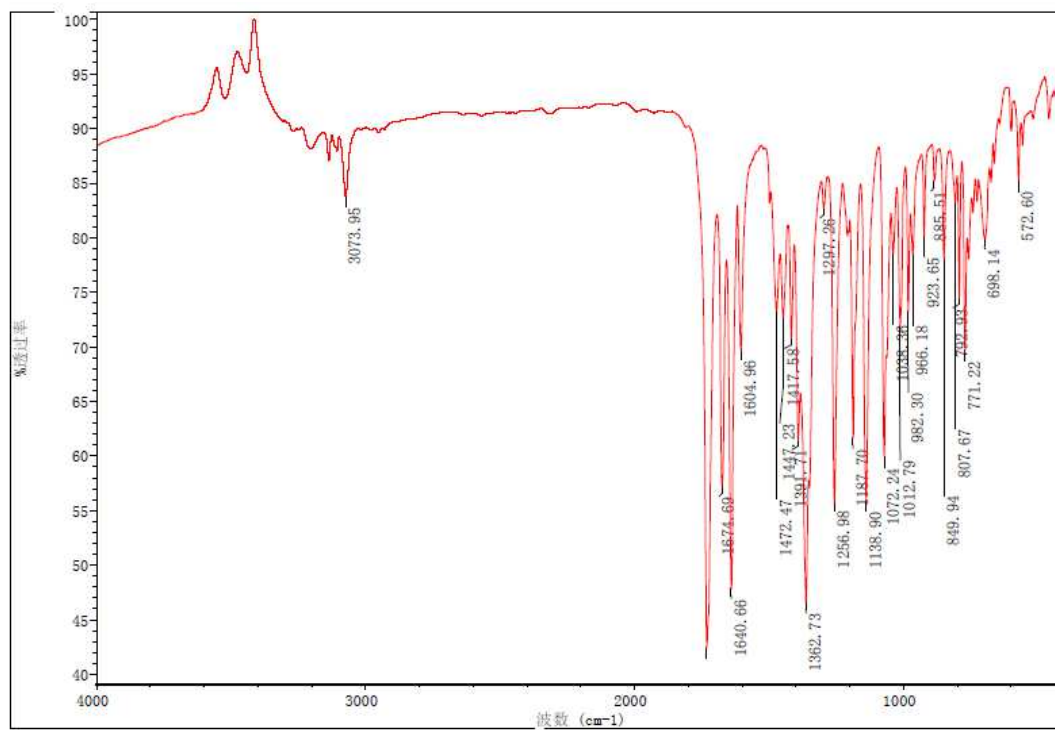


Figure S40 IR spectrum of compound 4n

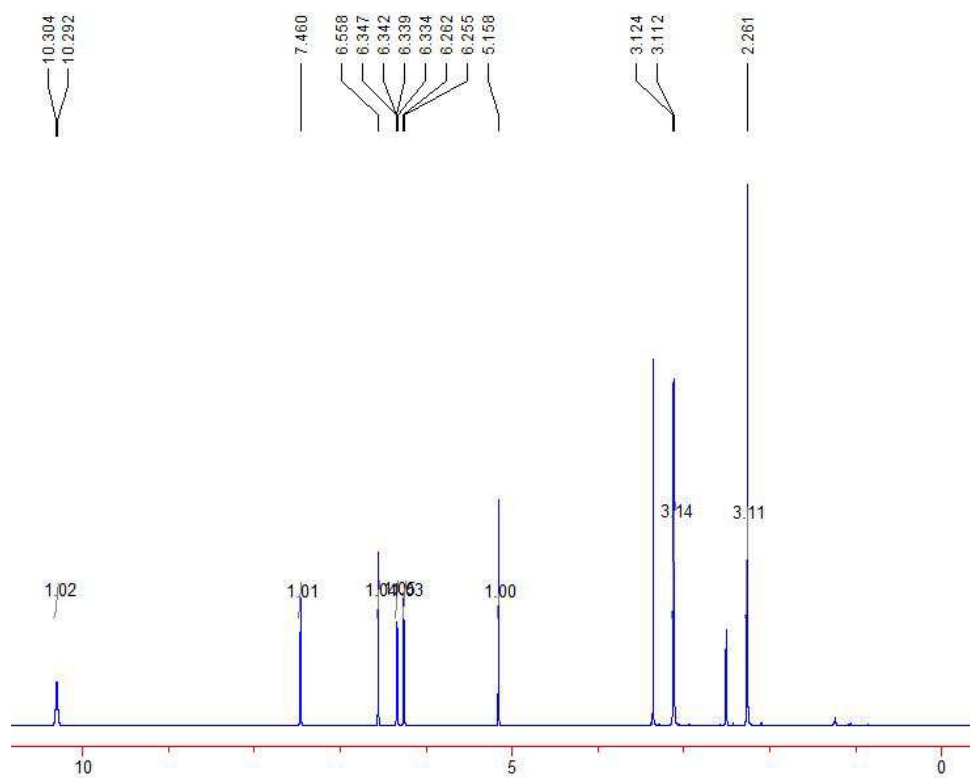


Figure S41 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 4n

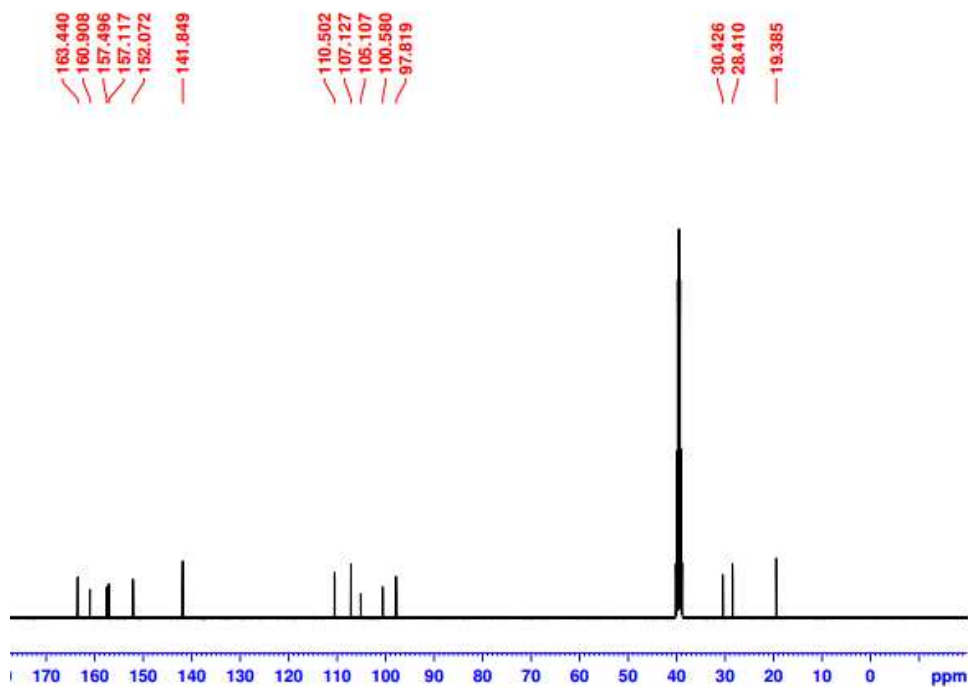


Figure S42 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 4n

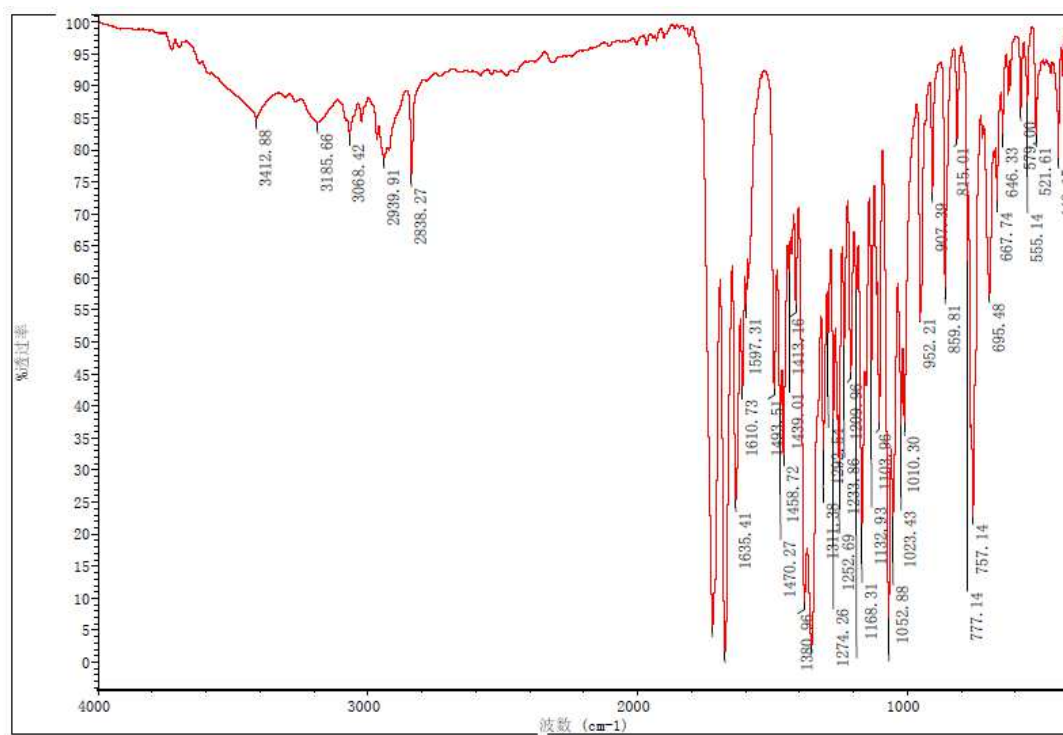
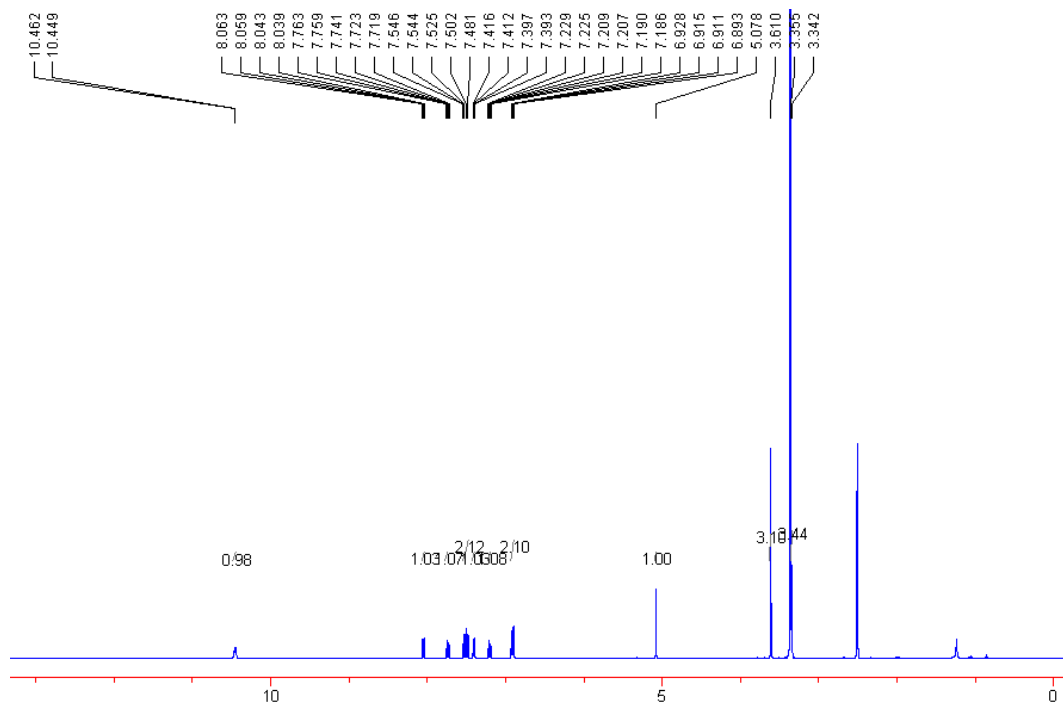


Figure S43 IR spectrum of compound 6a

Figure S44 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 6a

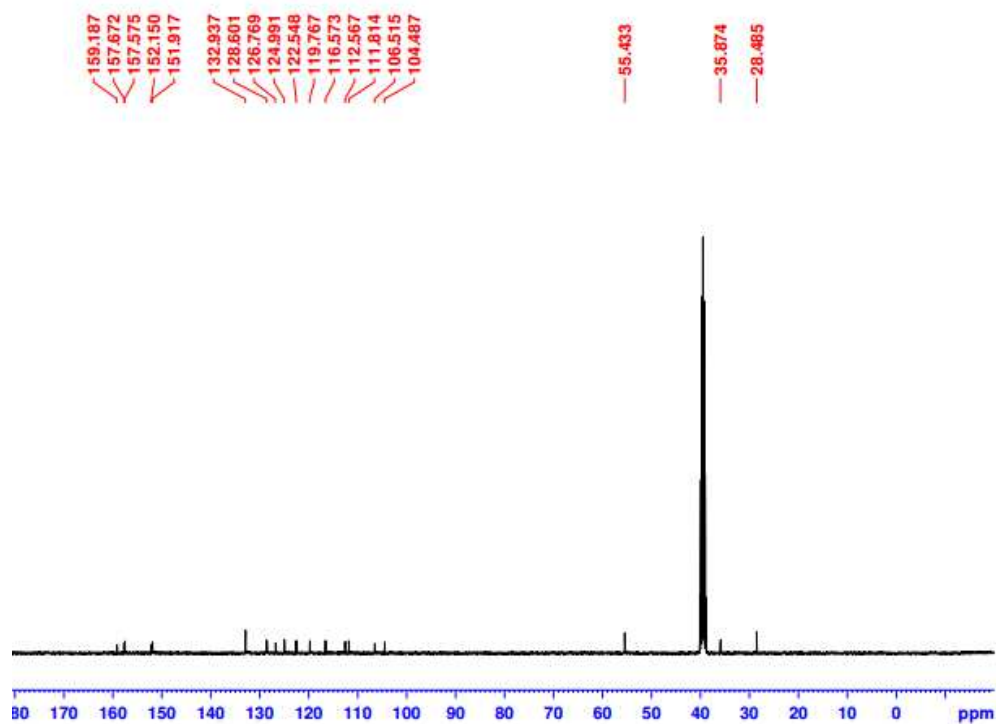


Figure S45 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 6a

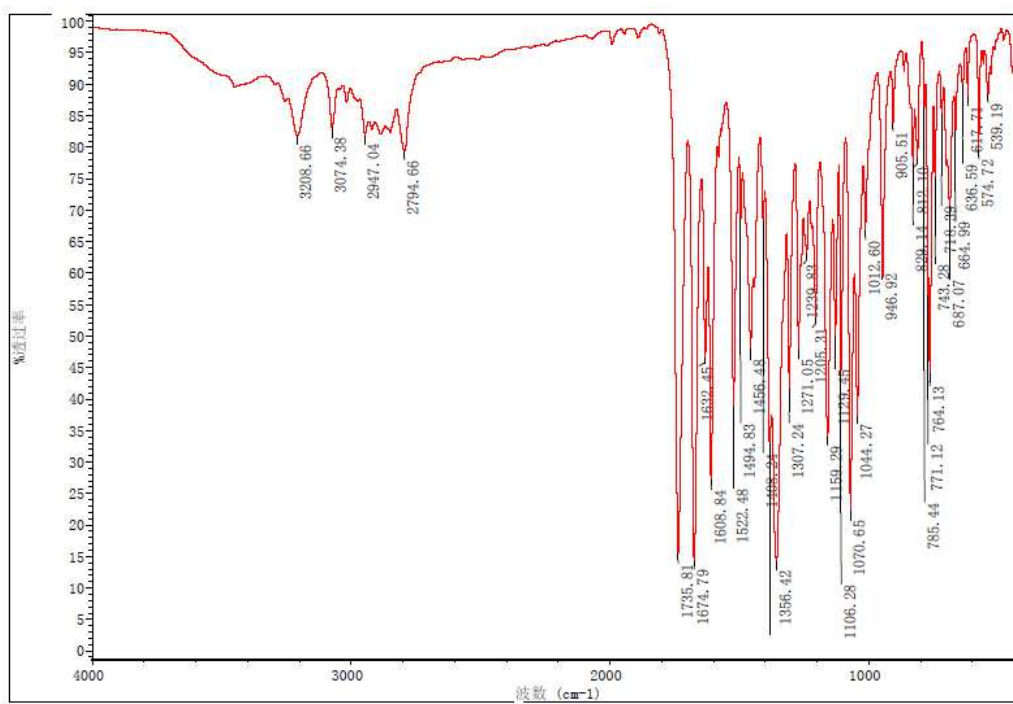


Figure S46 IR spectrum of compound 6b

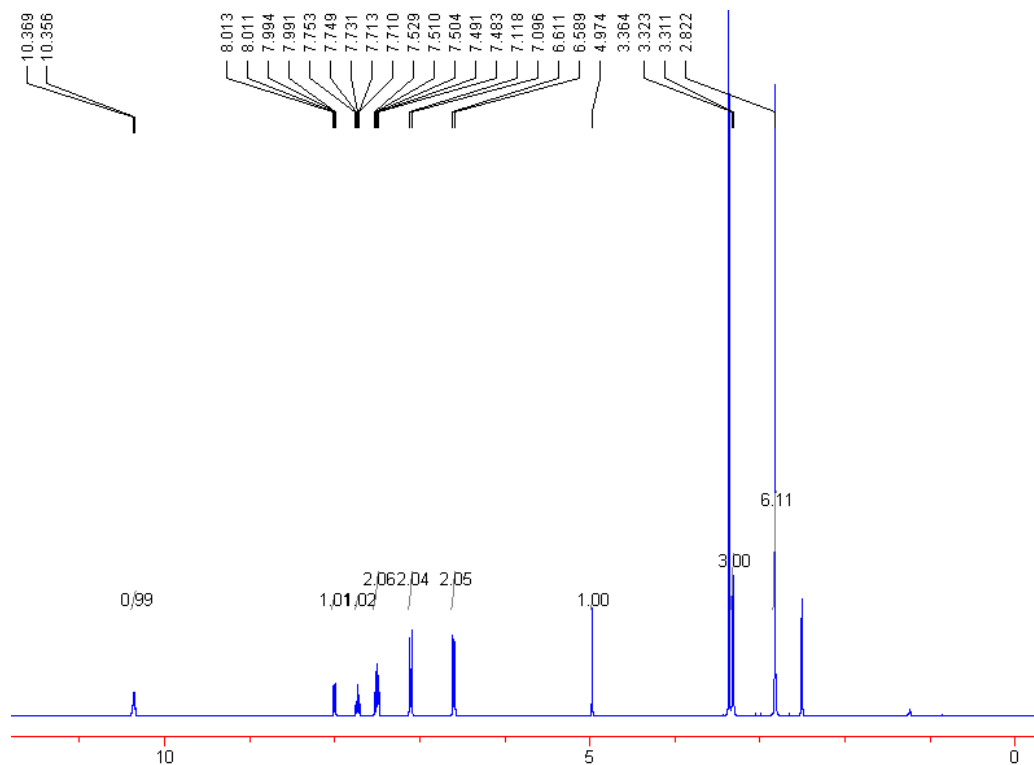


Figure S47 ^1H NMR Spectrum (400 MHz, $\text{DMSO-}d_6$) of Compound 6b

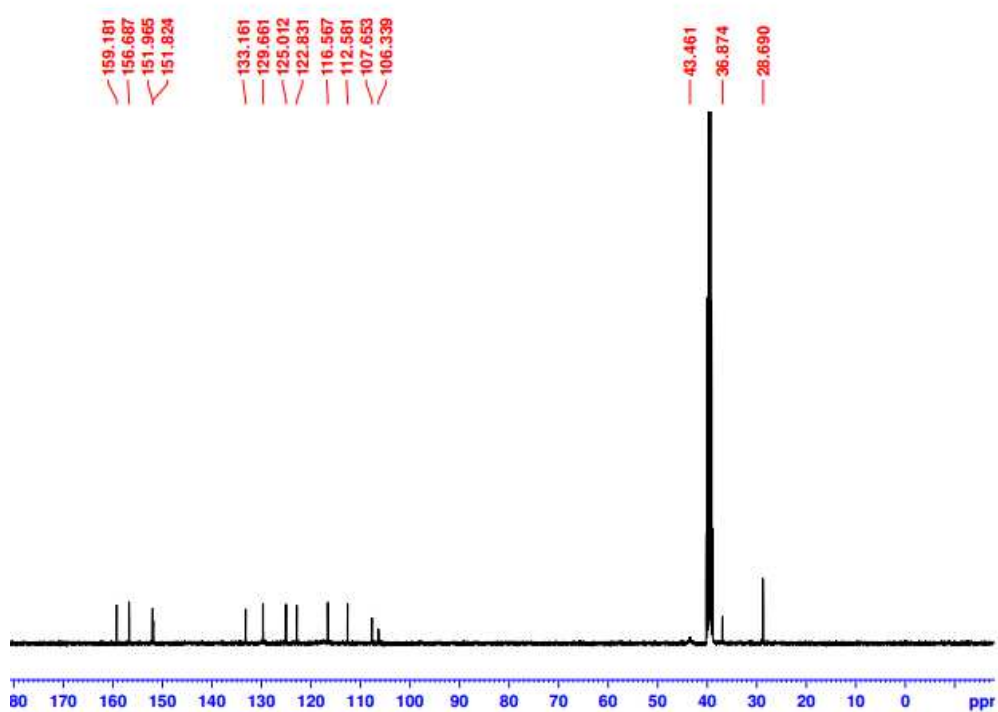


Figure S48 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 6b

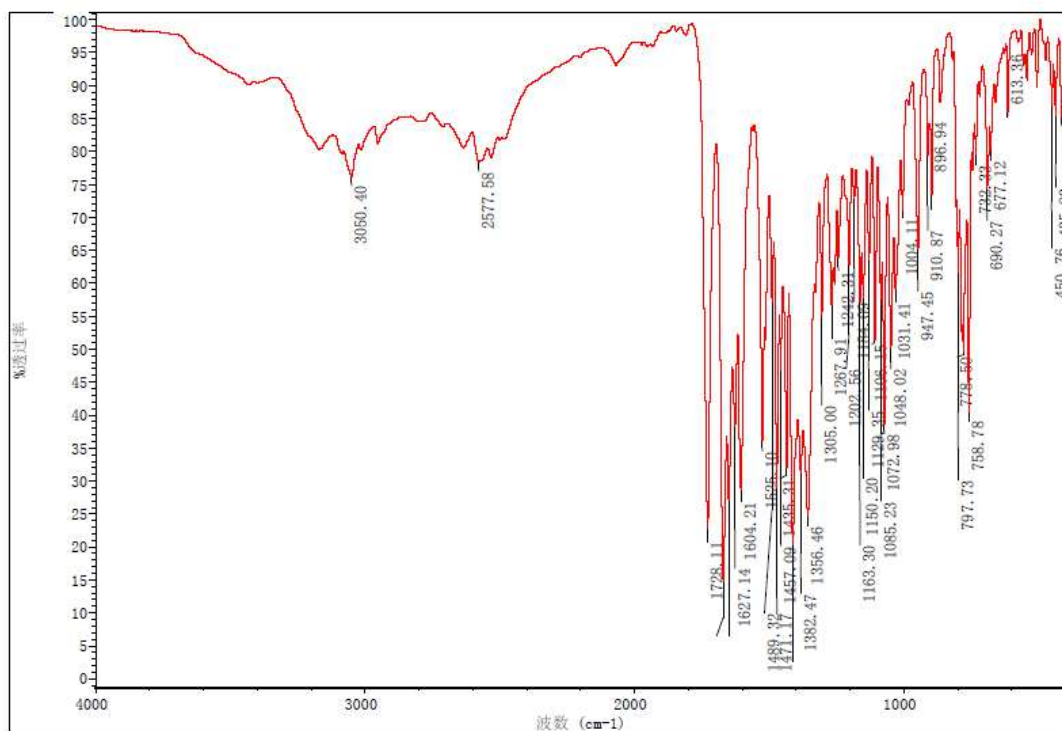
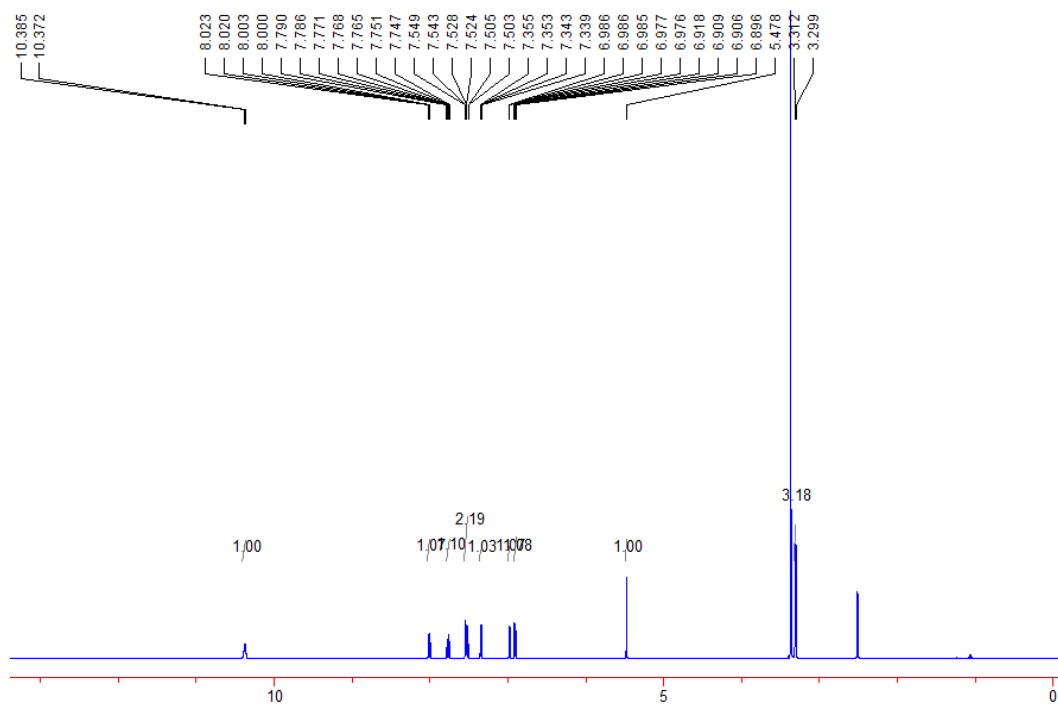


Figure S49 IR spectrum of compound 6c

Figure S50 ¹H NMR Spectrum (400 MHz, DMSO-*d*₆) of Compound 6c

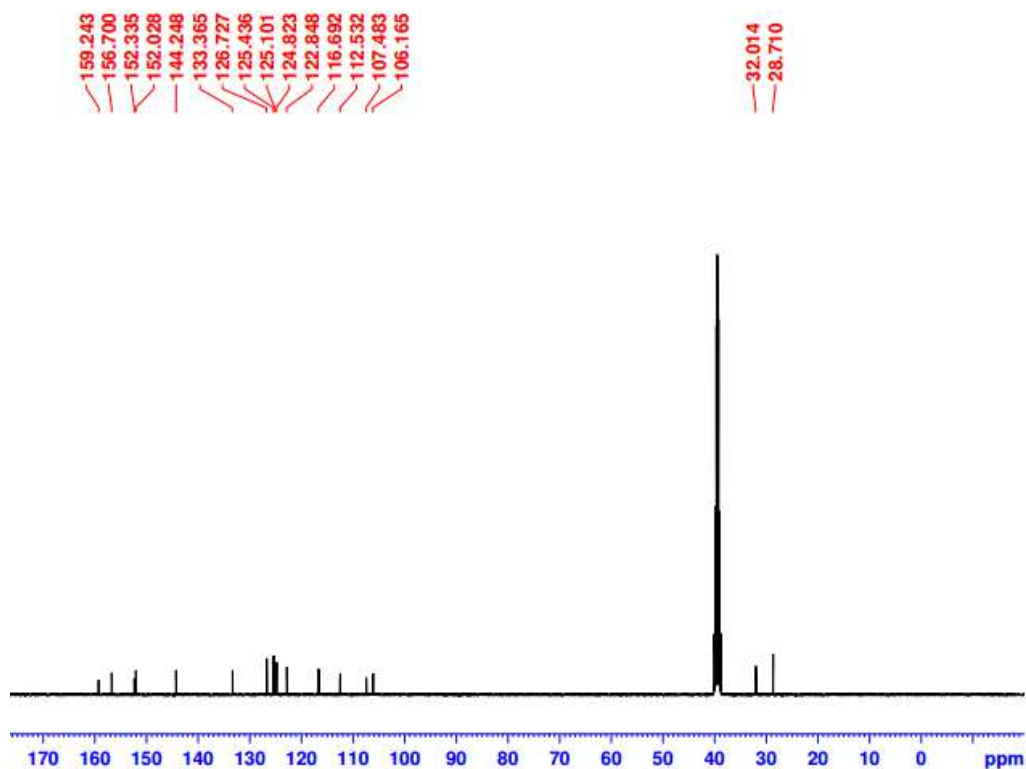


Figure S51 ¹³C NMR Spectrum (100 MHz, DMSO-*d*₆) of Compound 6c

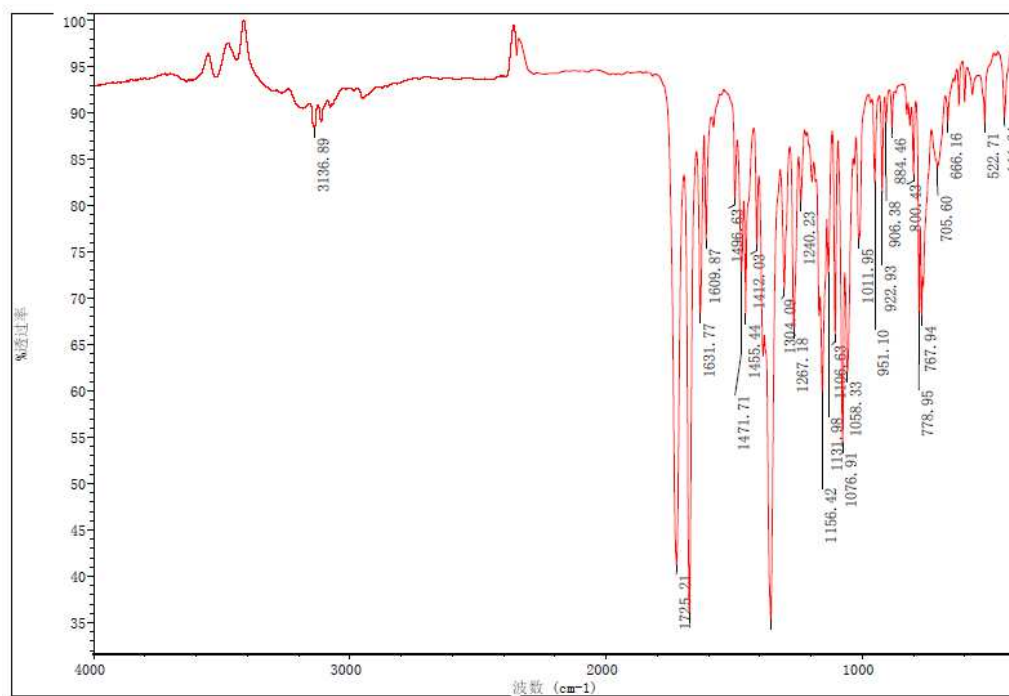


Figure S52 IR spectrum of compound 6d

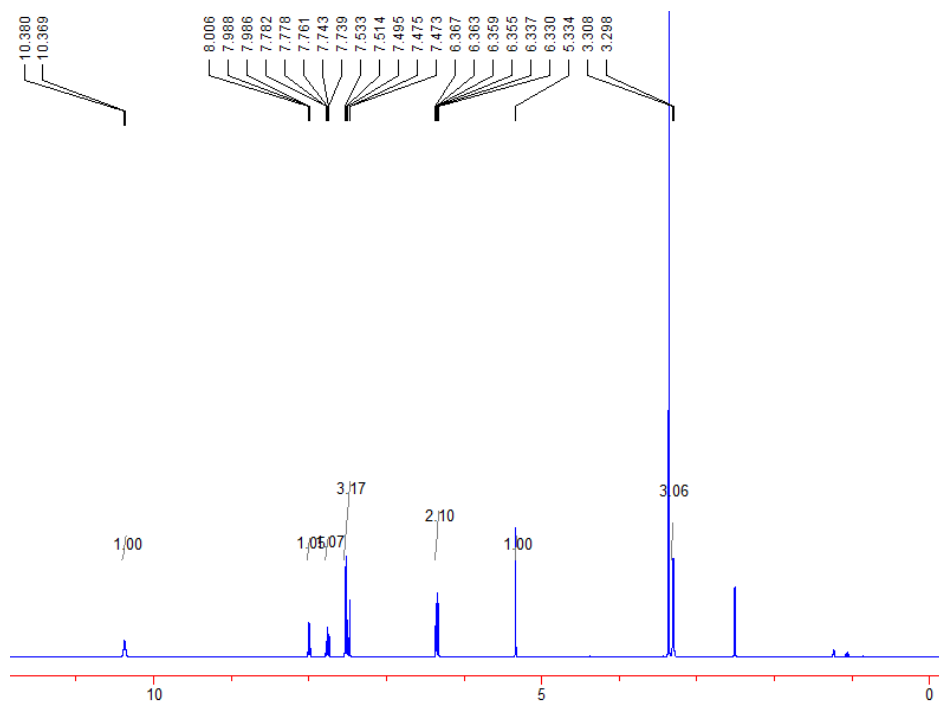


Figure S53 ^1H NMR Spectrum (400 MHz, $\text{DMSO-}d_6$) of Compound 6d

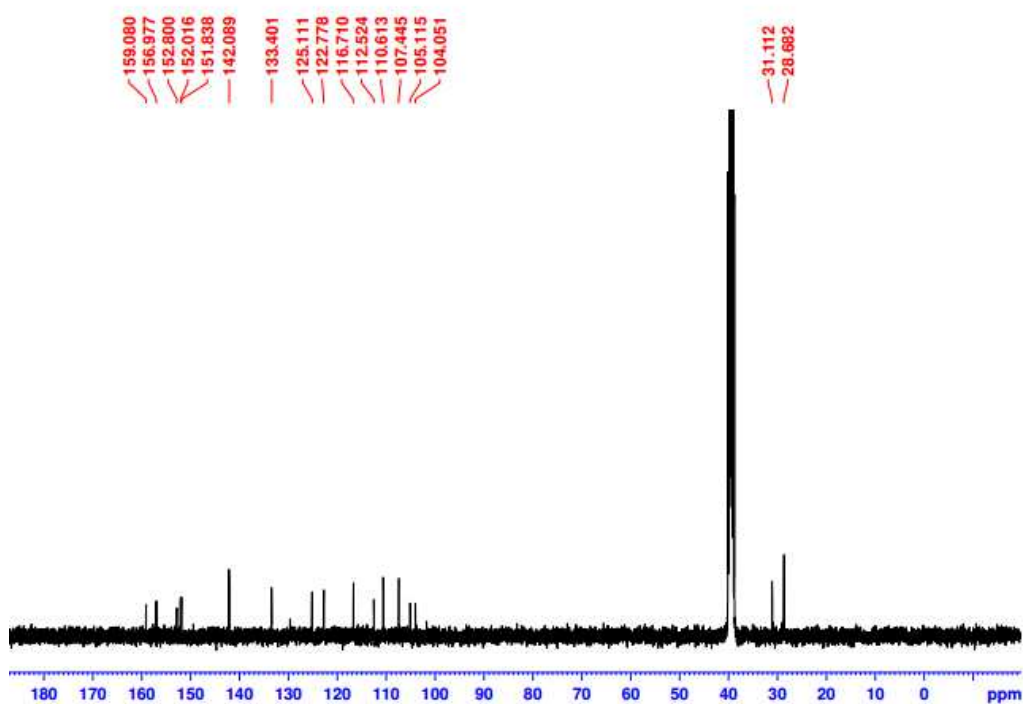
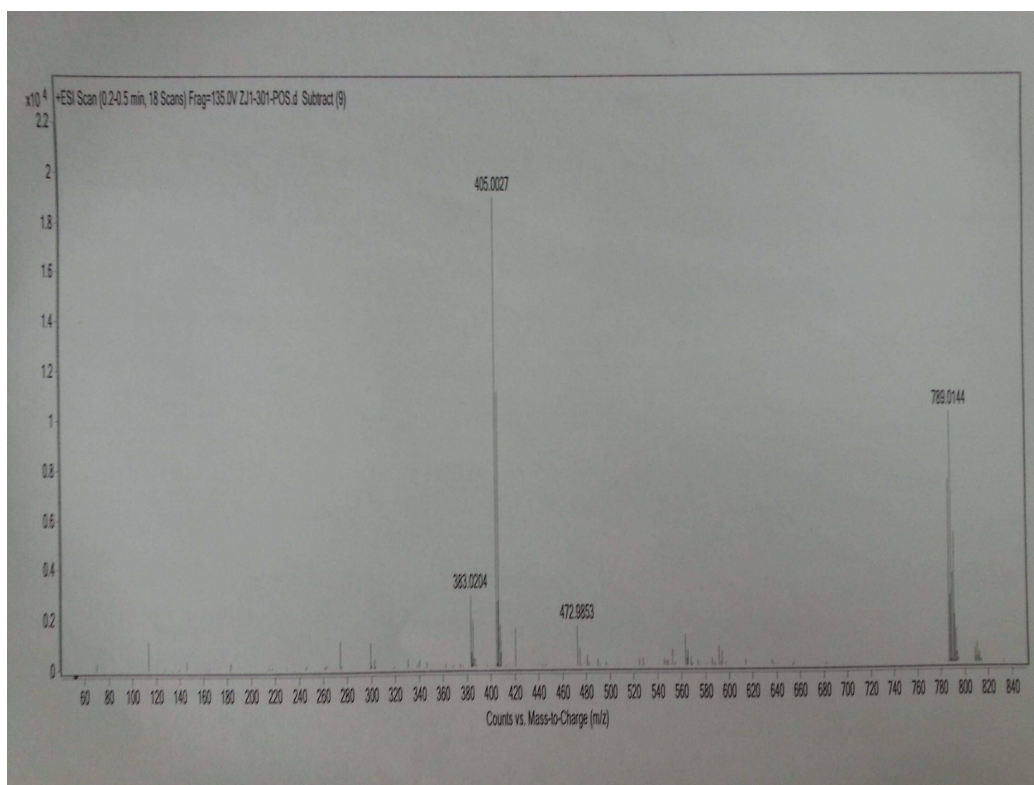
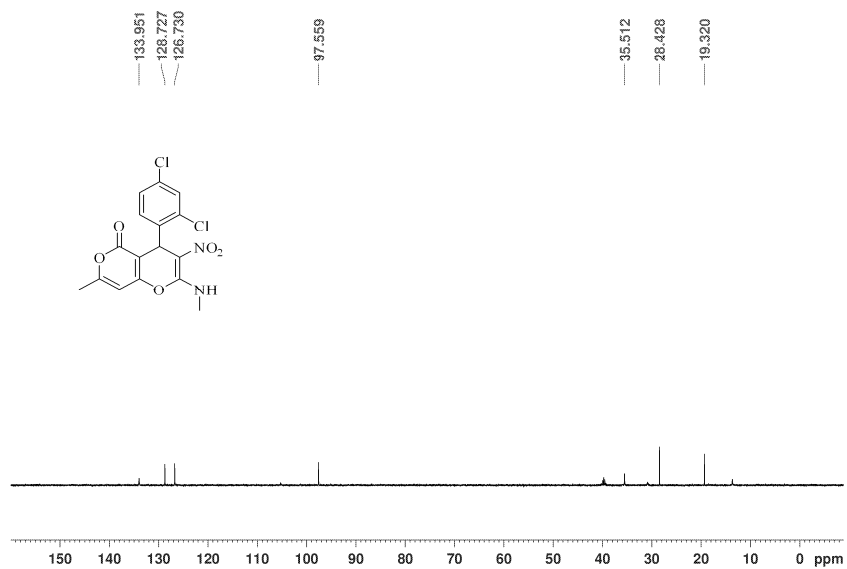


Figure S54 ^{13}C NMR Spectrum (100 MHz, $\text{DMSO-}d_6$) of Compound 6d

**Figure S55** HRMS of Compound 4k**Figure S56** DEPT 135 Spectrum (100 MHz, DMSO-d₆) of Compound 4k

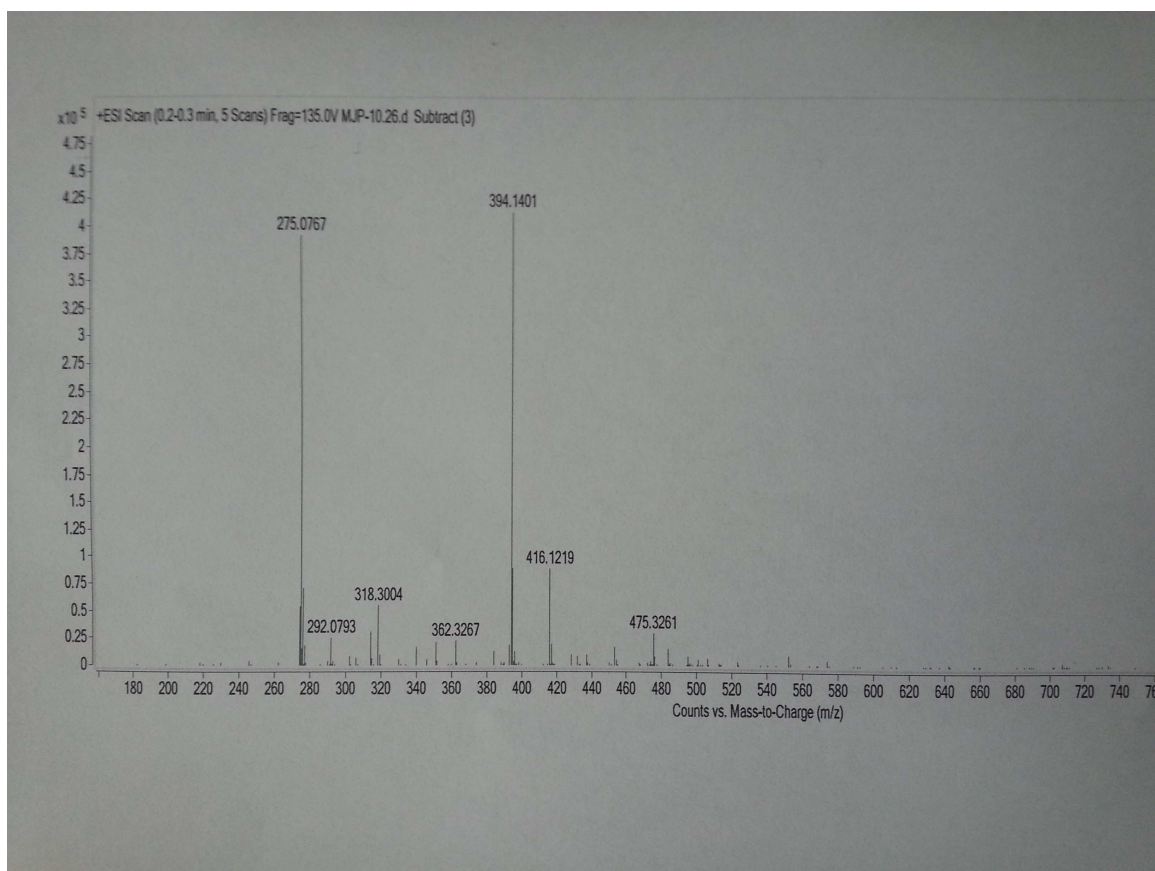


Figure S57 HRMS of Compound 6b