

Supplementary Material

N-(1H-Pyrazol-5-yl)cyanoacetamide in heterocyclic synthesis: Synthesis of novel N-(pyrazol-5-yl)pyridine-3,5-dicarbonitriles and pyrazolo[4,3-e]pyrido[1,2-a]pyrimidine-6,8-dicarbonitrile moieties

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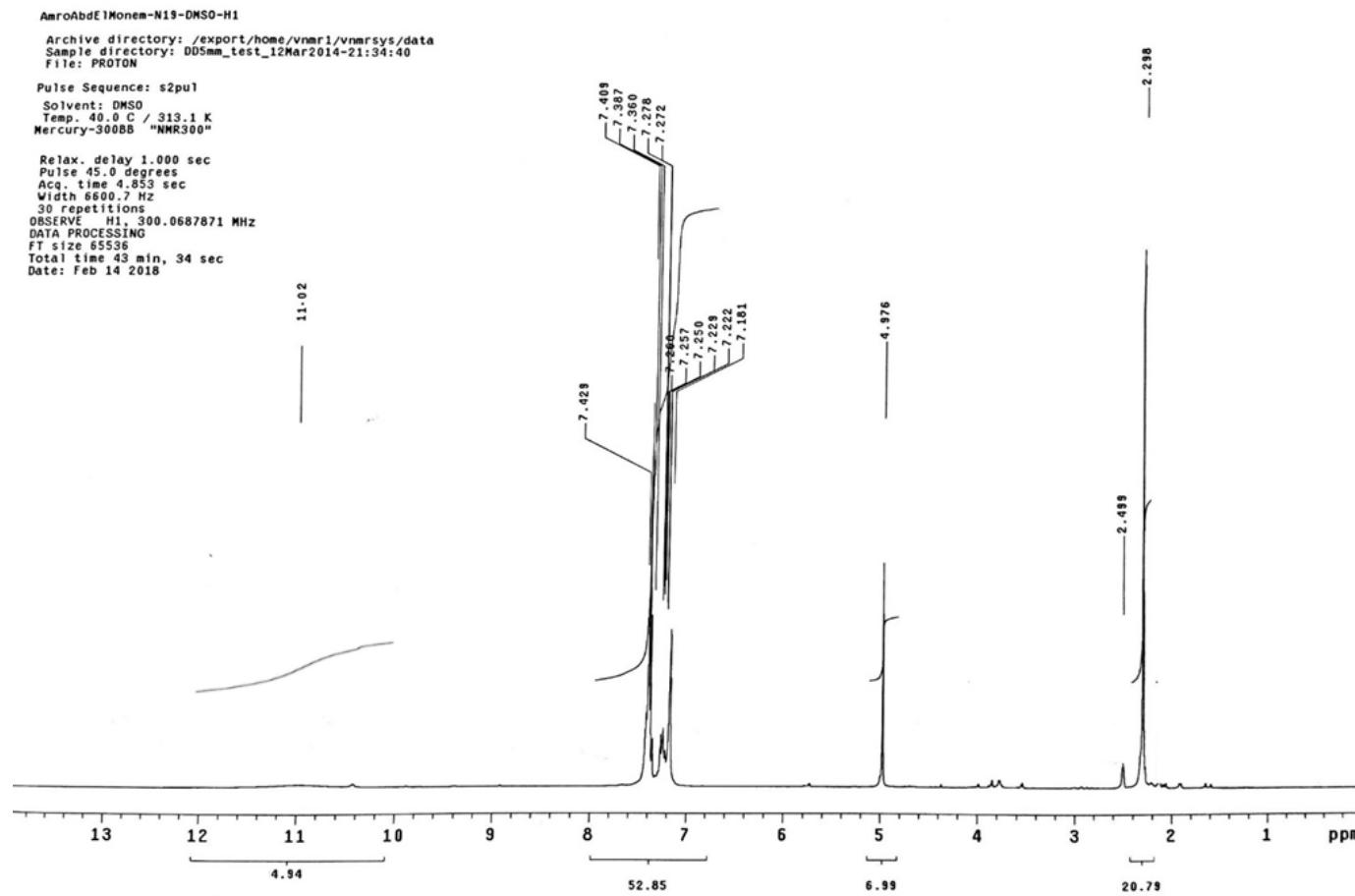


Figure 1. The ^1H NMR spectrum of compound 5.

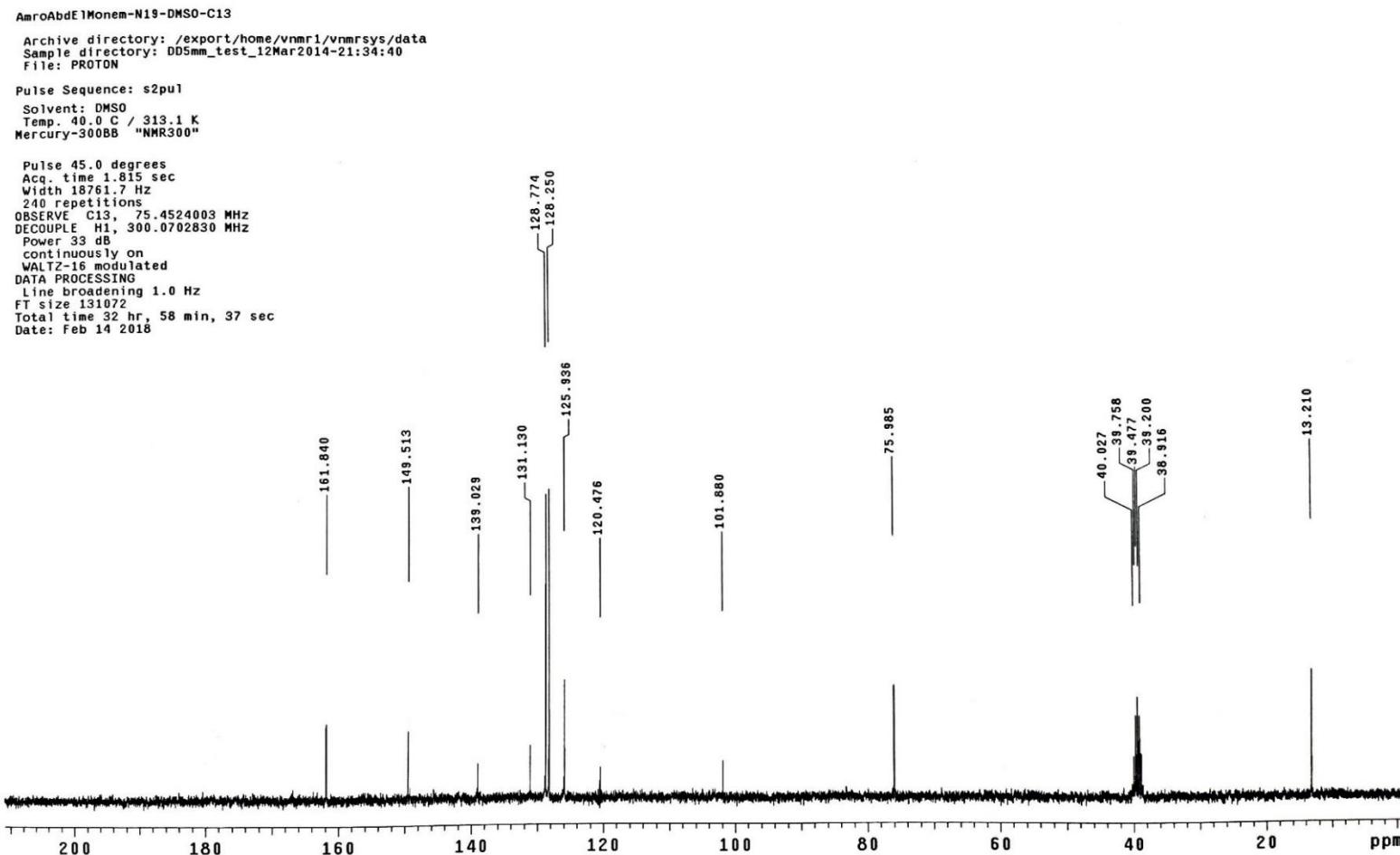


Figure 2. The ^{13}C NMR spectrum of compound 5.

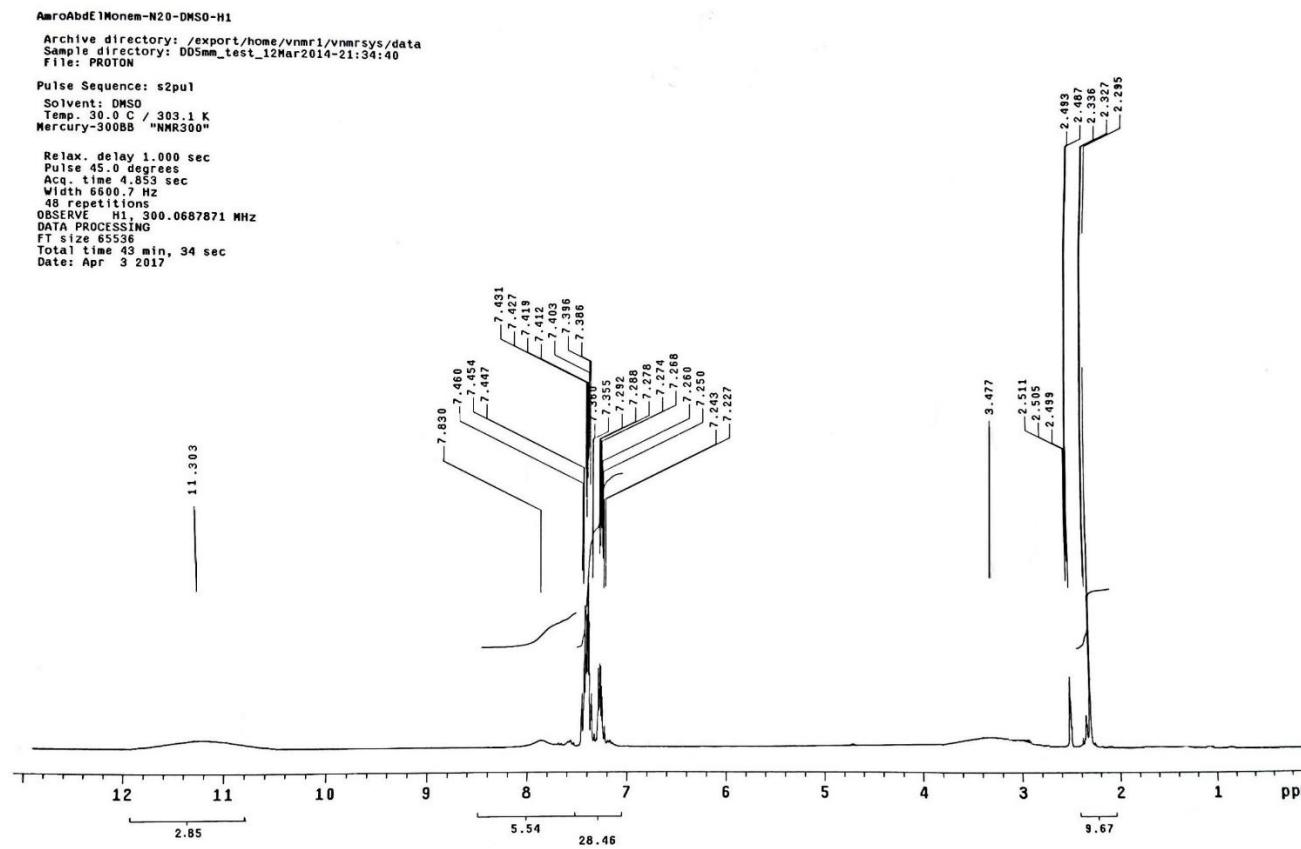


Figure 3. The ^1H NMR spectrum of compound 7a.

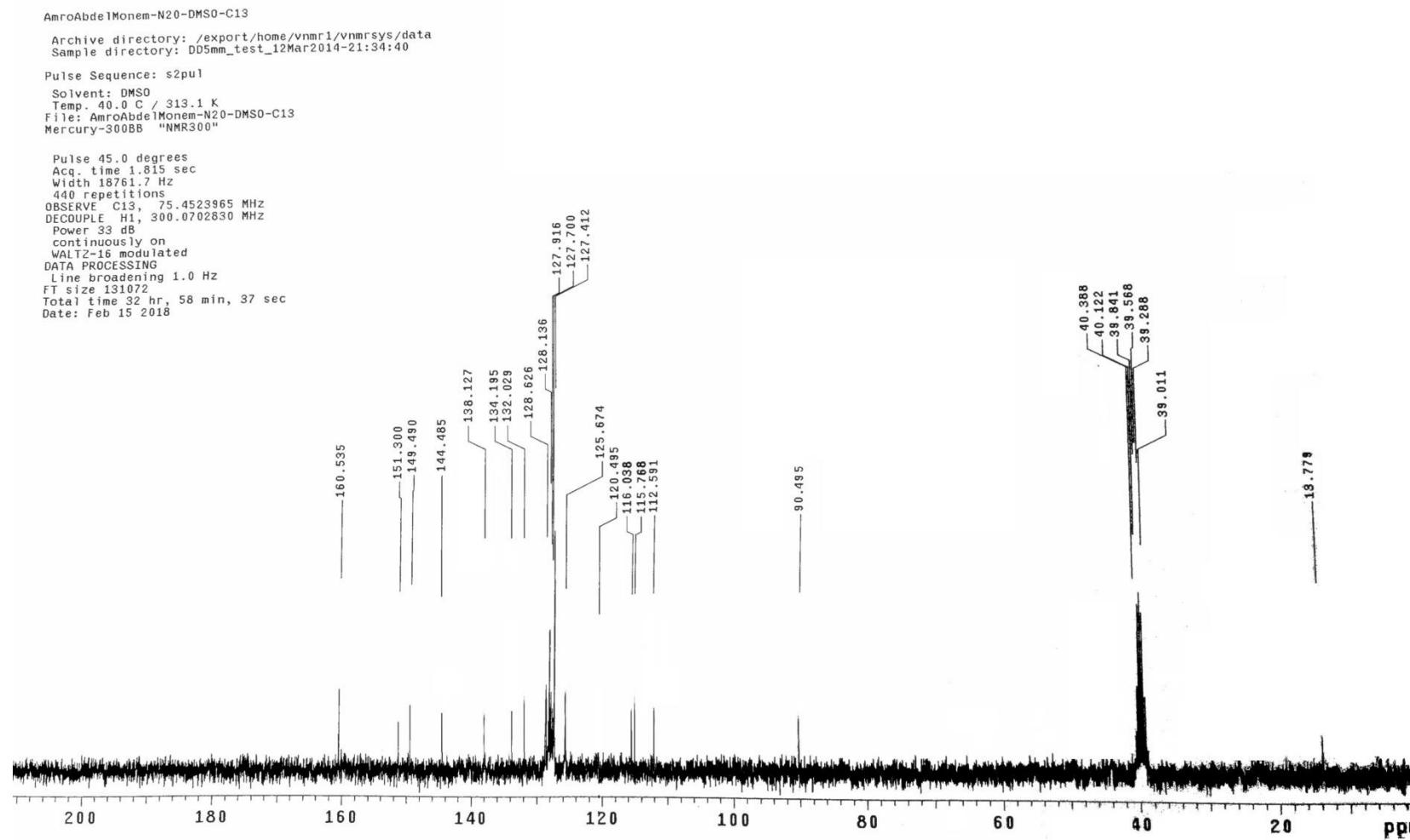


Figure 4. The ^{13}C NMR spectrum of compound 7a.

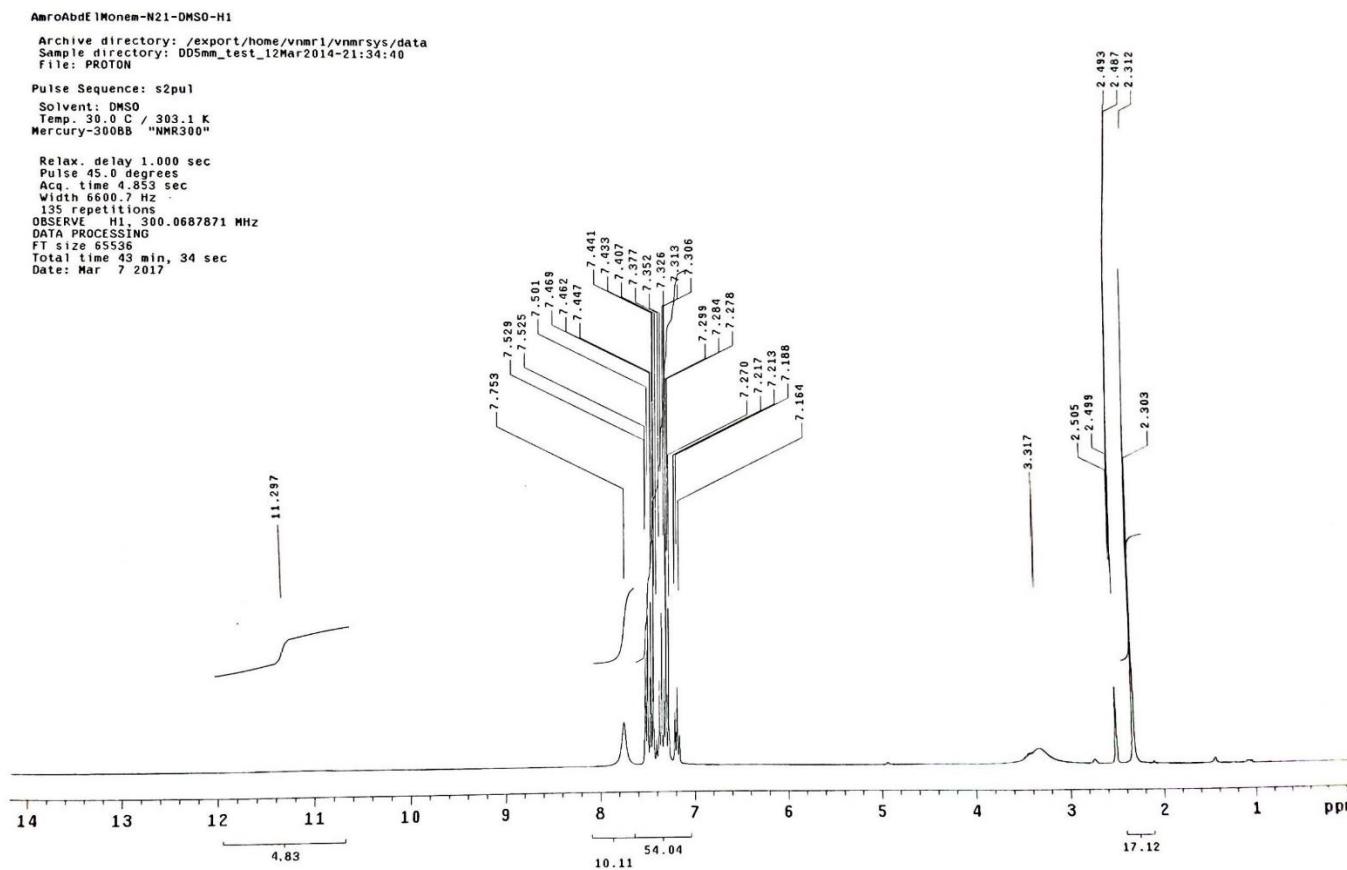


Figure 5. The ^1H NMR spectrum of compound **7b**.

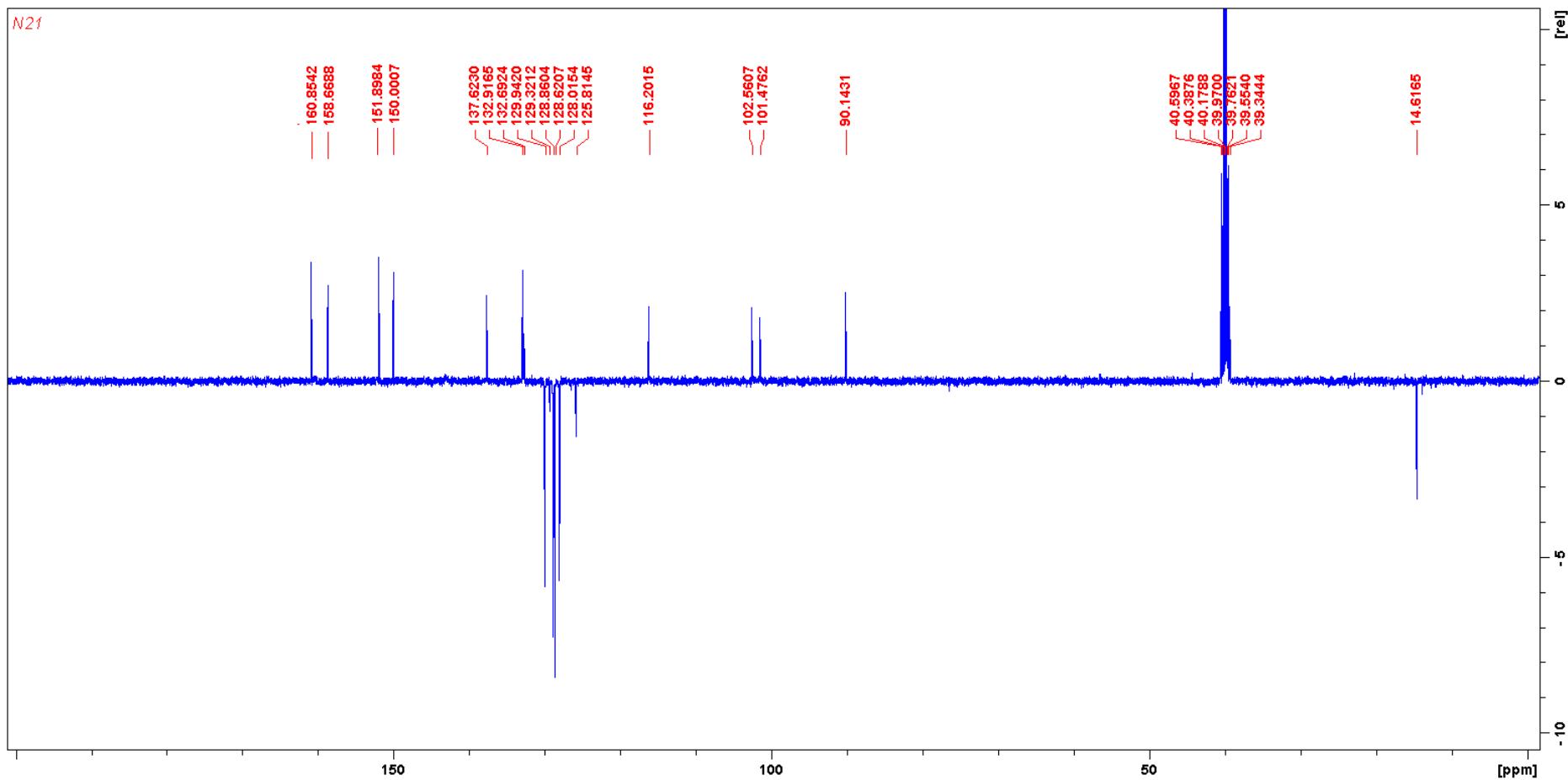


Figure 6. The ^{13}C NMR spectrum of compound **7b**.

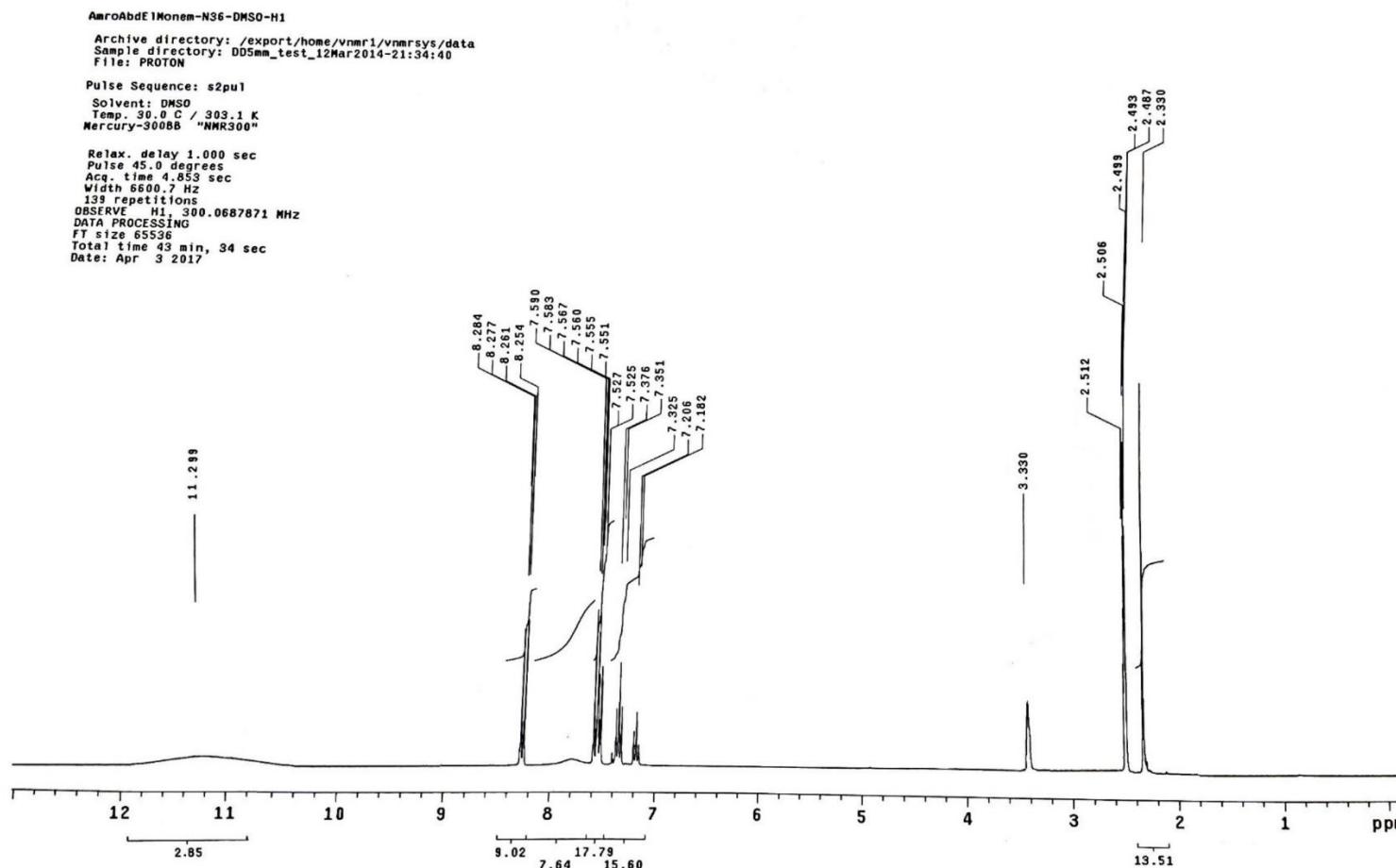


Figure 7. The ^1H NMR spectrum of compound 7c.

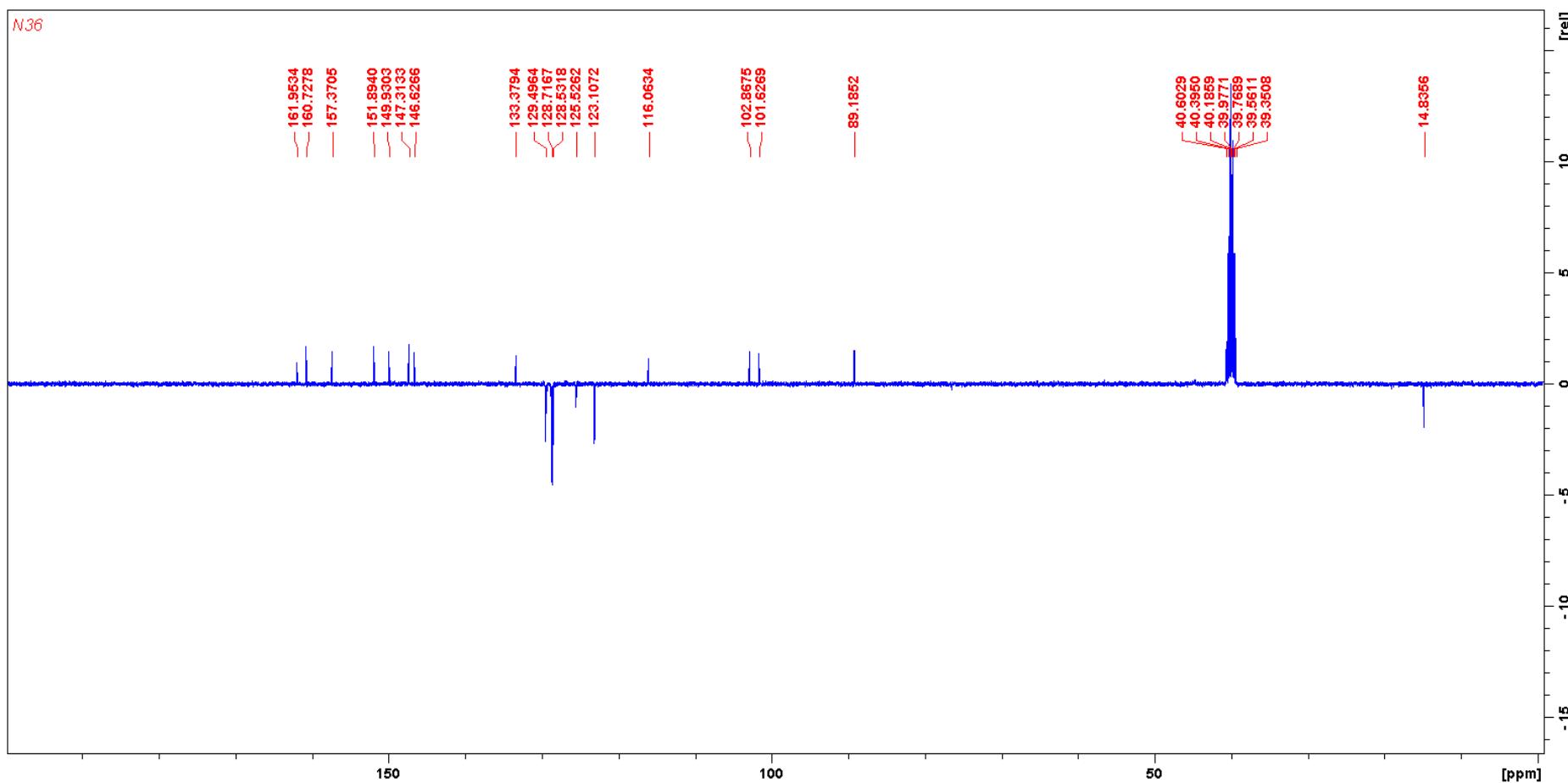


Figure 8. The ^{13}C NMR spectrum of compound **7c**.

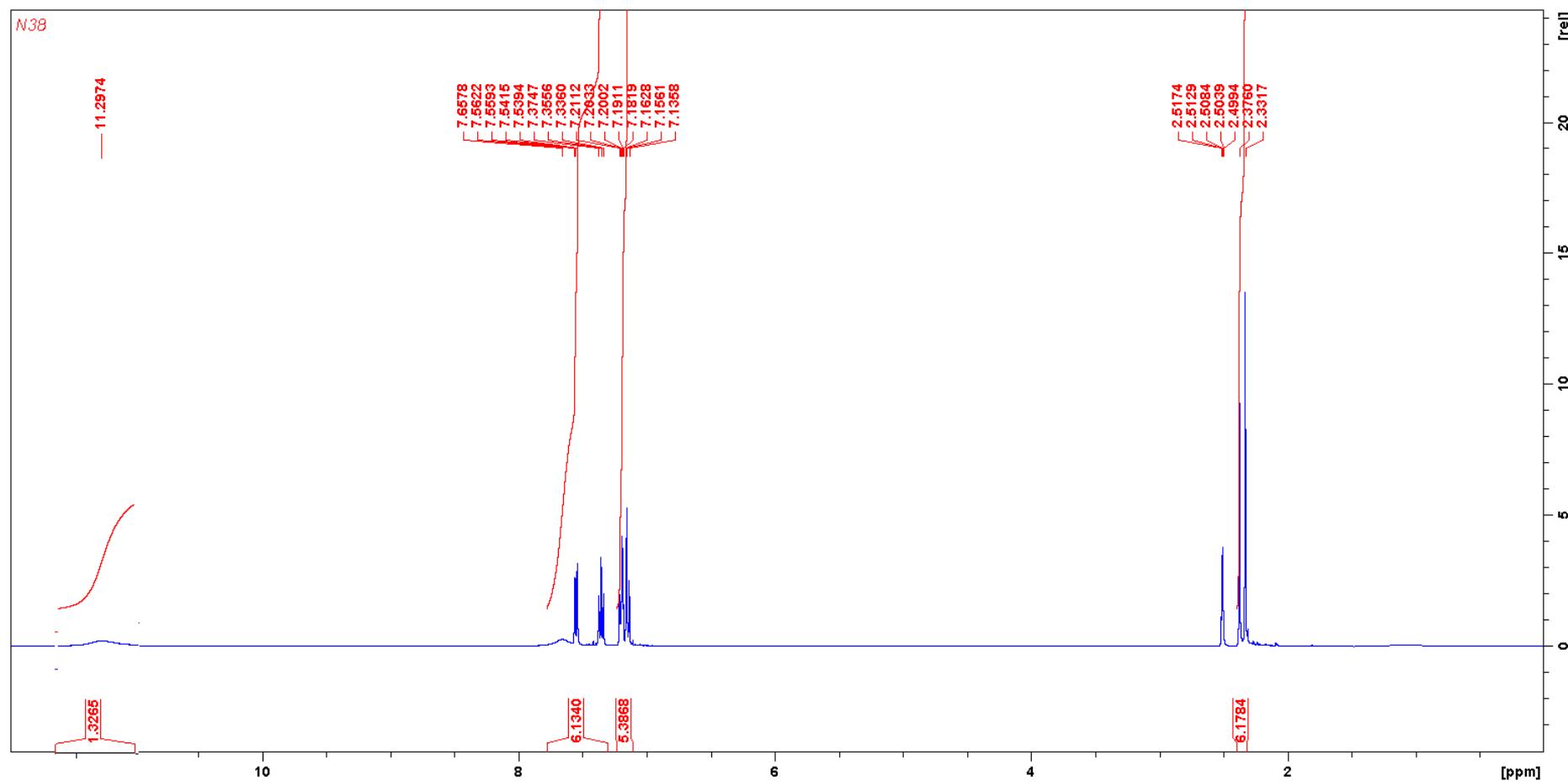


Figure 9. The ^1H NMR spectrum of compound 7d.

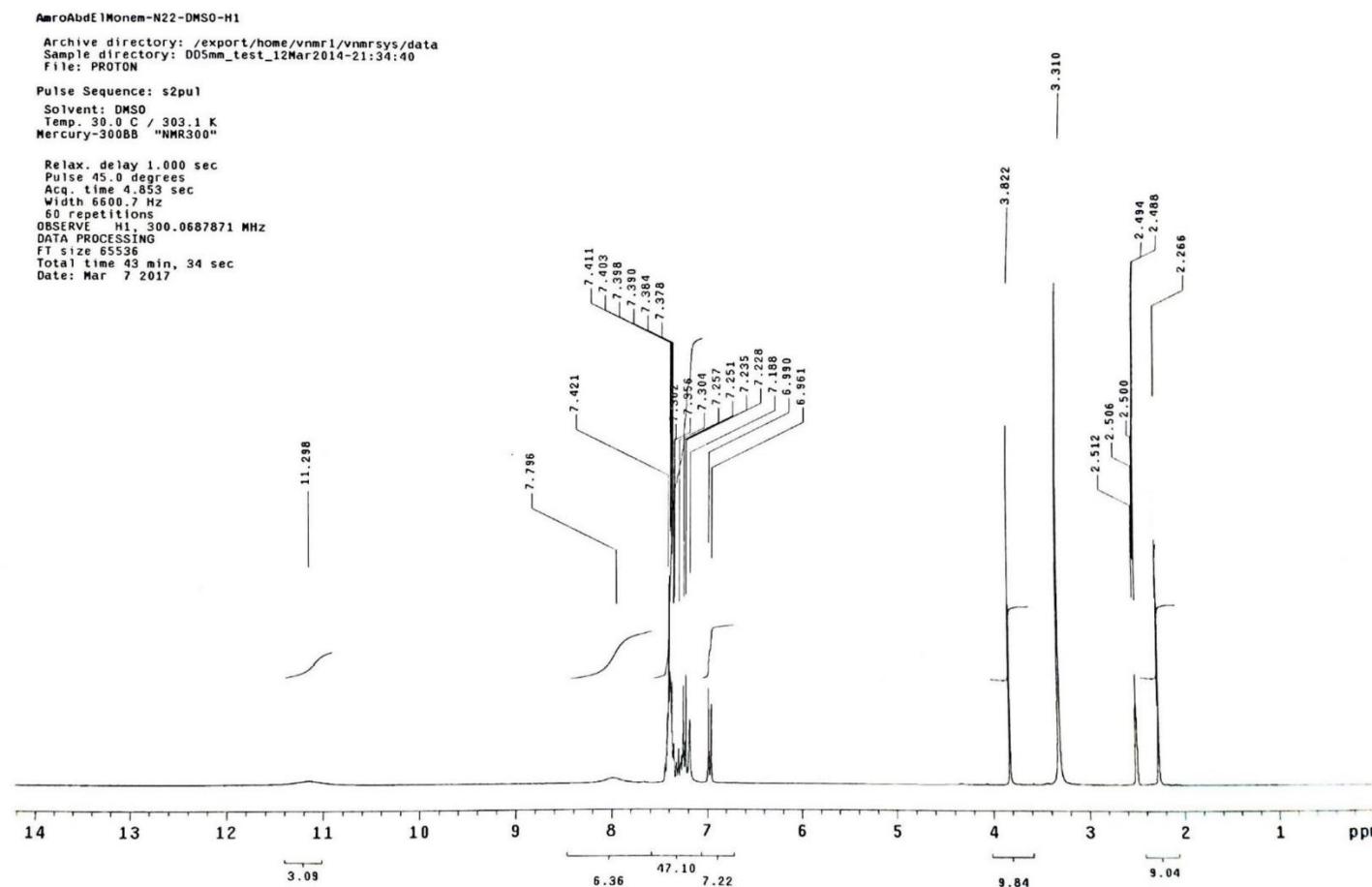


Figure 10. The ^1H NMR spectrum of compound 7e.

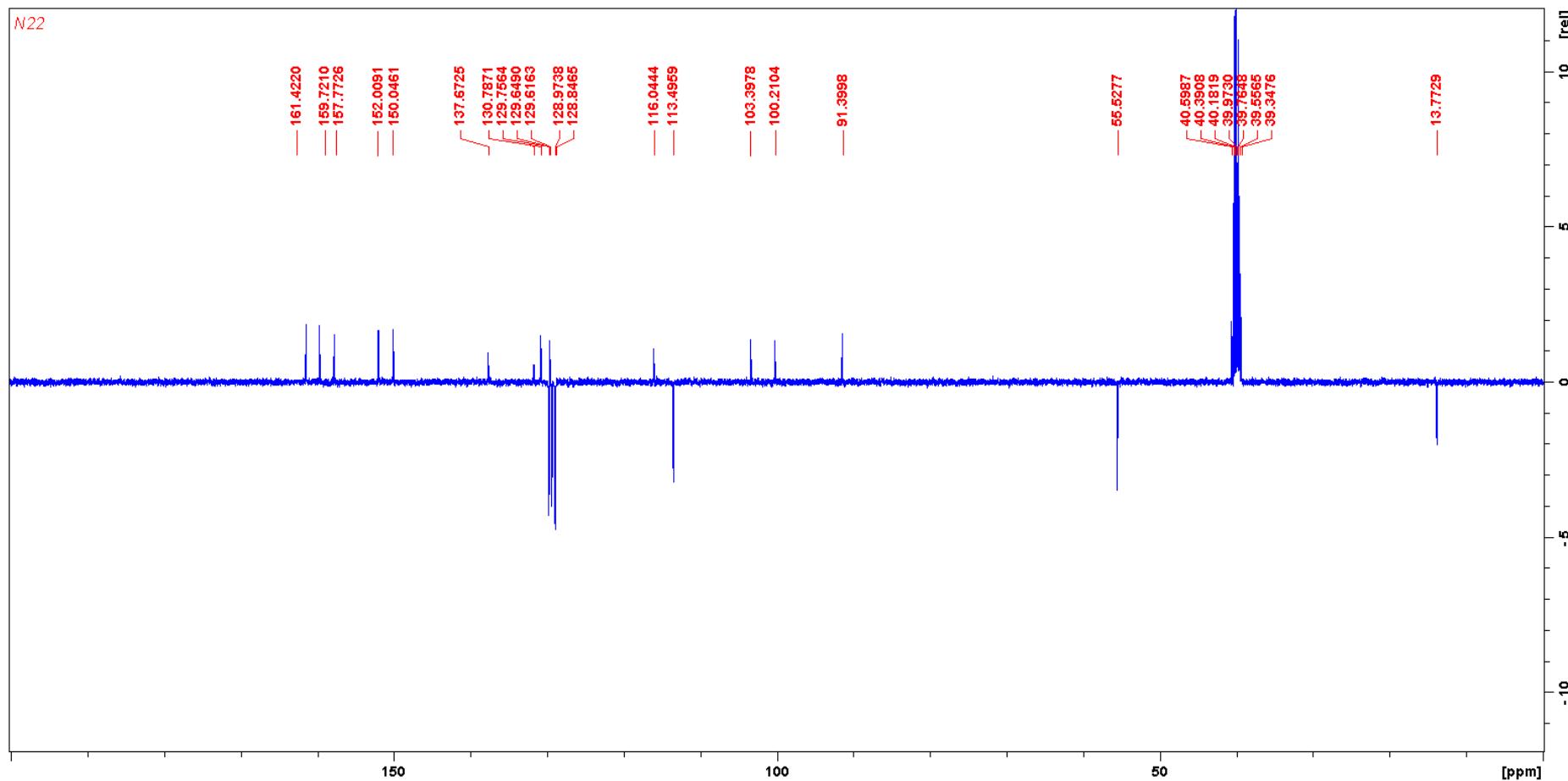


Figure 11. The ^{13}C NMR spectrum of compound 7e.

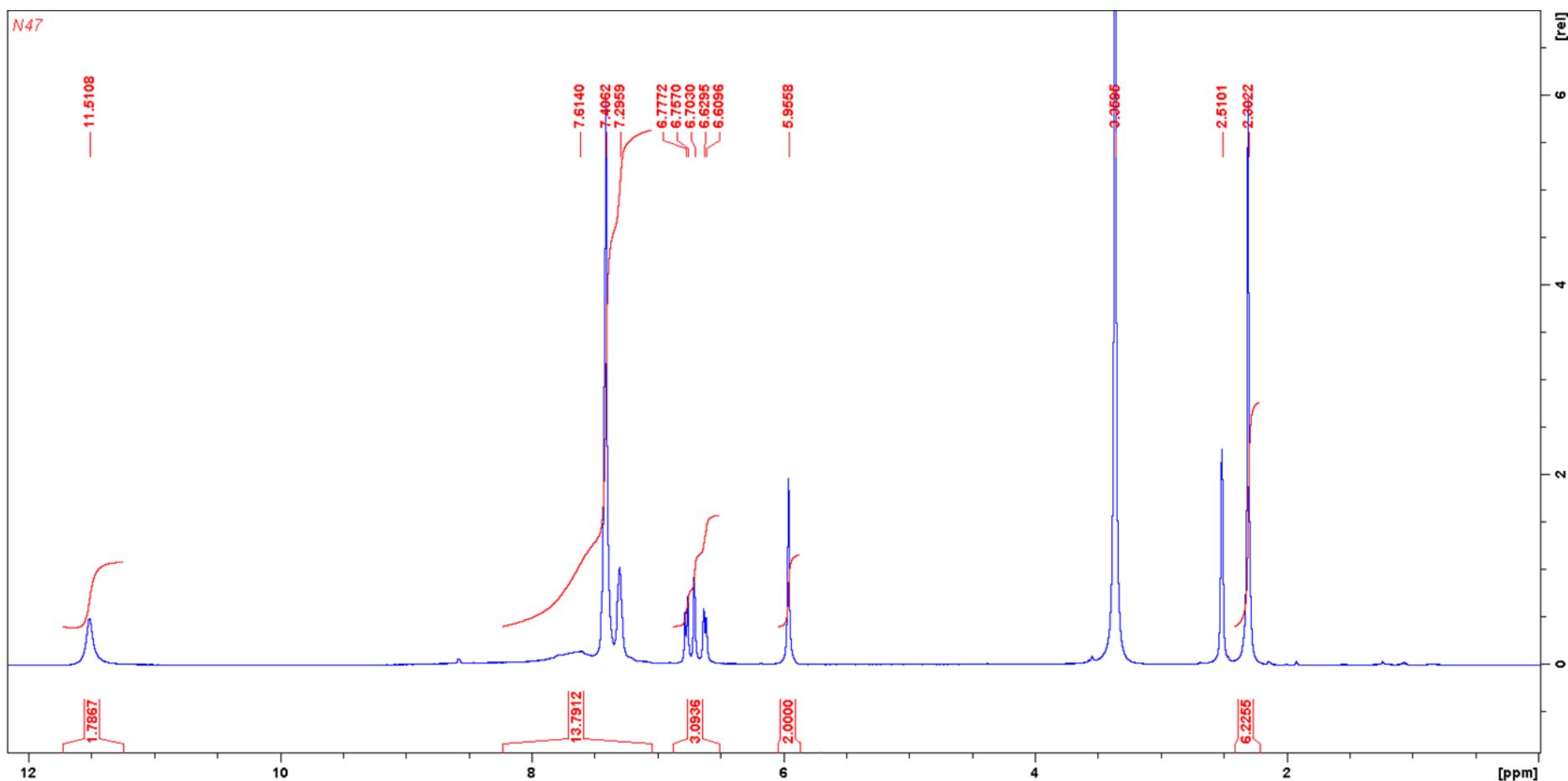


Figure 12. The ^1H NMR spectrum of compound **7f**.

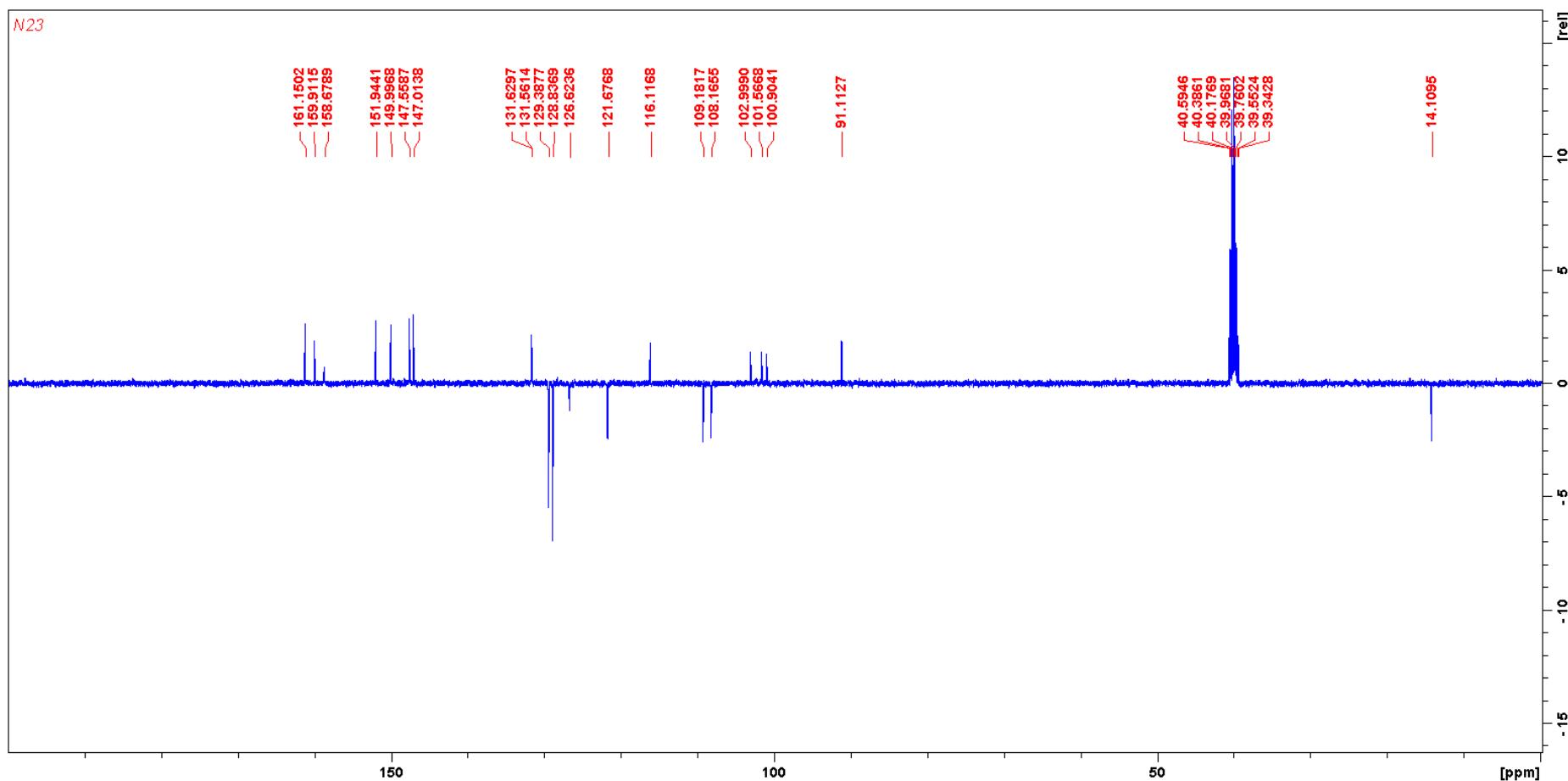


Figure 13. The ^{13}C NMR spectrum of compound **7f**.

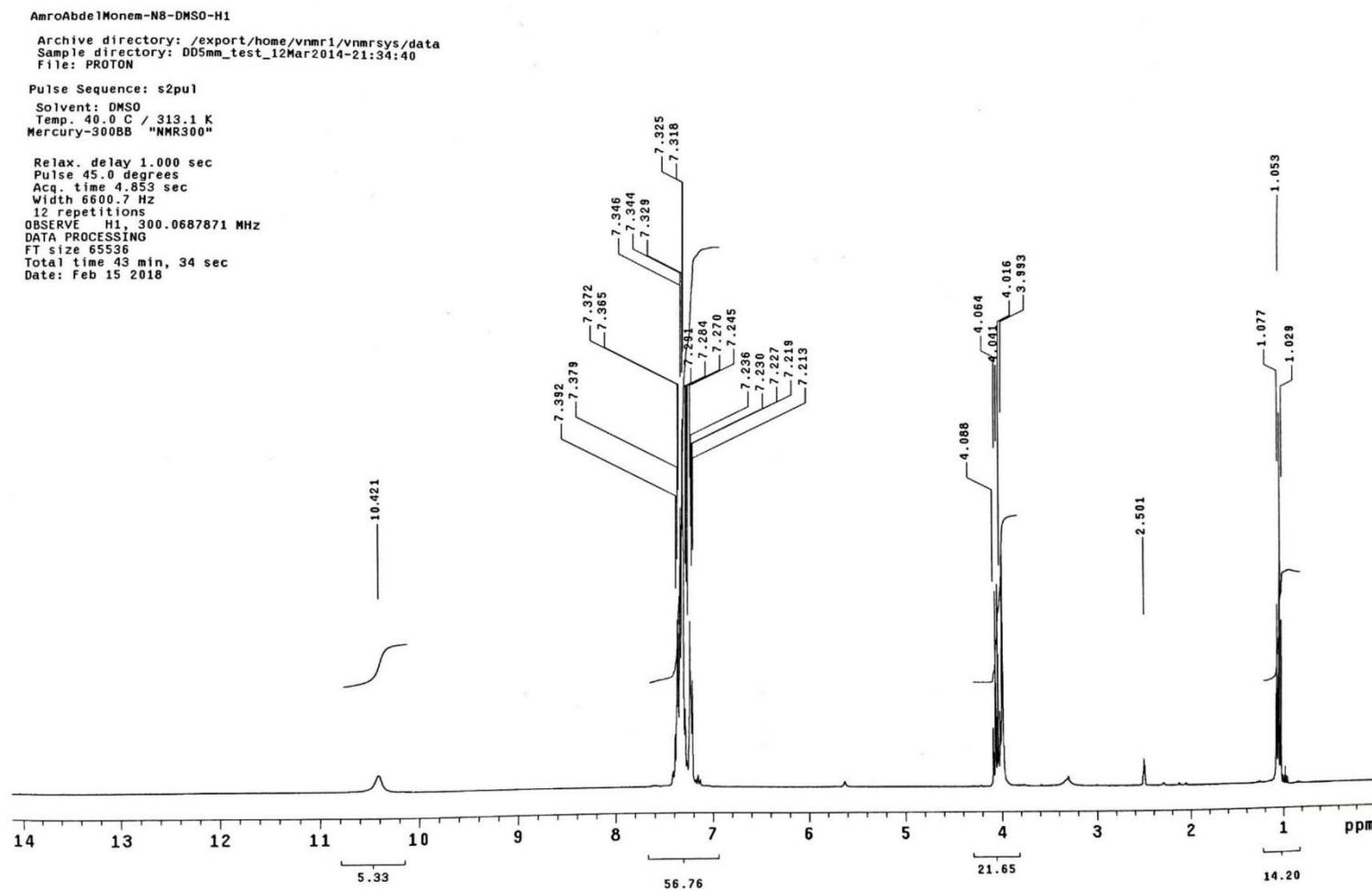


Figure 14. The ^1H NMR spectrum of compound **18**.

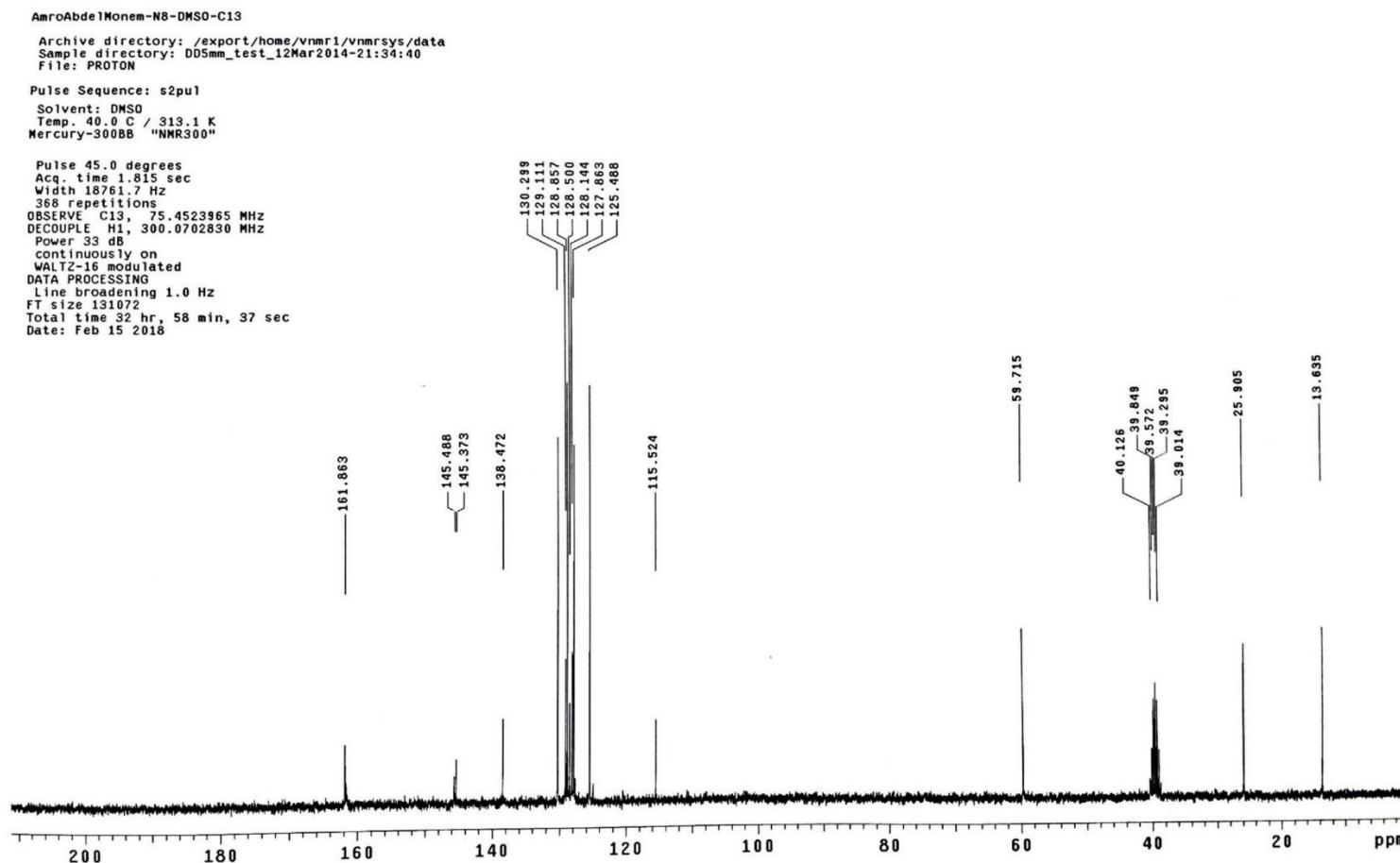


Figure 15. The ^{13}C NMR spectrum of compound 18.

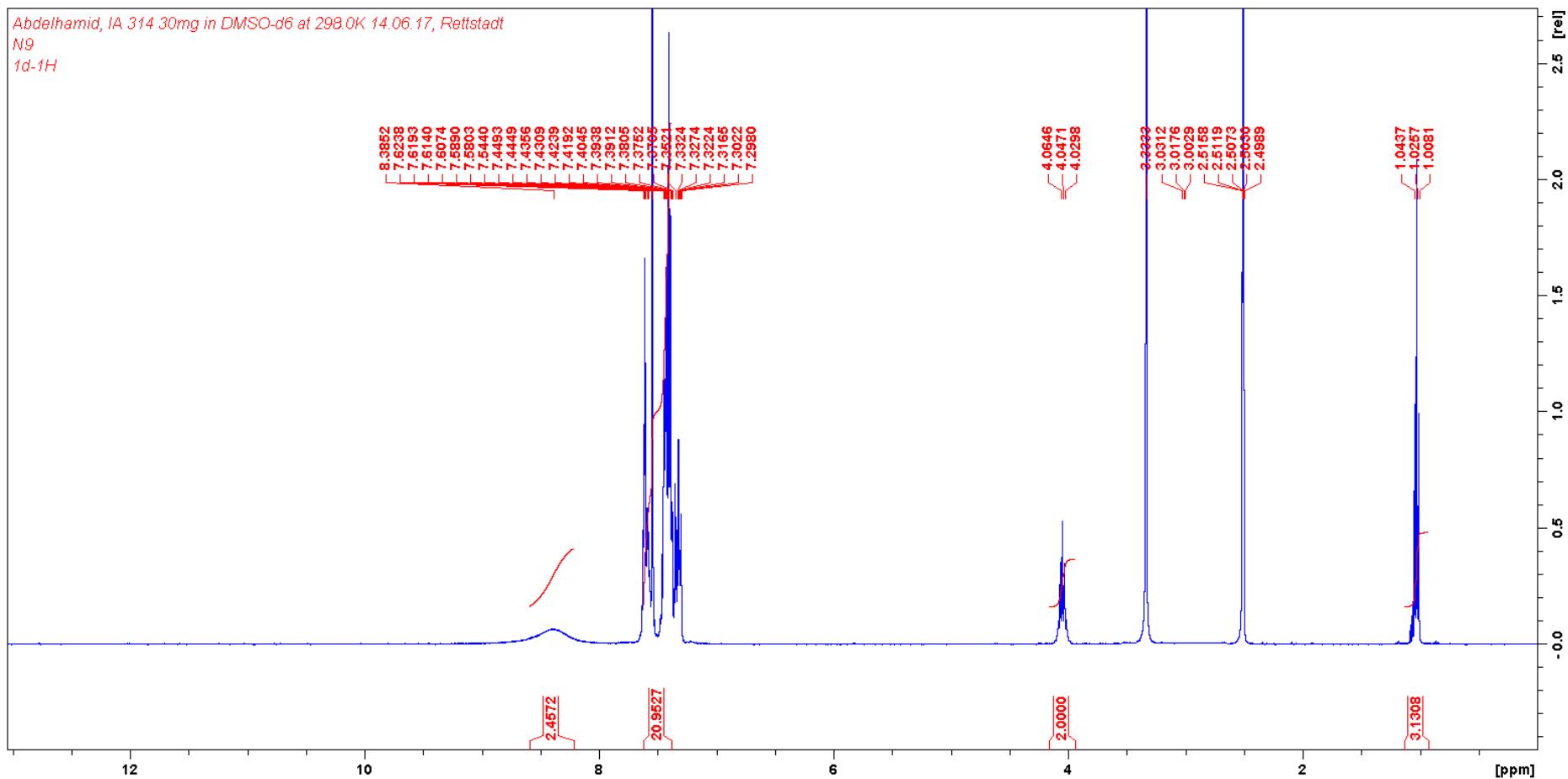


Figure 16. The ¹H NMR spectrum of compound **20a**.

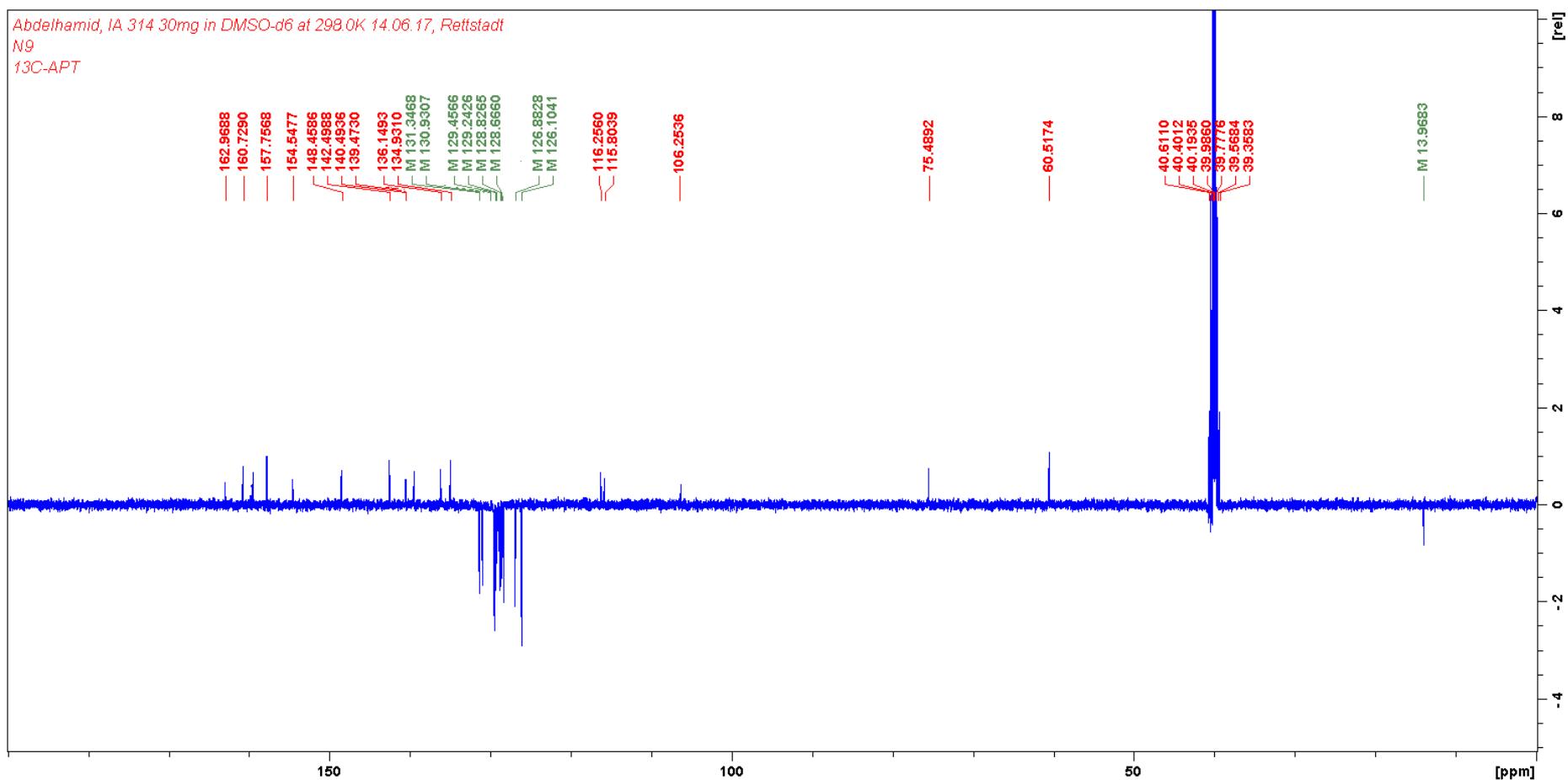


Figure 17. The ^{13}C NMR spectrum of compound **20a**.

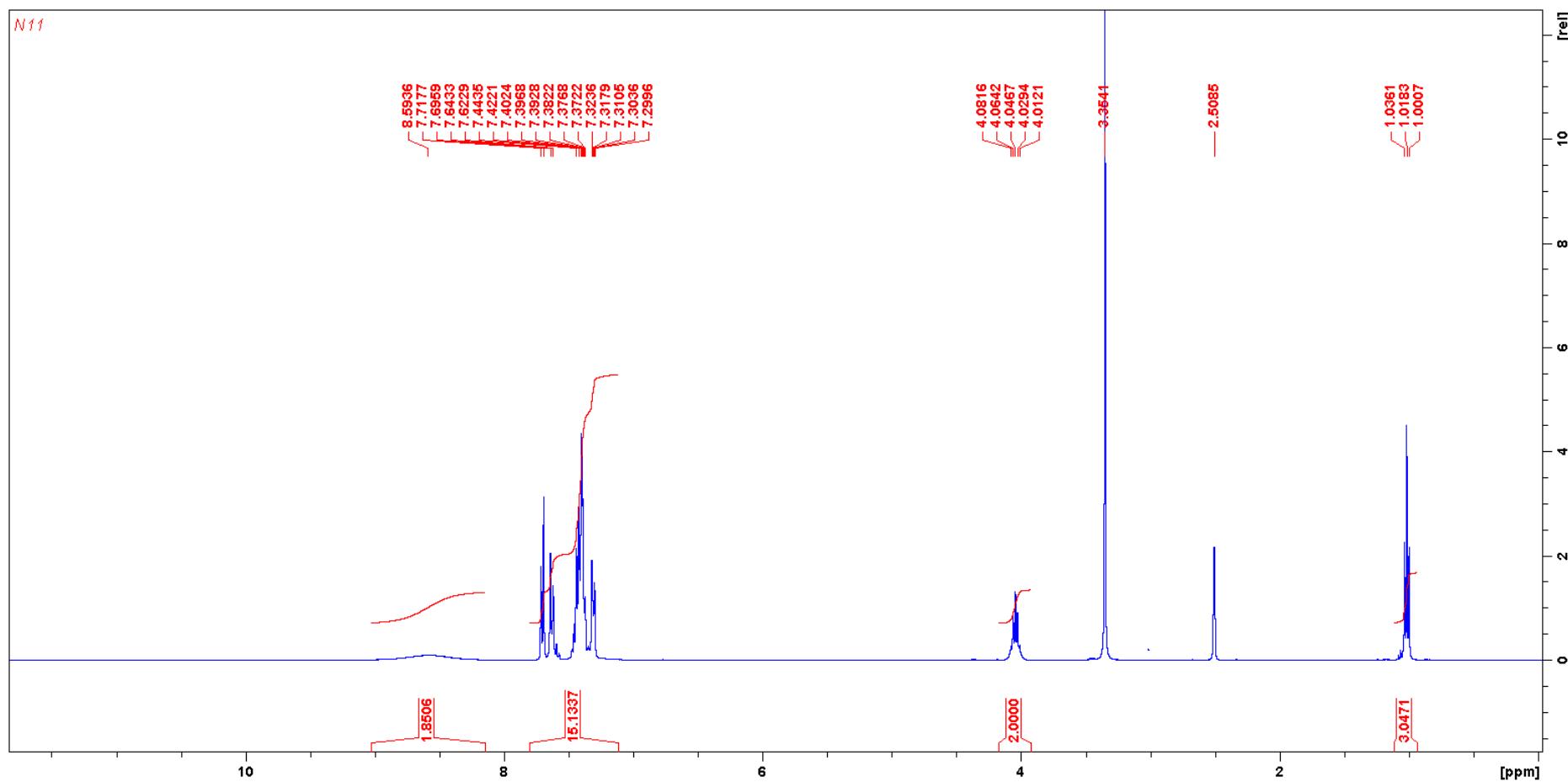


Figure 18. The ¹H NMR spectrum of compound 20b.

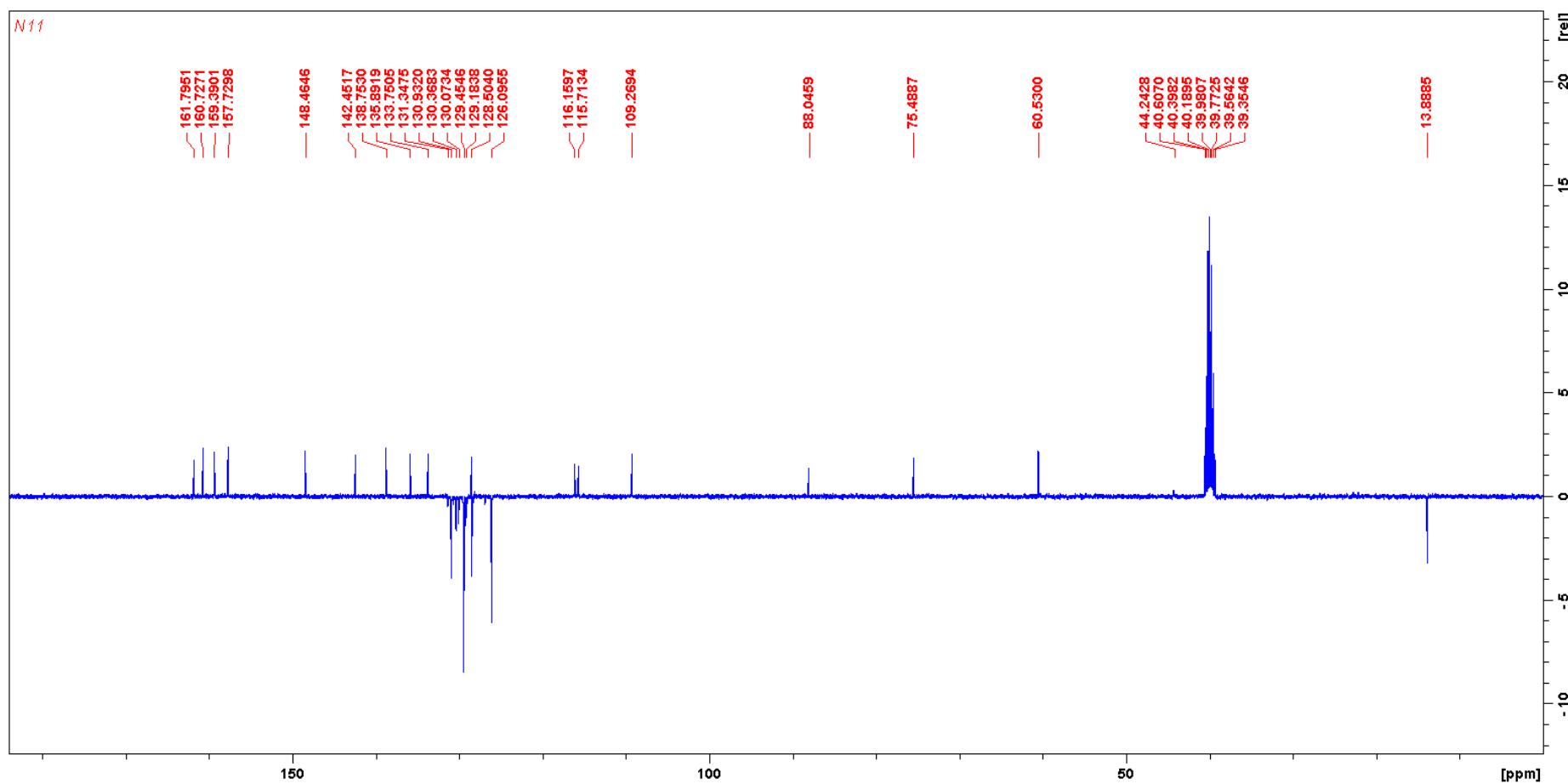


Figure 19. The ^{13}C NMR spectrum of compound **20b**.

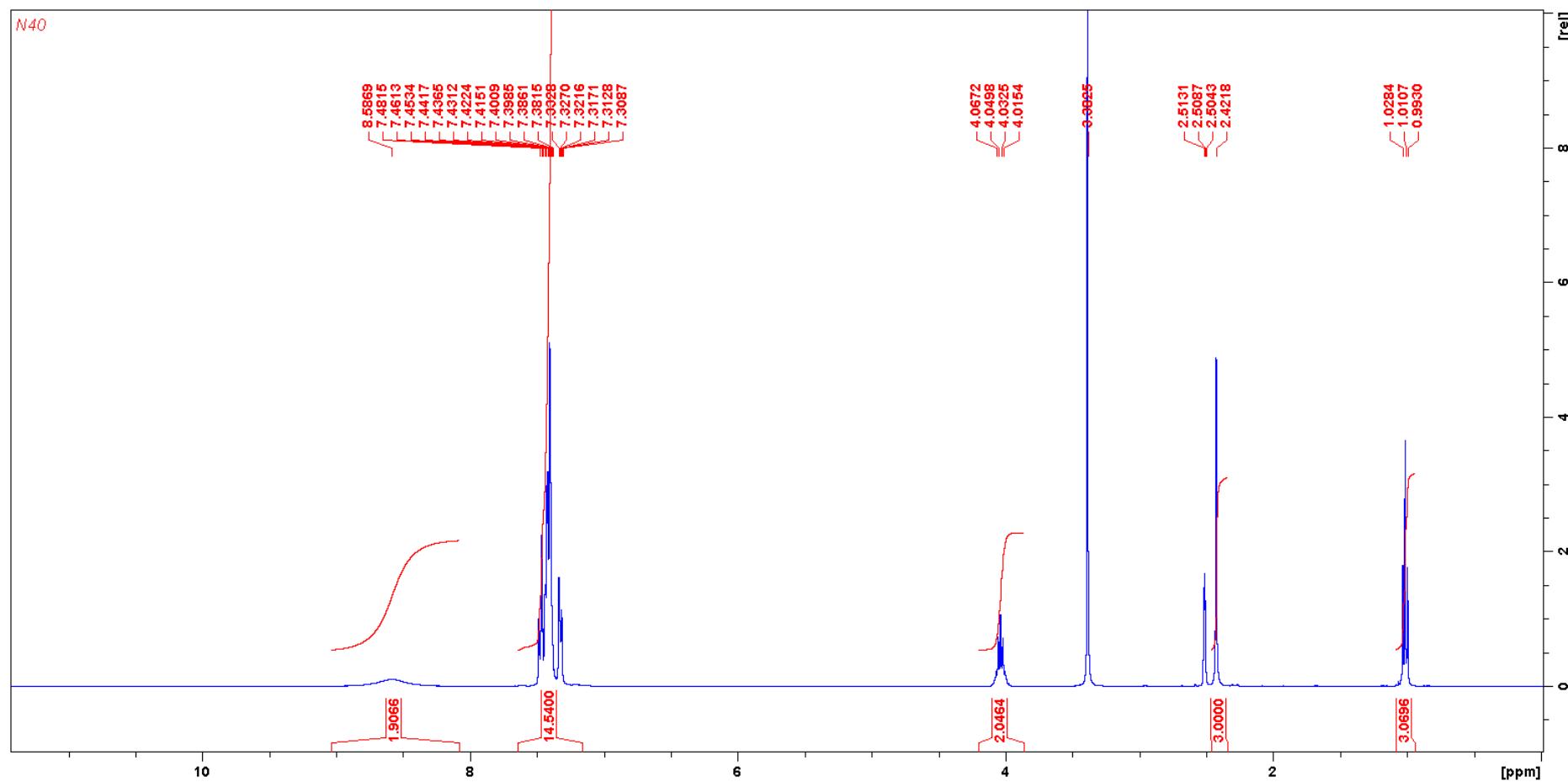


Figure 20. The ^1H NMR spectrum of compound **20d**.

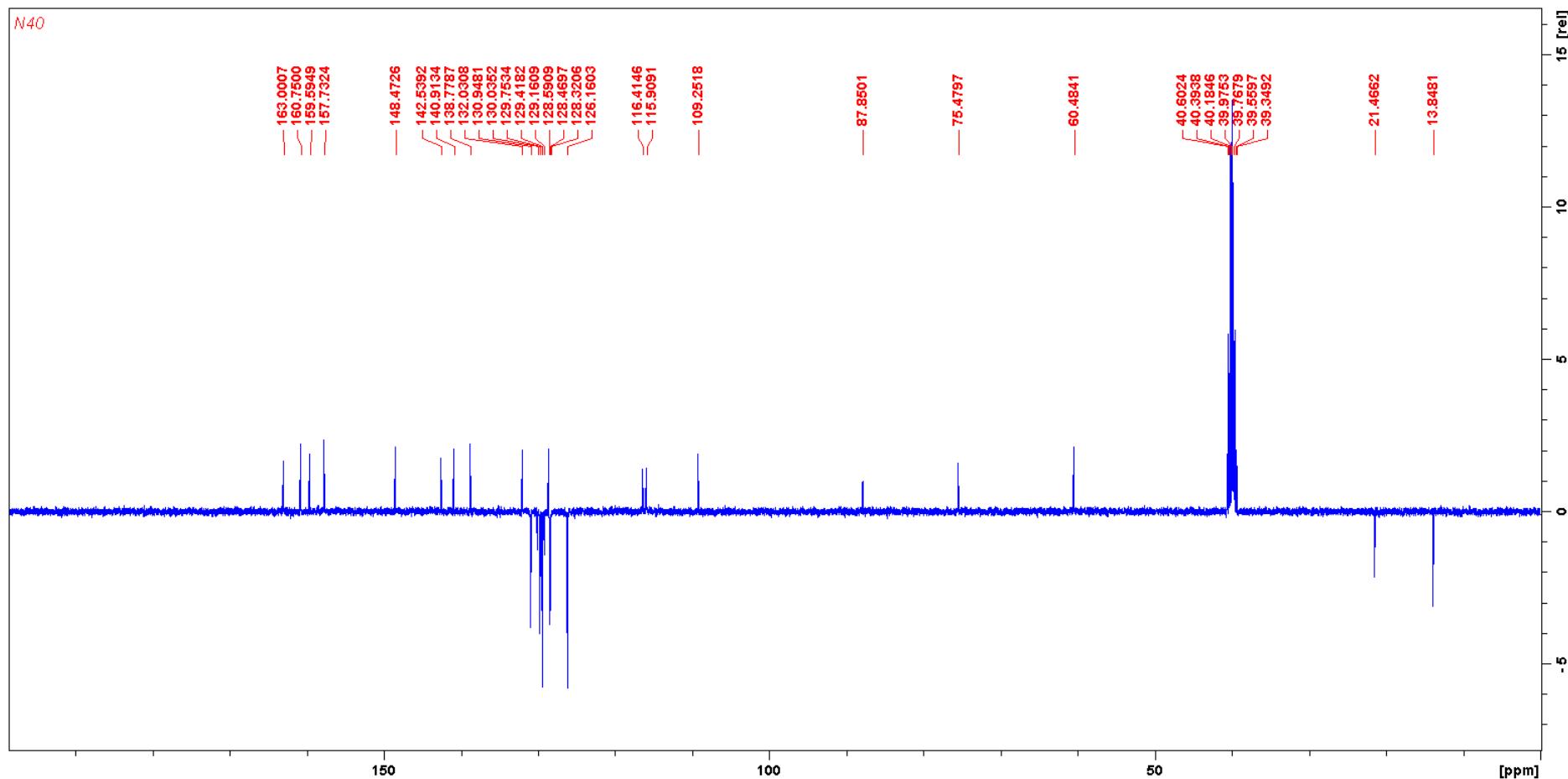


Figure 21. The ^{13}C NMR spectrum of compound 20d.

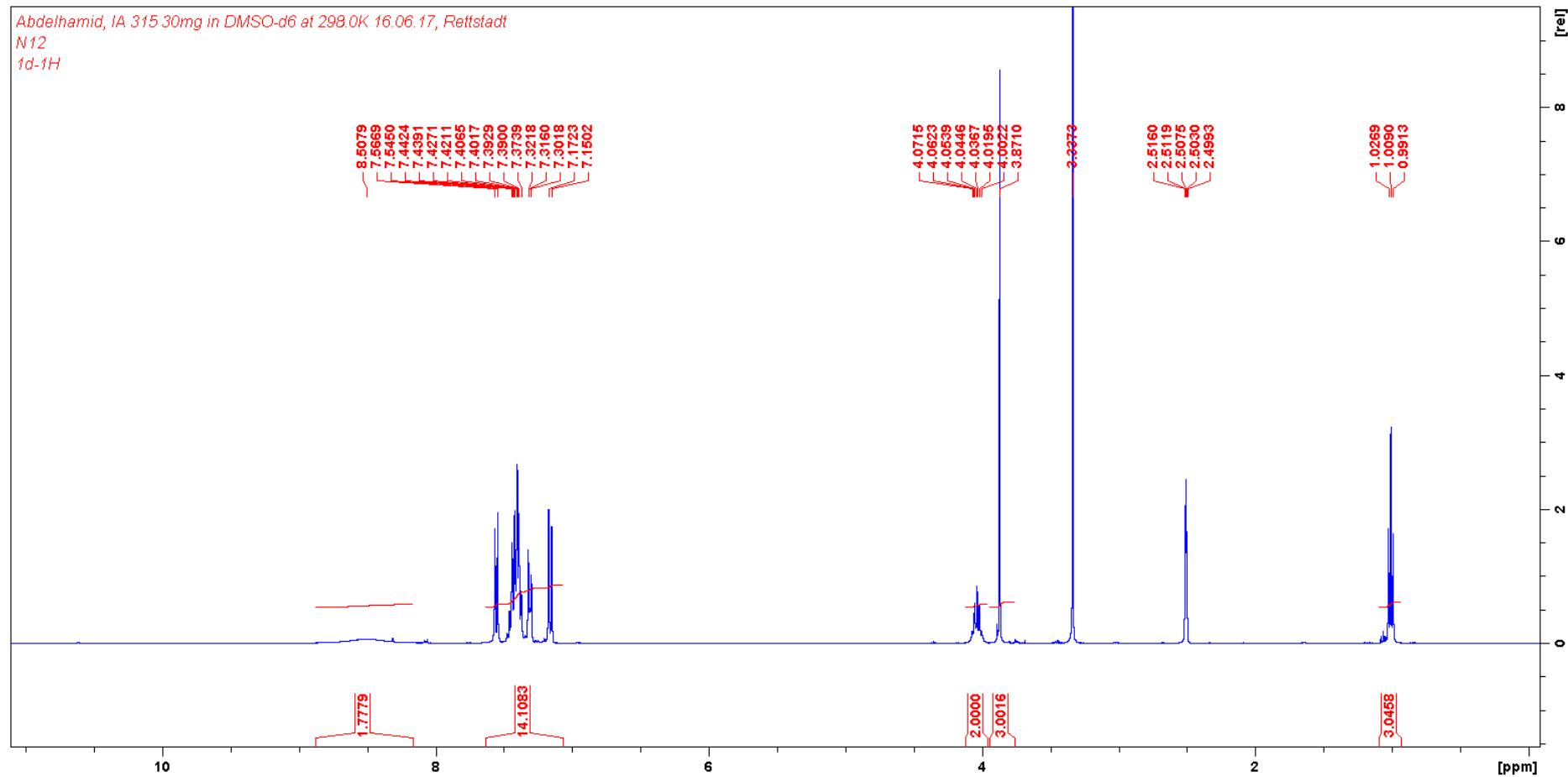


Figure 22. The ¹H NMR spectrum of compound 20e.

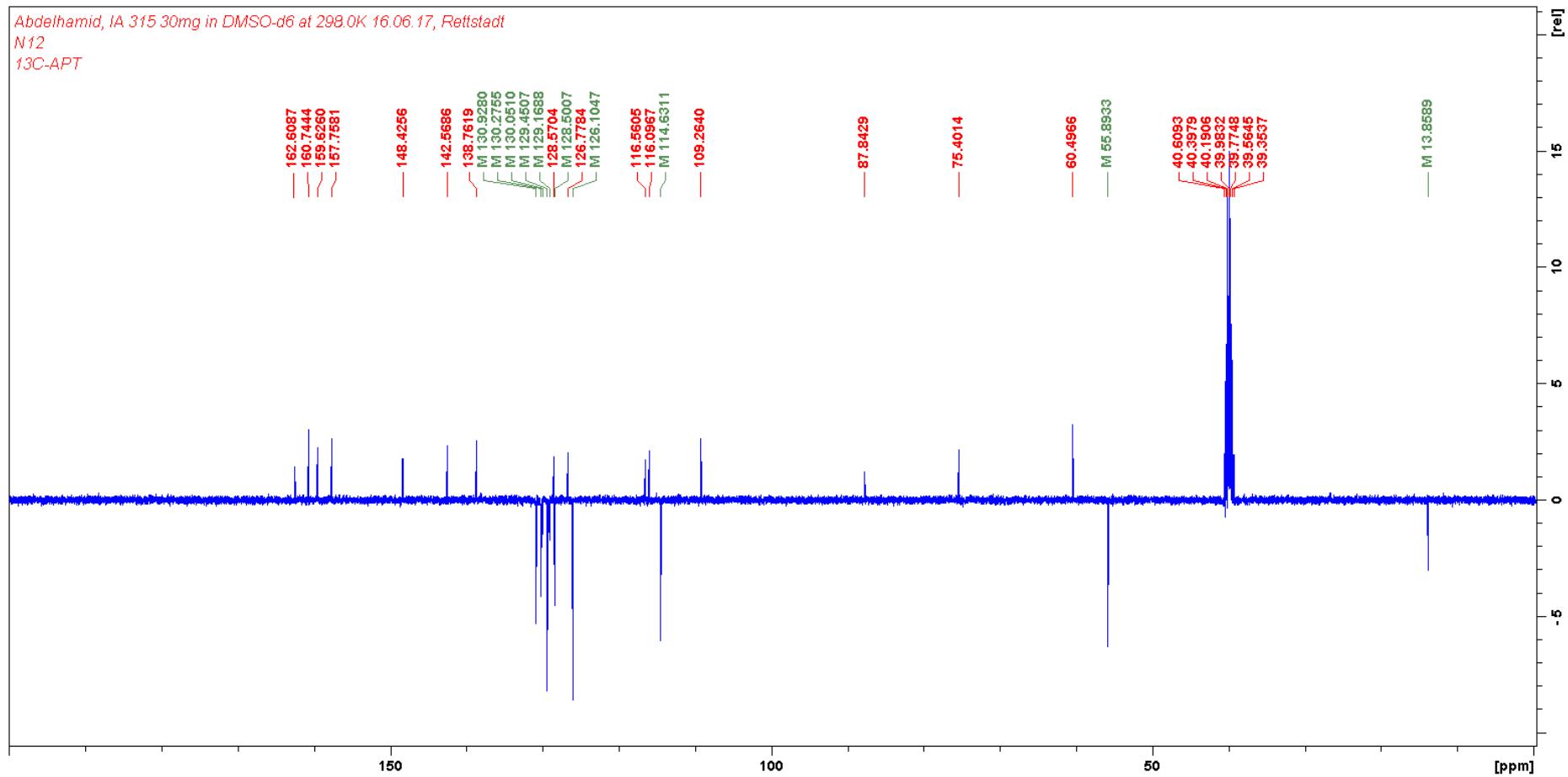


Figure 23. The ^{13}C NMR spectrum of compound 20e.

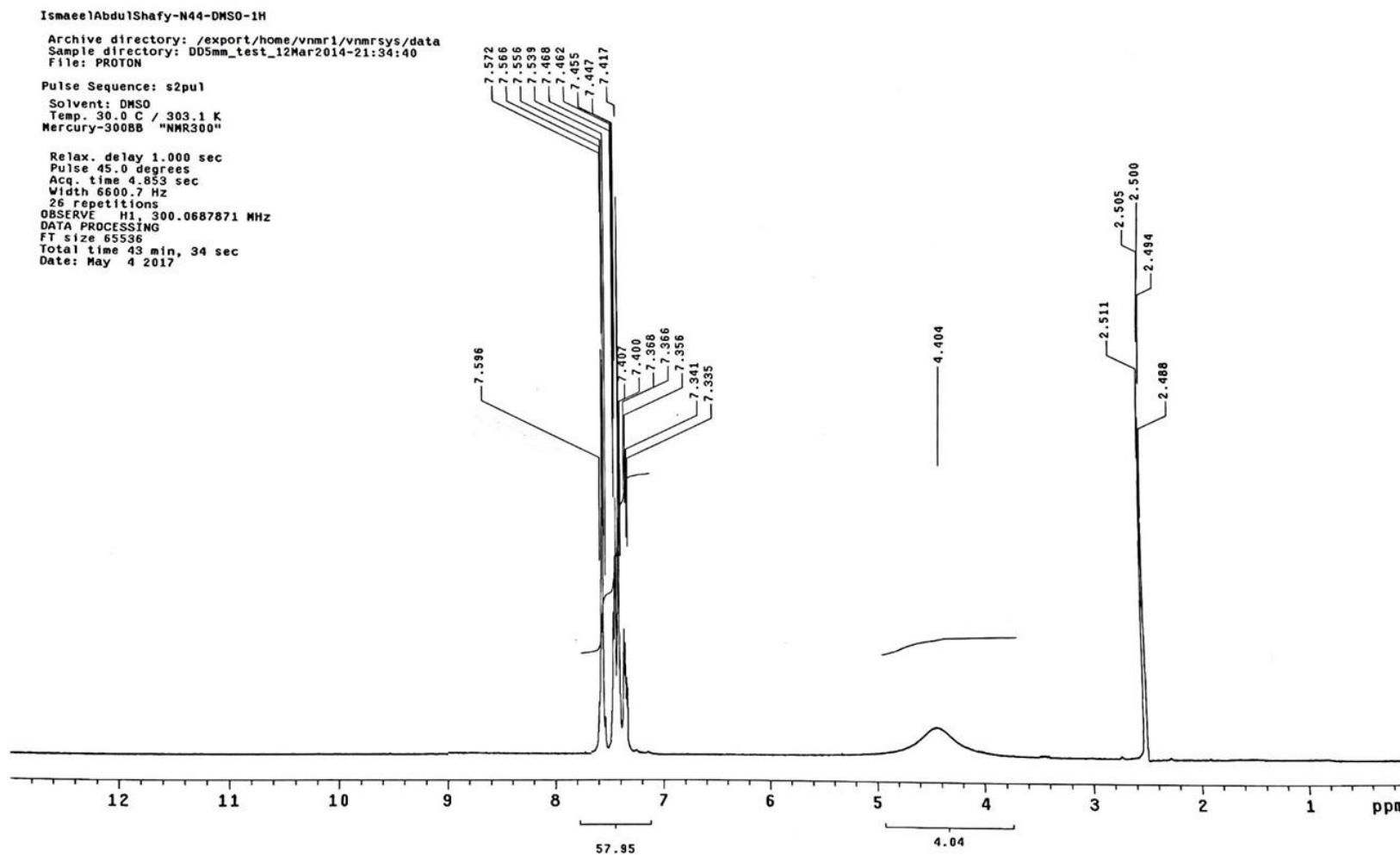


Figure 24. The ^1H NMR spectrum of compound 21a.

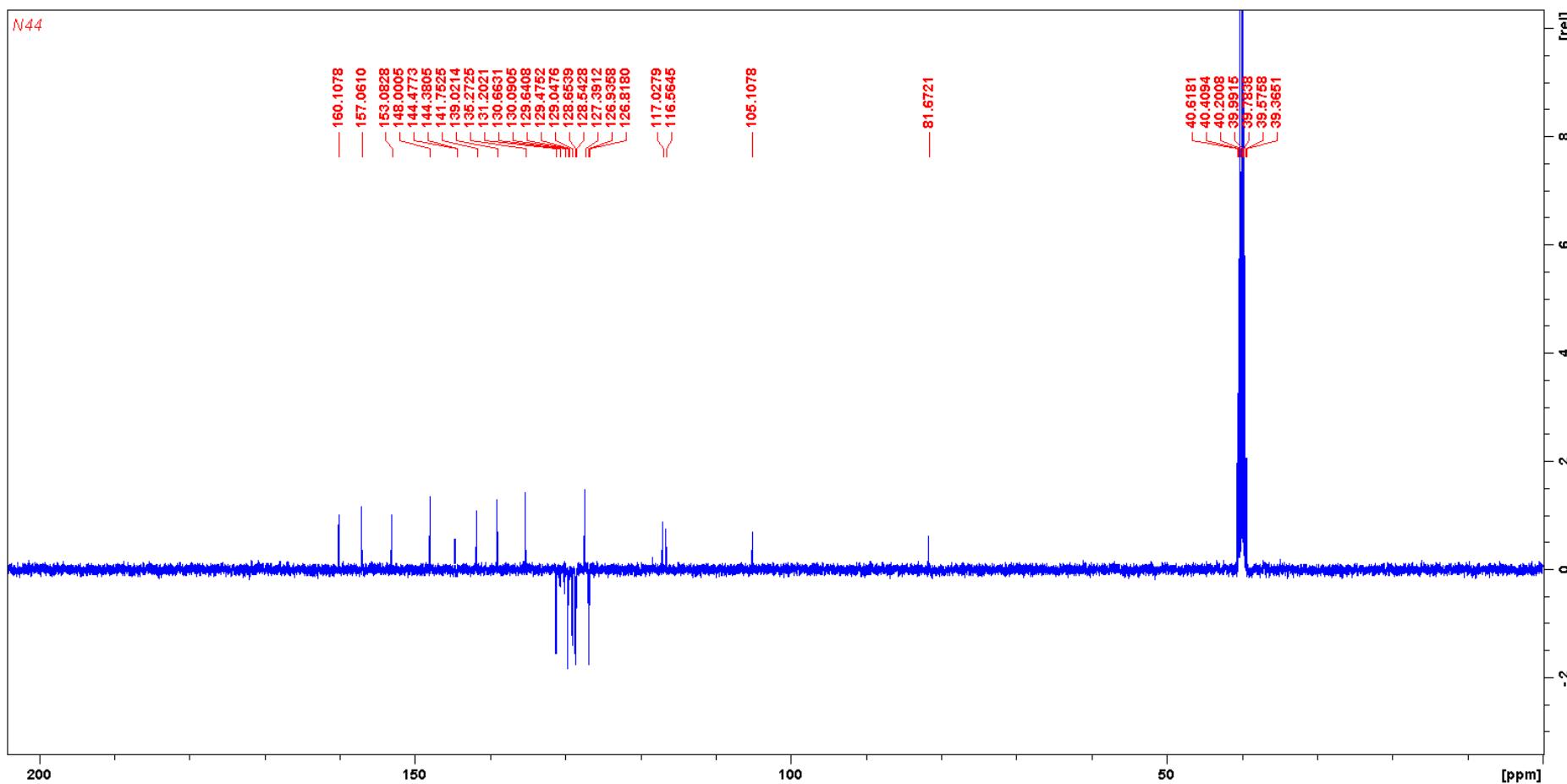


Figure 25. The ^{13}C NMR spectrum of compound 21a.

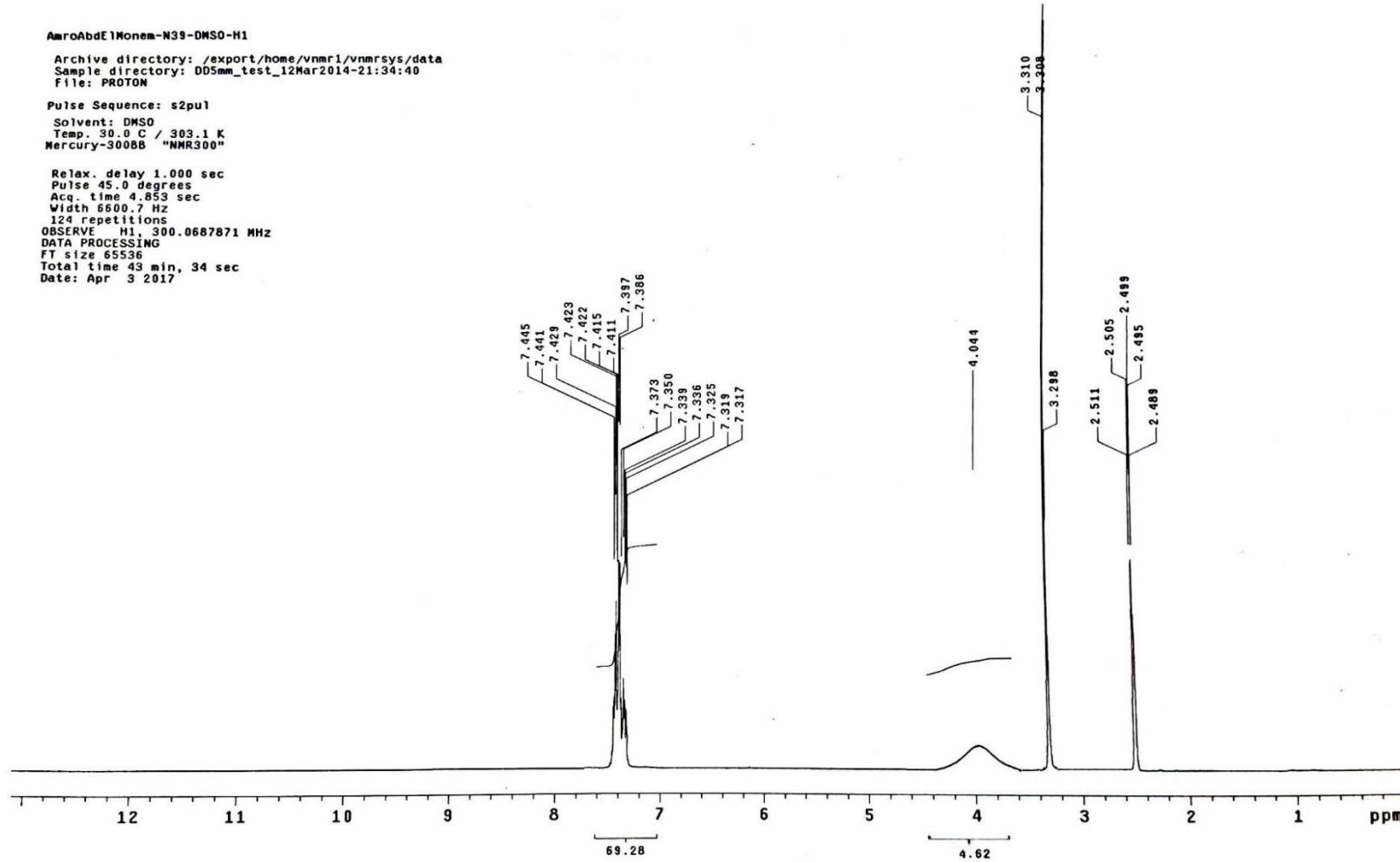


Figure 26. The ^1H NMR spectrum of compound **21c**.

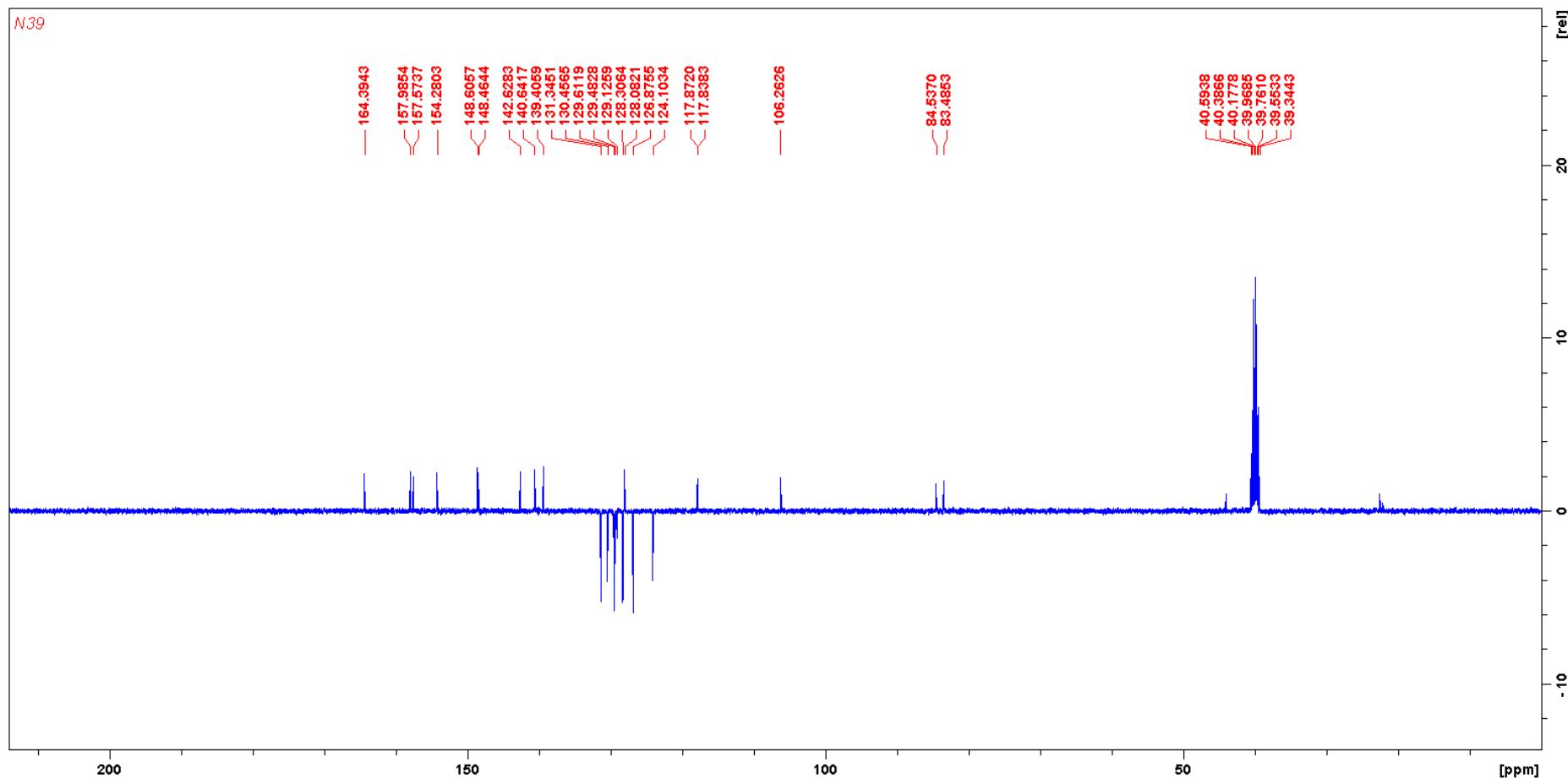


Figure 27. The ^{13}C NMR spectrum of compound **21c**.

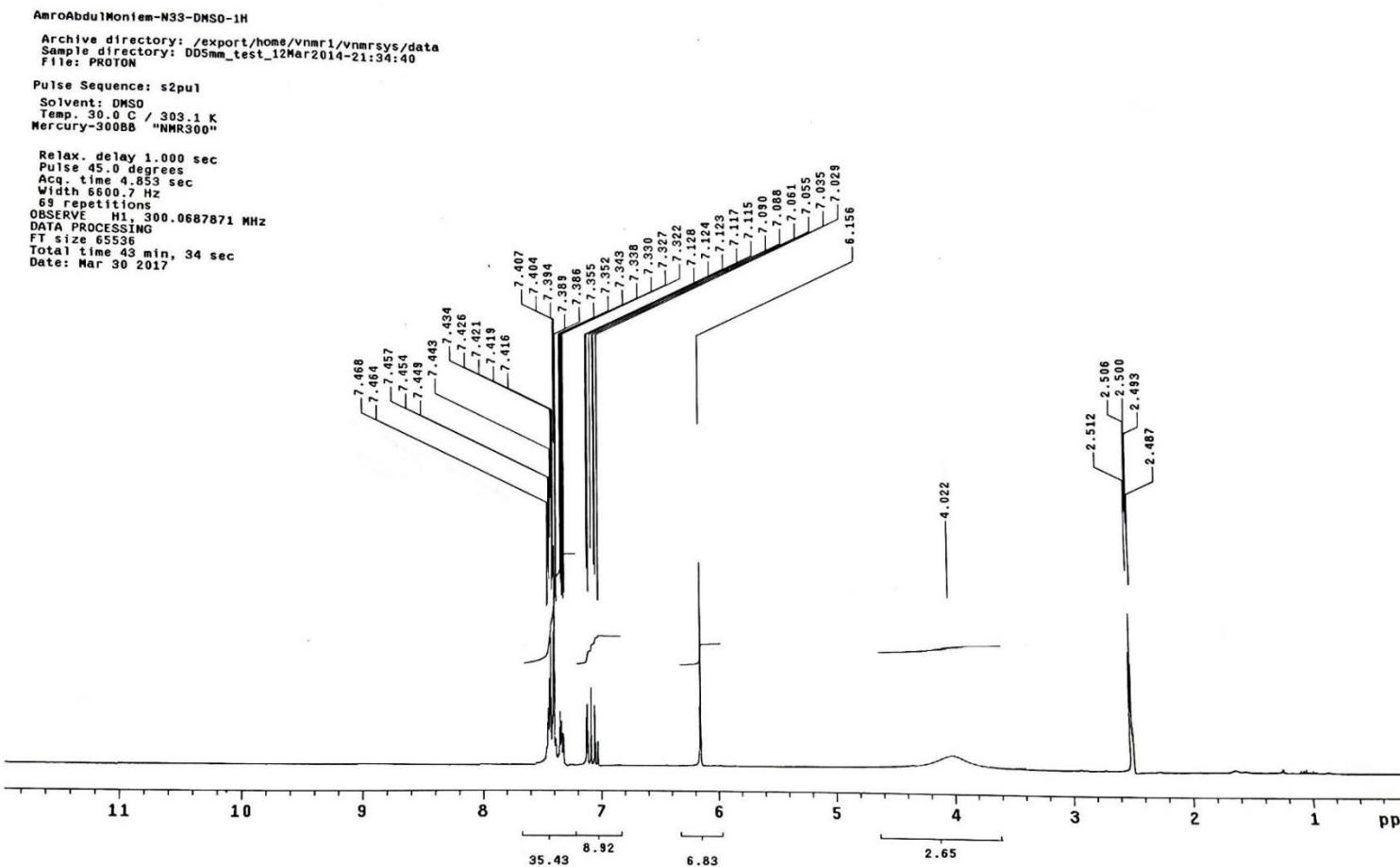


Figure 28. The ^1H NMR spectrum of compound **21f**.

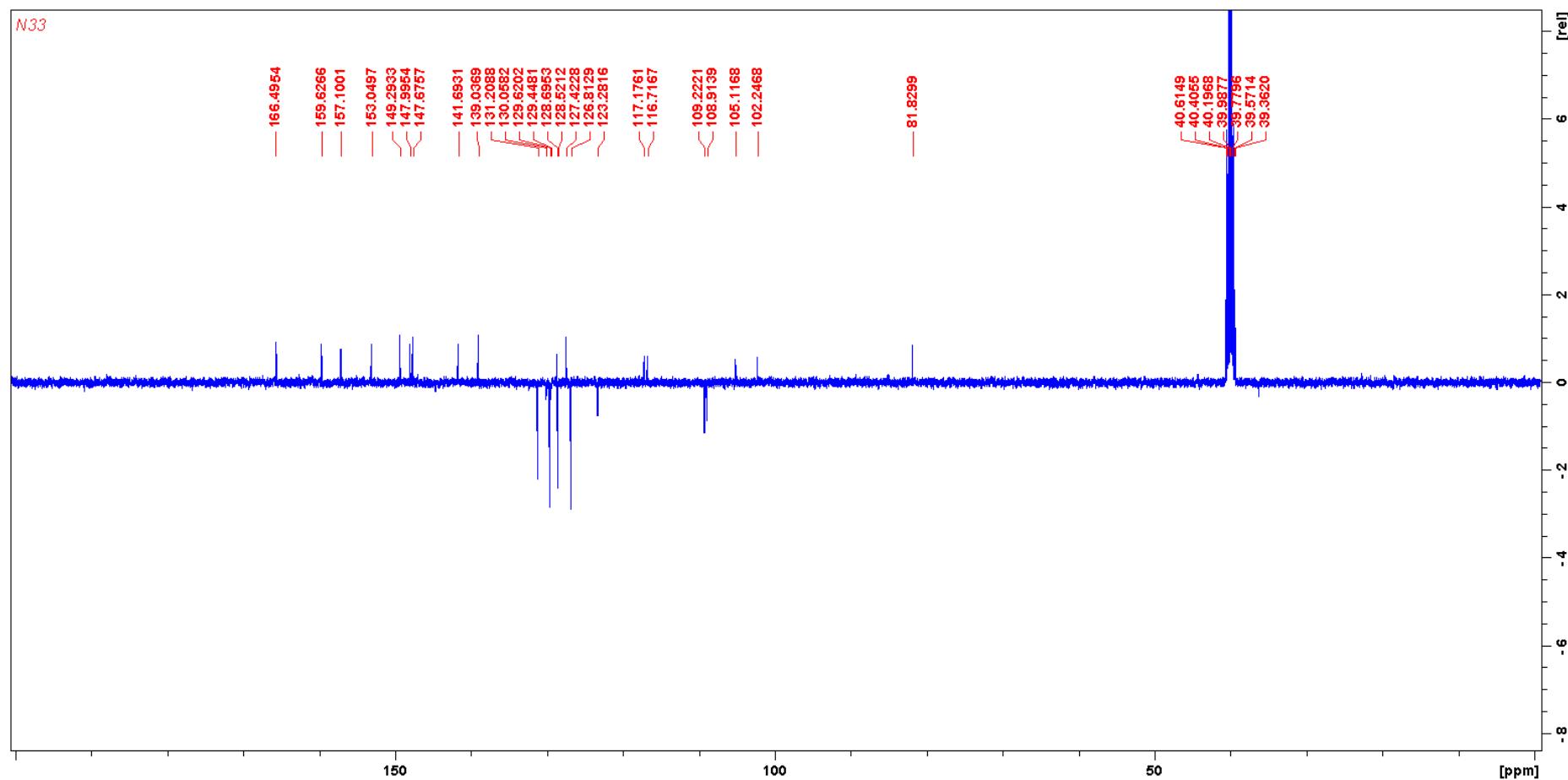


Figure 29. The ^{13}C NMR spectrum of compound **21f**.

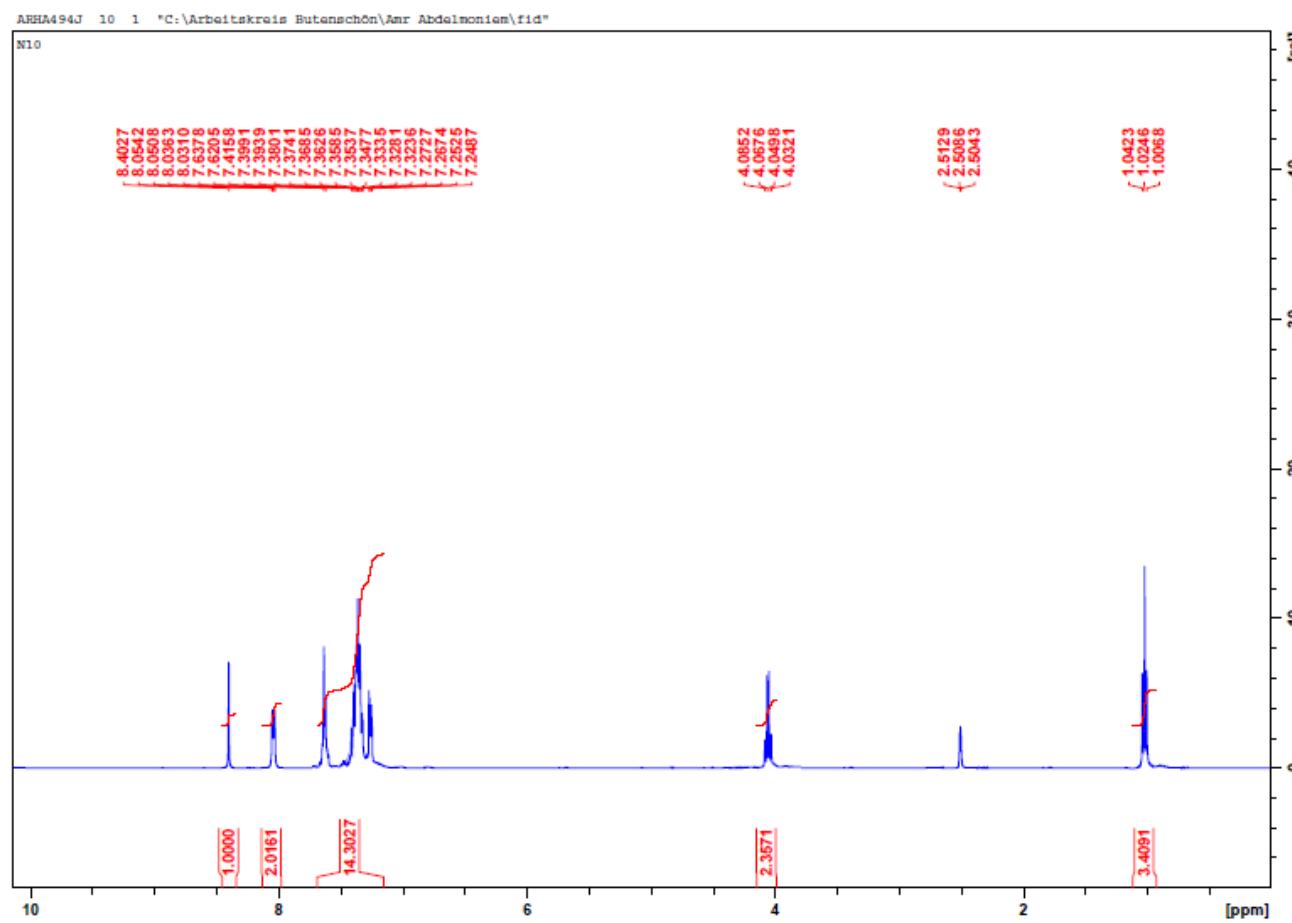


Figure 30. The ^1H NMR spectrum of compound 24a.

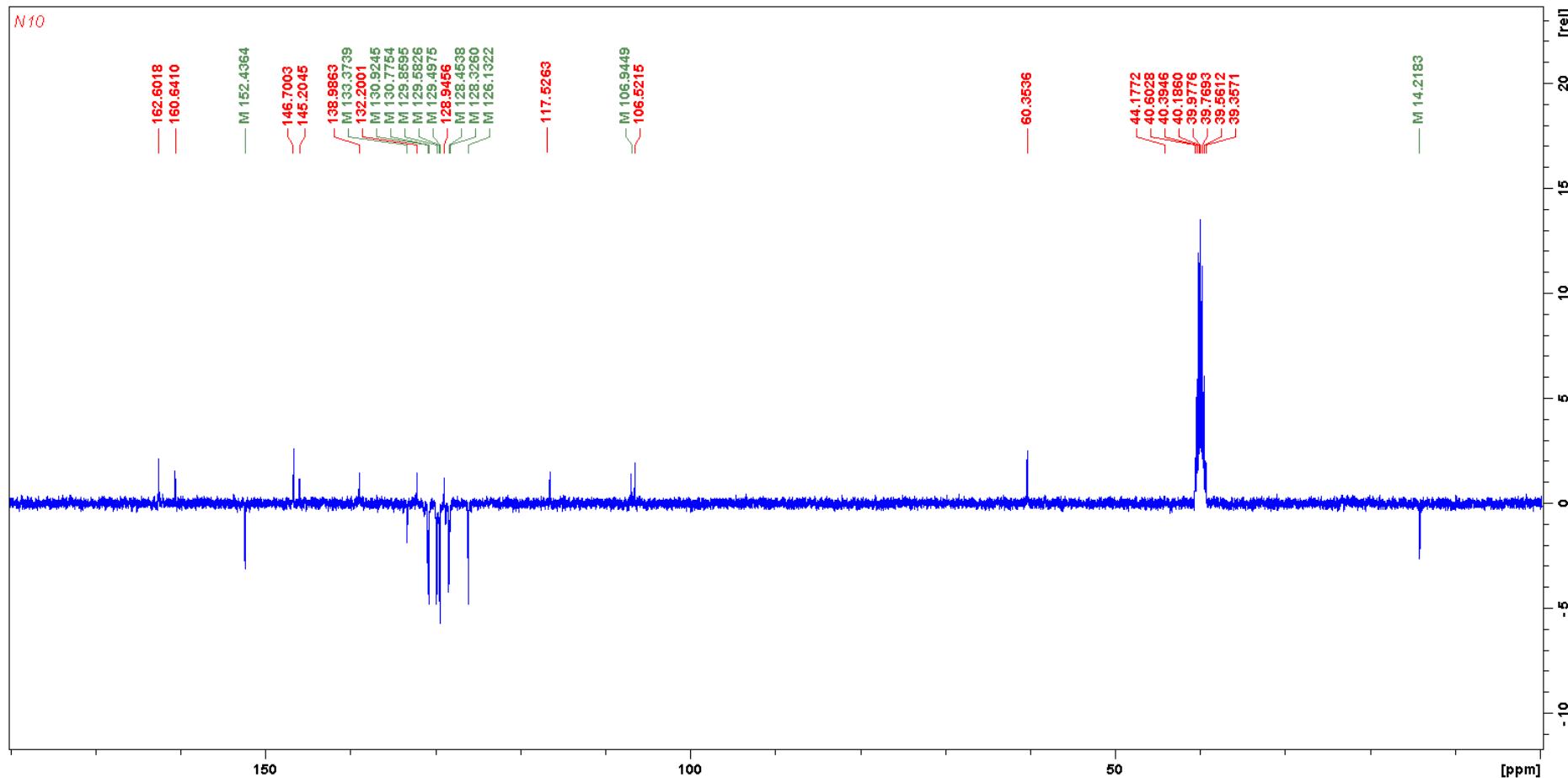


Figure 31. The ^{13}C NMR spectrum of compound **24a**.

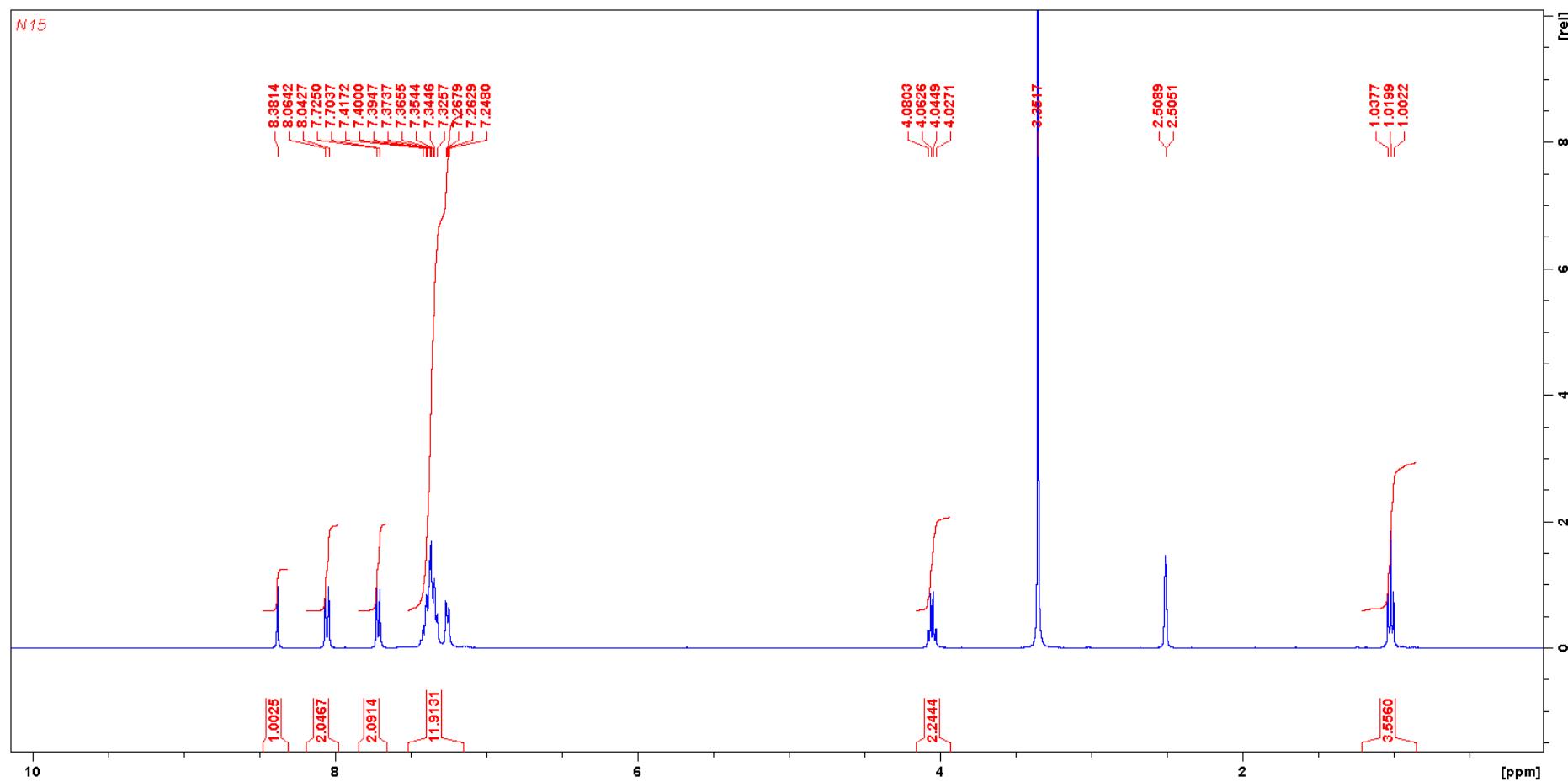


Figure 32. The ^1H NMR spectrum of compound 24b.

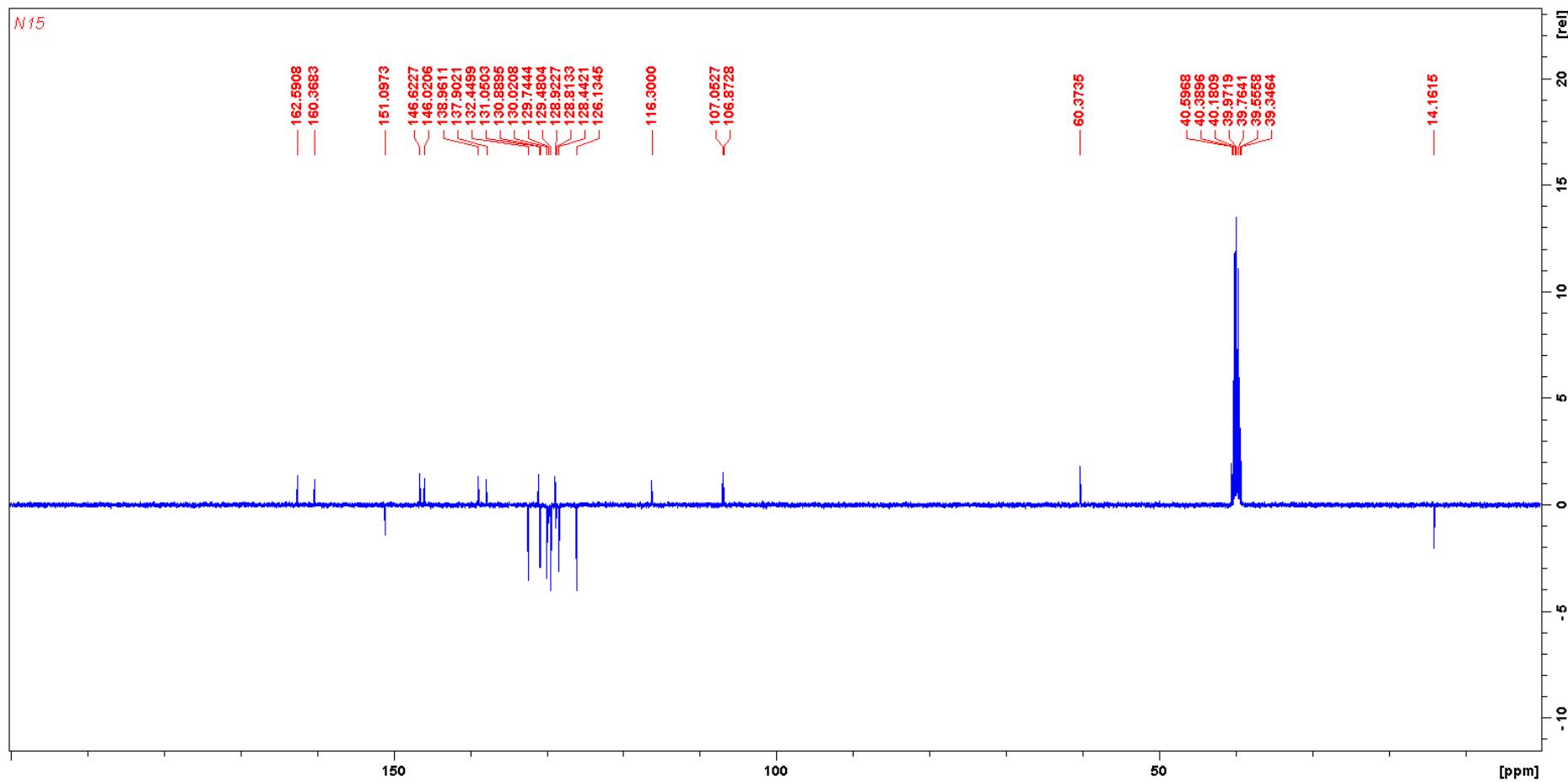


Figure 33. The ^{13}C NMR spectrum of compound 24b