

Design and synthesis of new bis(1,2,4-triazolo[3,4-b][1,3,4]thiadiazines) and bis(quinoxalin-2-yl)phenoxy)alkanes as anti-breast cancer agents through dual inhibitory activity of PARP-1 and EGFR

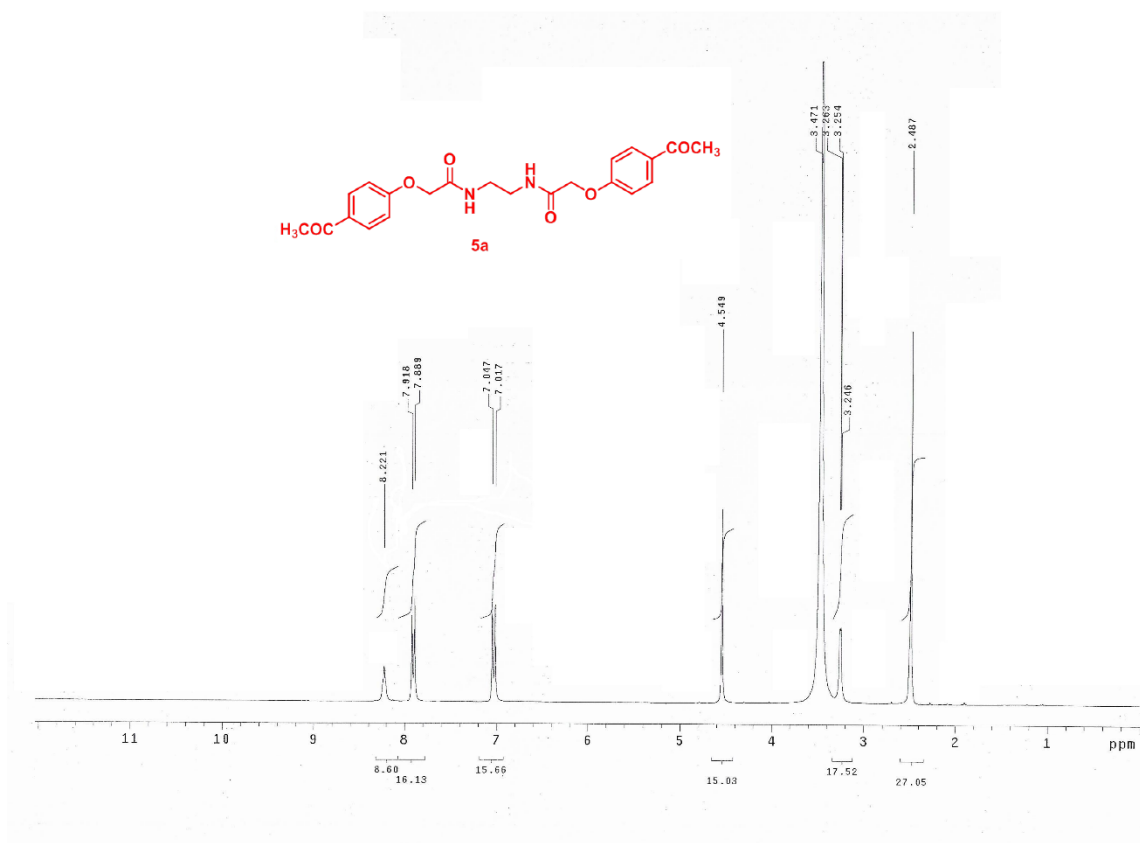
Fatma M. Thabet,¹ Kamal M. Dawood,^{1,*} Eman A. Ragab,¹ Mohamed S. Nafie² and Ashraf A. Abbas^{1,*}

¹ Department of Chemistry, Faculty of Science, Cairo University, Giza, 12613, Egypt.

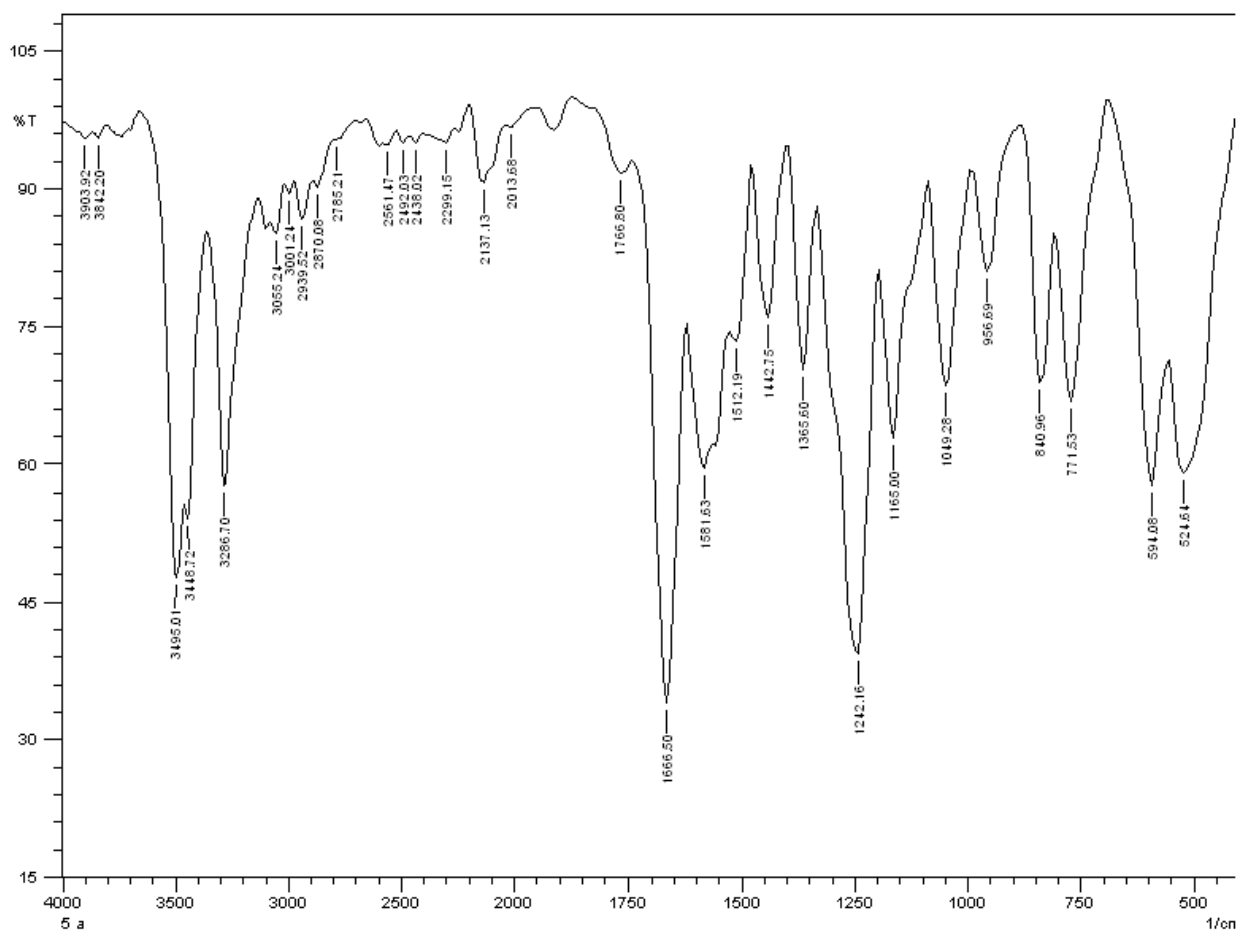
² Department of Chemistry, Faculty of Science, Suez Canal University, Ismailia, 41522, Egypt.

Corresponding author 1: (Ashraf A. Abbas: E-mail: ashrafabbas@cu.edu.eg; ORCID: <https://orcid.org/my-orcid?orcid=0000-0001-7061-9907>

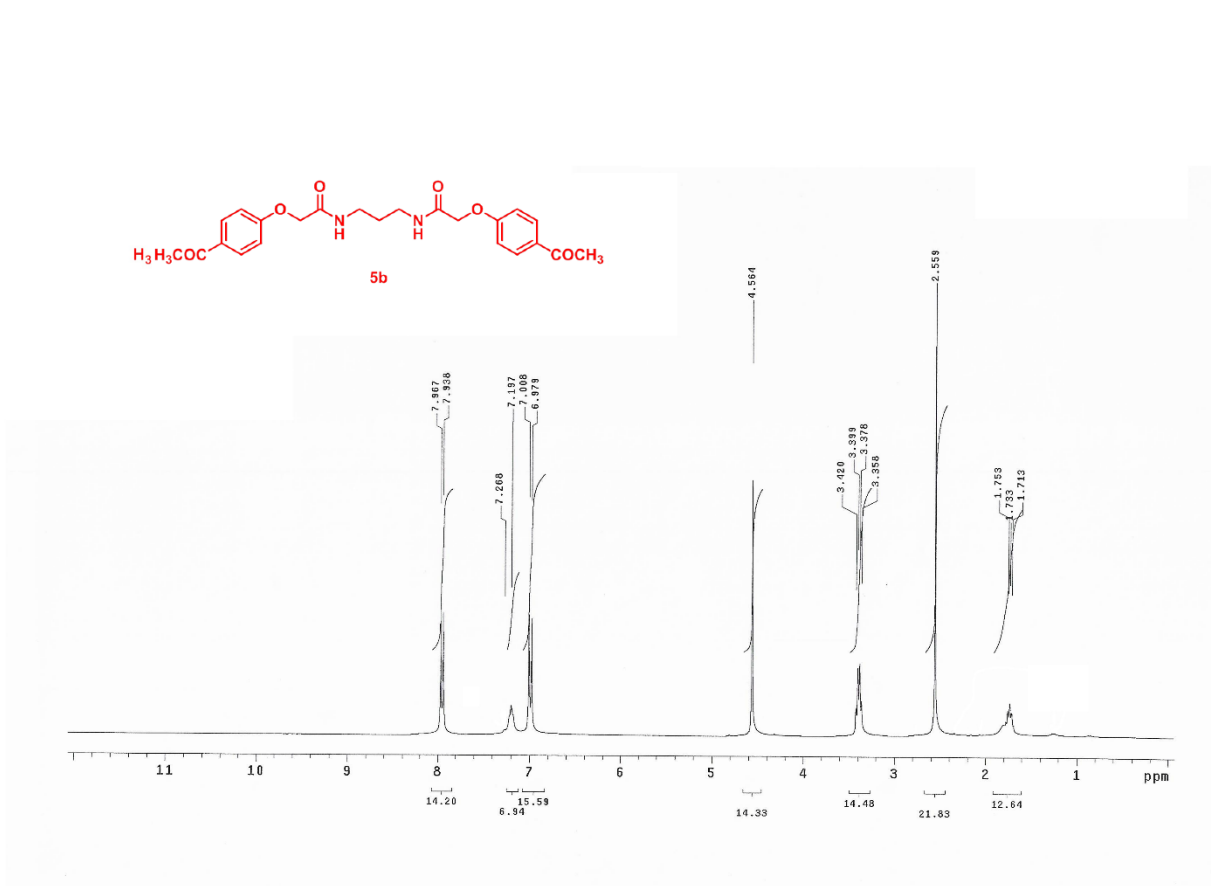
Corresponding author 2: Kamal M. Dawood: E-Mail: kmdawood@sci.cu.edu.eg ORCID: <https://orcid.org/0000-0002-1351-9886>



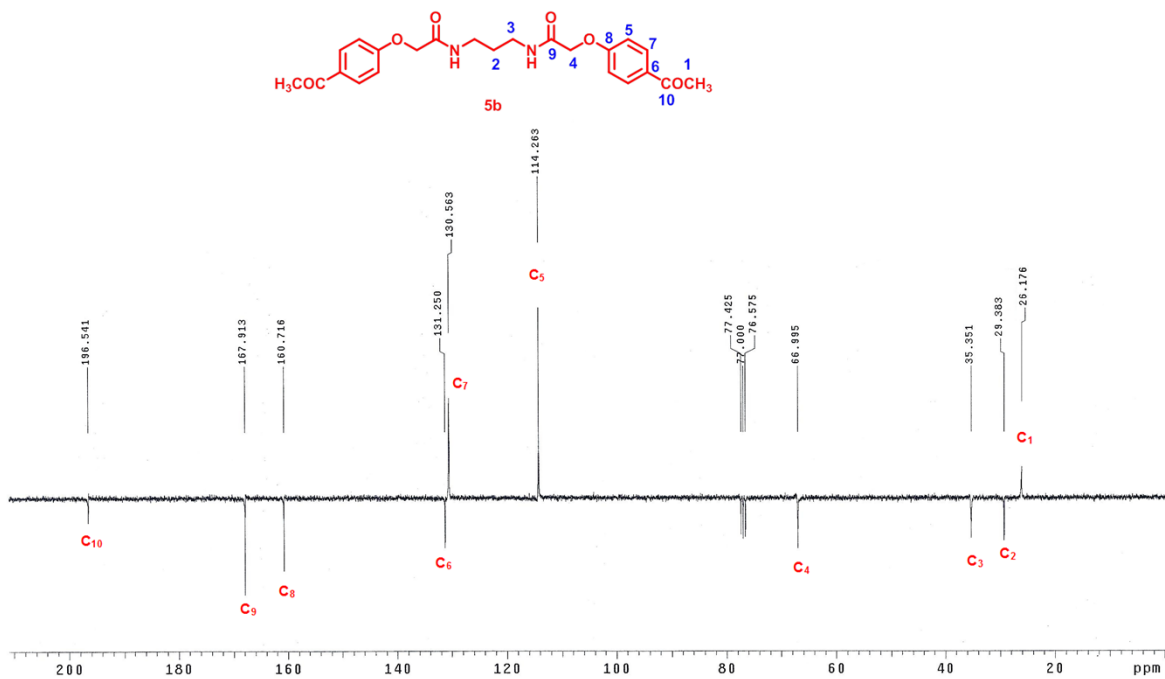
¹H NMR spectrum of 5a



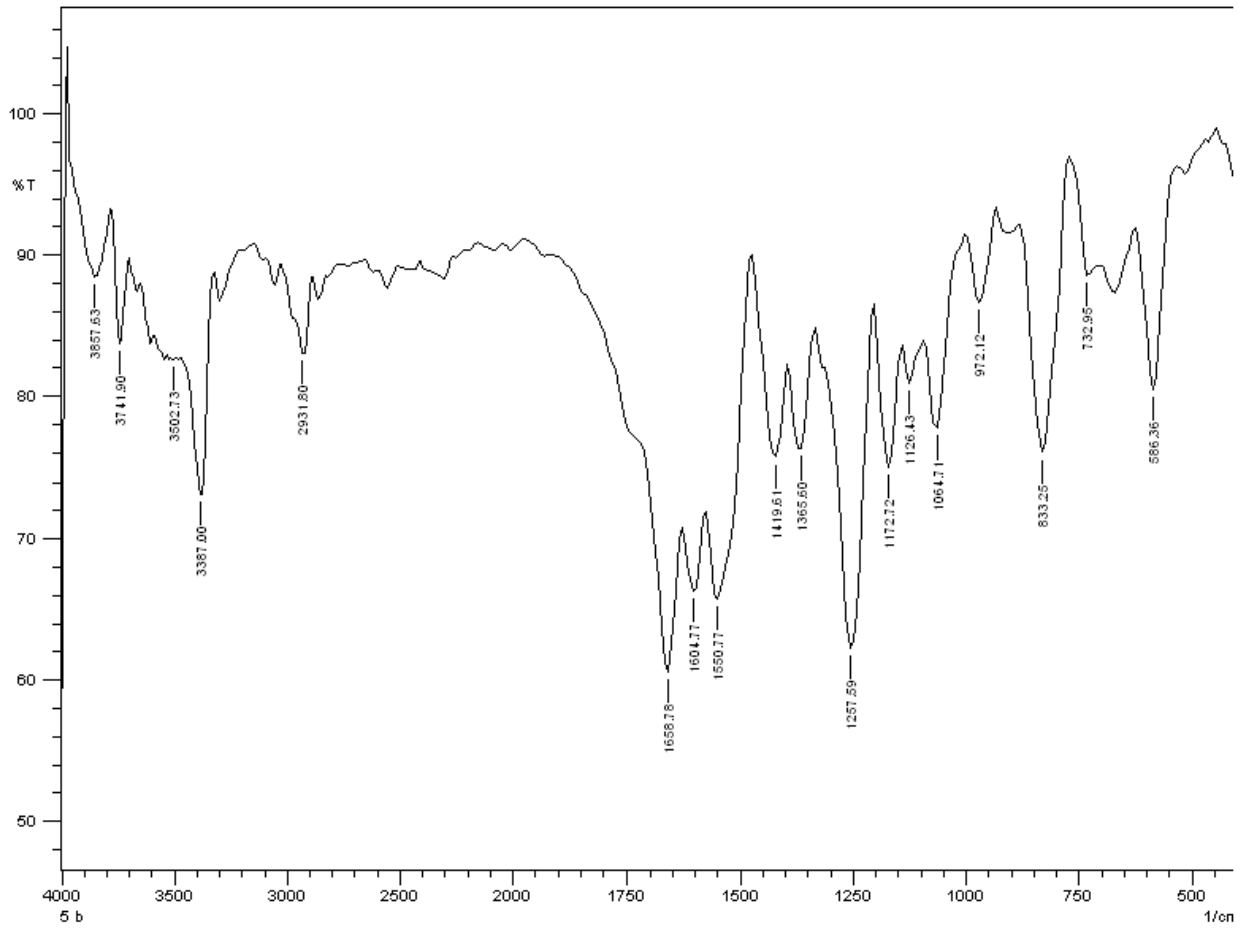
IR spectrum of 5a



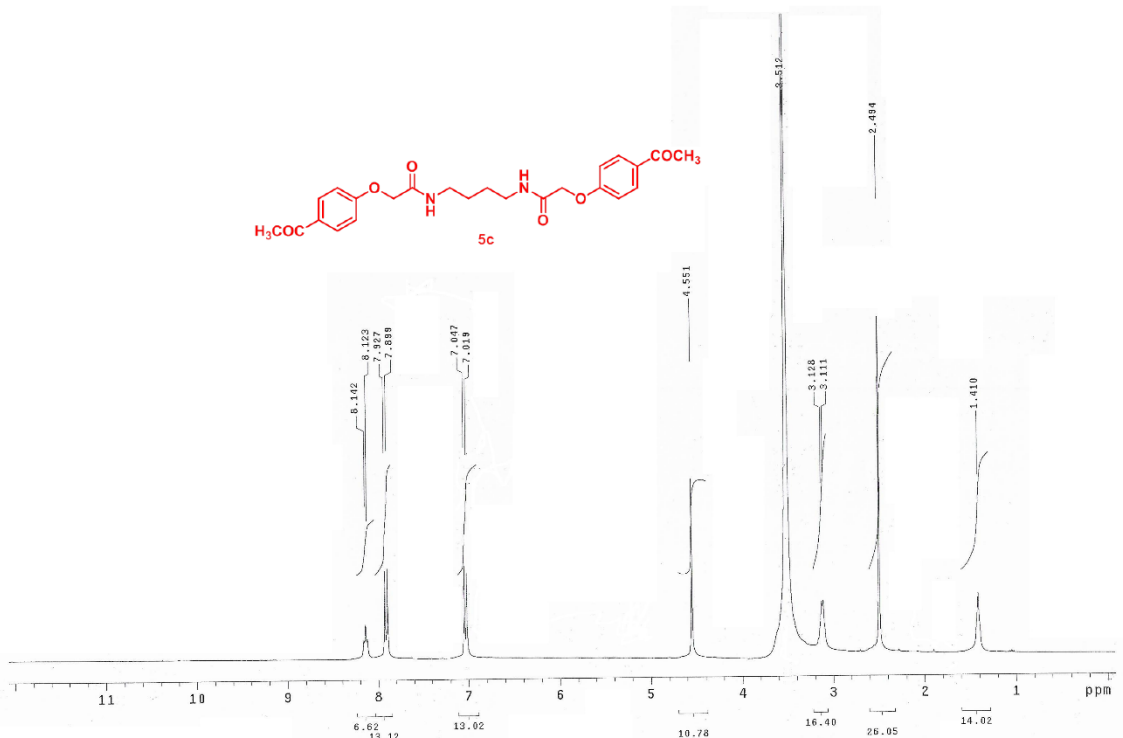
¹H NMR spectrum of 5b



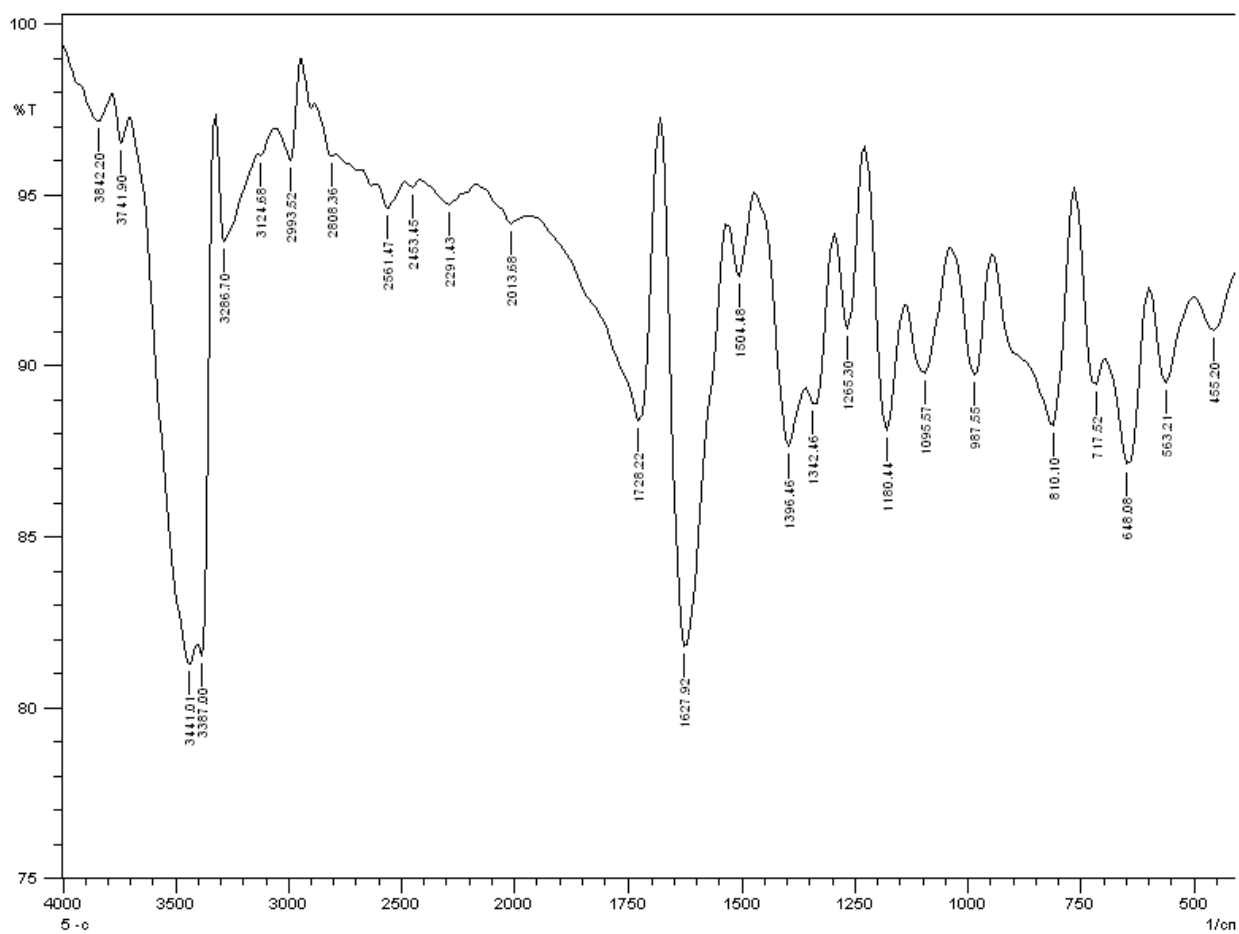
¹³C NMR spectrum of 5b (APT)



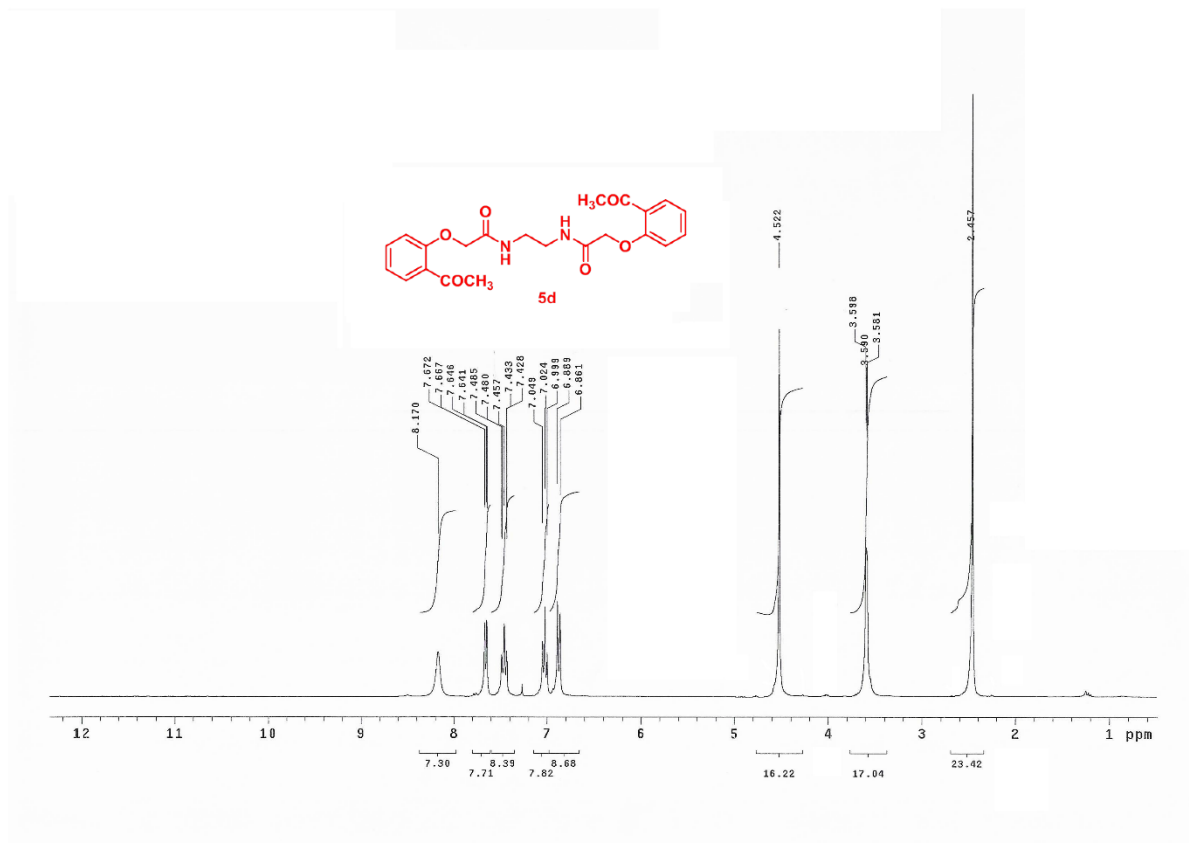
IR spectrum of 5b



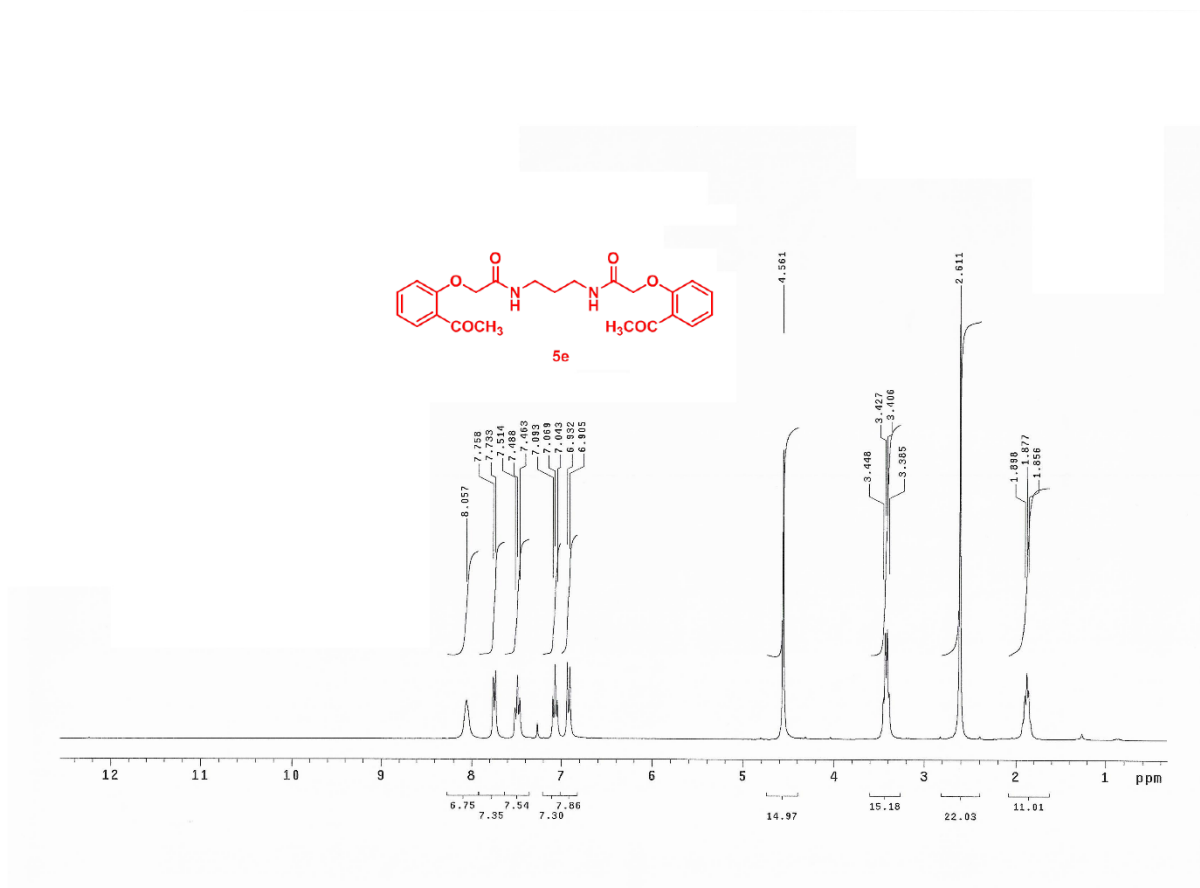
¹H NMR spectrum of 5c



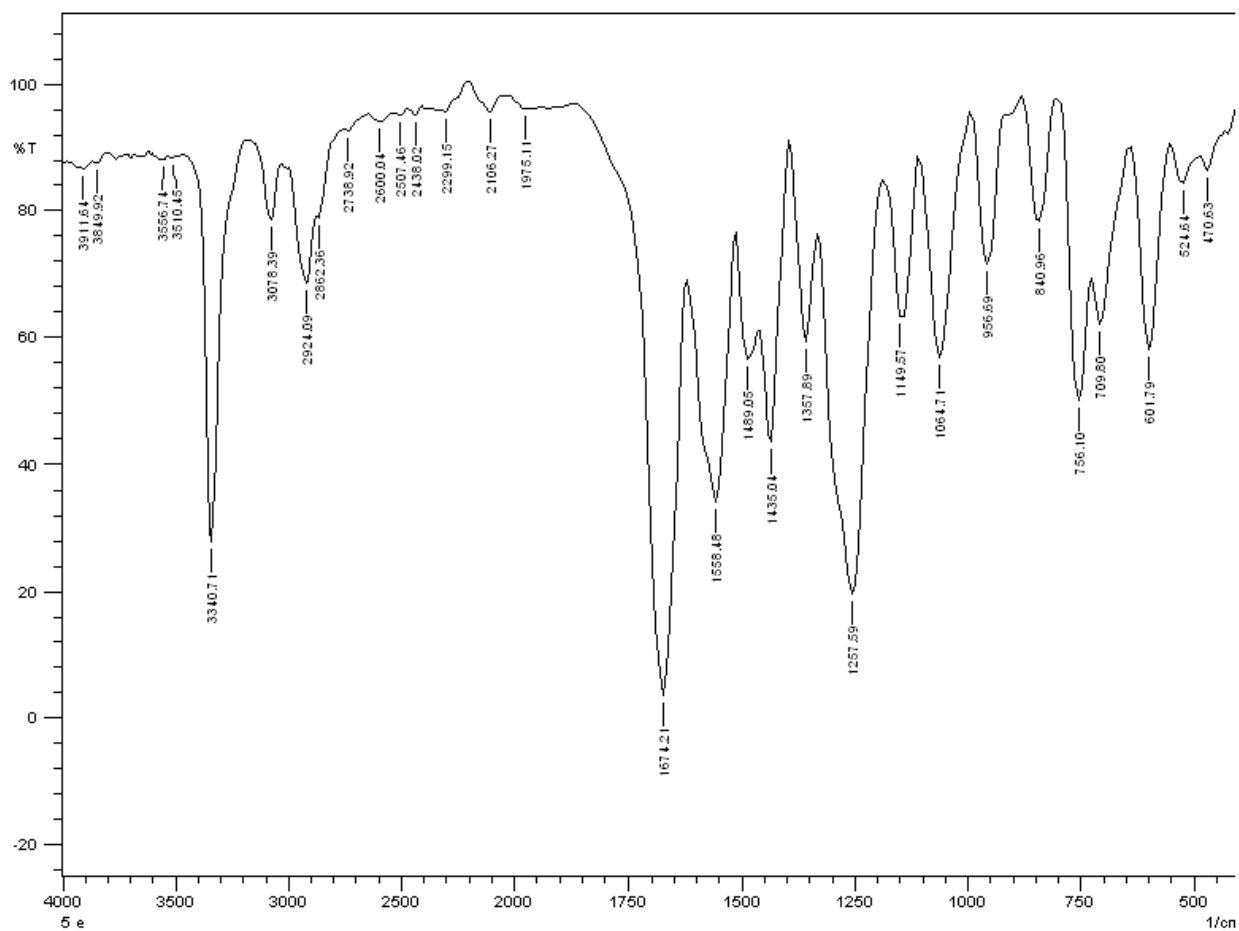
IR spectrum of 5c



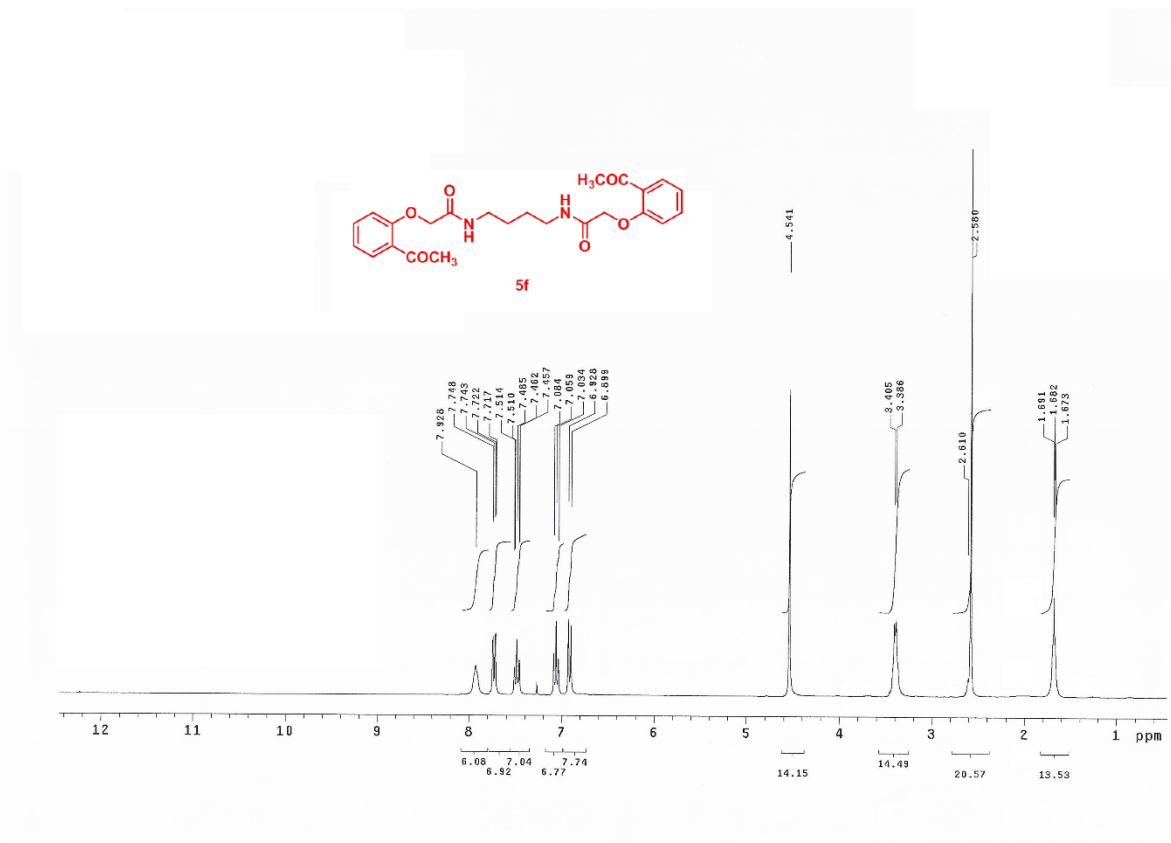
¹H NMR spectrum of 5d



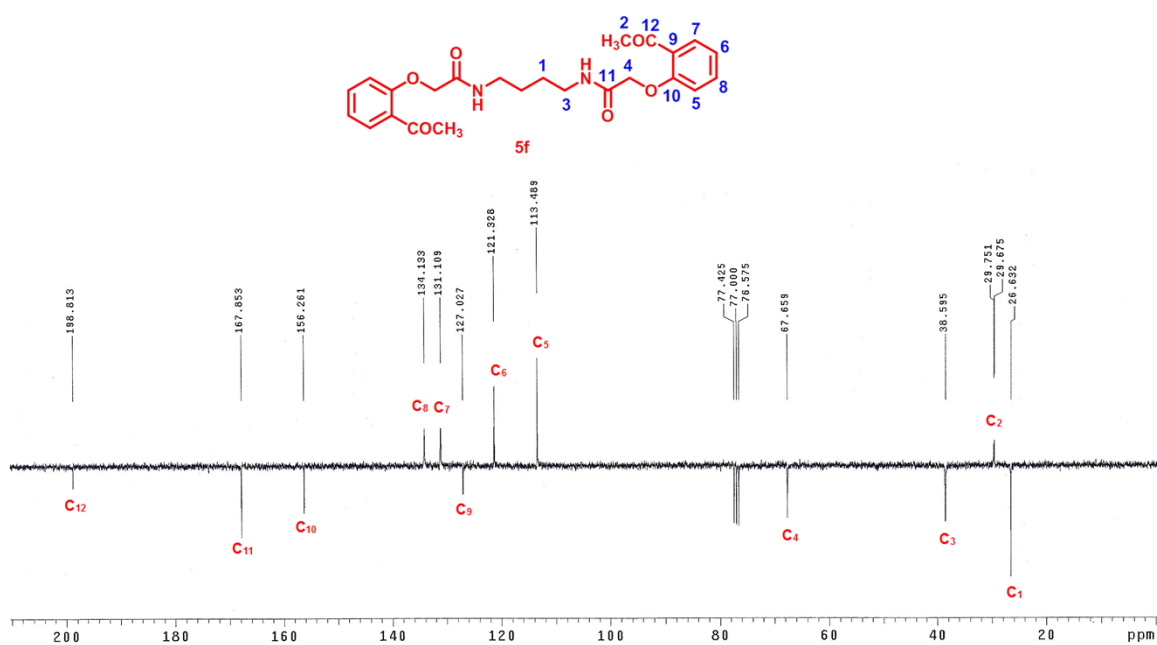
¹H NMR spectrum of 5e



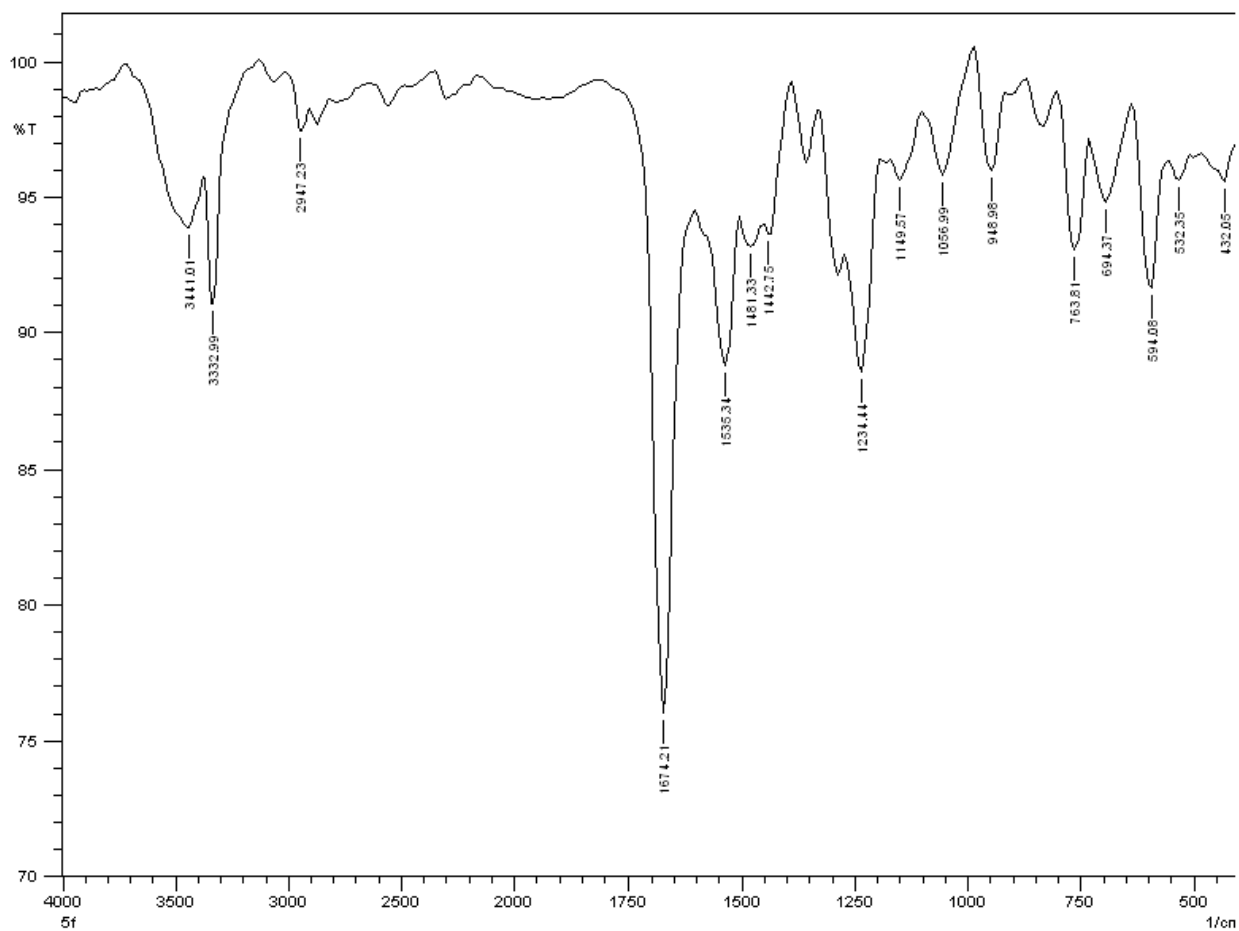
IR spectrum of 5e



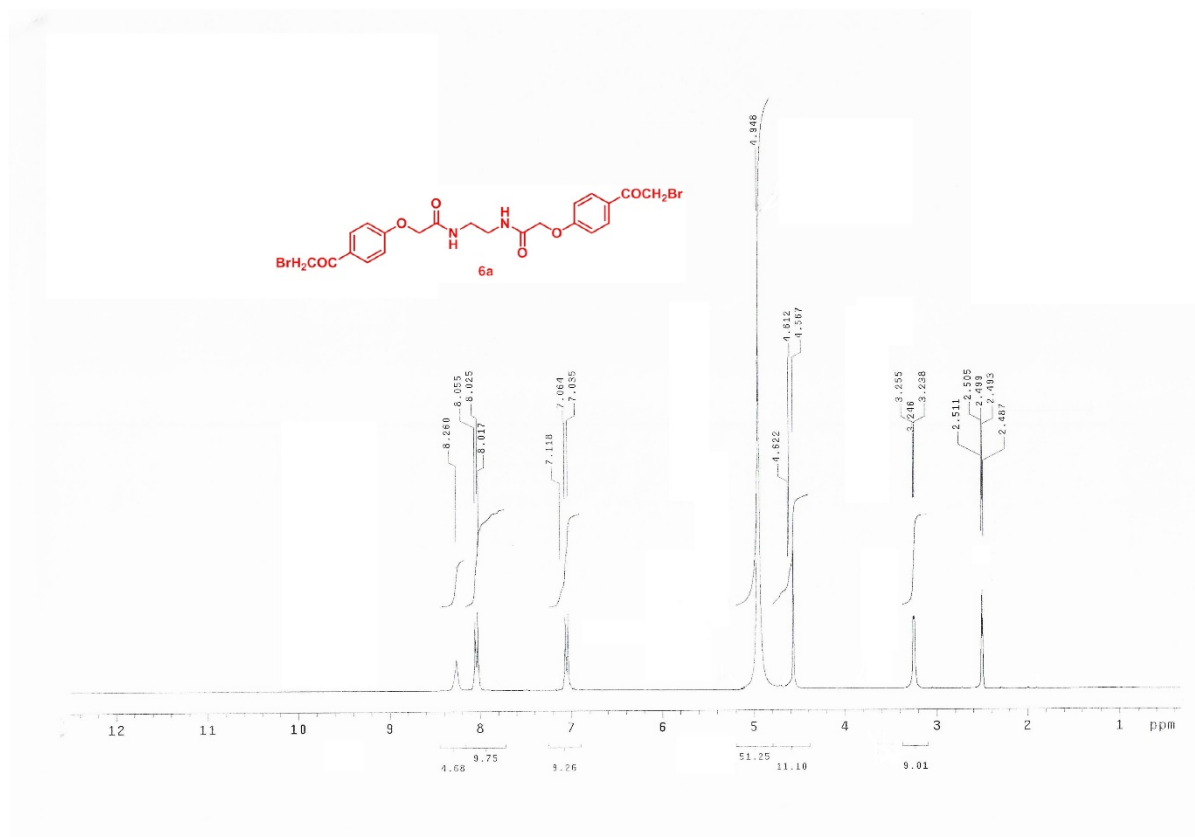
¹H NMR spectrum of 5f



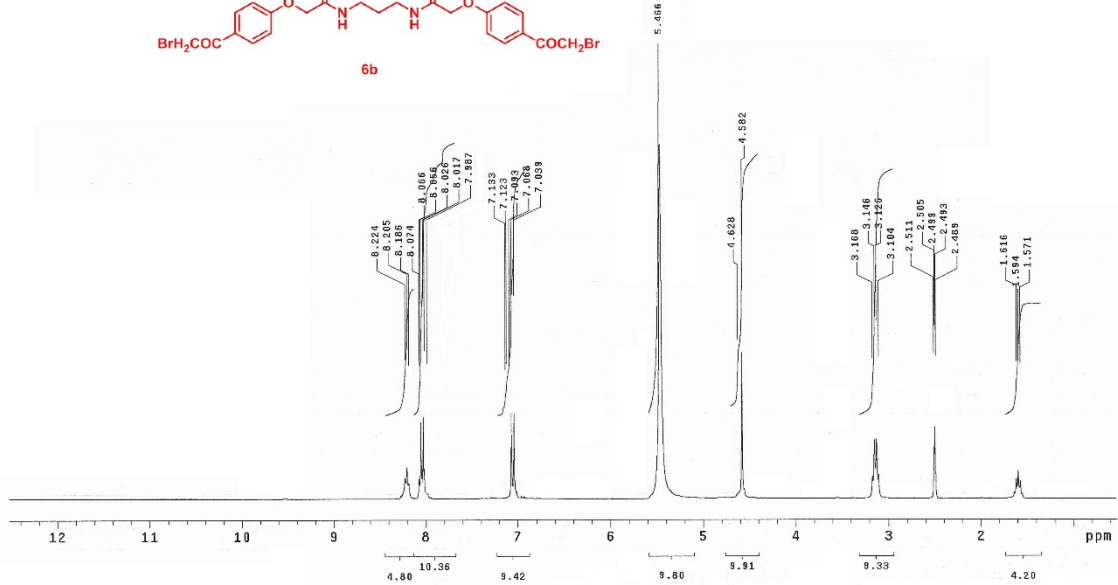
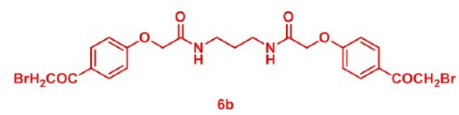
¹³C NMR spectrum of 5f (APT)



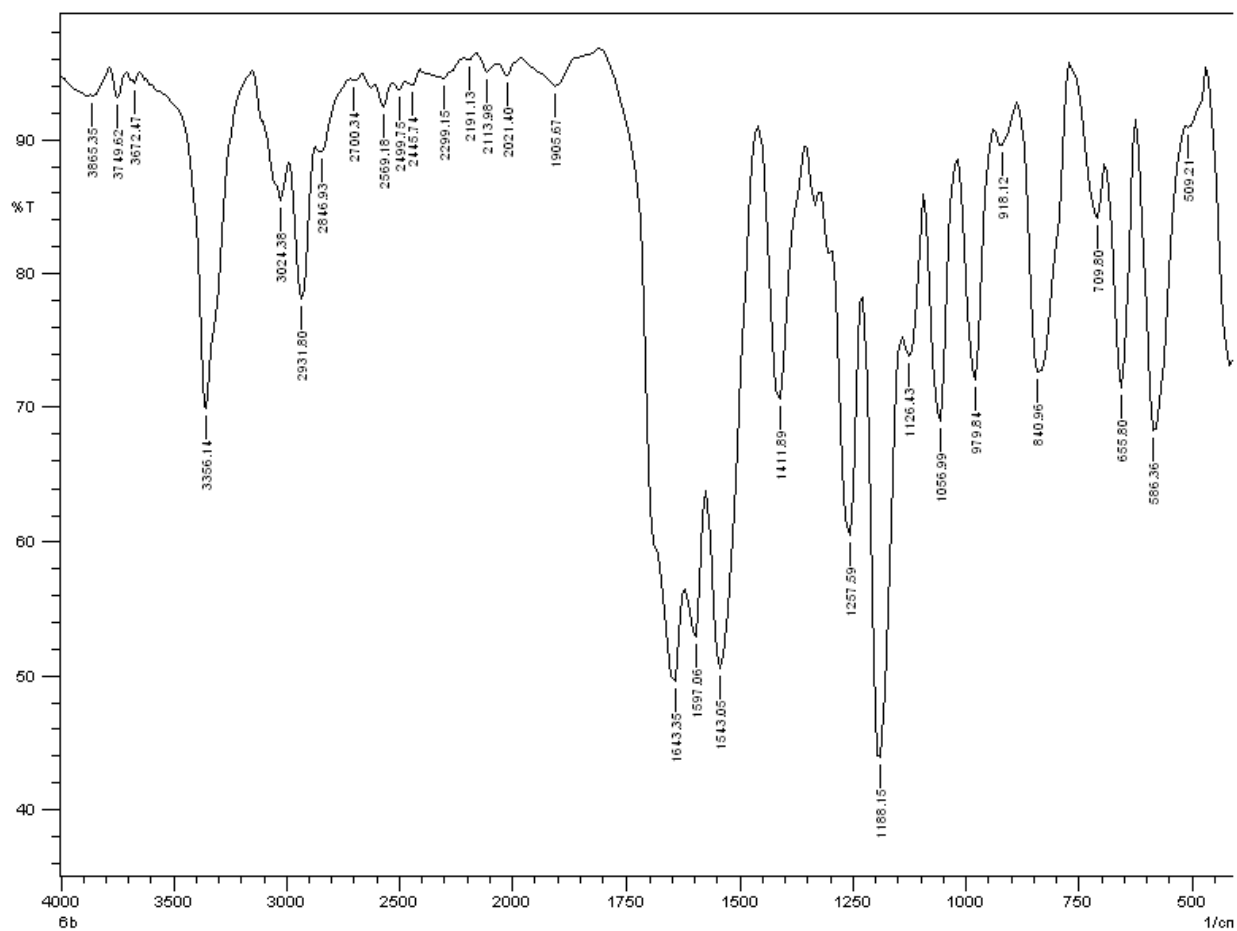
IR spectrum of 5f



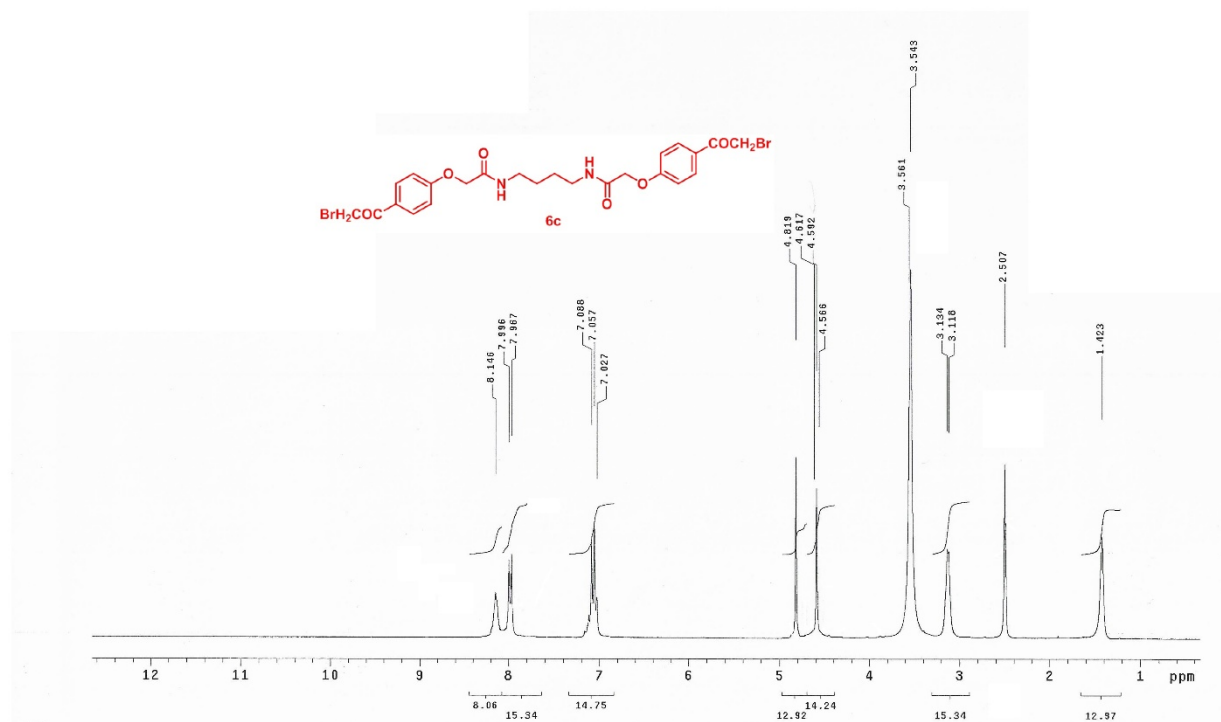
¹H NMR spectrum of 6a



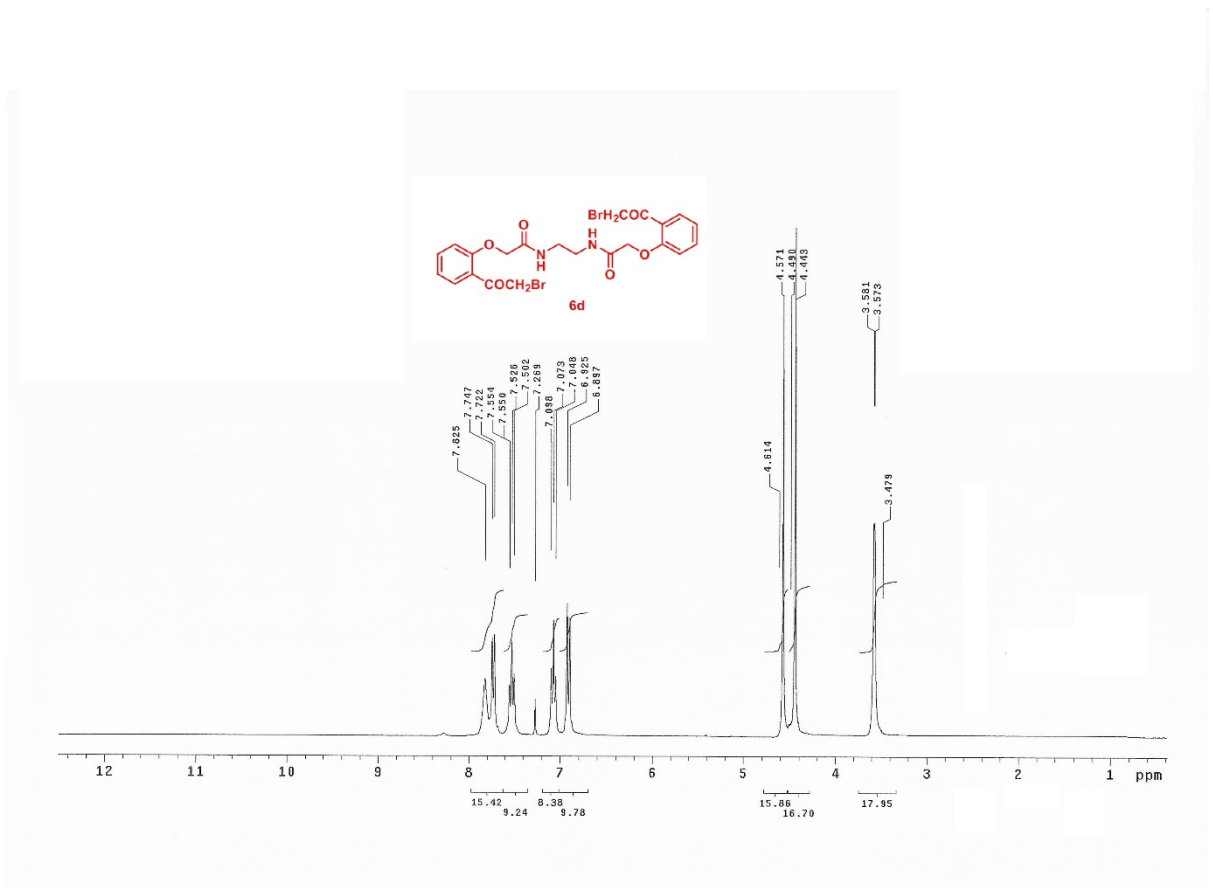
¹H NMR spectrum of 6b



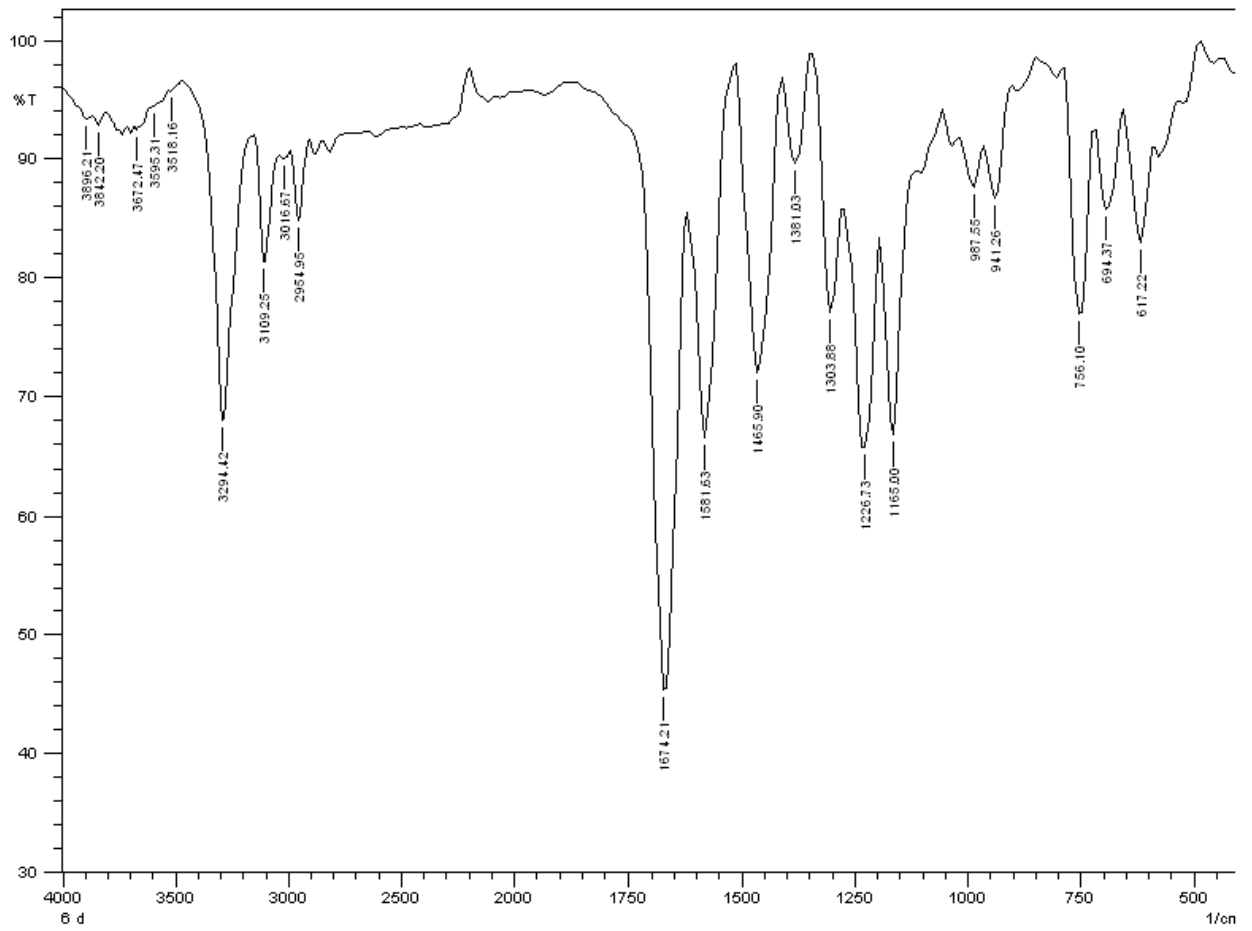
IR spectrum of 6b



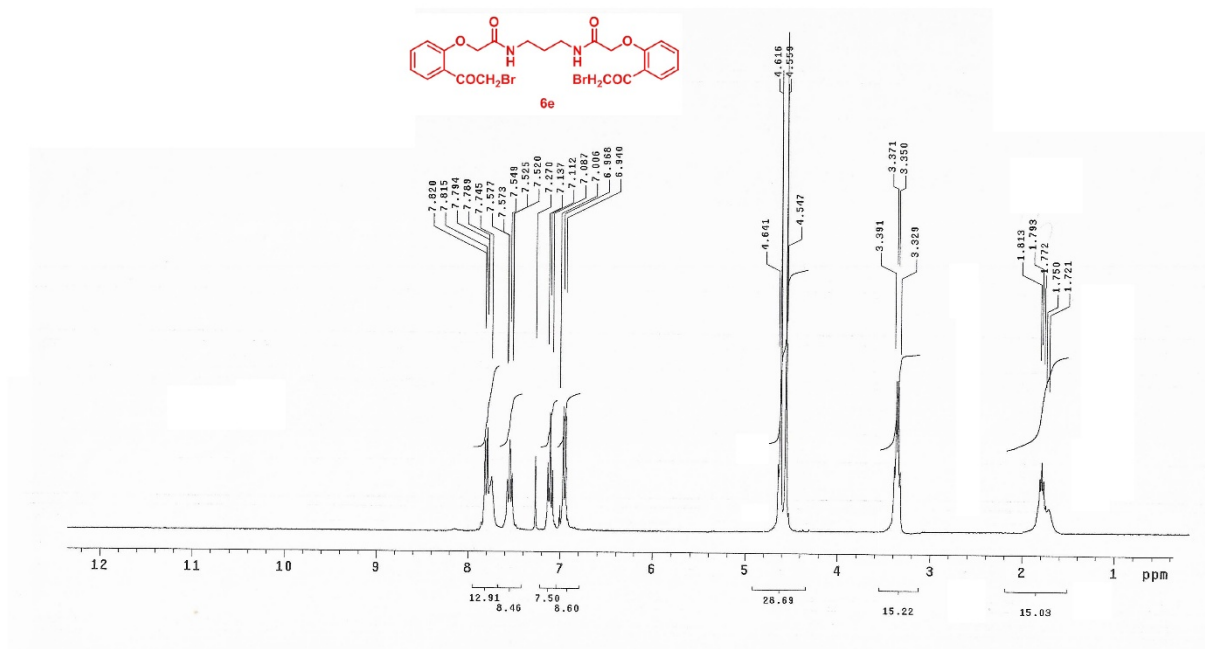
^1H NMR spectrum of **6c**



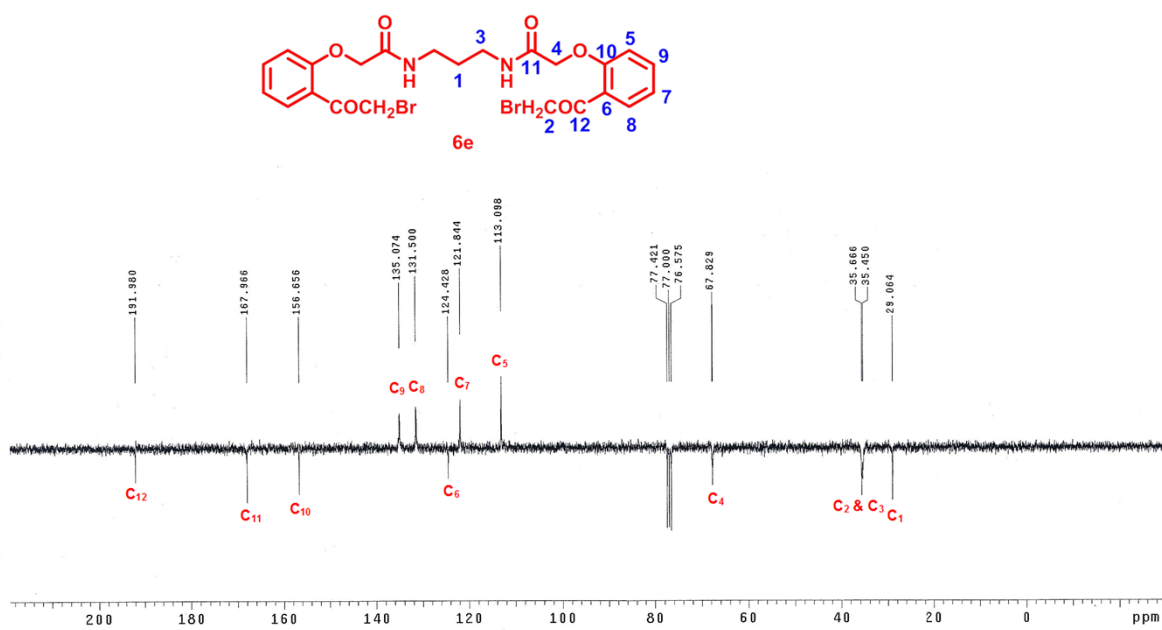
^1H NMR spectrum of **6d**



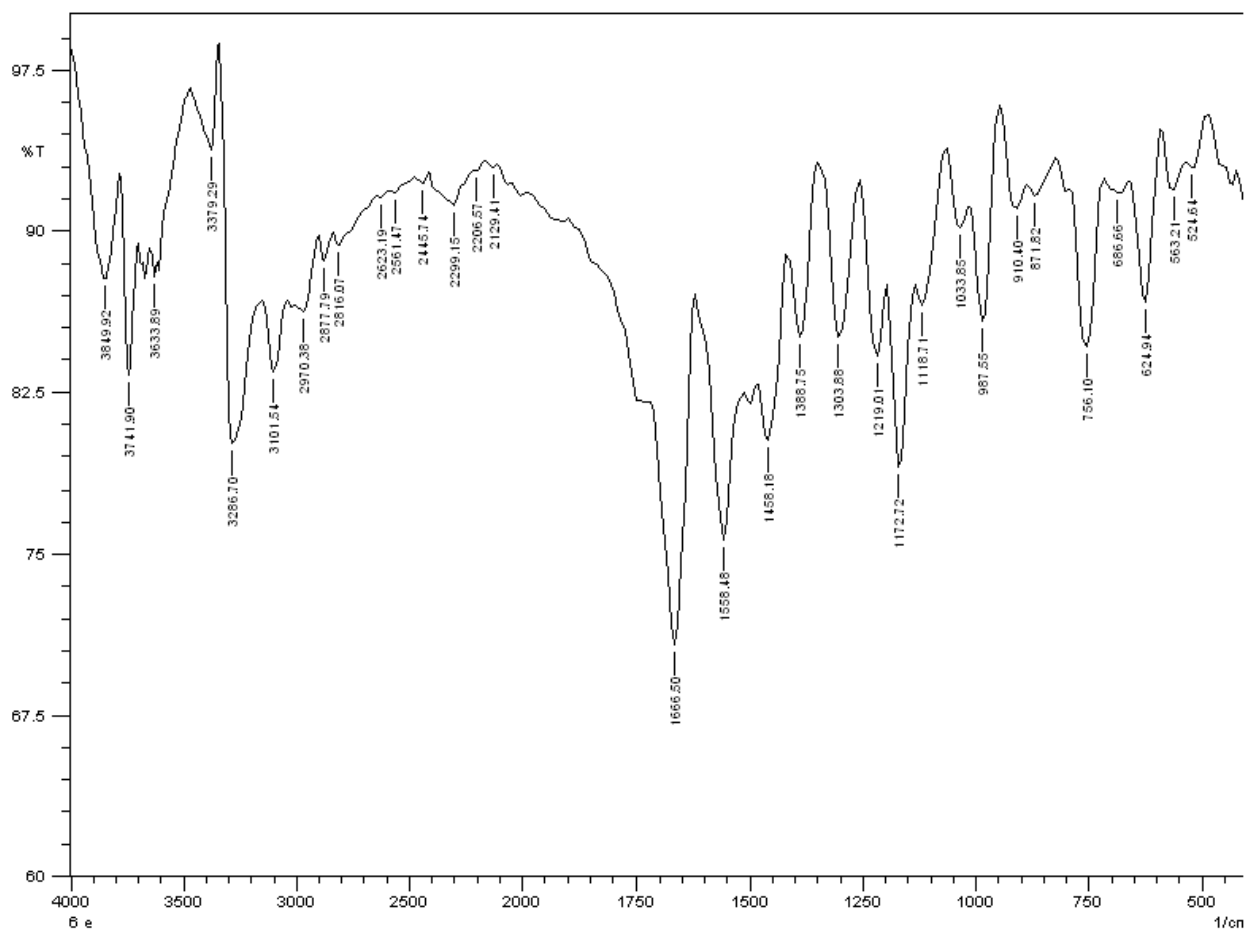
IR spectrum of 6d



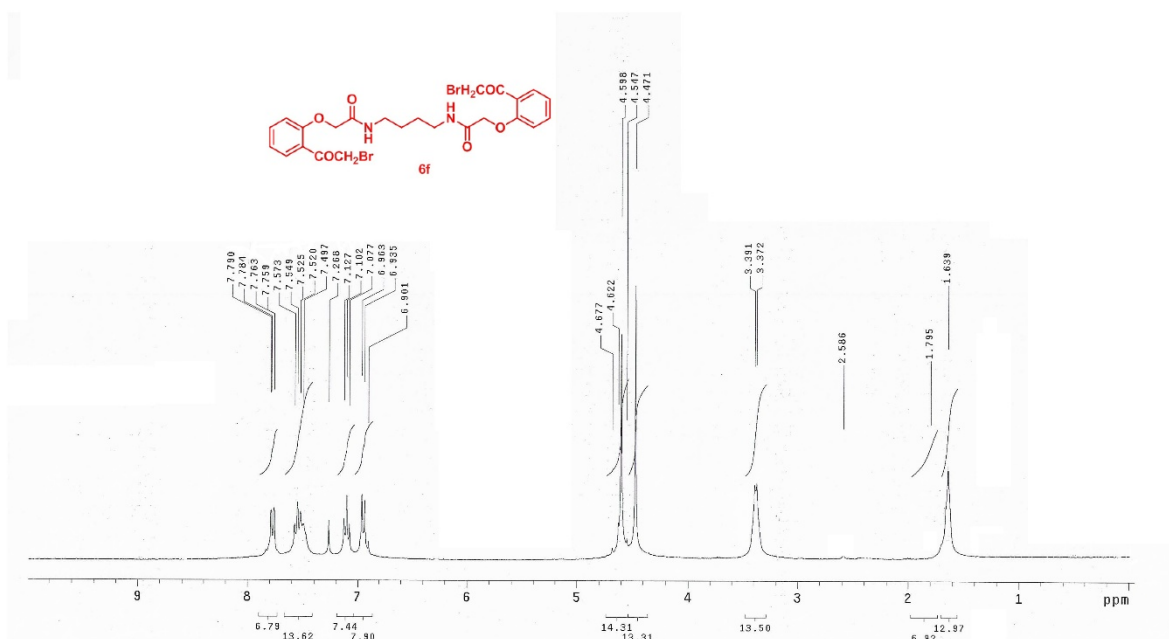
¹H NMR spectrum of 6e



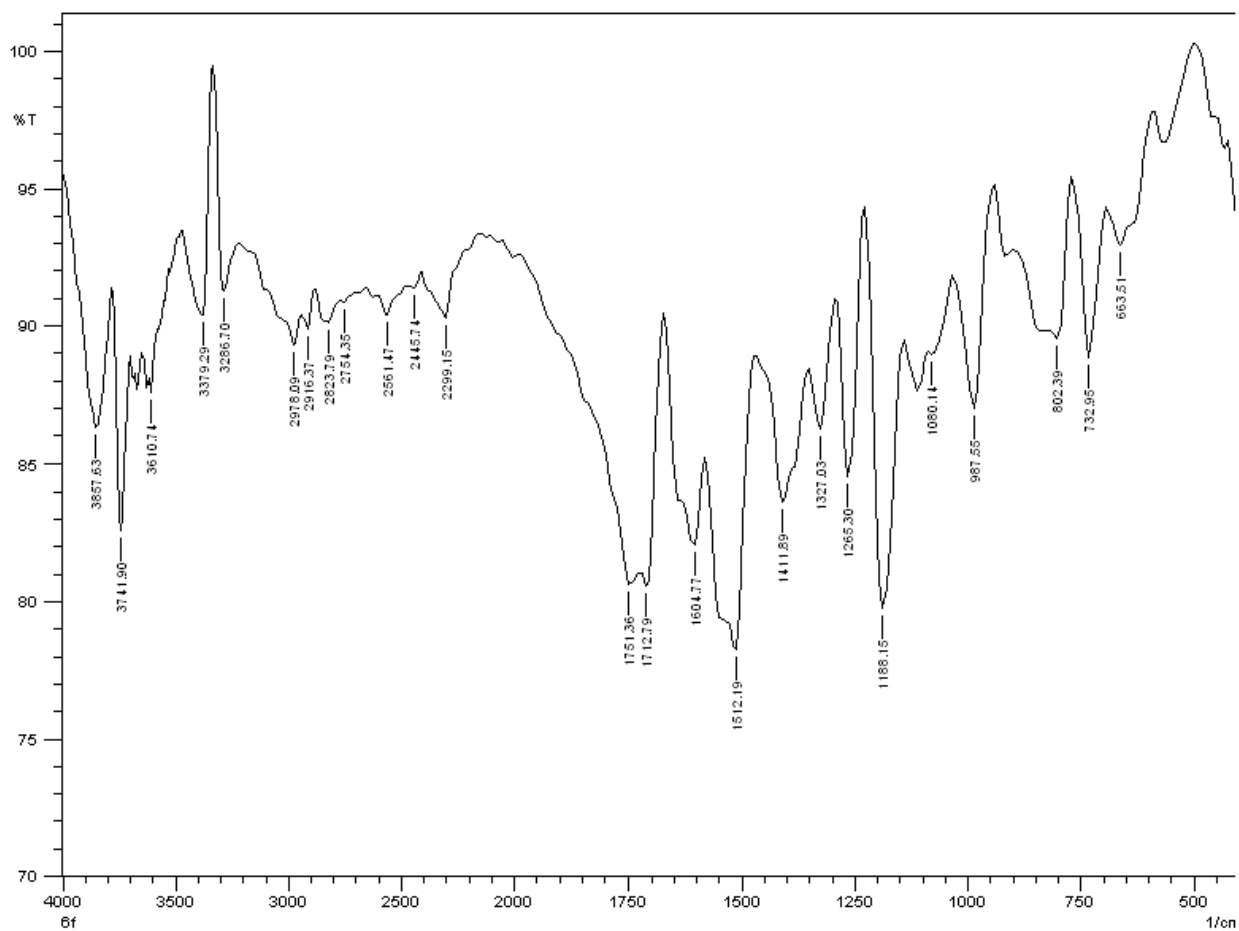
¹³C NMR spectrum of 6e (APT)



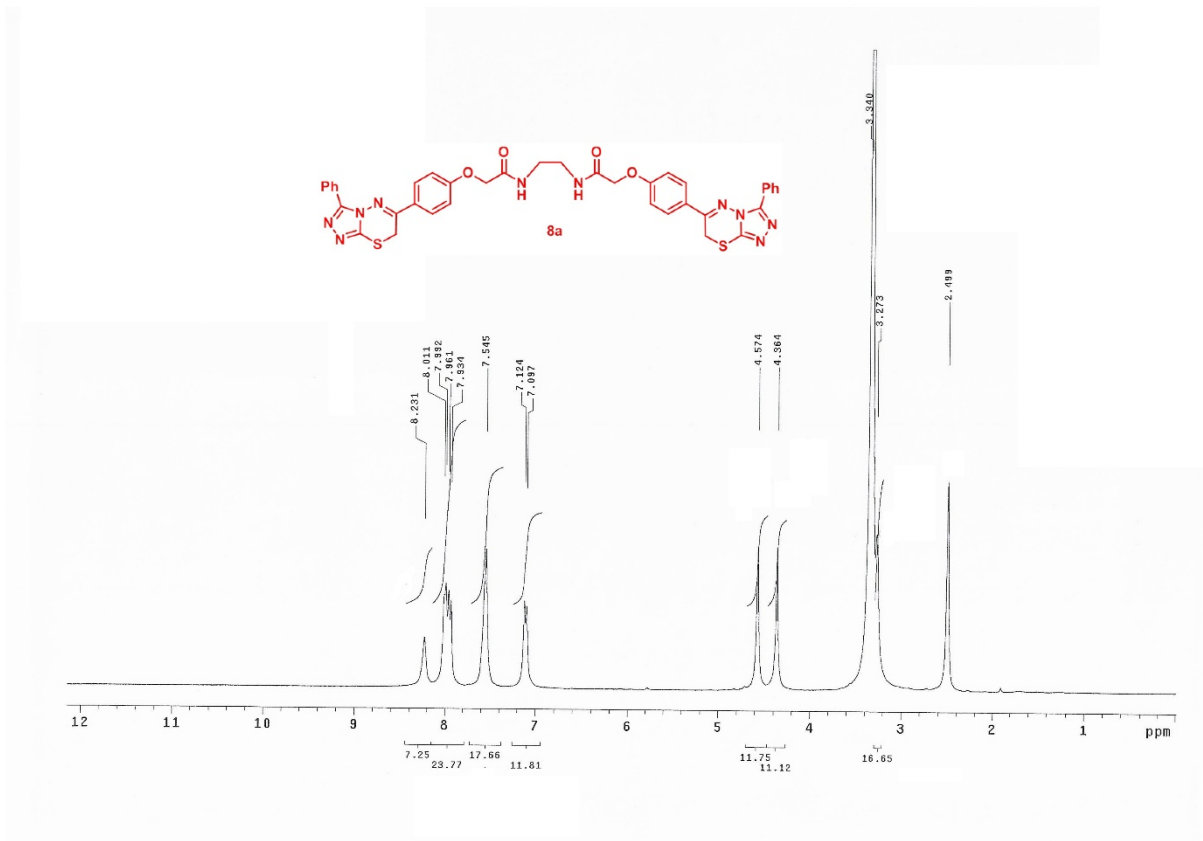
IR spectrum of 6e



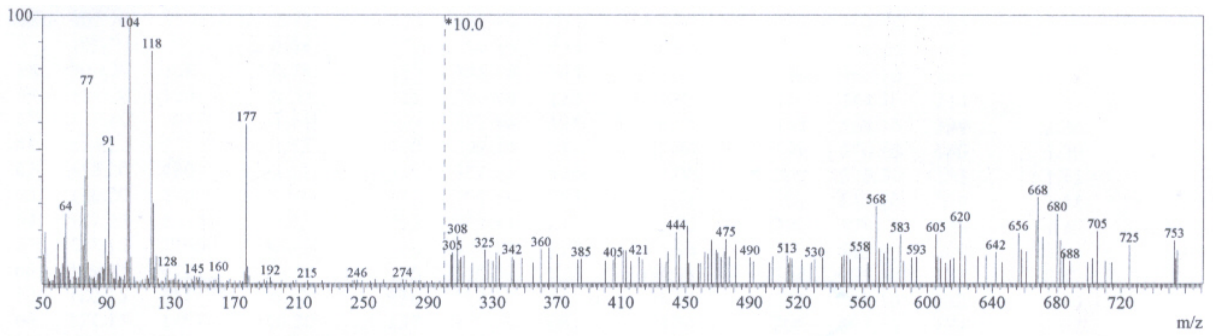
¹H NMR spectrum of 6f



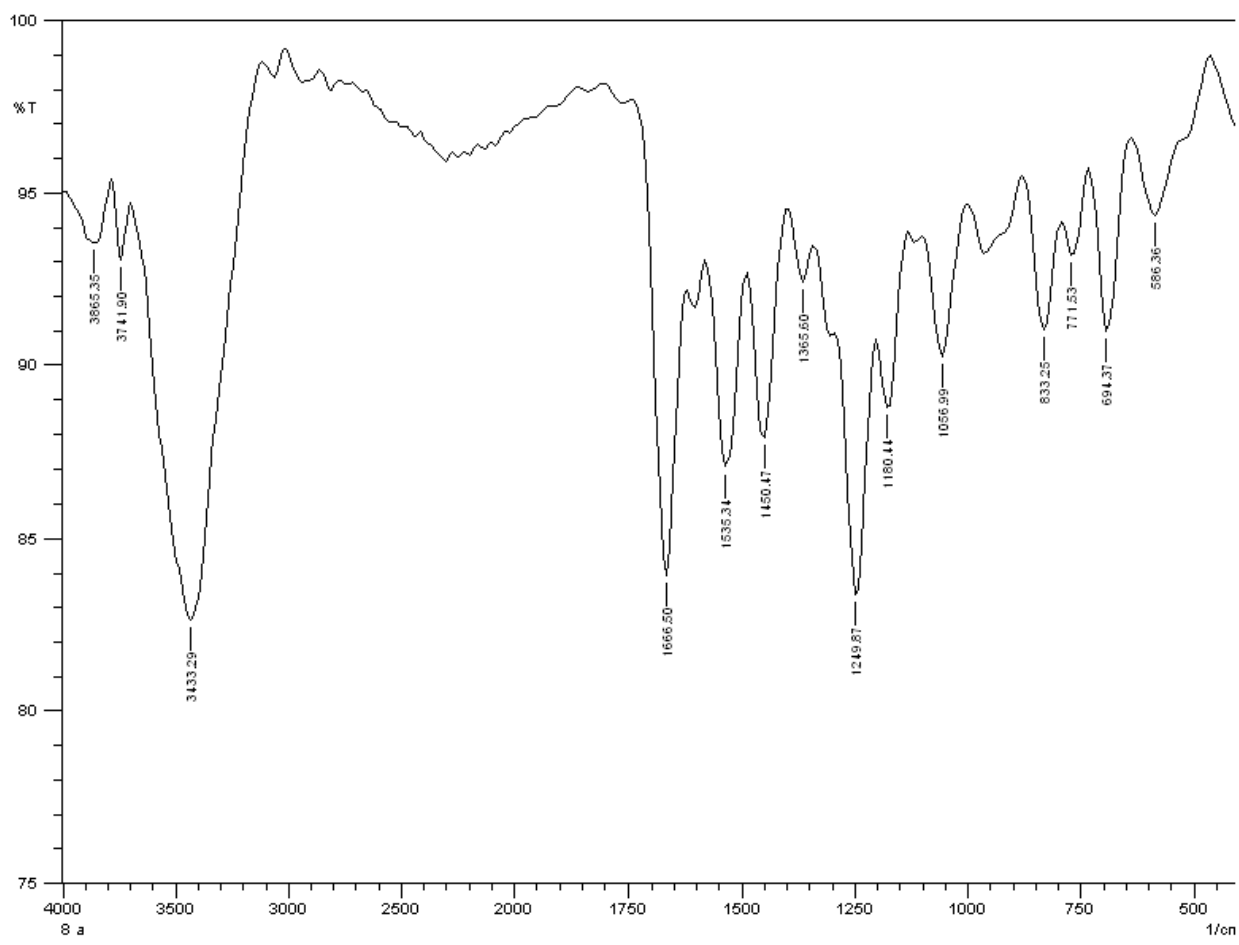
IR spectrum of 6f



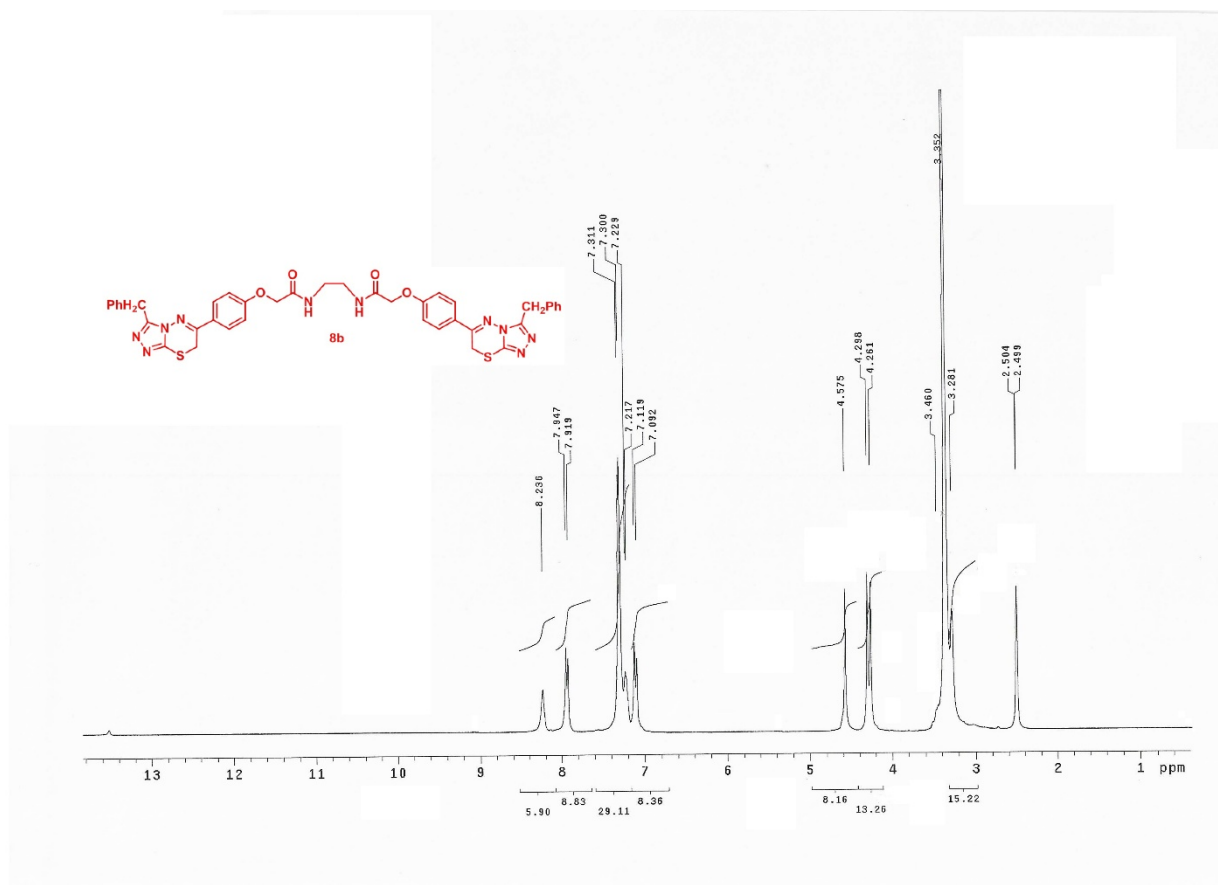
¹H NMR spectrum of 8a



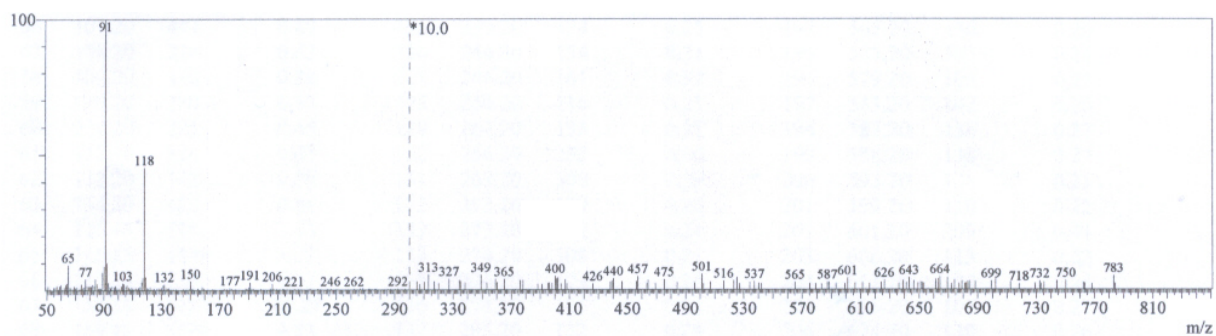
Mass spectrum of 8a



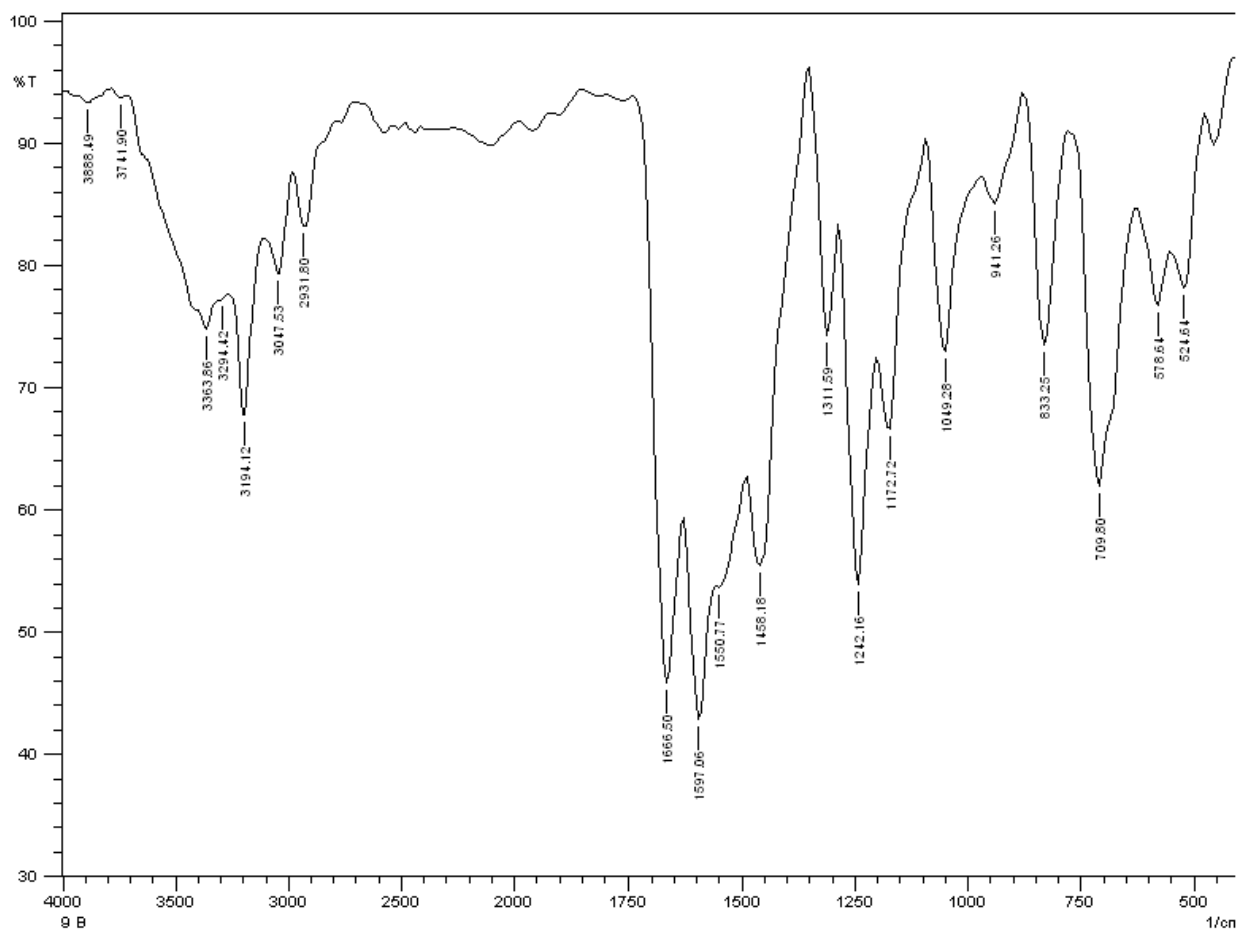
IR spectrum of 8a



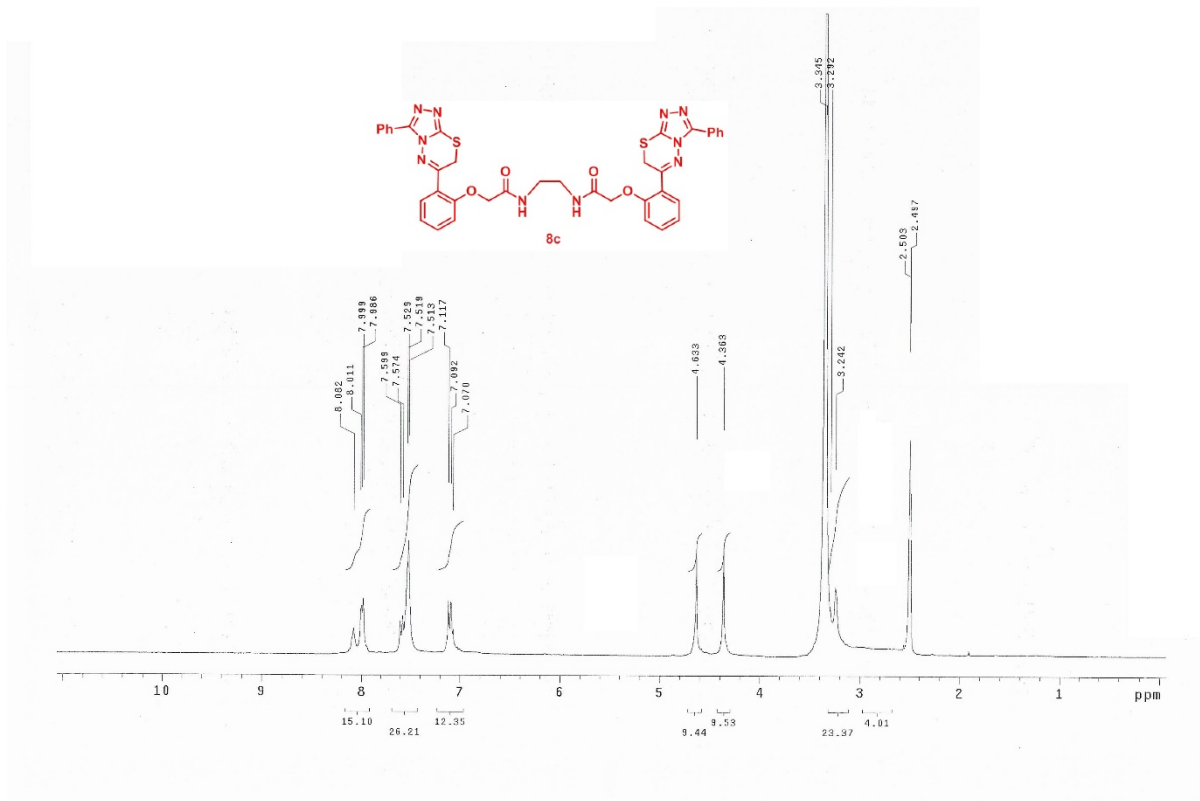
¹H NMR spectrum of 8b



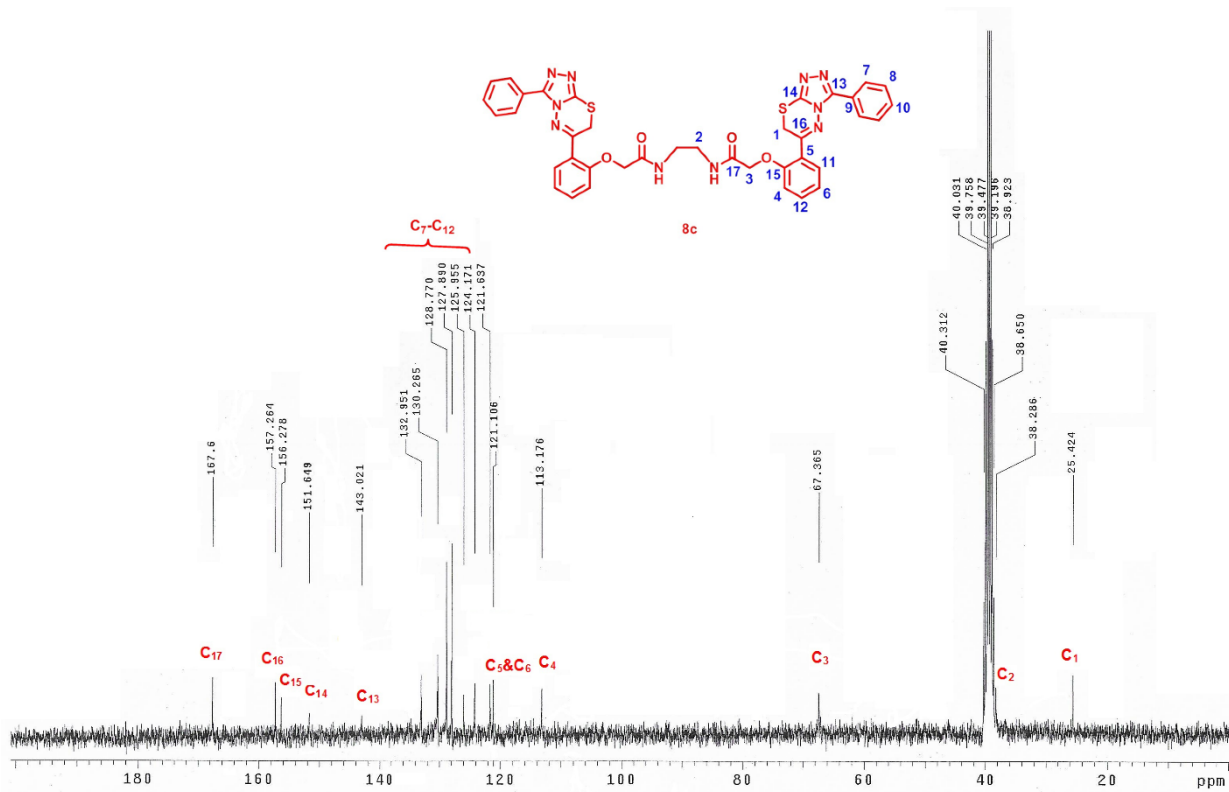
Mass spectrum of 8b



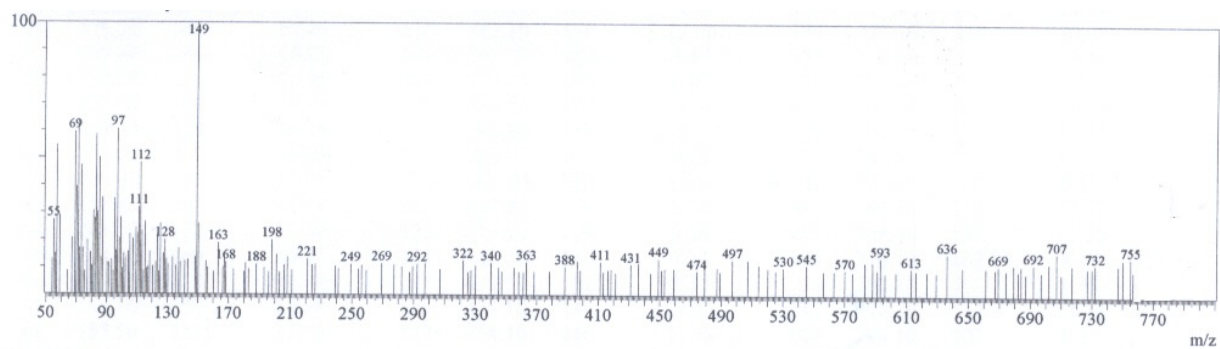
IR spectrum of 8b



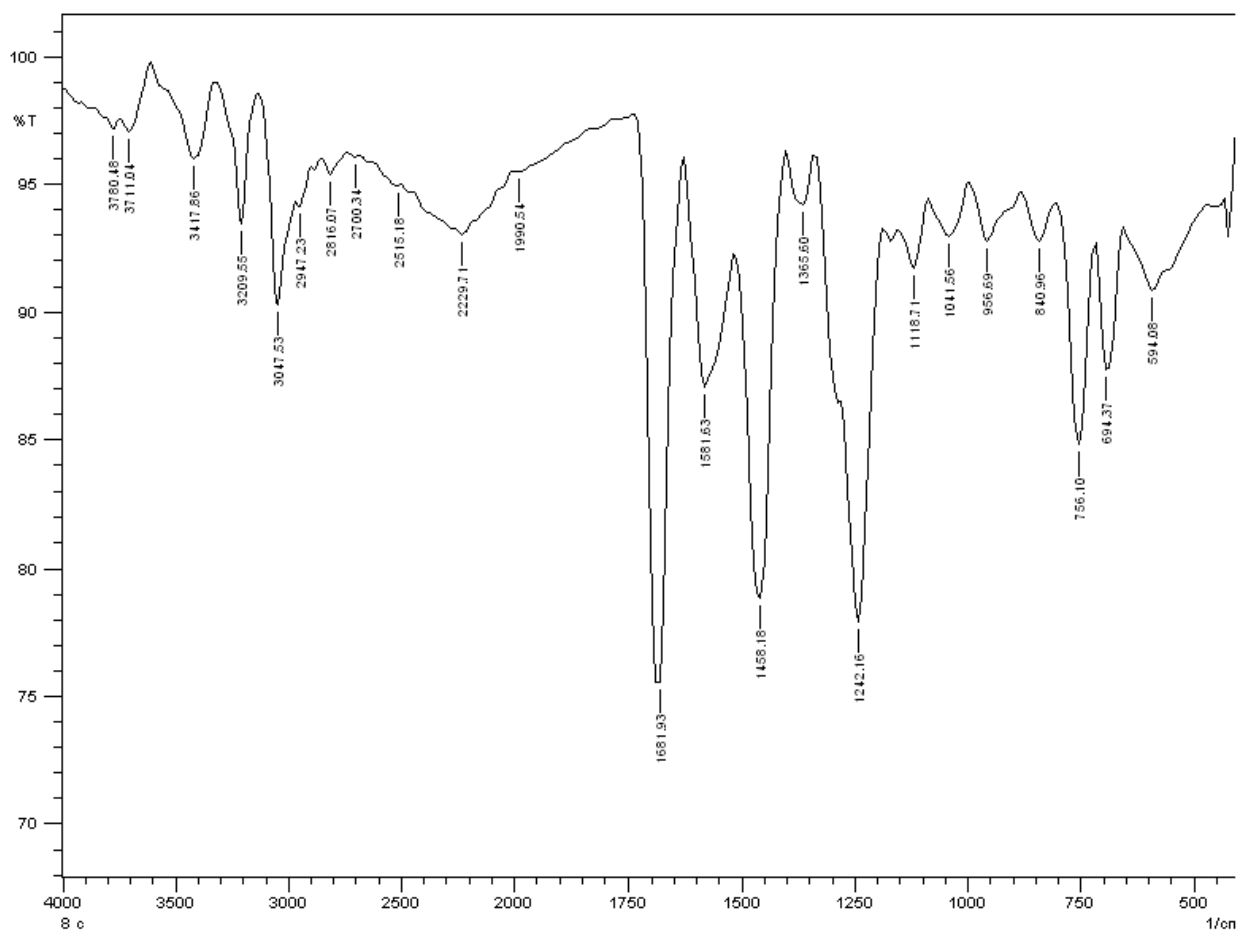
¹H NMR spectrum of 8c



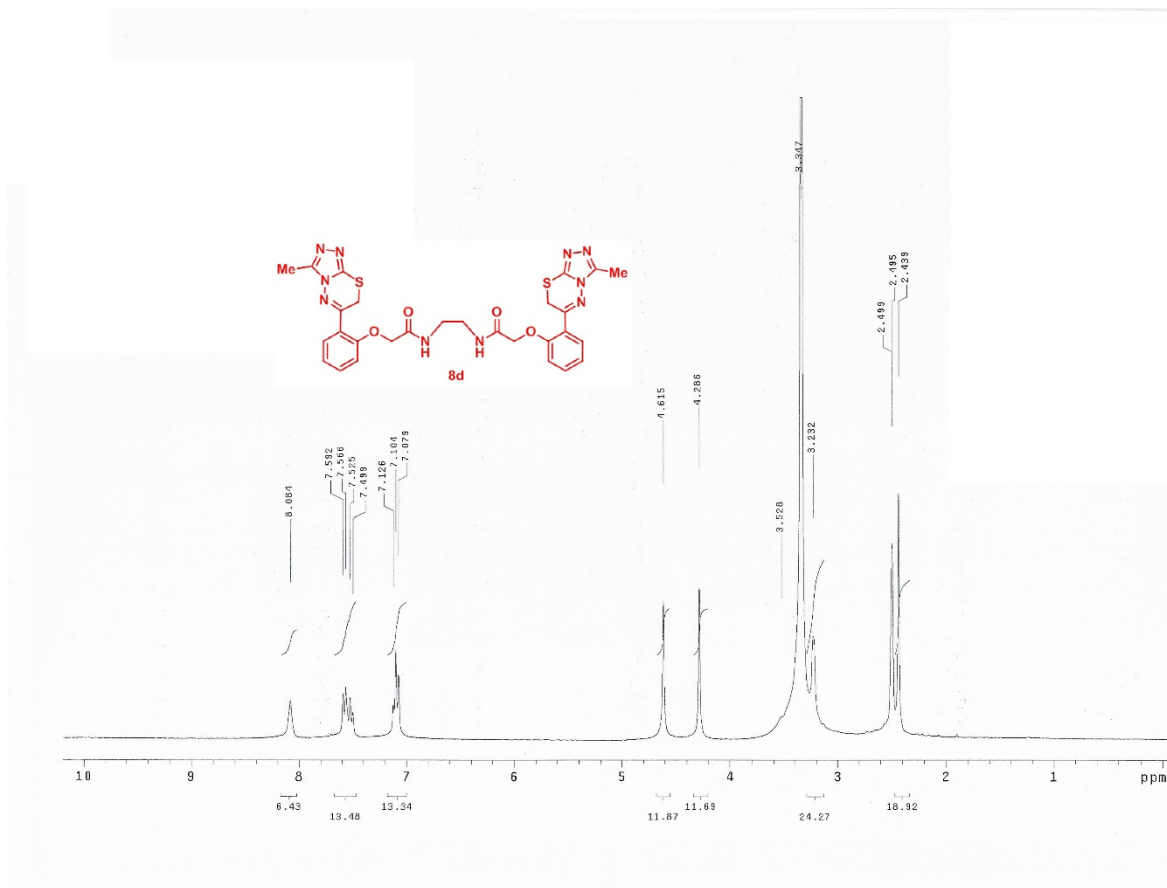
¹³C NMR spectrum of 8c



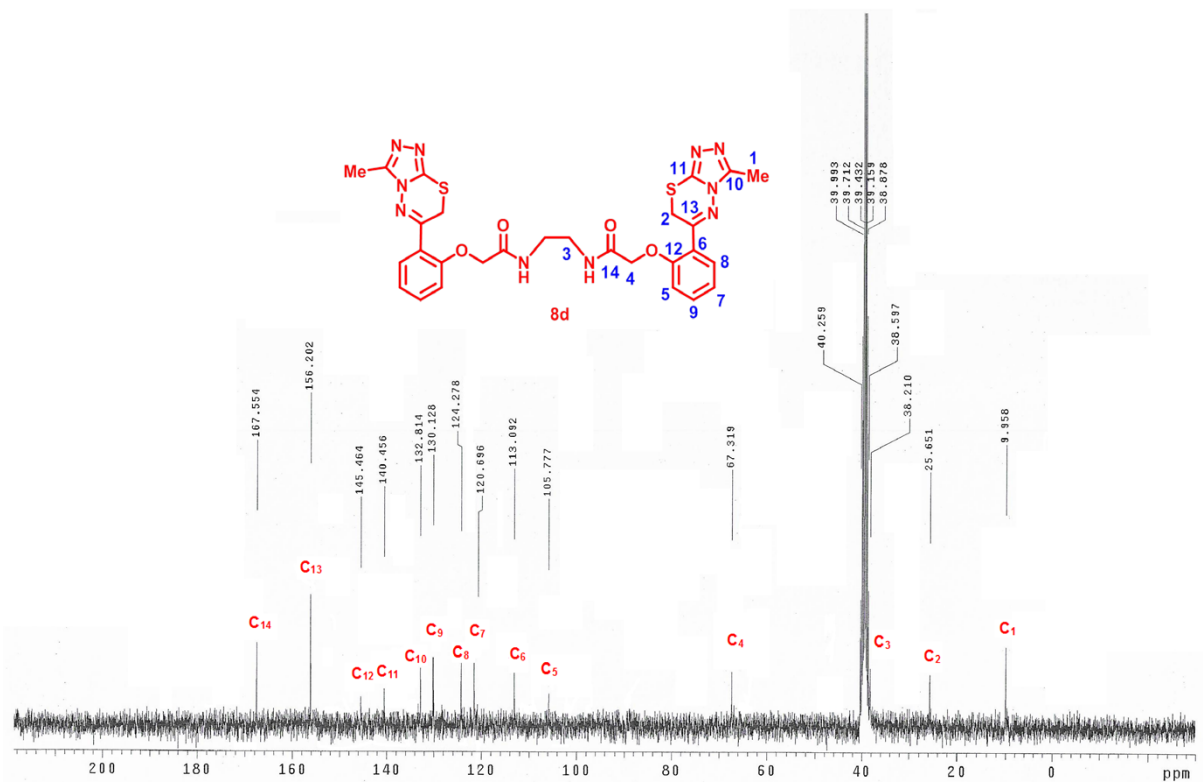
Mass spectrum of 8c



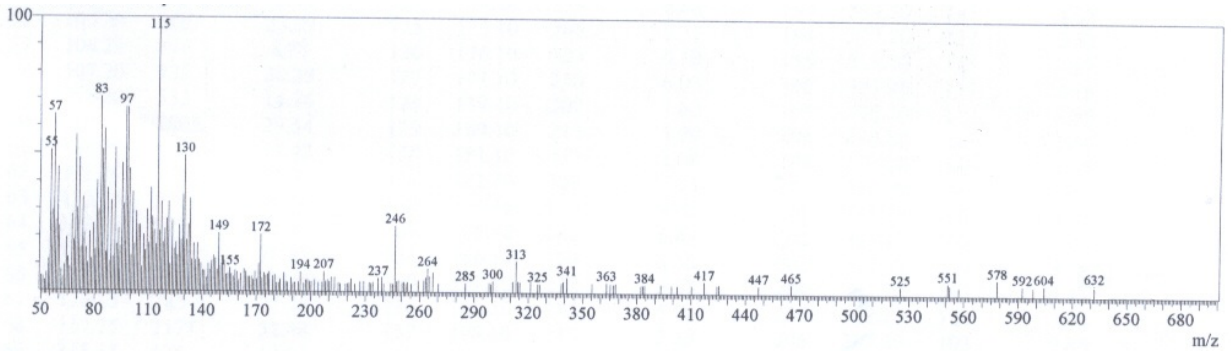
IR spectrum of 8c



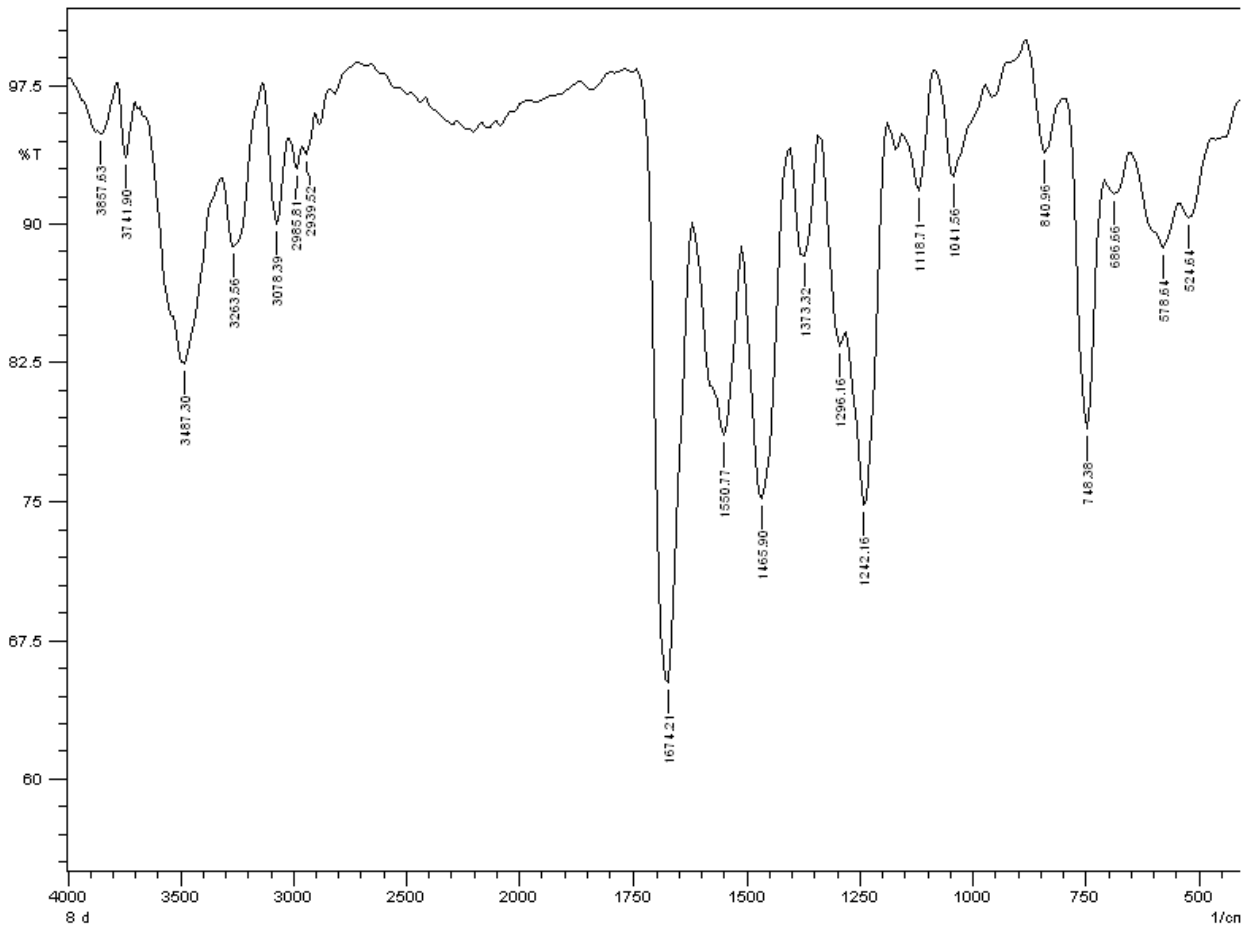
¹H NMR spectrum of 8d



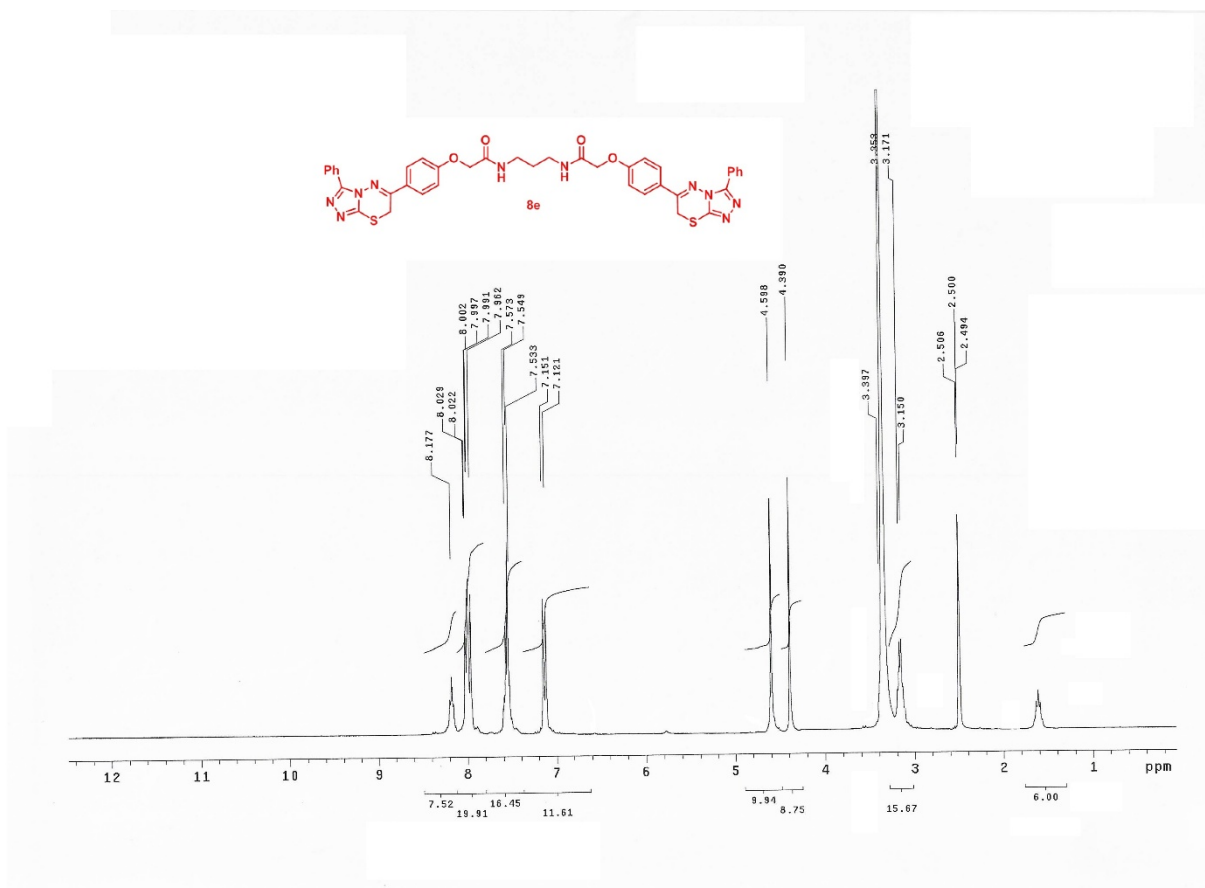
¹³C NMR spectrum of 8d



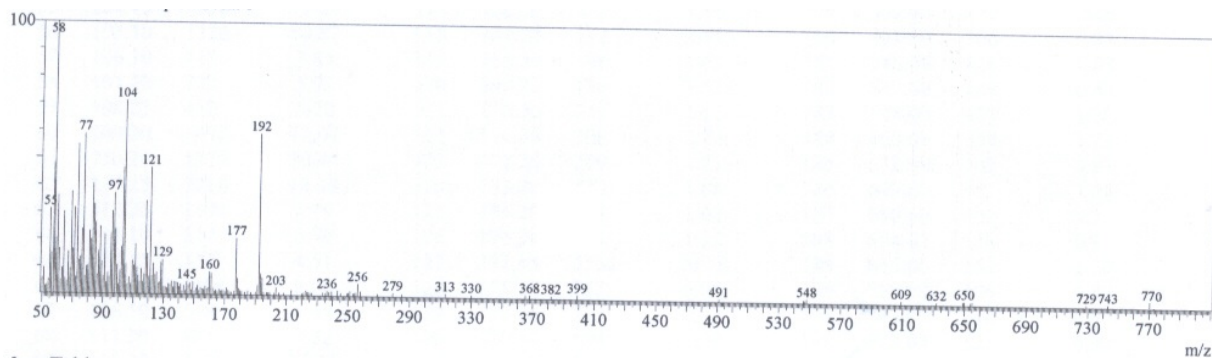
Mass spectrum of 8d



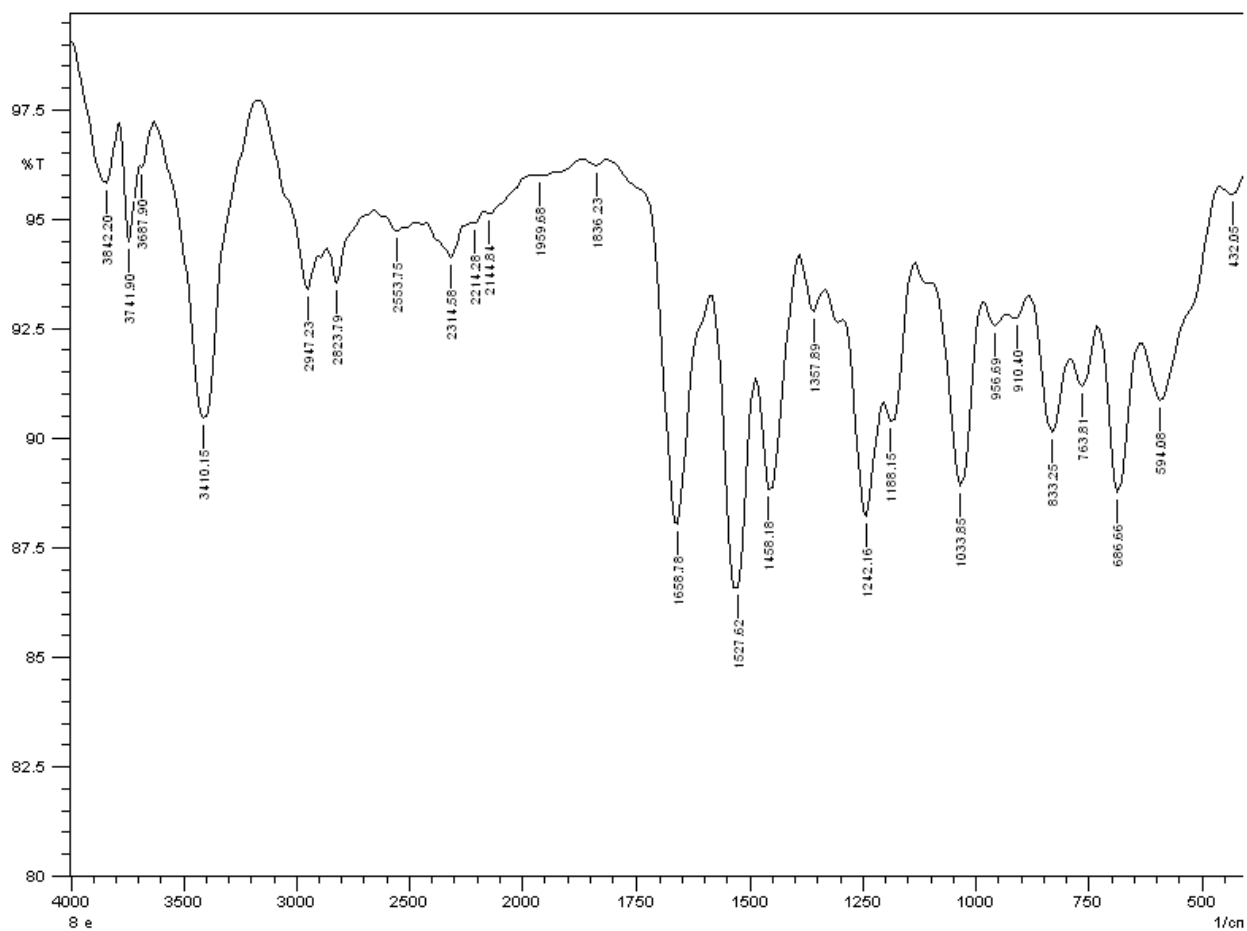
IR spectrum of 8d



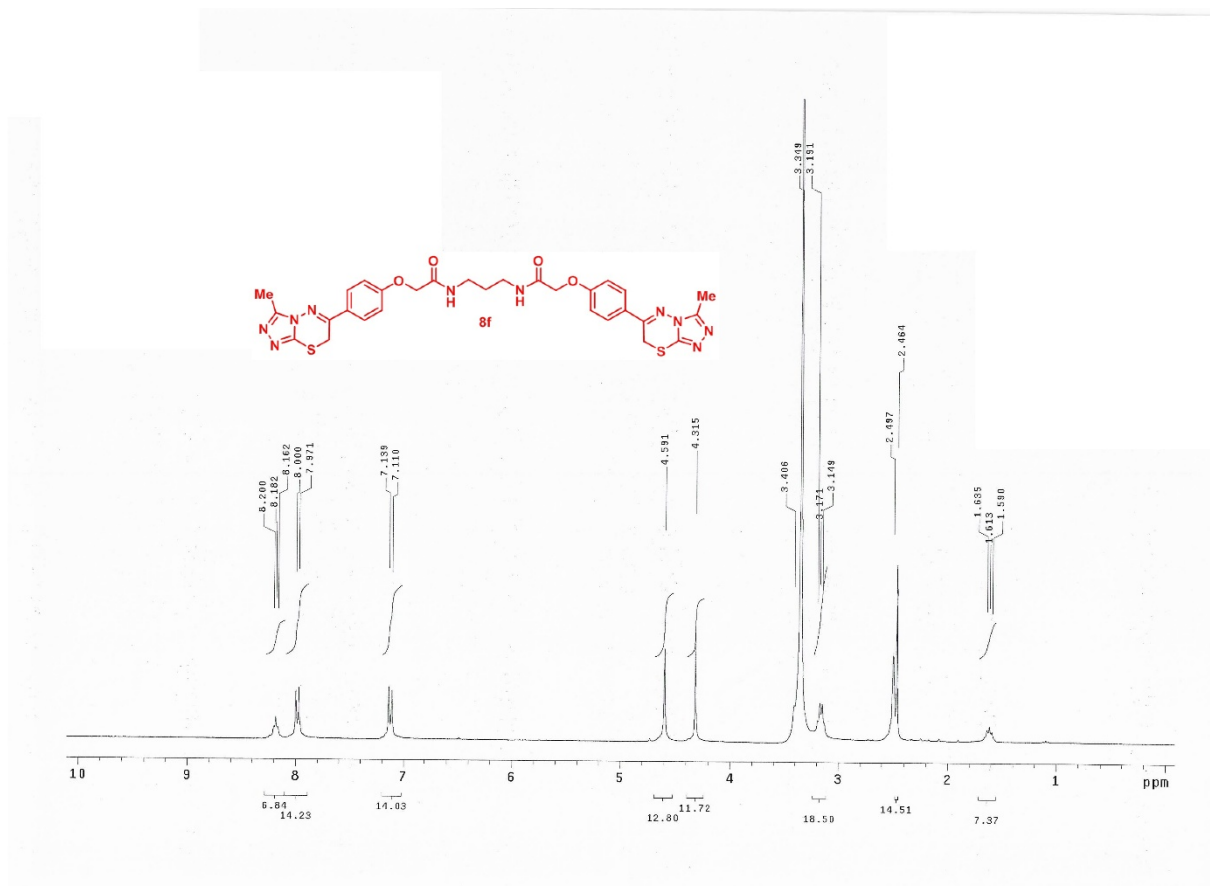
¹H NMR spectrum of 8e



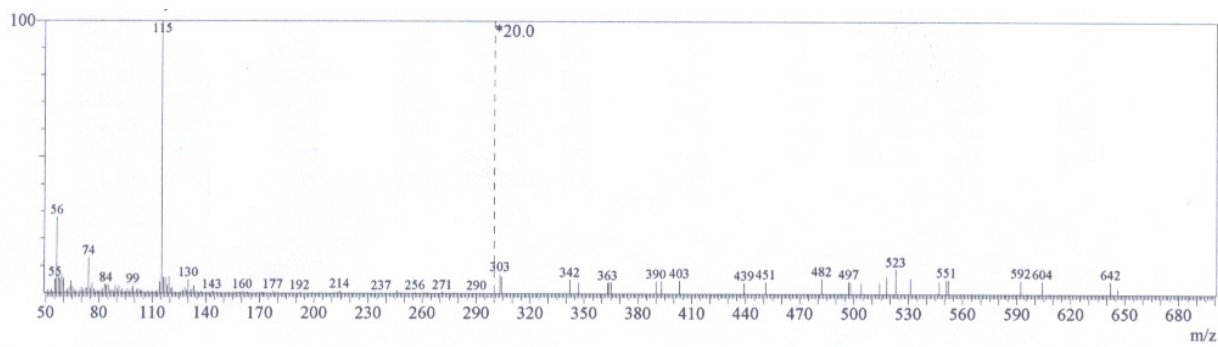
Mass spectrum of 8e



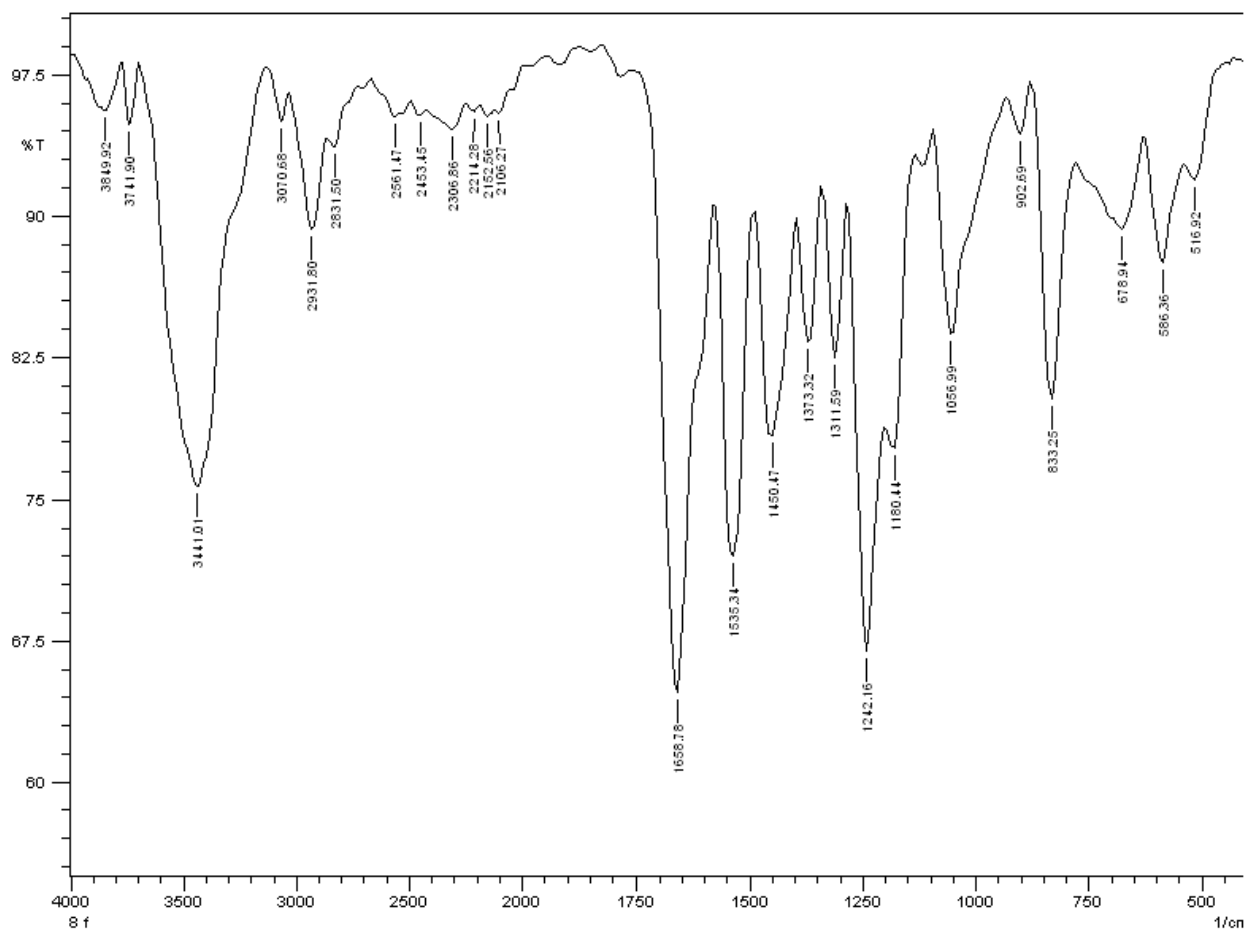
IR spectrum of 8e



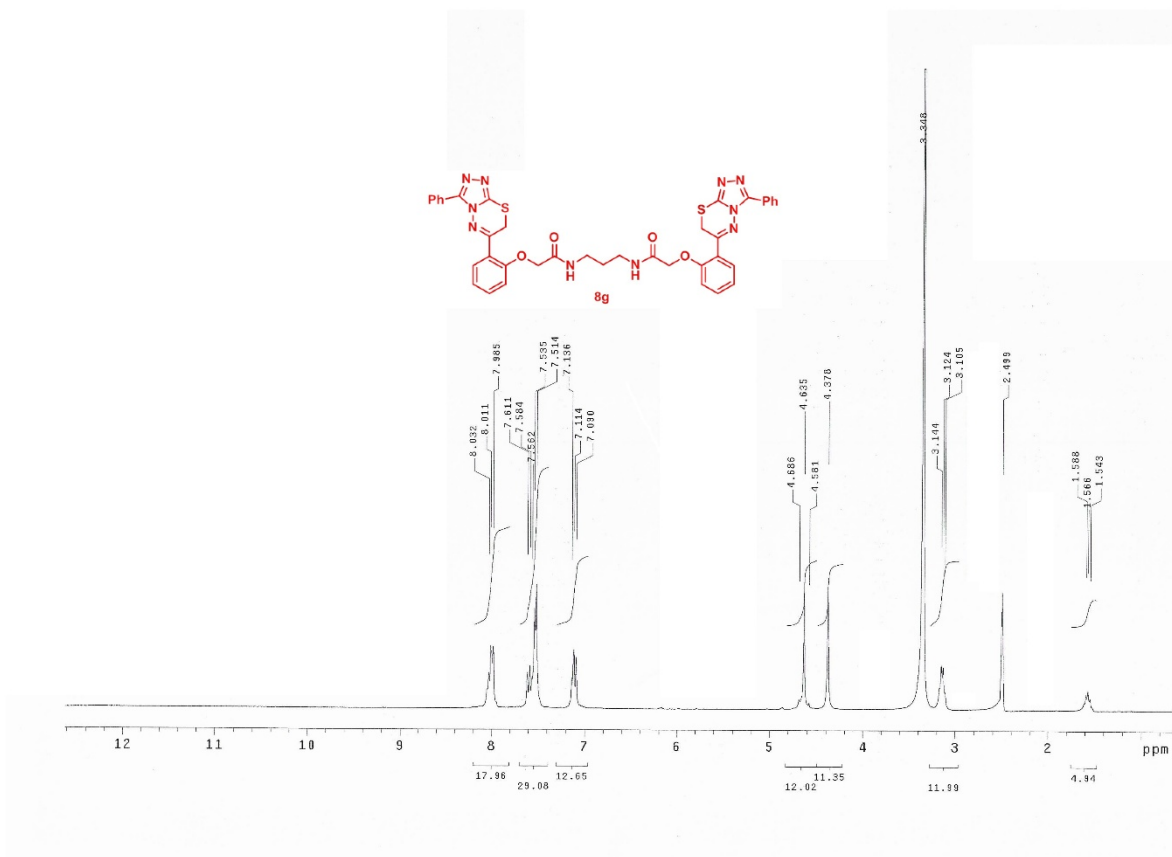
¹H NMR spectrum of 8f



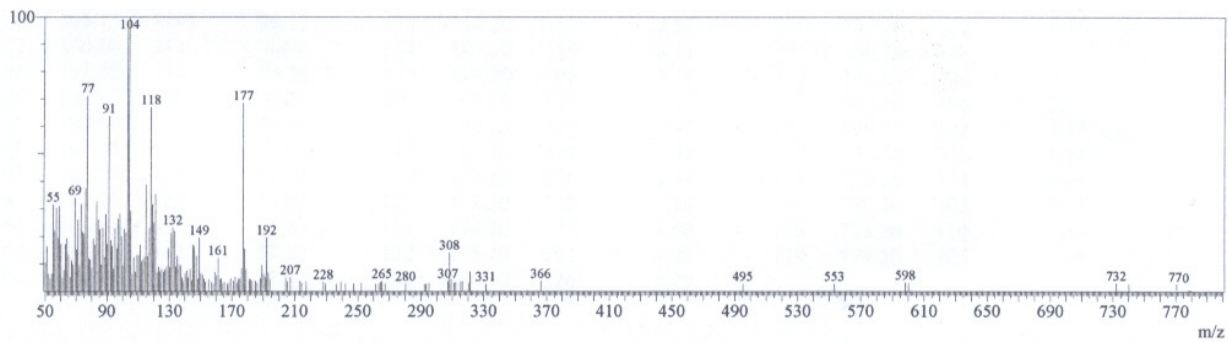
Mass spectrum of 8f



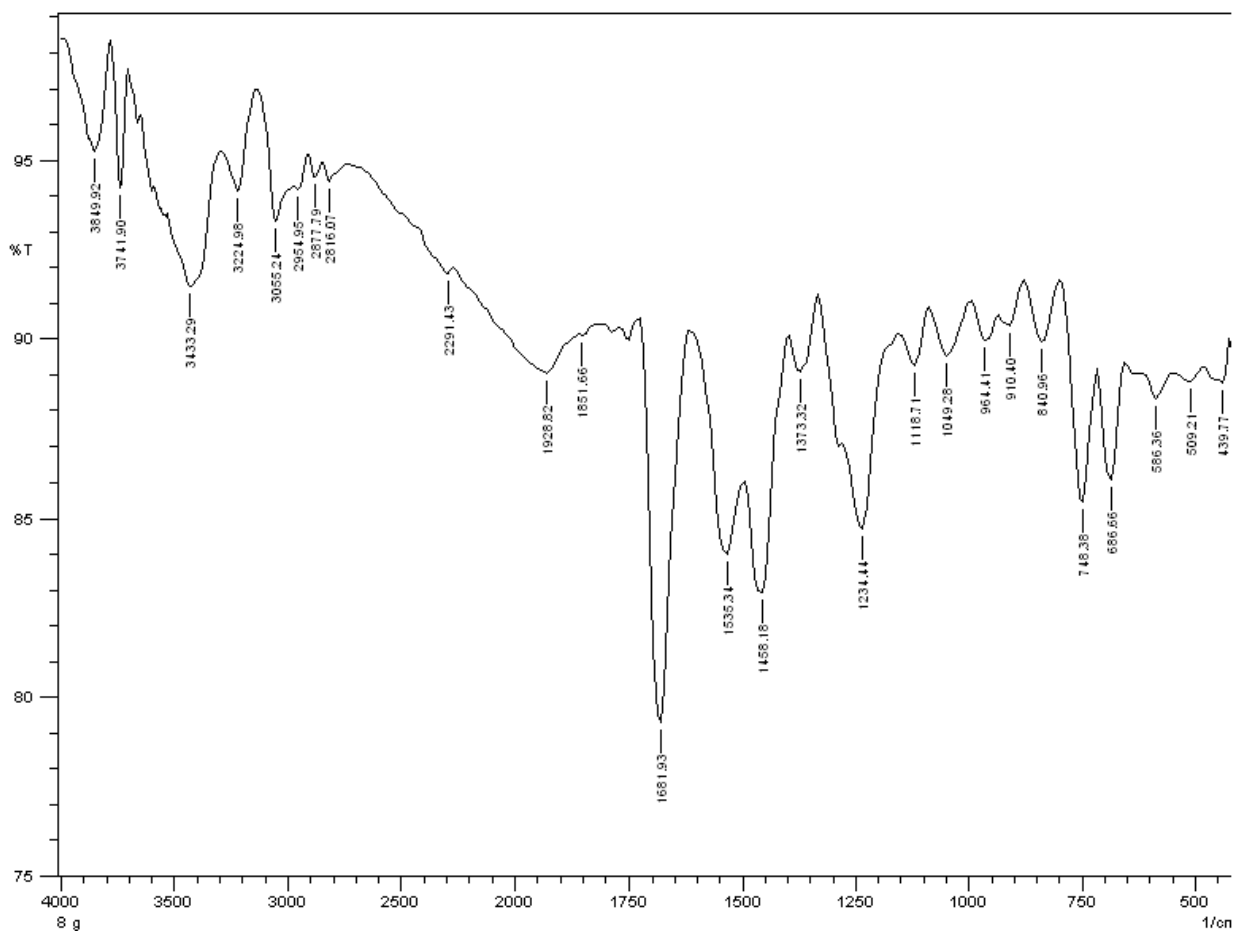
IR spectrum of 8f



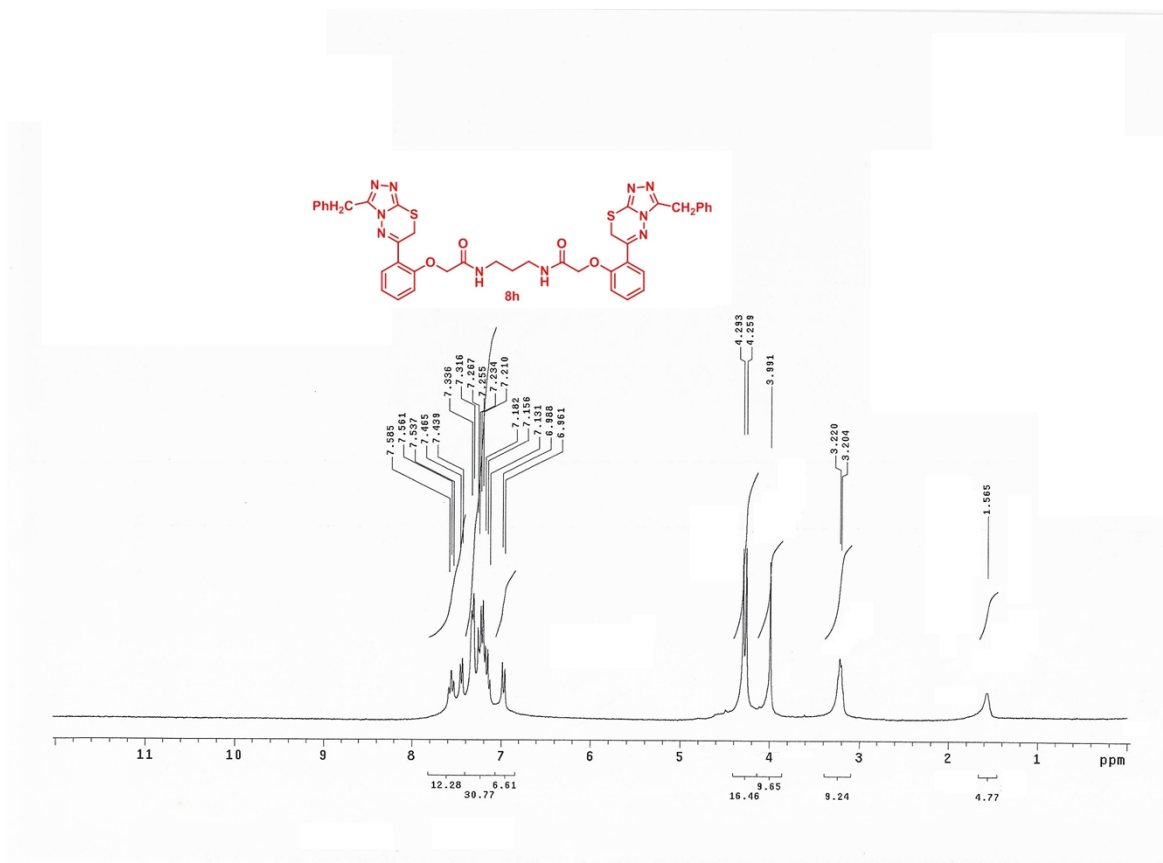
¹H NMR spectrum of 8g



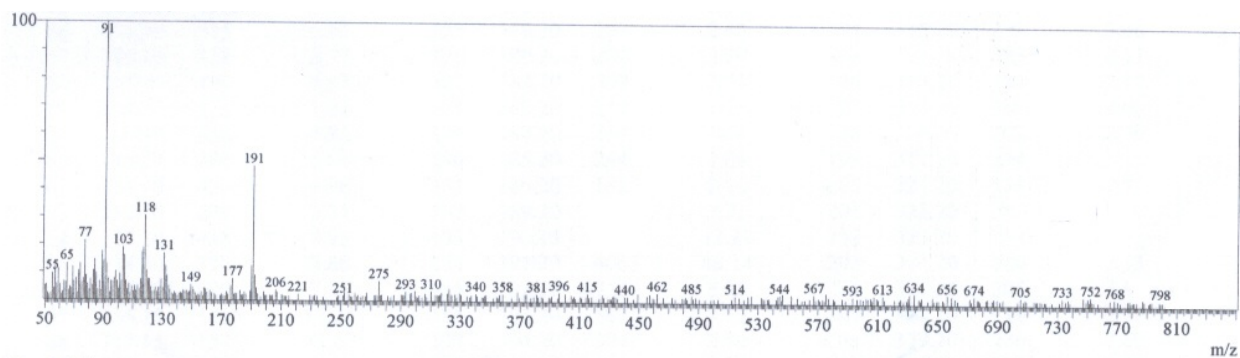
Mass spectrum of 8g



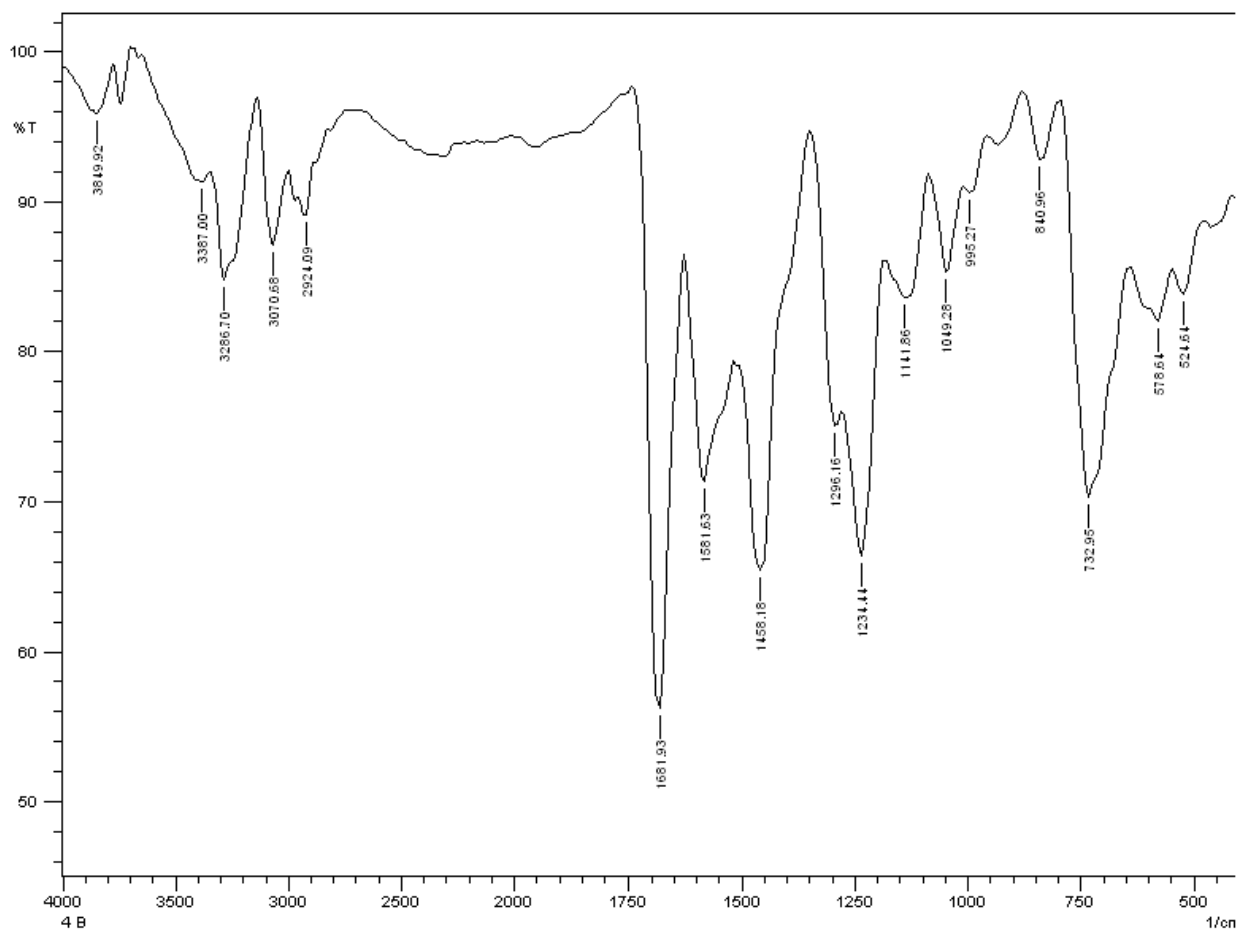
IR spectrum of 8g



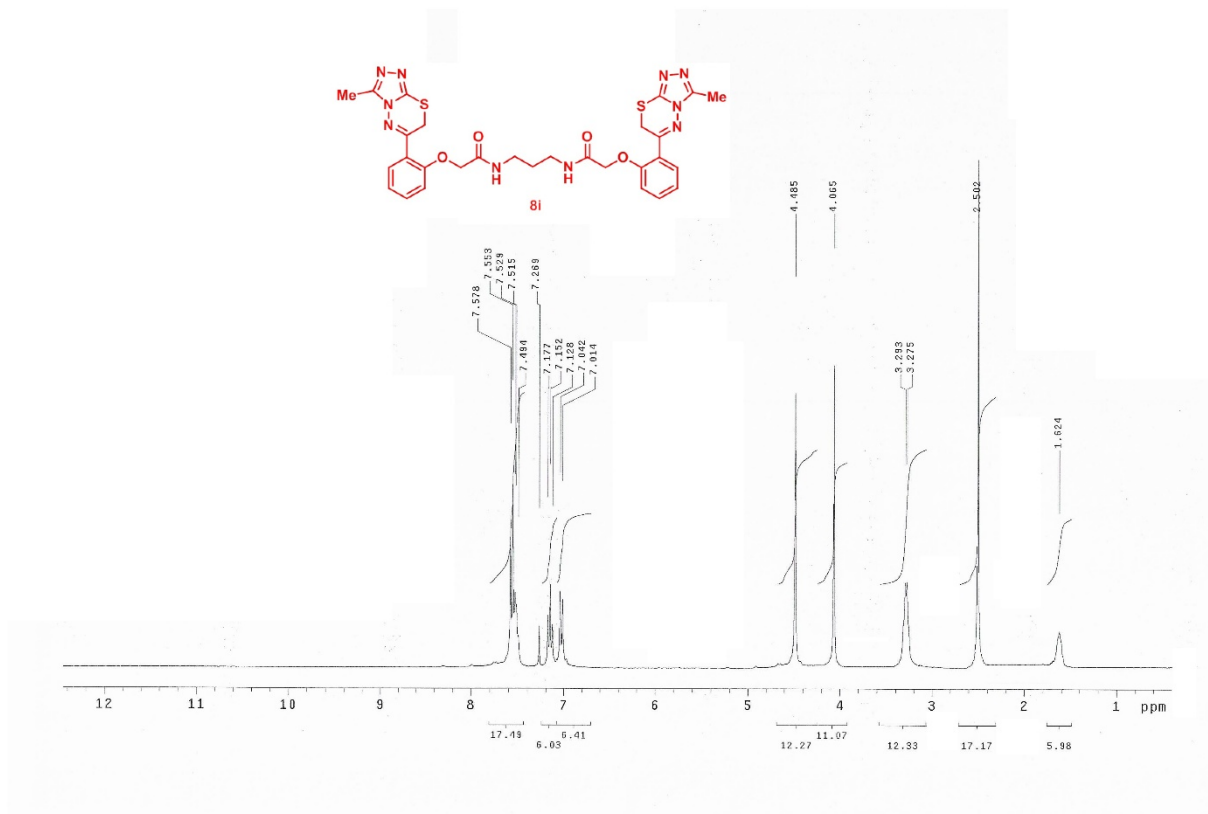
¹H NMR spectrum of 8h



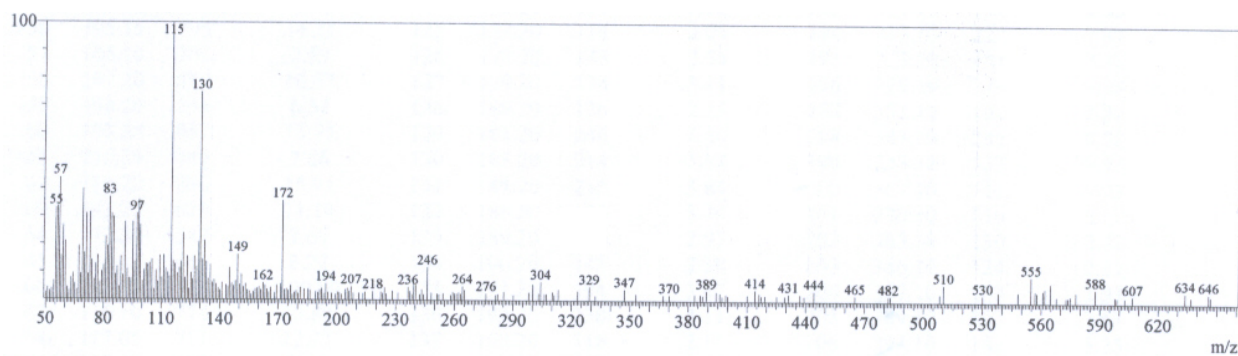
Mass spectrum of 8h



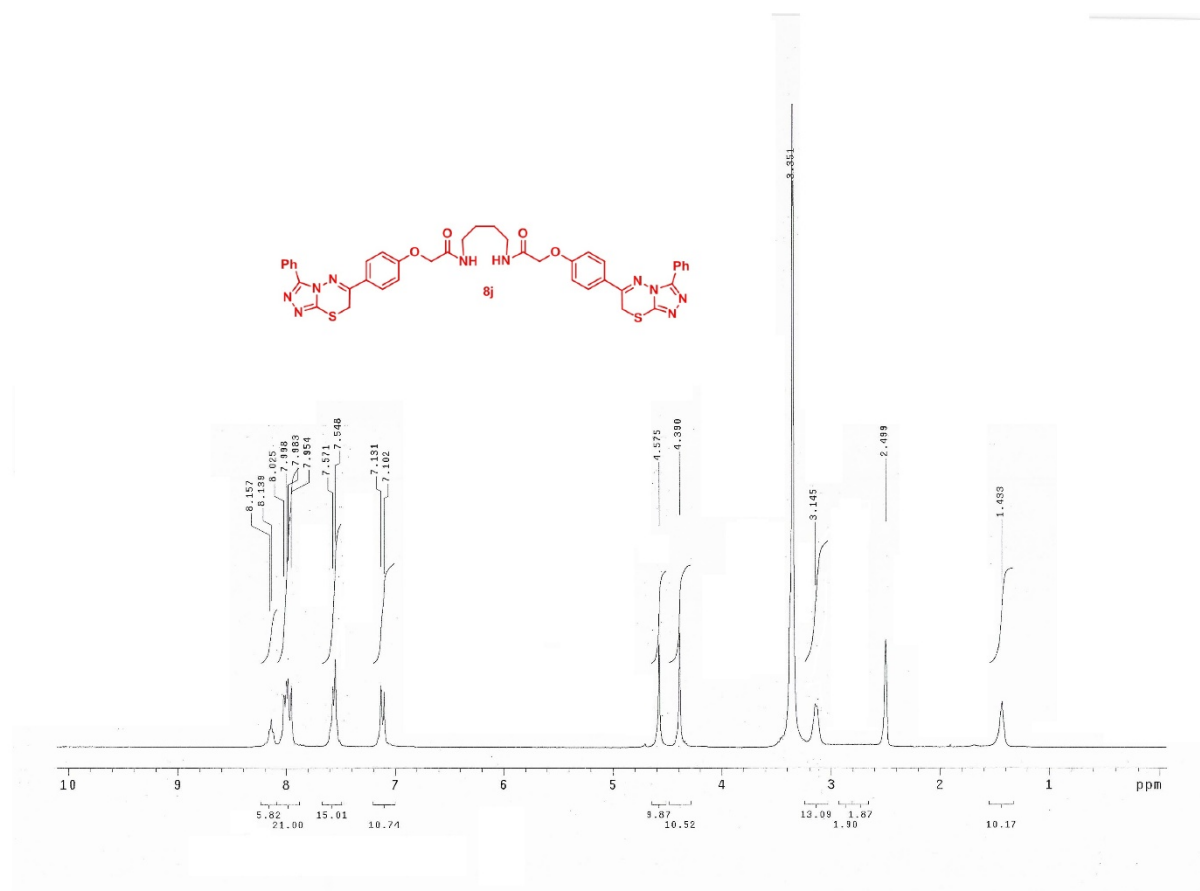
IR spectrum of 8h



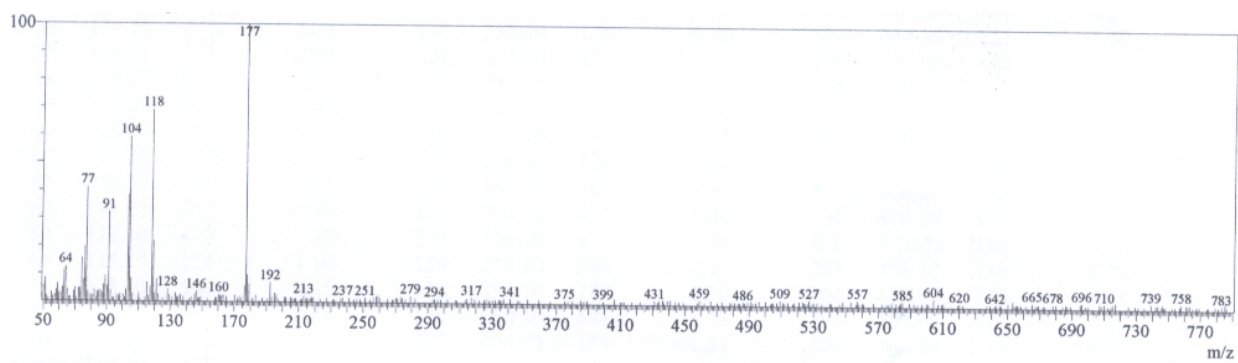
¹H NMR spectrum of 8i



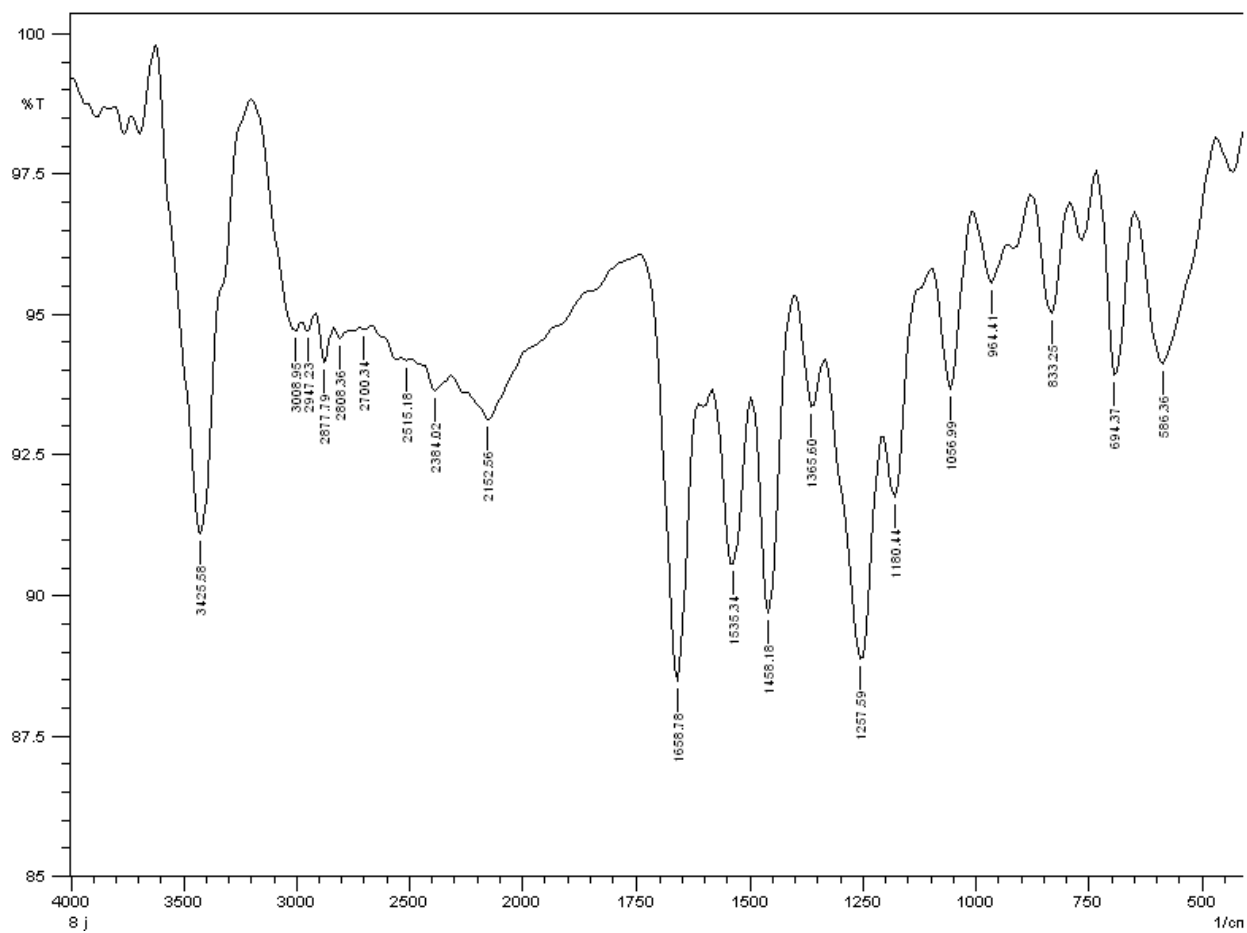
Mass spectrum of 8i



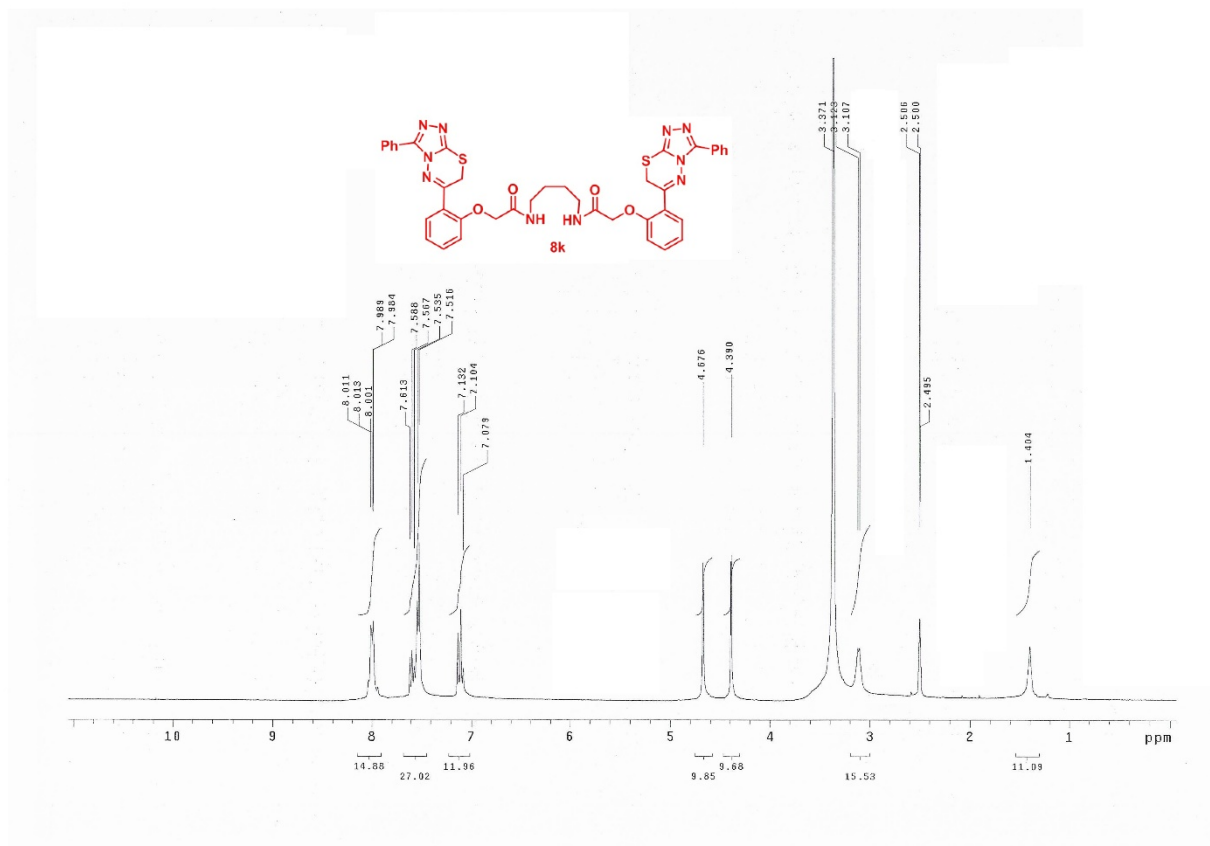
¹H NMR spectrum of 8j



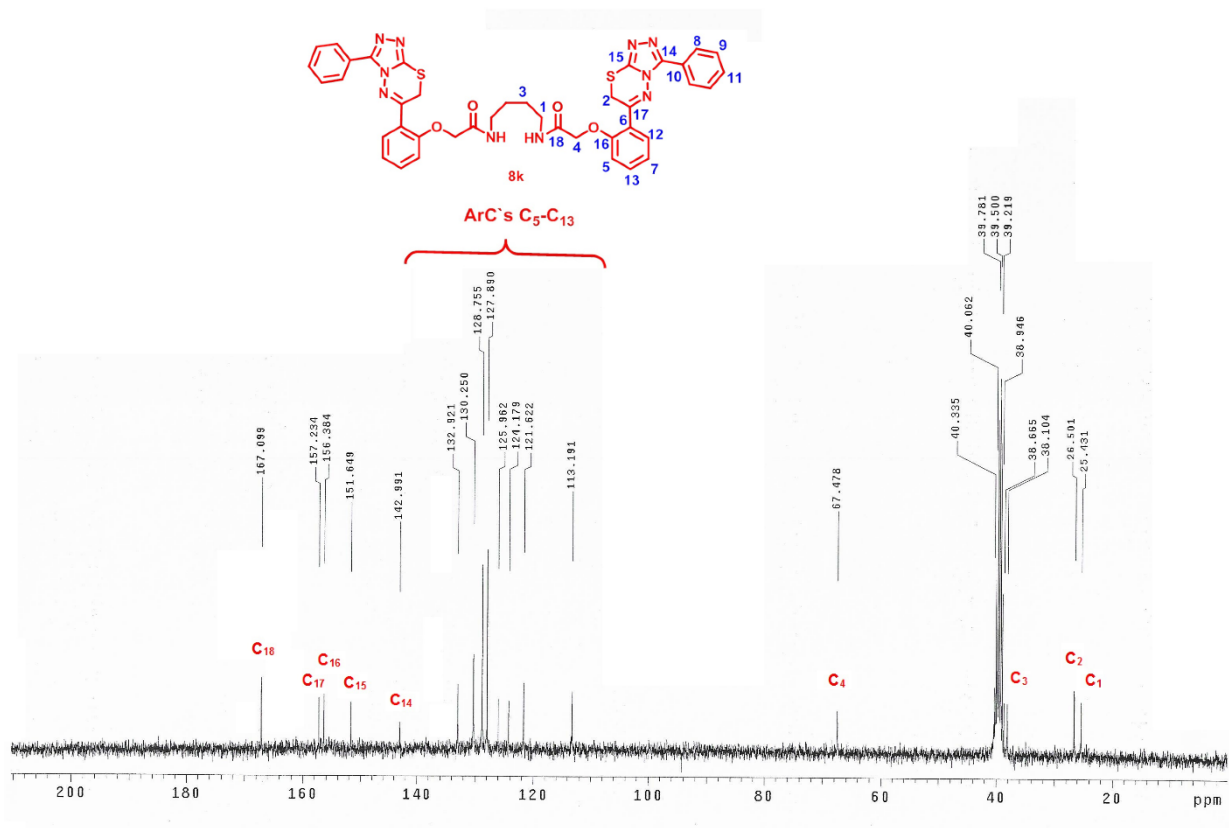
Mass spectrum of 8j



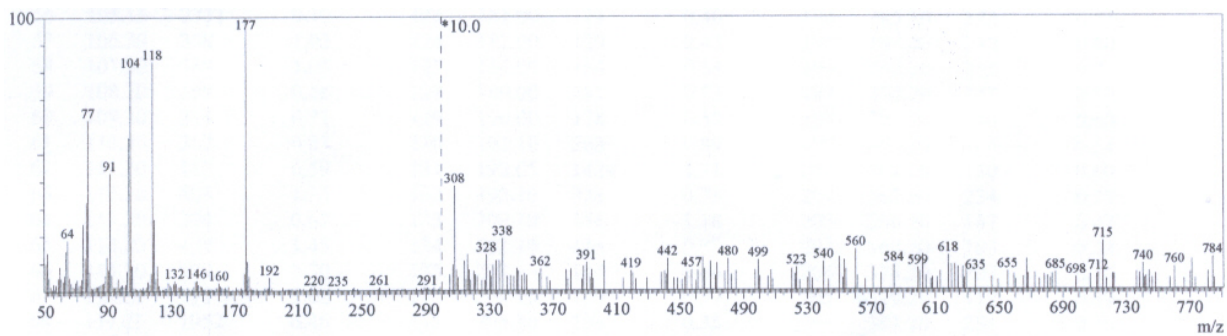
IR spectrum of 8j



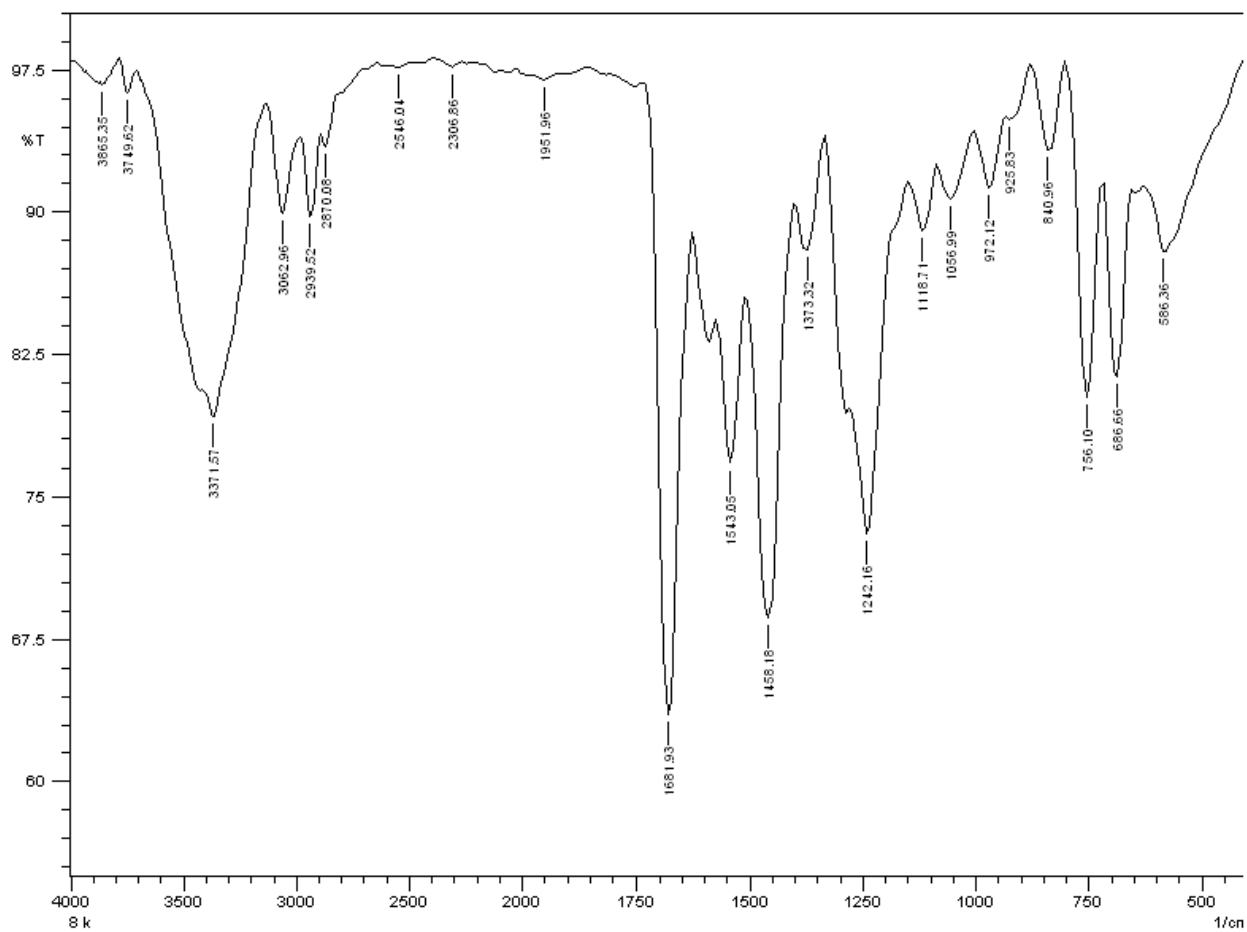
¹H NMR spectrum of 8k



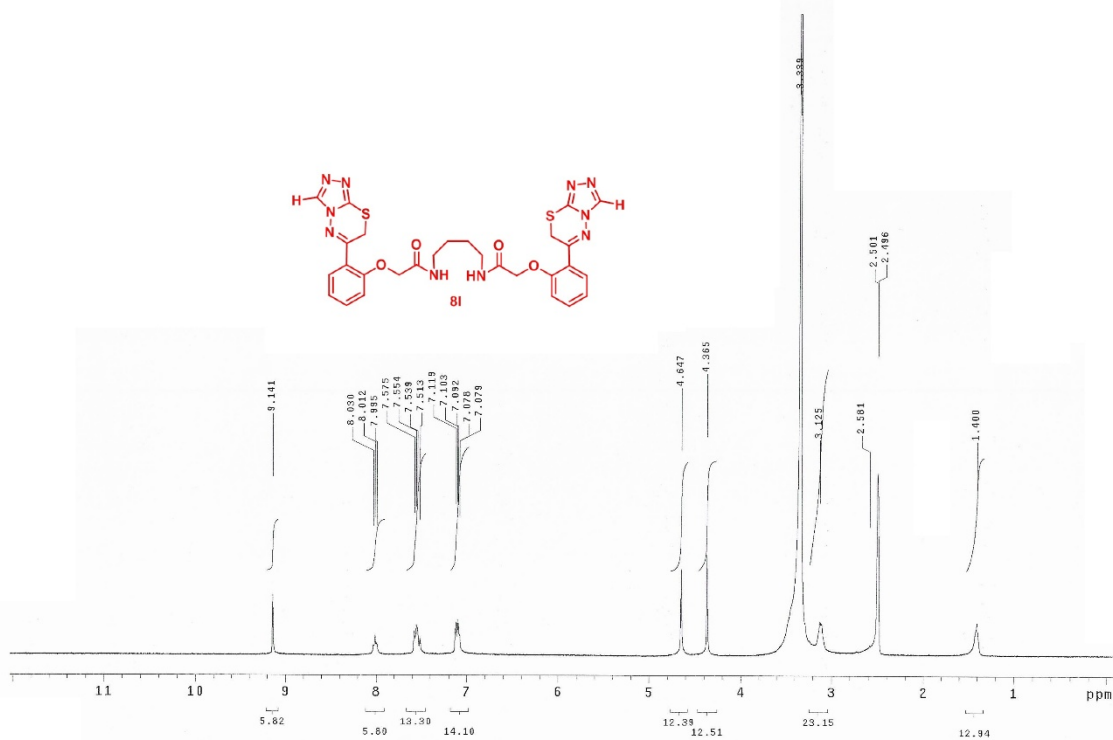
¹³C NMR spectrum of 8k



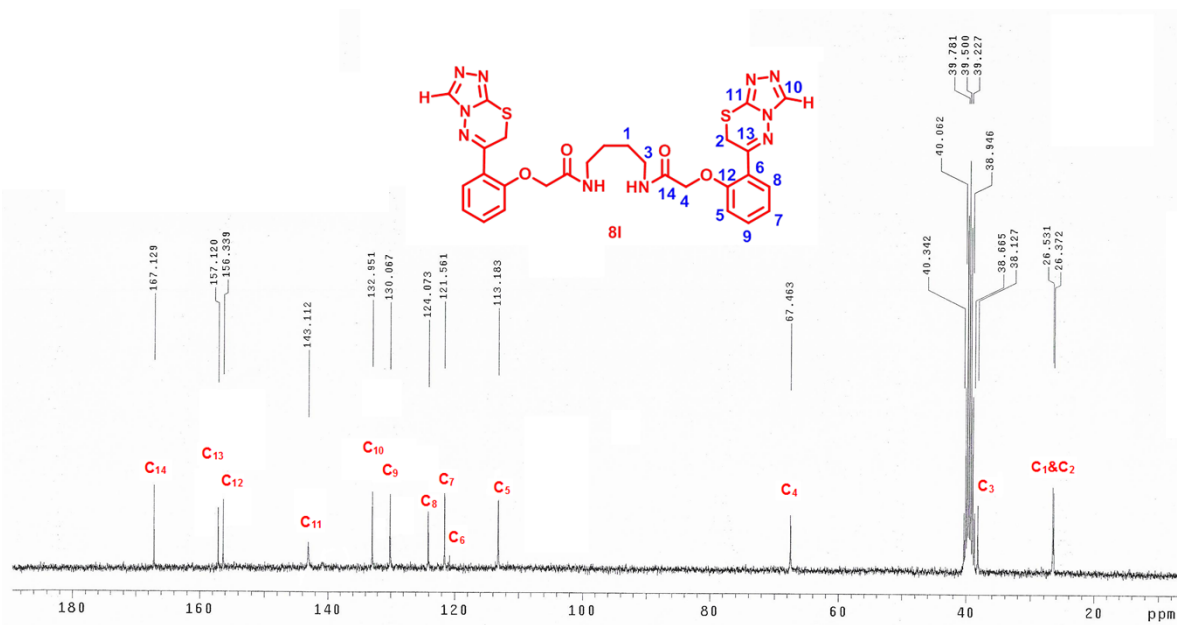
Mass spectrum of 8k



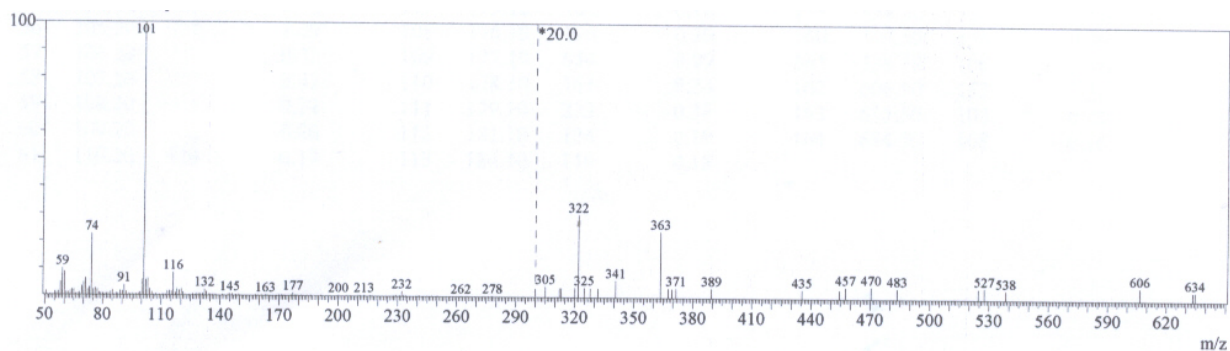
IR spectrum of 8k



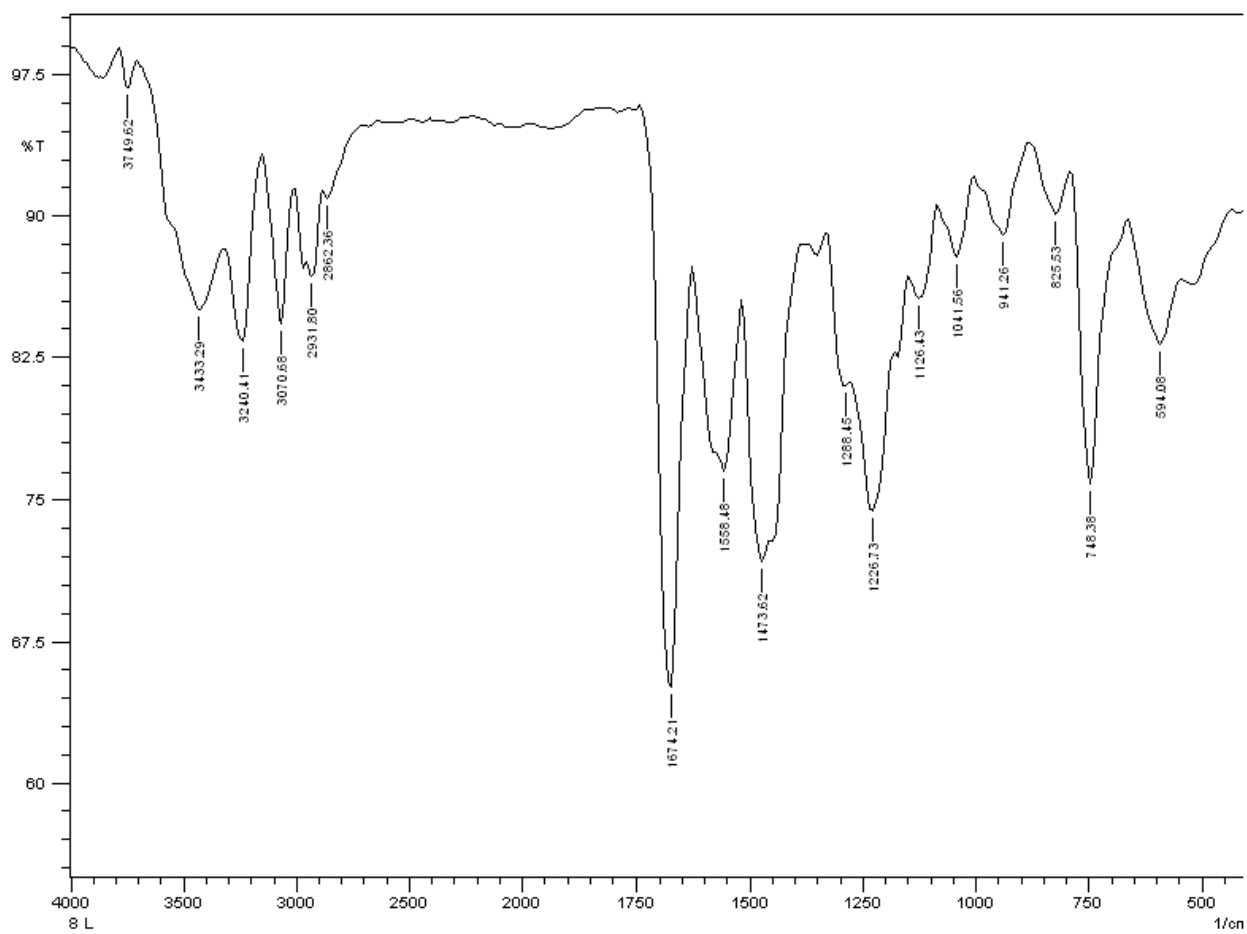
¹H NMR spectrum of 8I



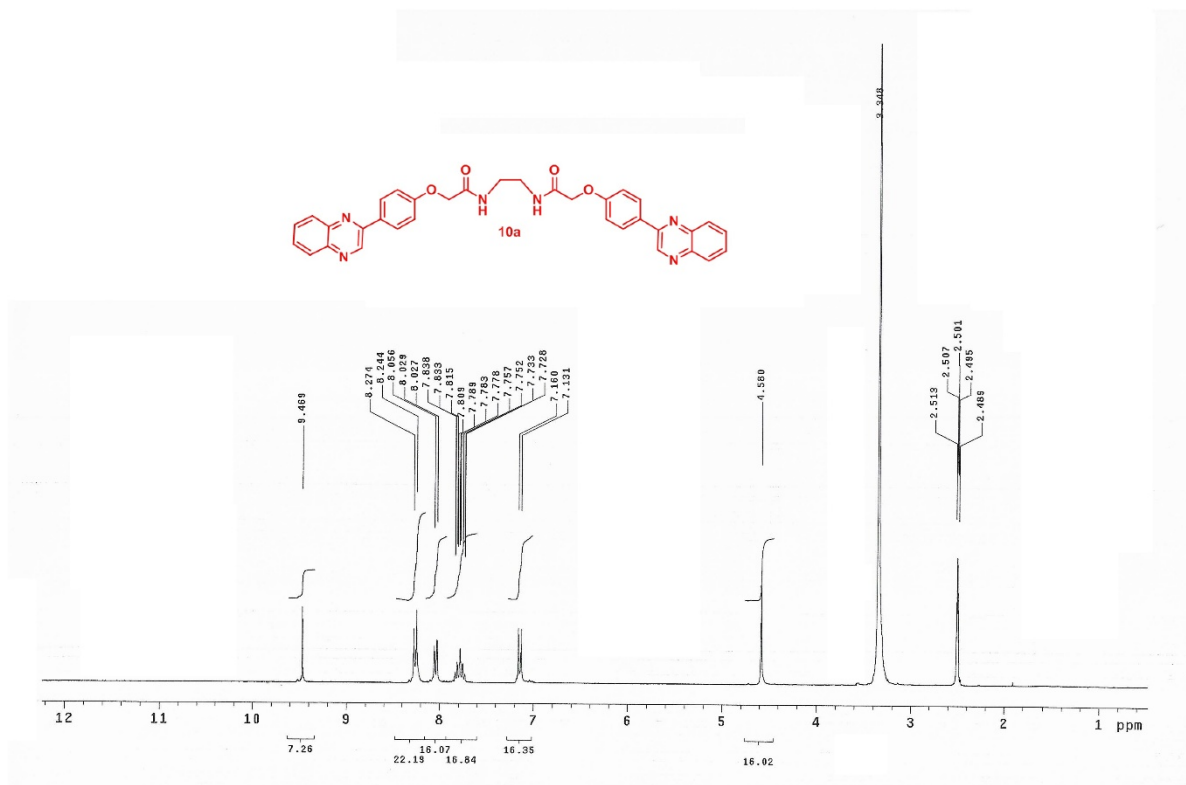
¹³C NMR spectrum of 8I



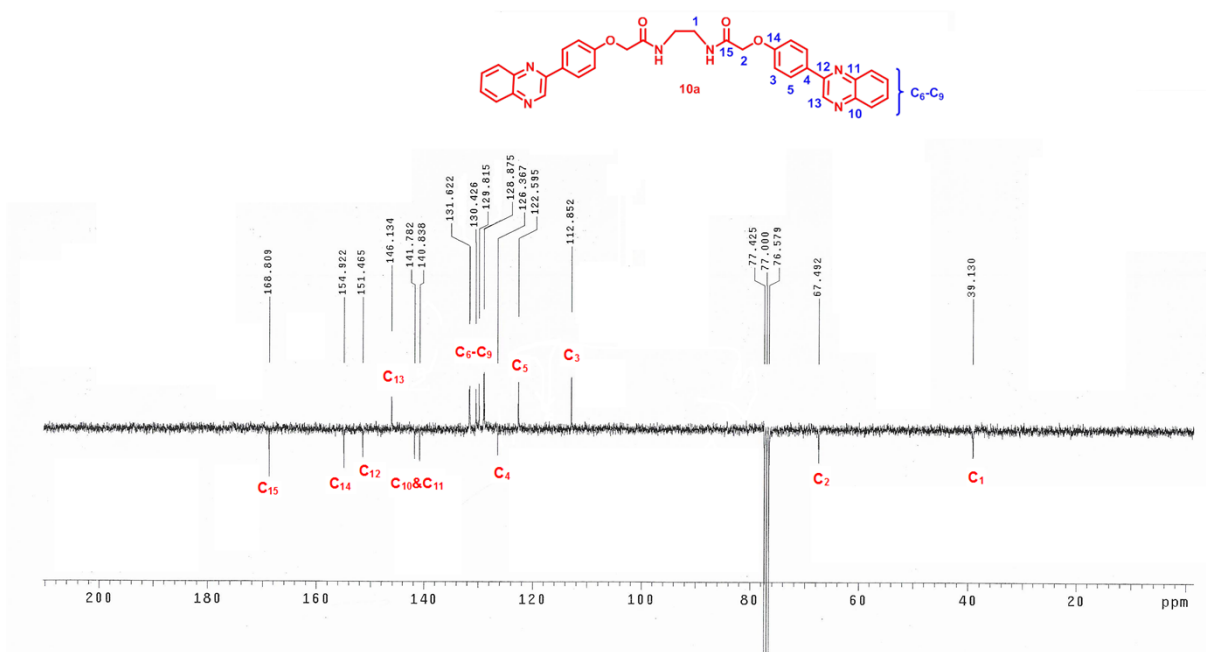
Mass spectrum of 8l



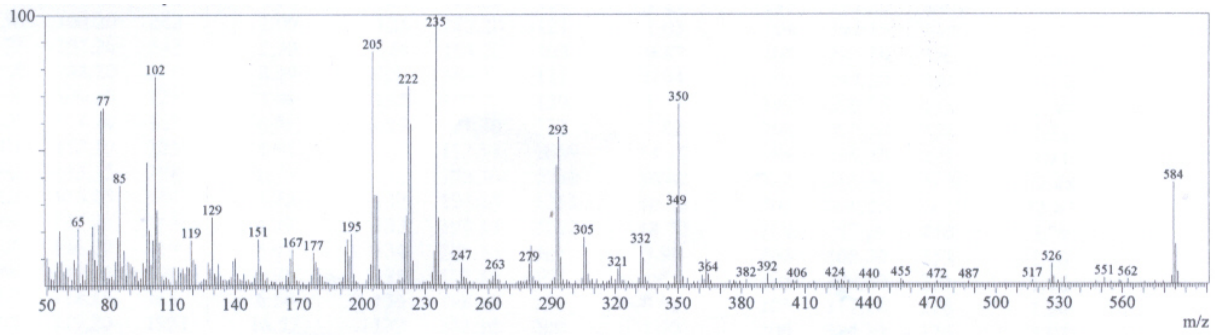
IR spectrum of 8l



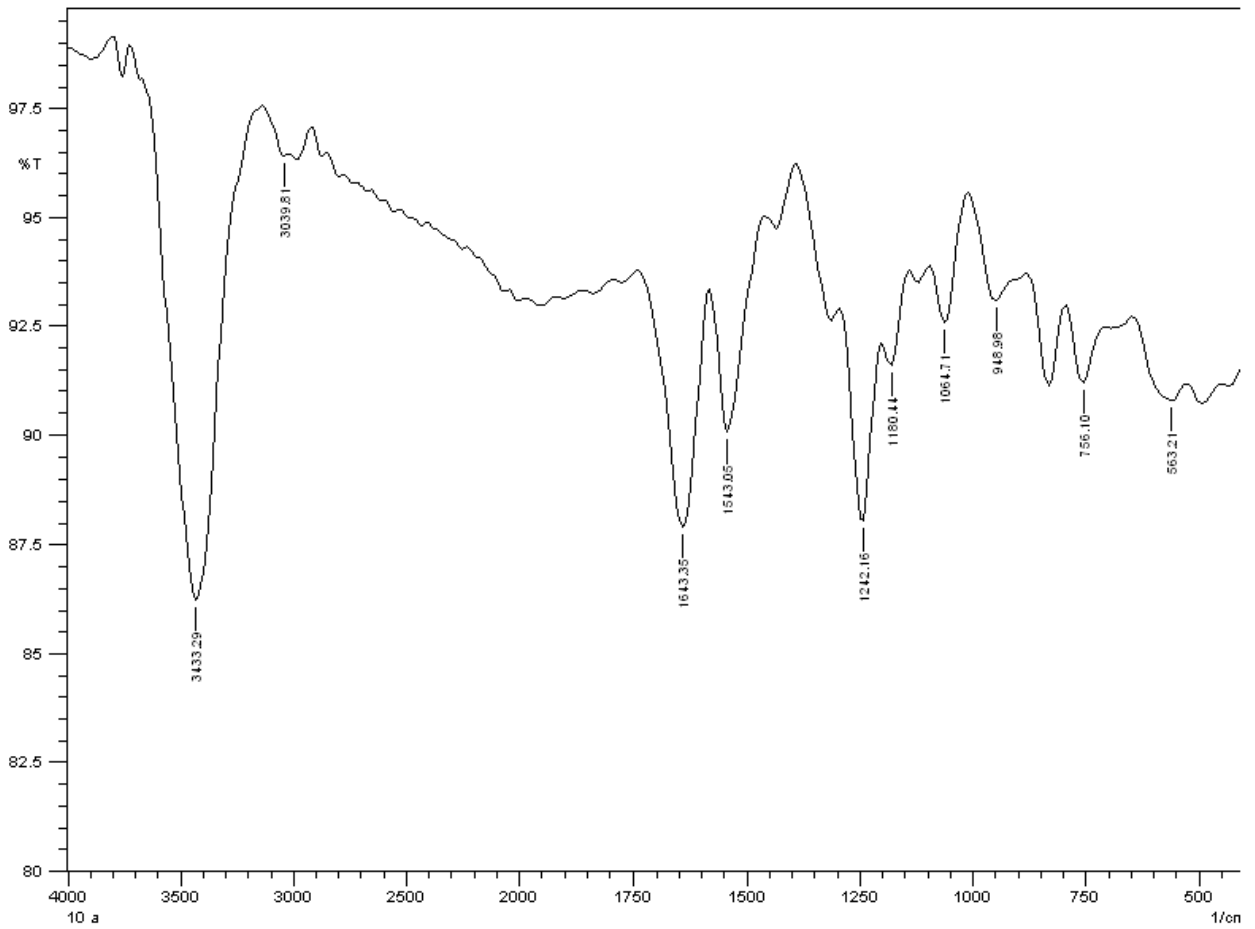
¹H NMR spectrum of 10a



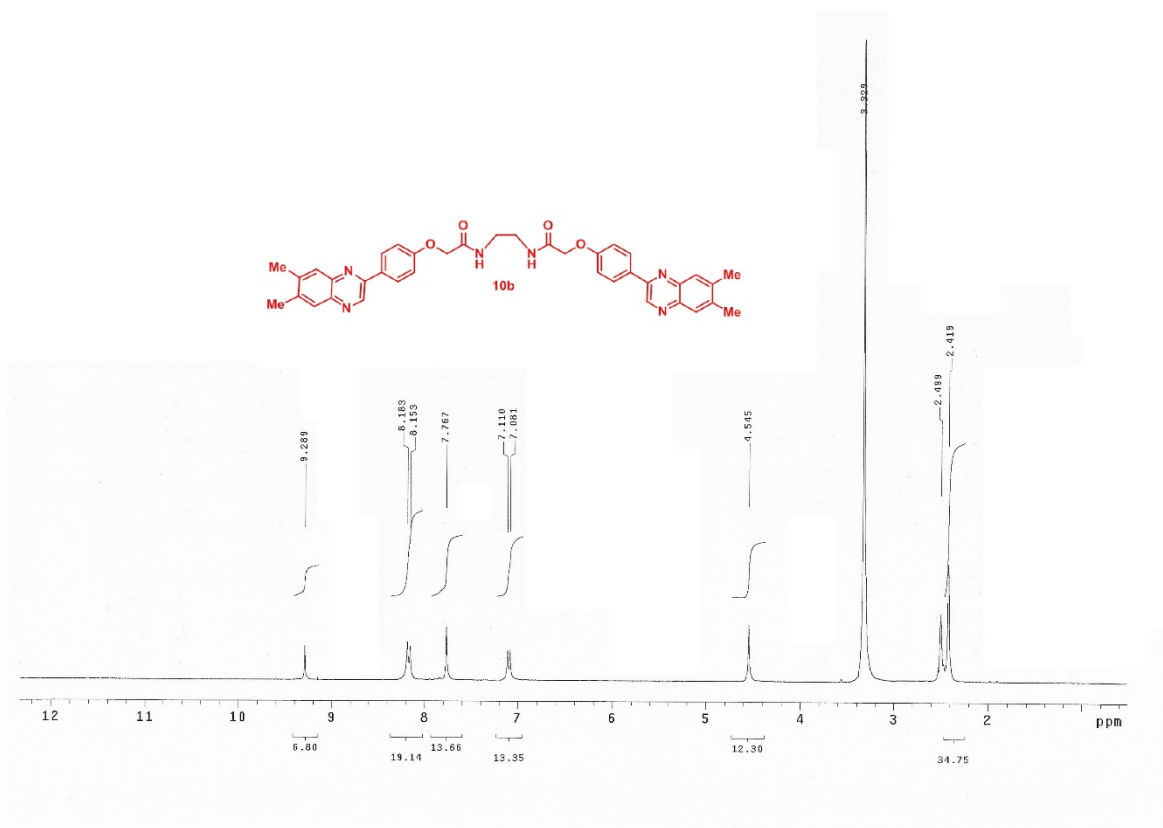
¹³C NMR spectrum of 10a (APT)



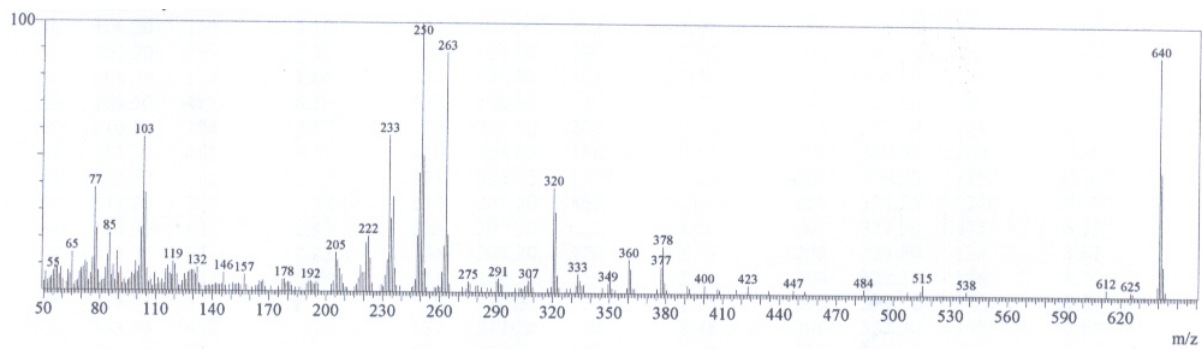
Mass spectrum of 10a



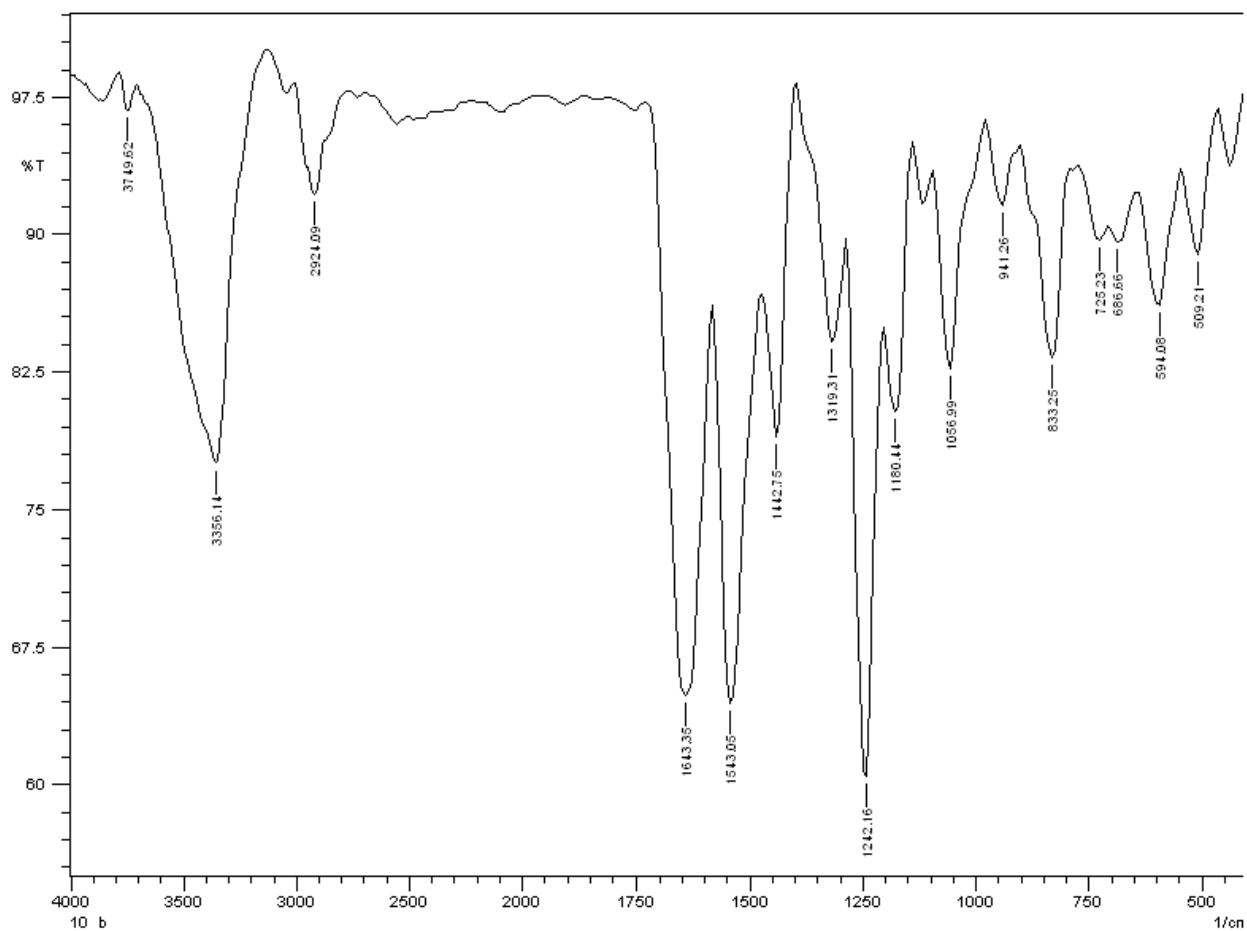
IR spectrum of 10a



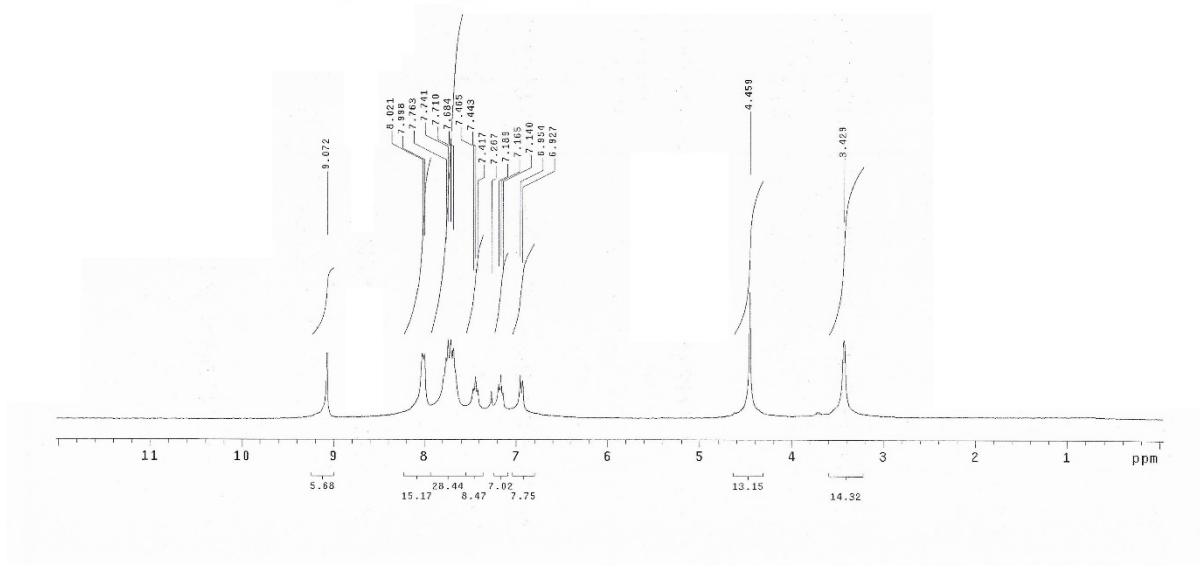
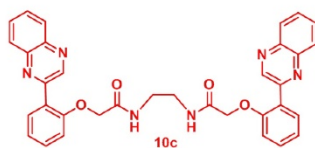
¹H NMR spectrum of 10b



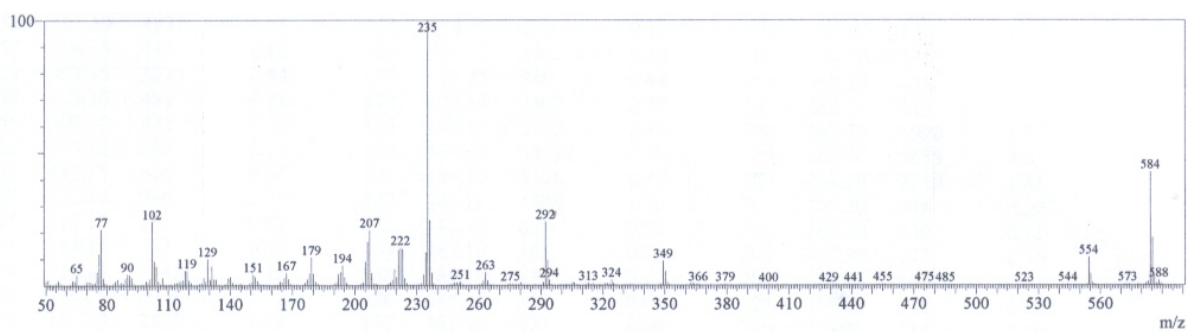
Mass spectrum of 10b



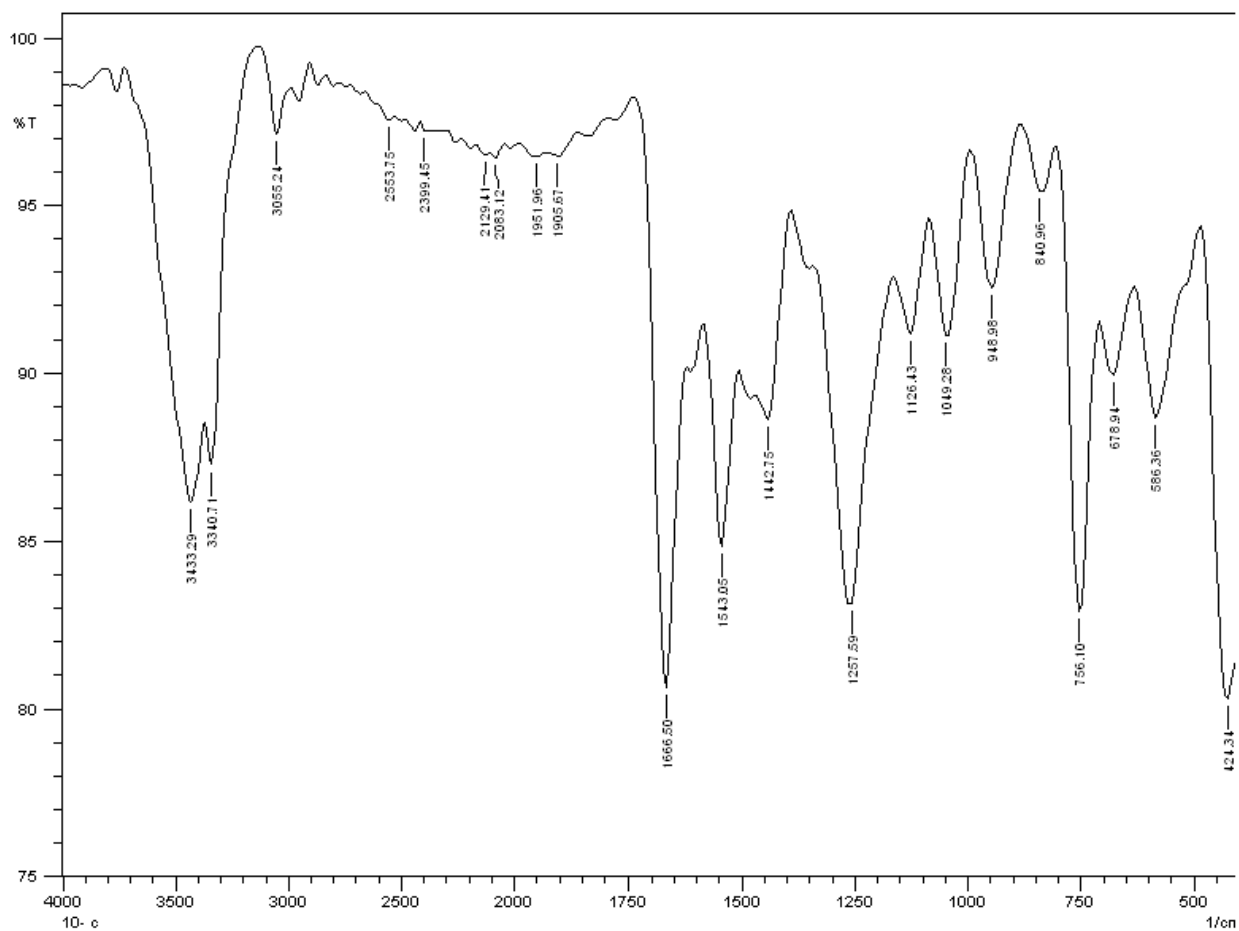
IR spectrum of 10b



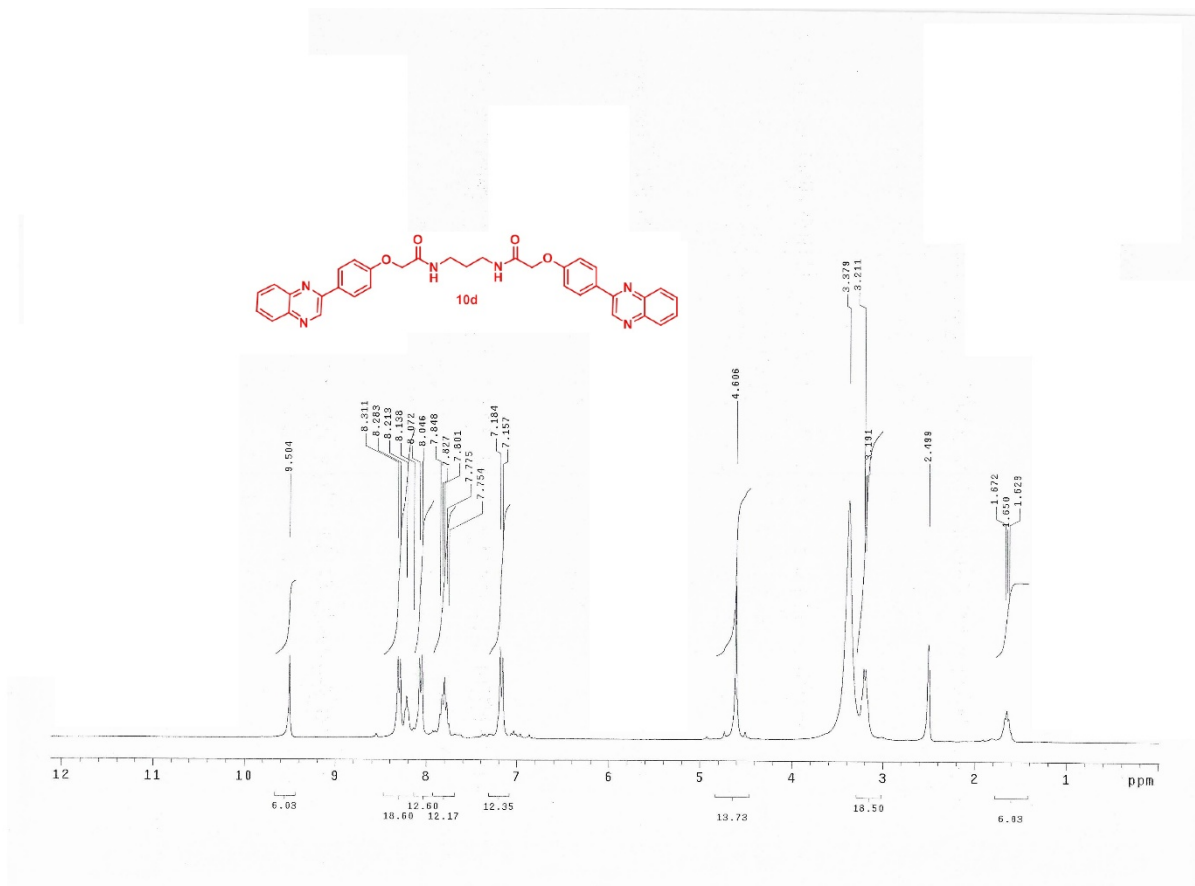
¹H NMR spectrum of 10c



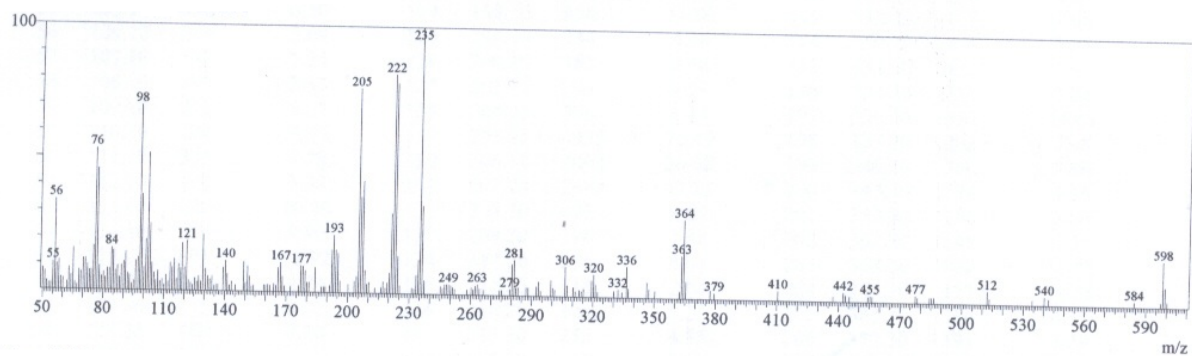
Mass spectrum of 10c



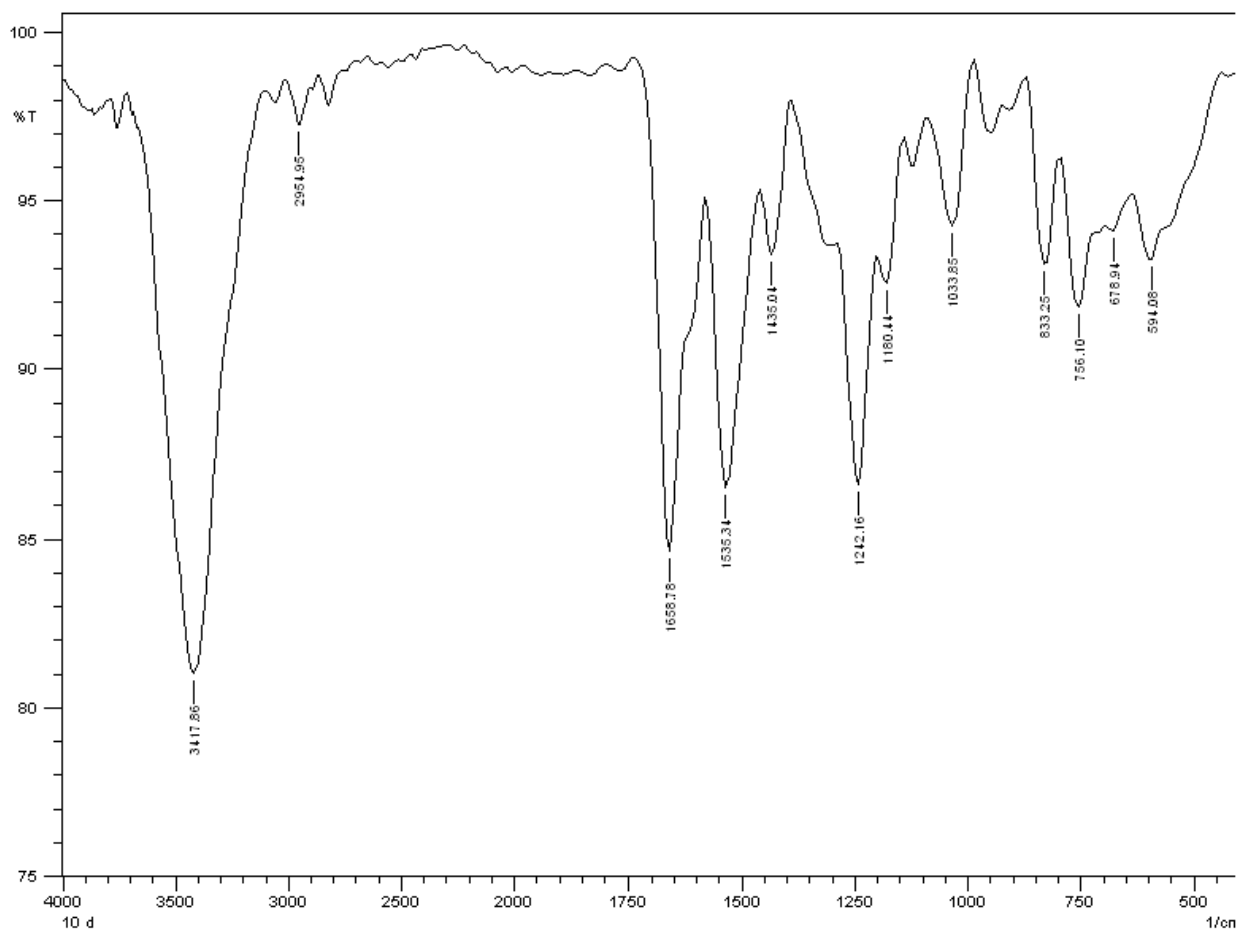
IR spectrum of 10c



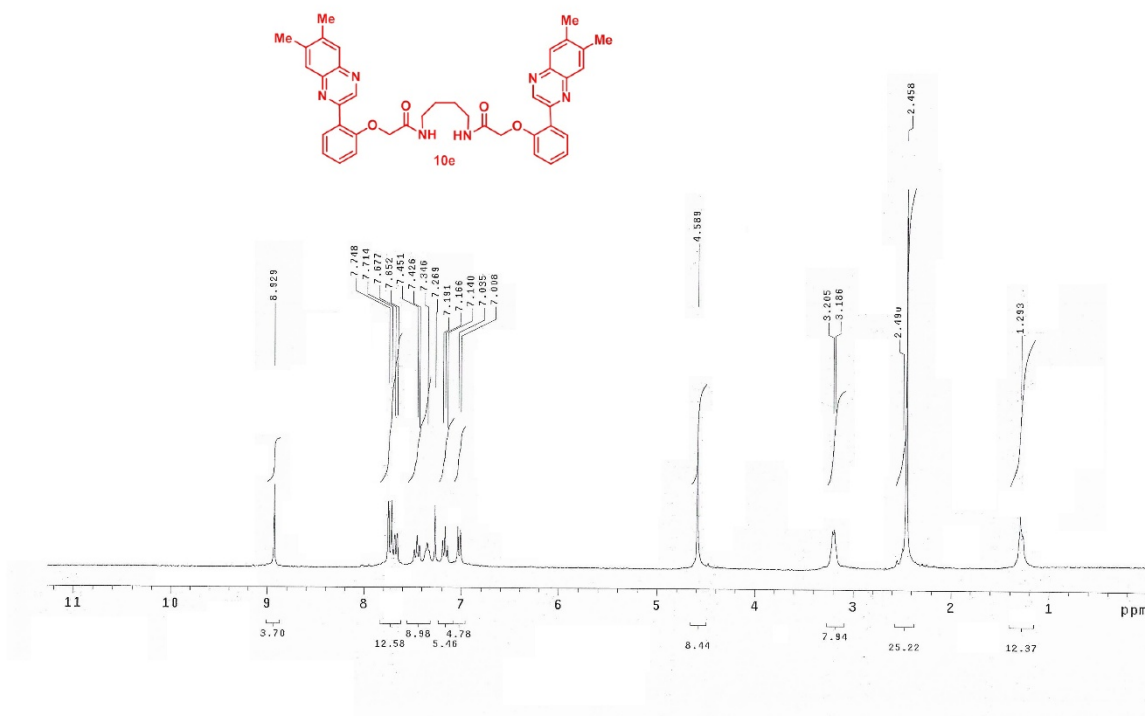
¹H NMR spectrum of 10d



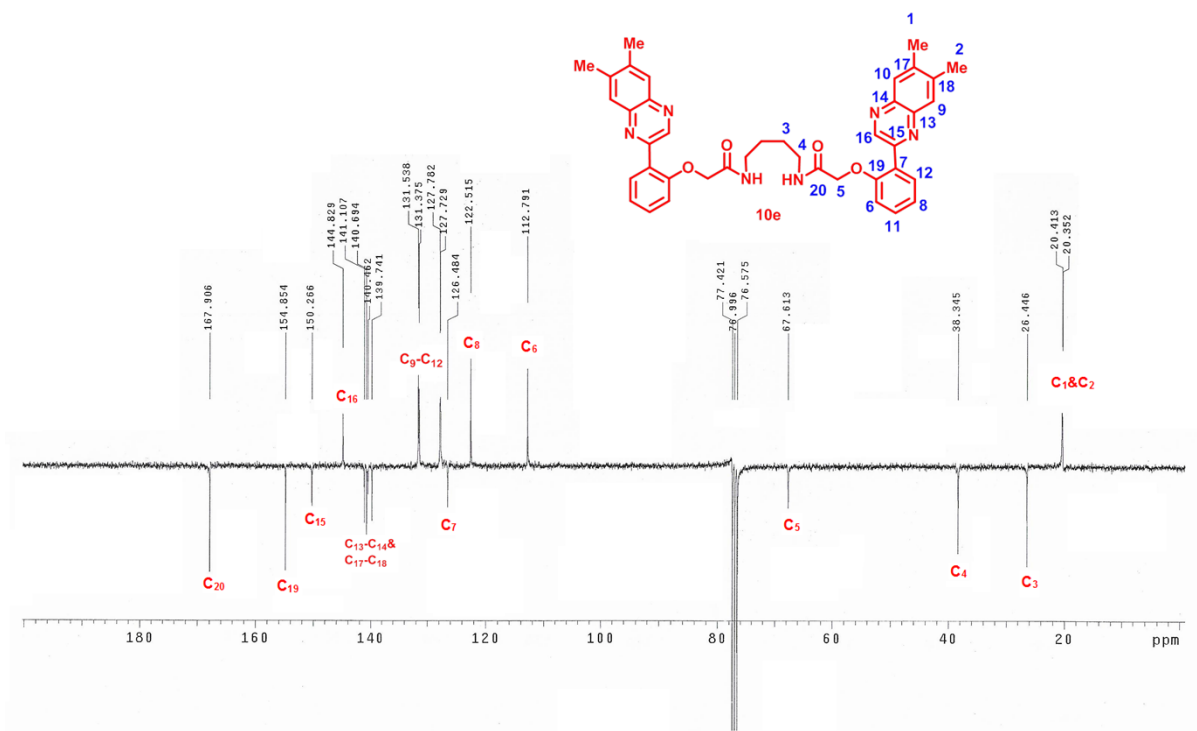
Mass spectrum of 10d



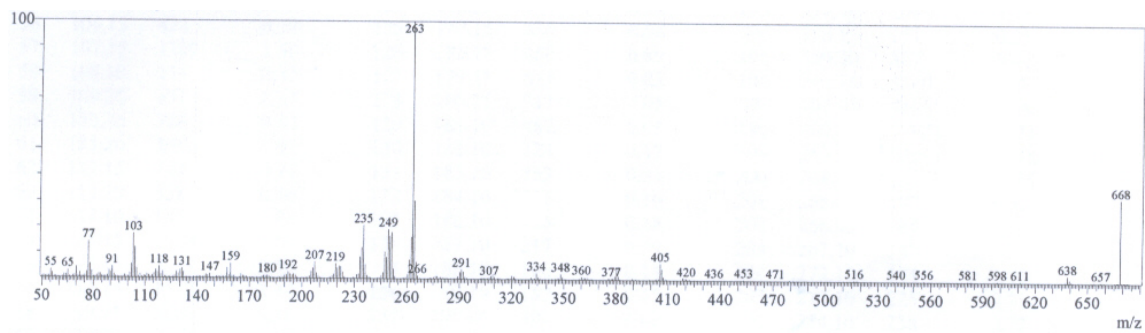
IR spectrum of 10d



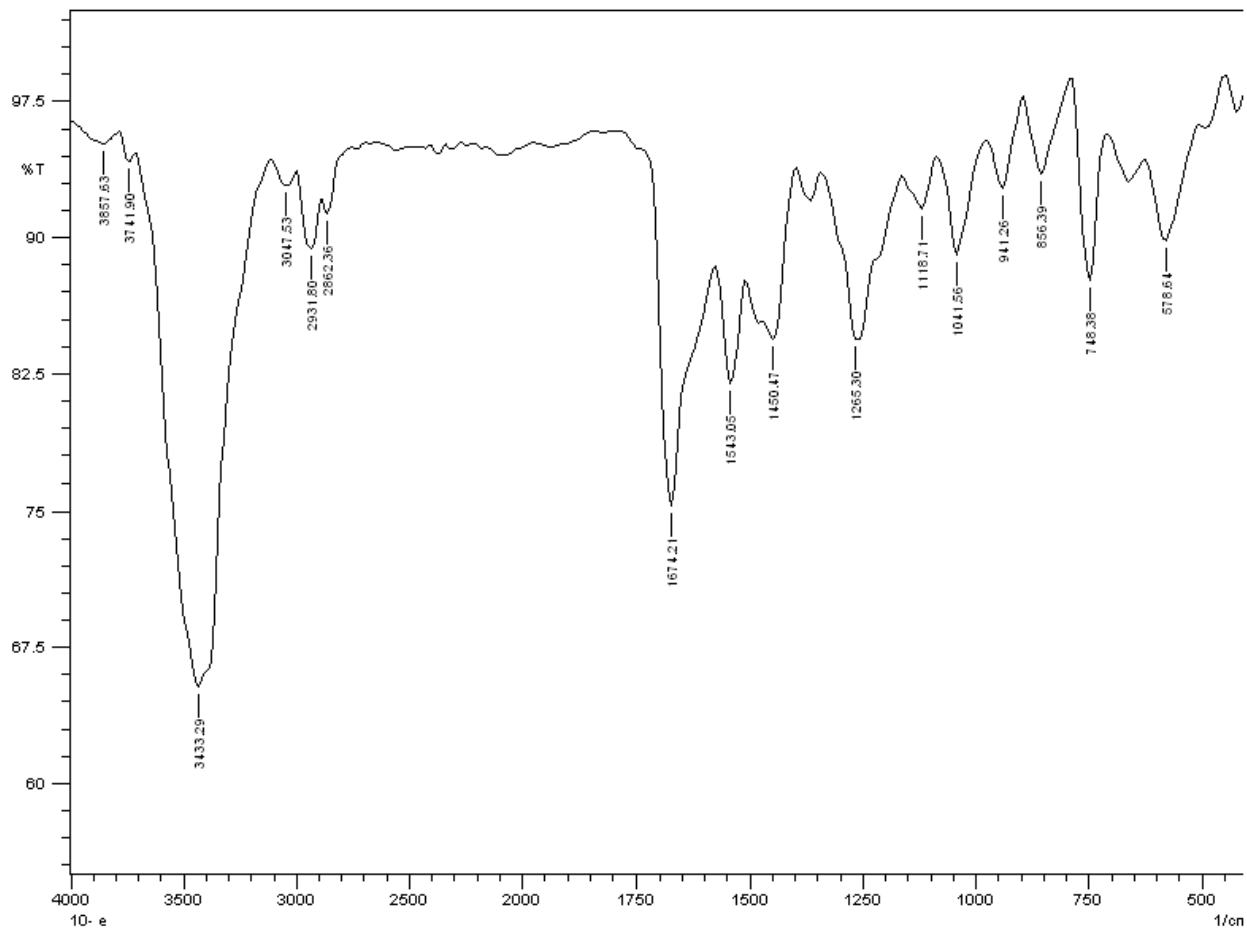
¹H NMR spectrum of 10e



¹³C NMR spectrum of 10e (APT)



Mass spectrum of 10e



IR spectrum of 10e