

Supplementary data for the article:

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Novel 1,3,4-thiadiazole conjugates derived from protocatechuic acid: Synthesis, antioxidant activity, computational and electrochemical studies

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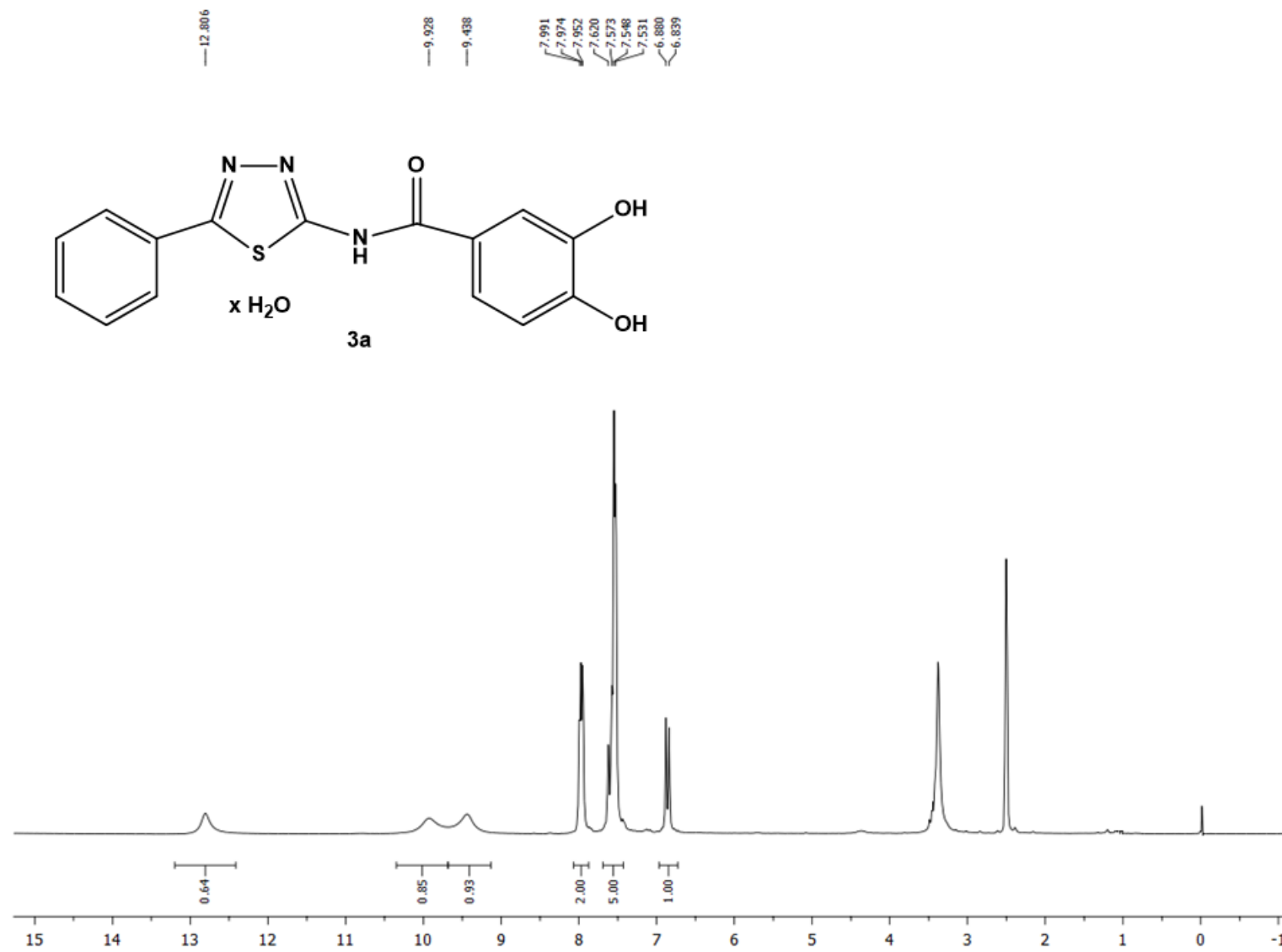


Figure S1. ¹H NMR spectrum of **3a** in DMSO-d₆ (200 MHz).

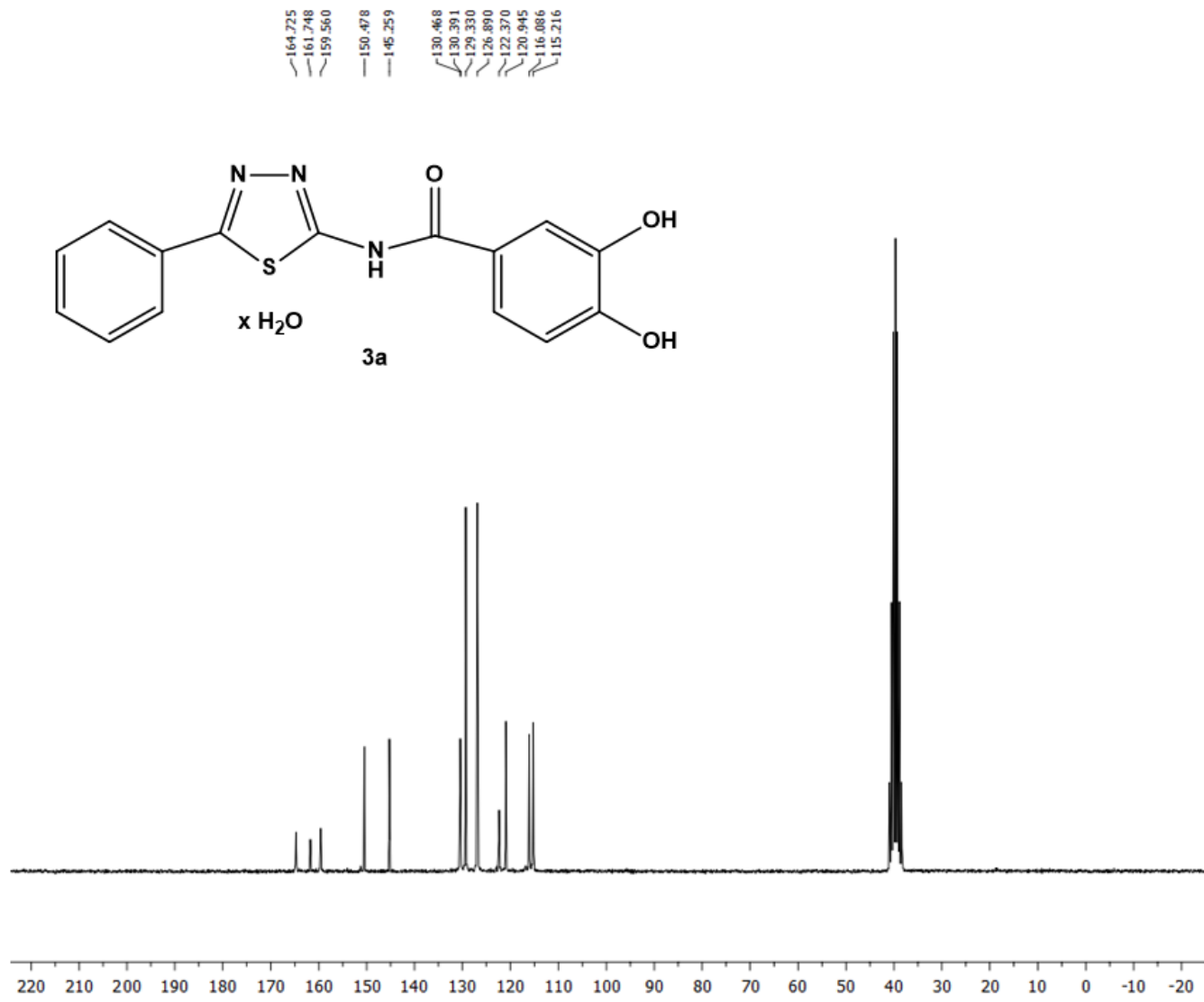


Figure S2. ¹³C NMR spectrum of **3a** in DMSO-d₆ (50 MHz).

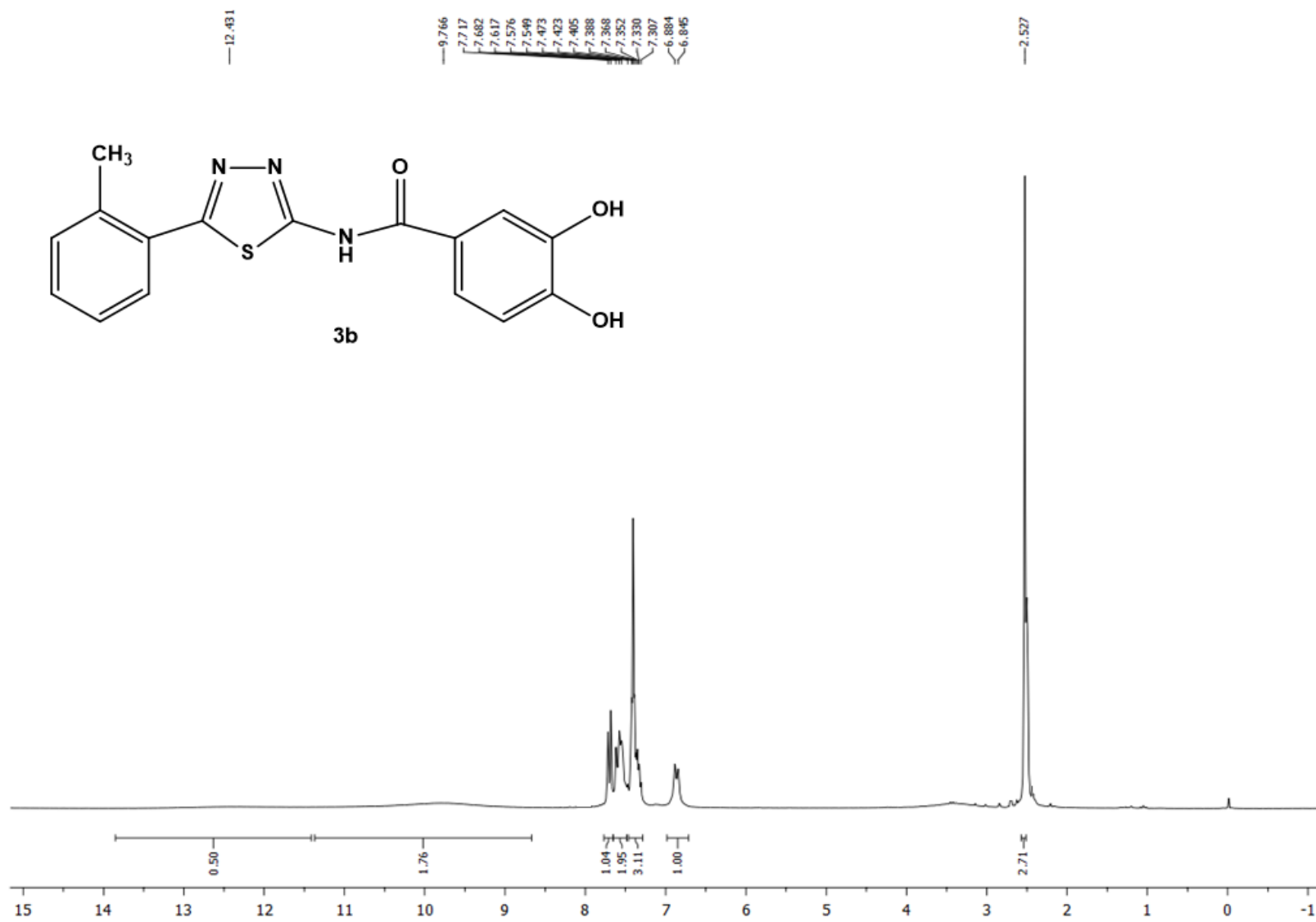


Figure S3. ¹H NMR spectrum of **3b** in DMSO-d₆ (200 MHz).

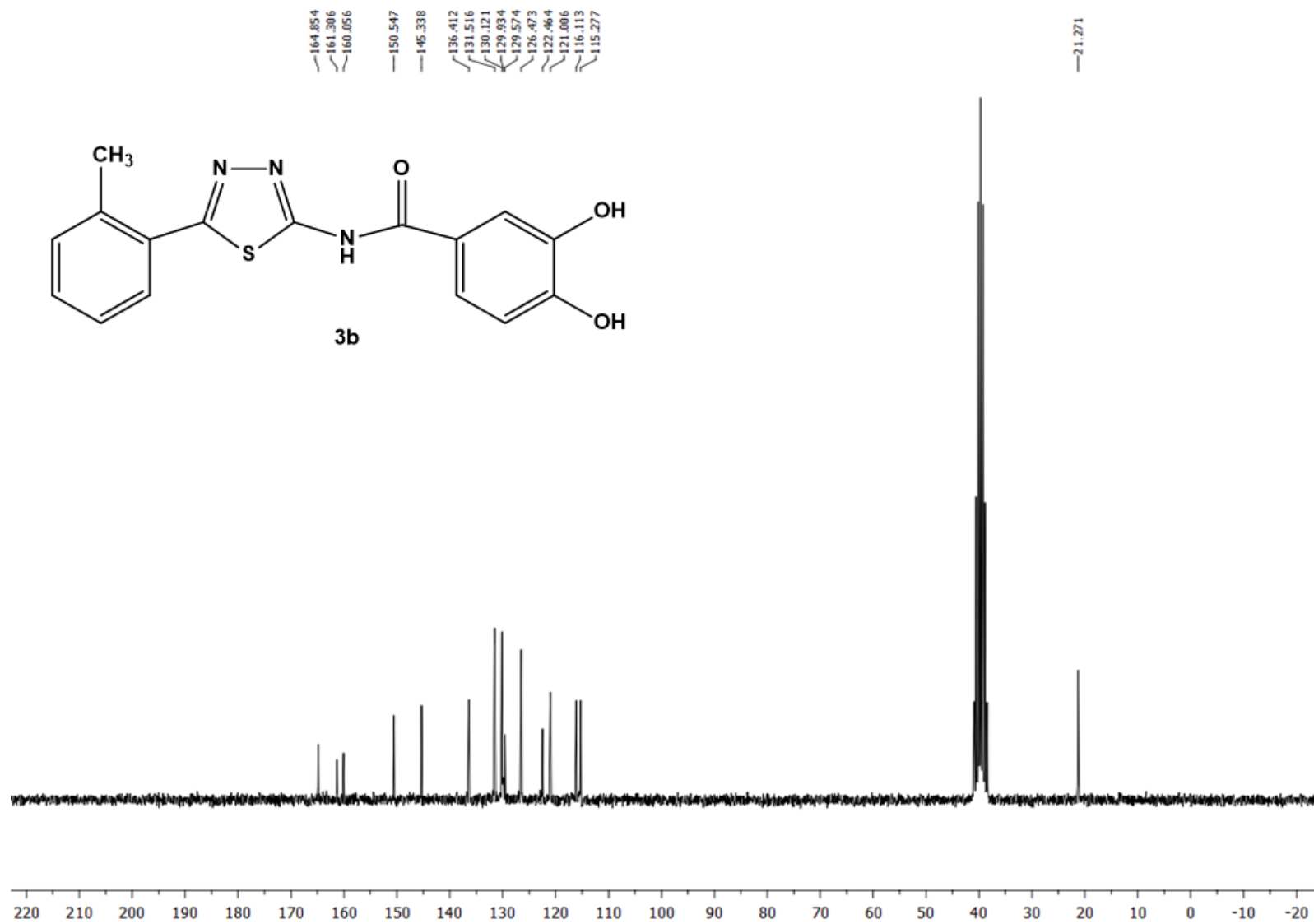


Figure S4. ¹³C NMR spectrum of **3b** in DMSO-d₆ (50 MHz).

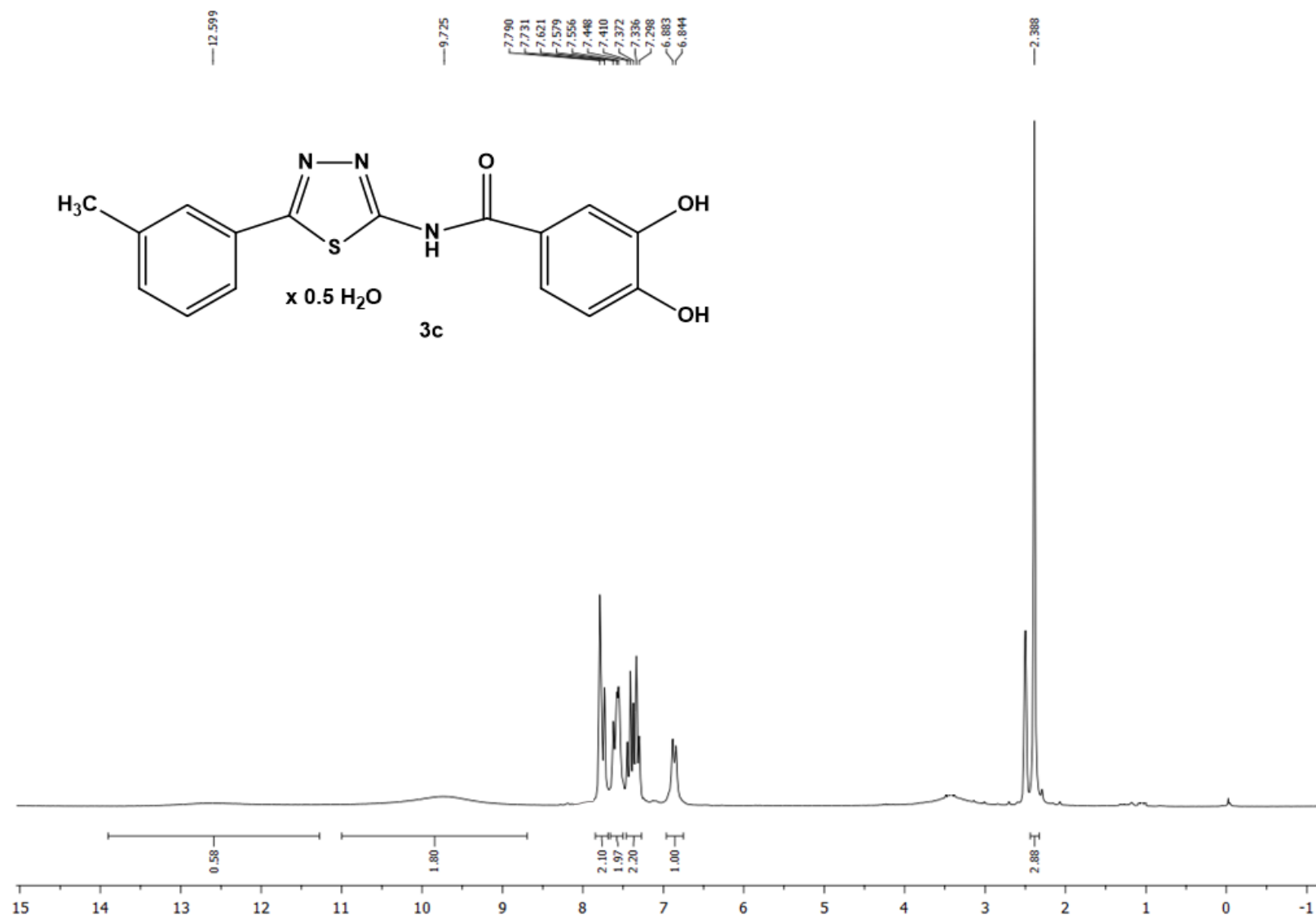


Figure S5. ¹H NMR spectrum of **3c** in DMSO-d₆ (200 MHz).

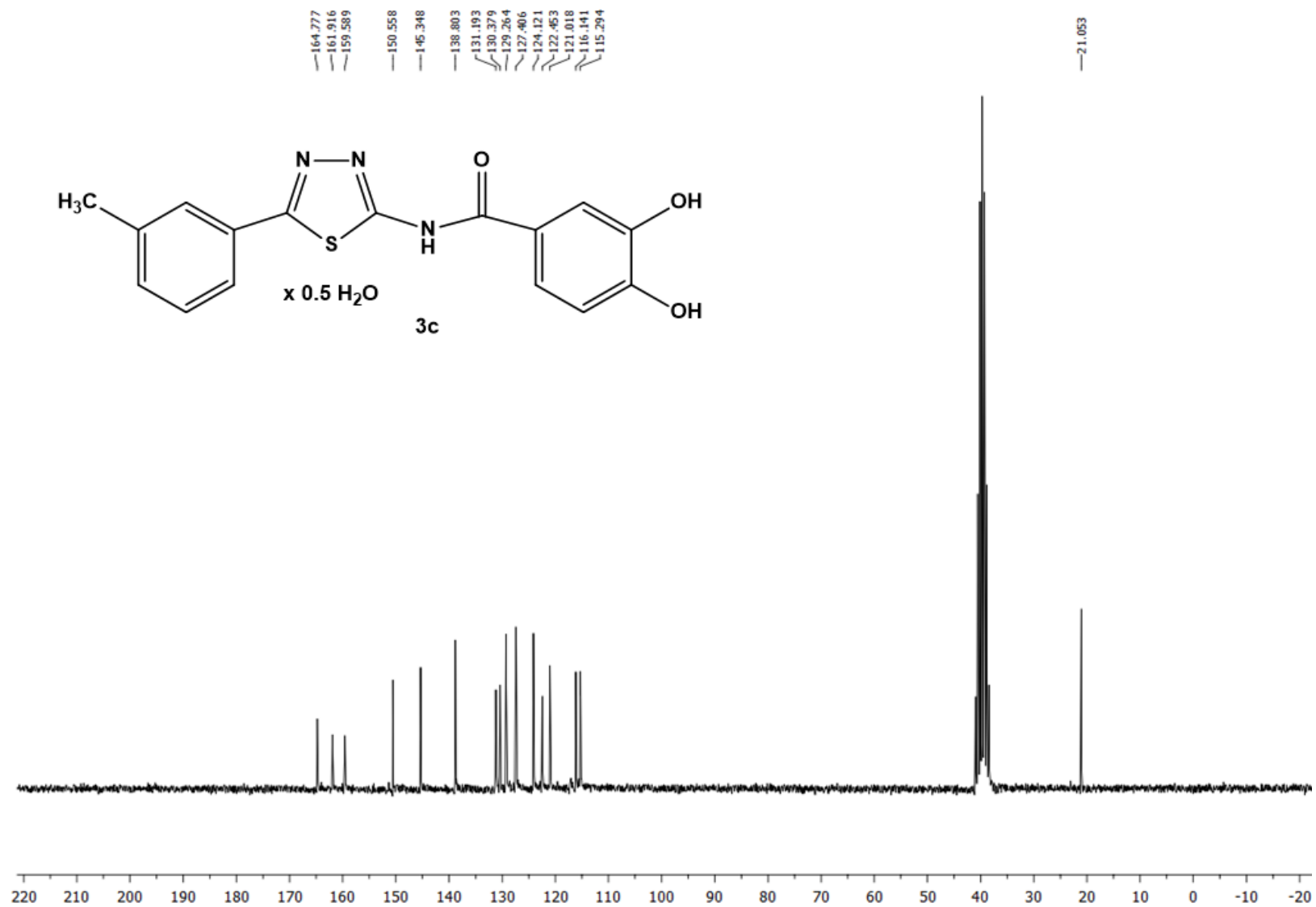


Figure S6. ¹³C NMR spectrum of **3c** in DMSO-d₆ (50 MHz).

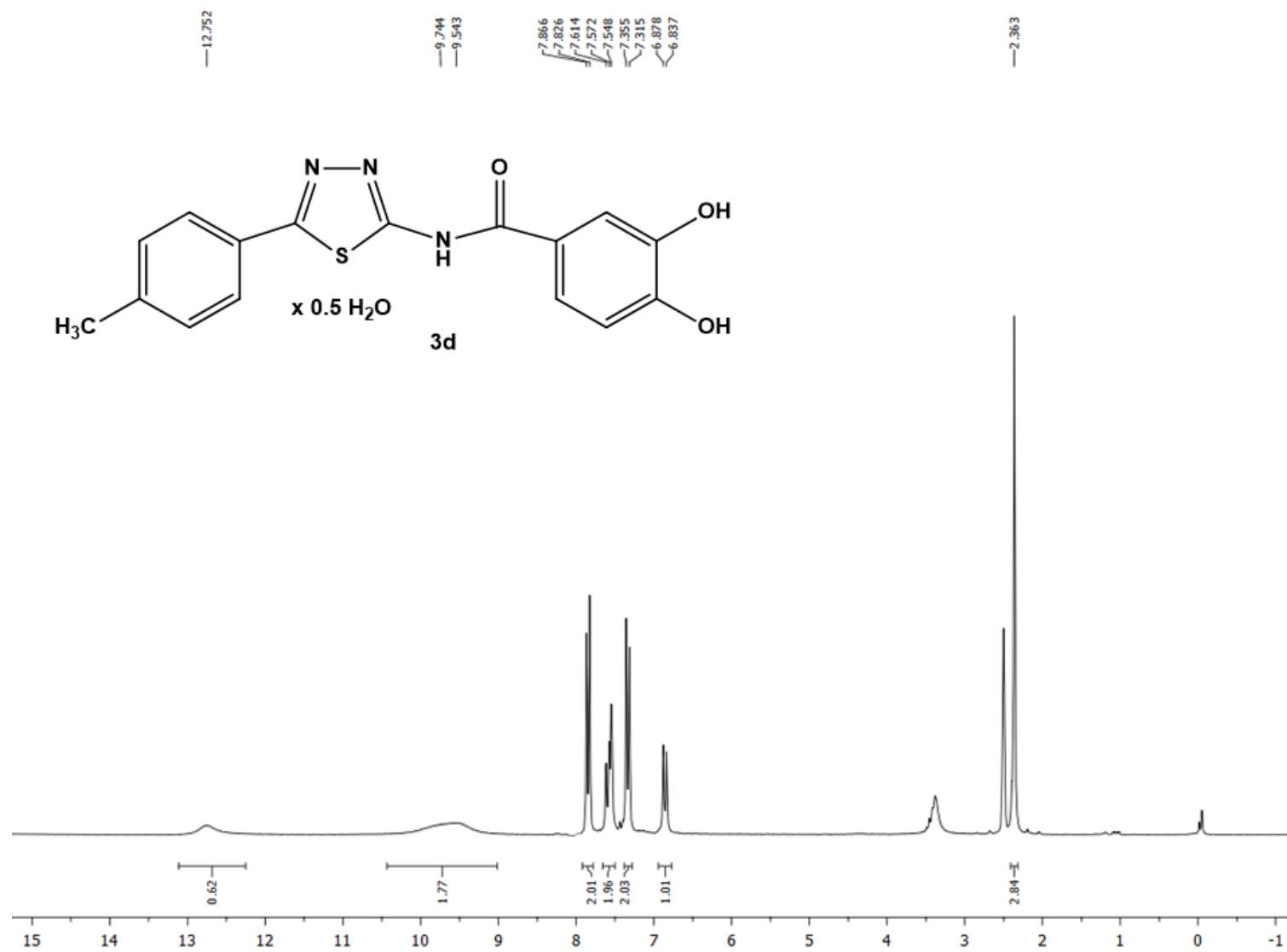


Figure S7. ¹H NMR spectrum of **3d** in DMSO-d₆ (200 MHz).

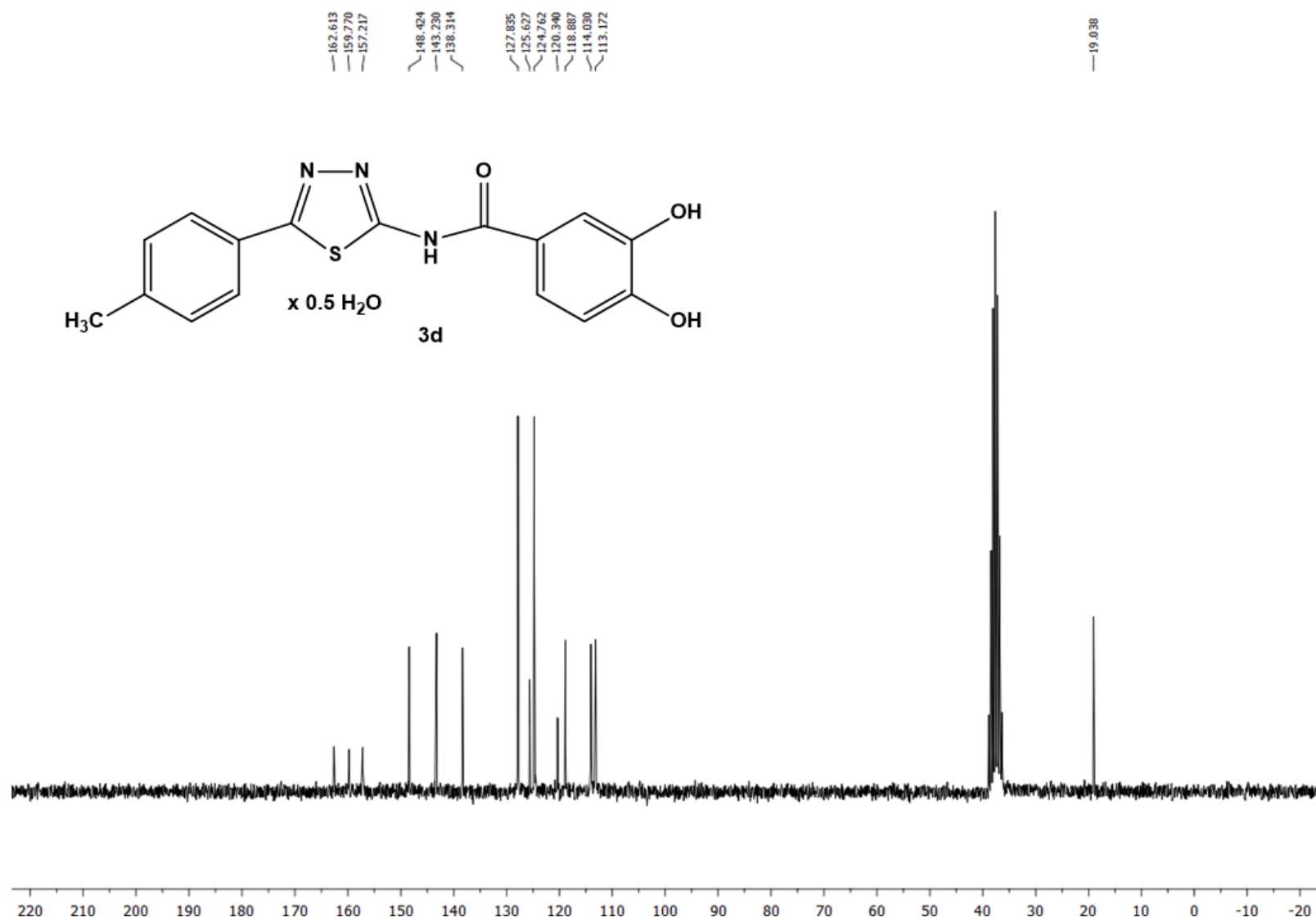


Figure S8. ¹³C NMR spectrum of **3d** in DMSO-d₆ (50 MHz).

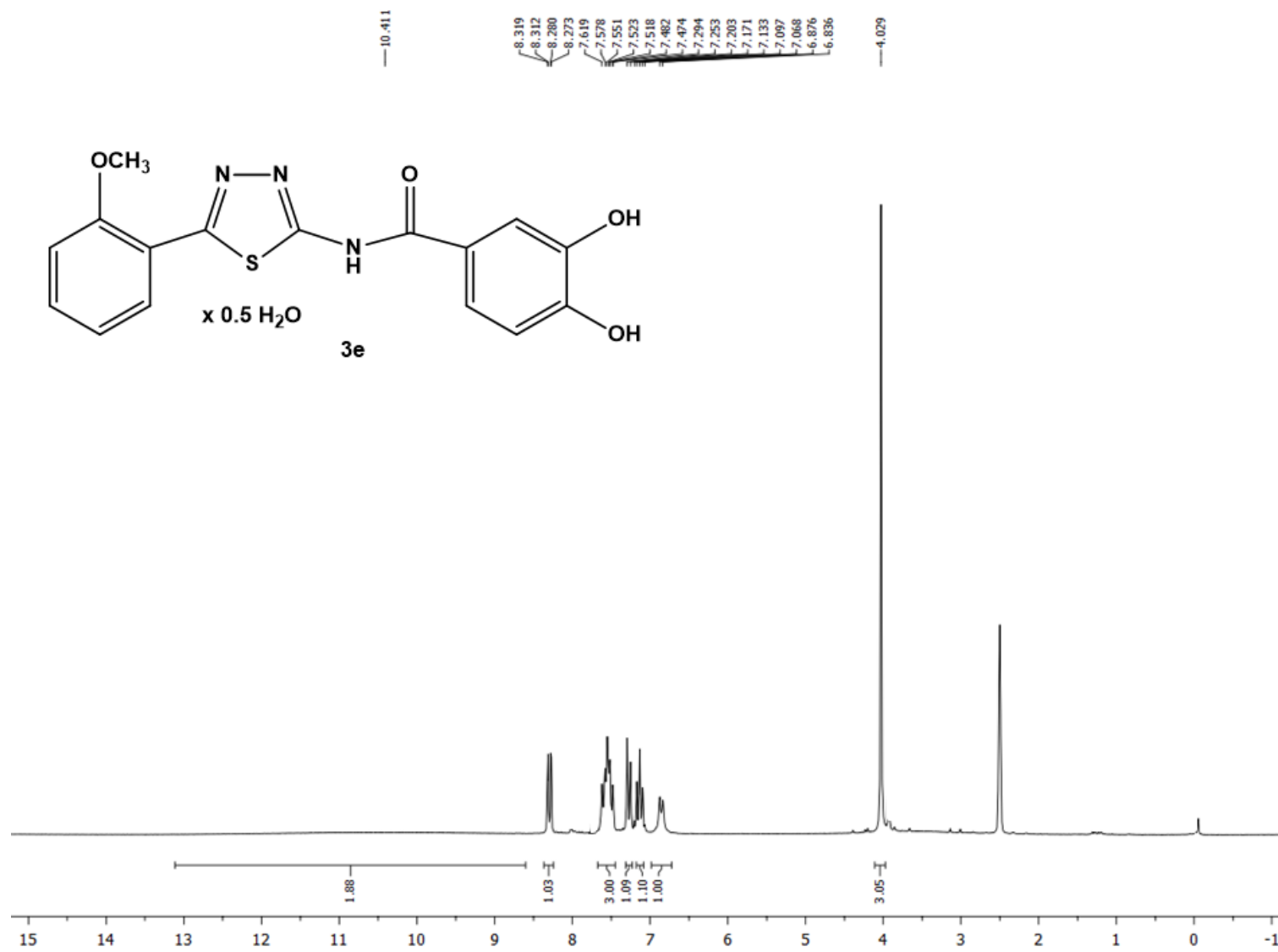


Figure S9. ¹H NMR spectrum of **3e** in DMSO-d₆ (200 MHz).

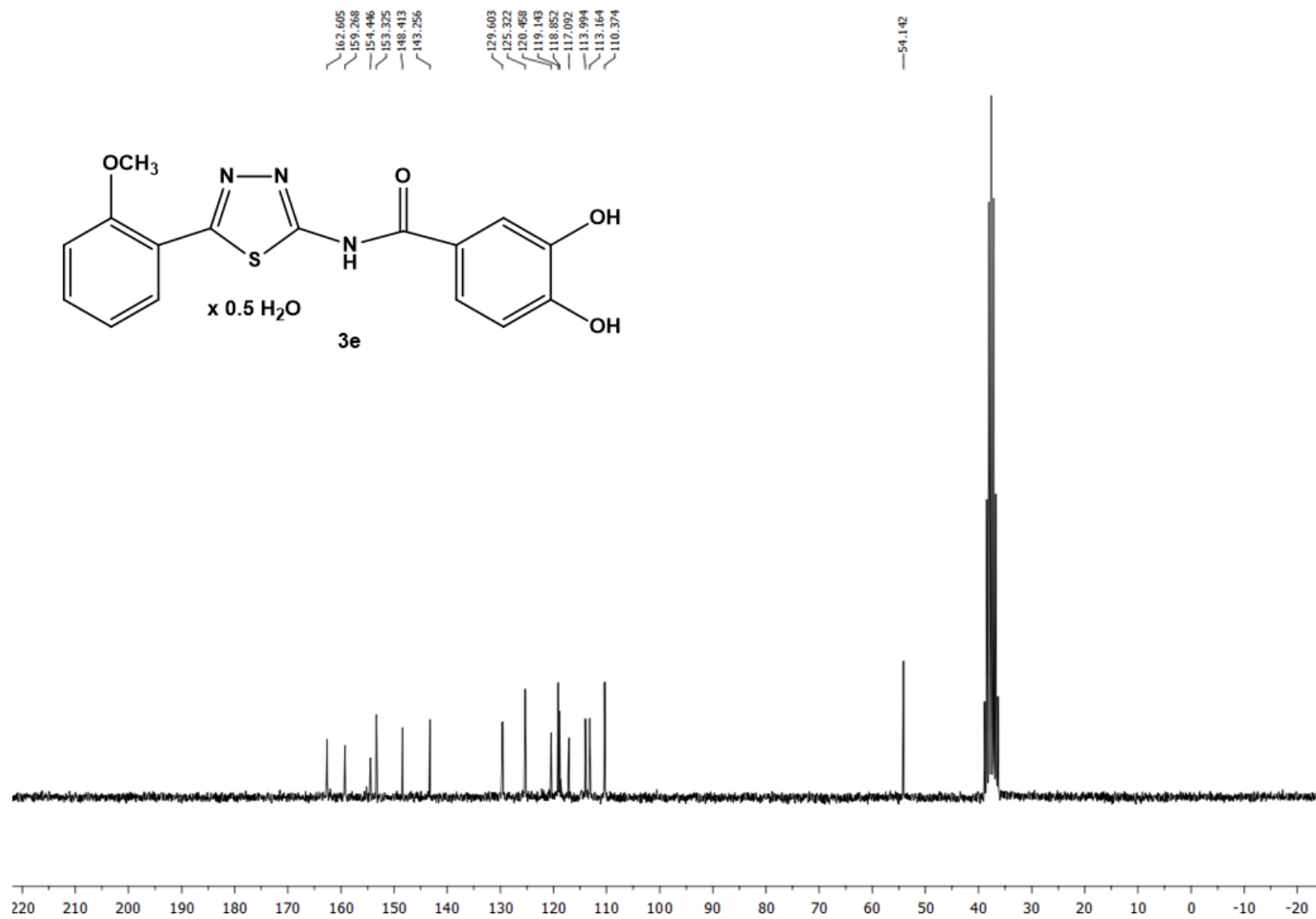


Figure S10. ¹³C NMR spectrum of **3e** in DMSO-d₆ (50 MHz).

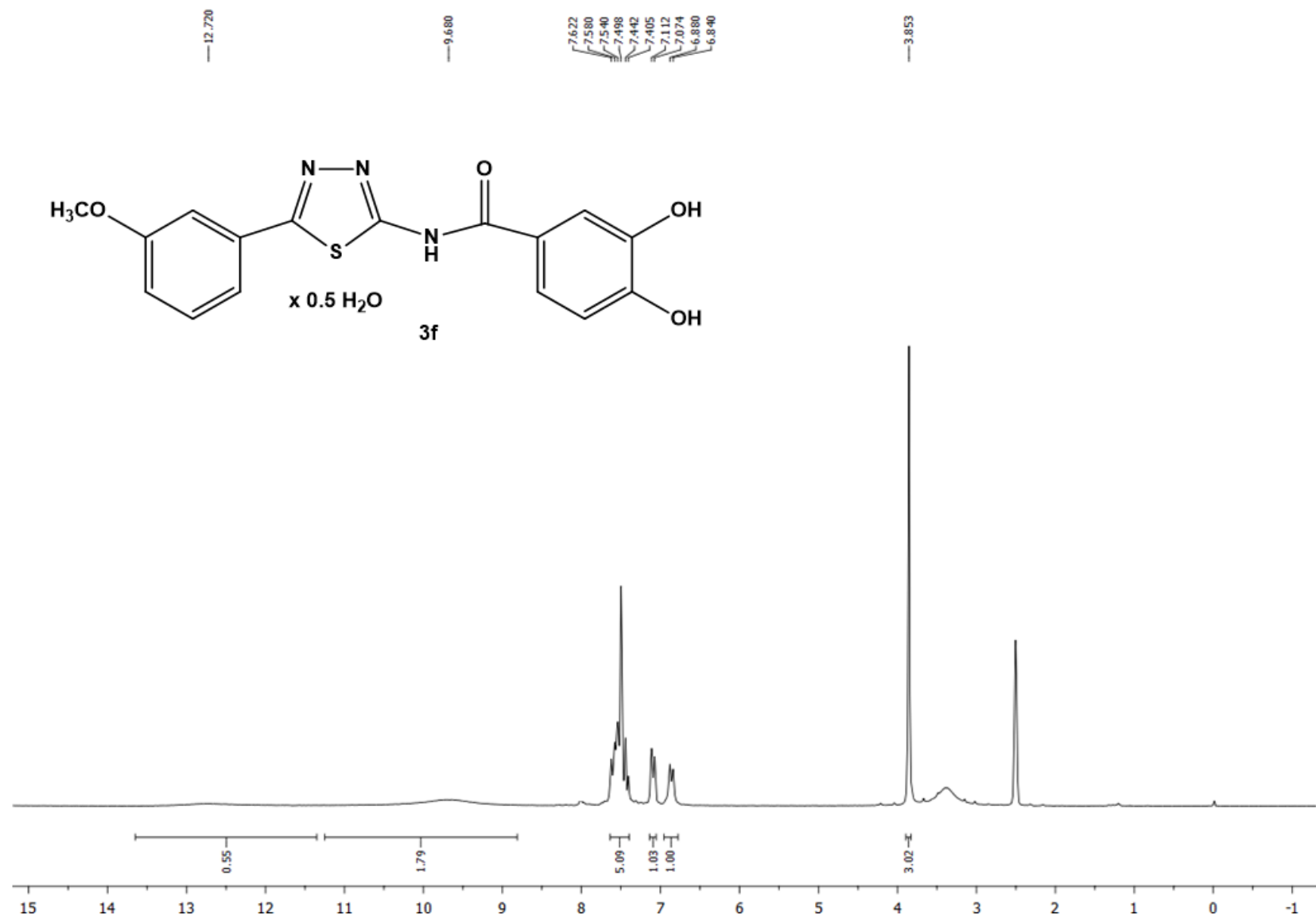


Figure S11. ¹H NMR spectrum of **3f** in DMSO-d₆ (200 MHz).

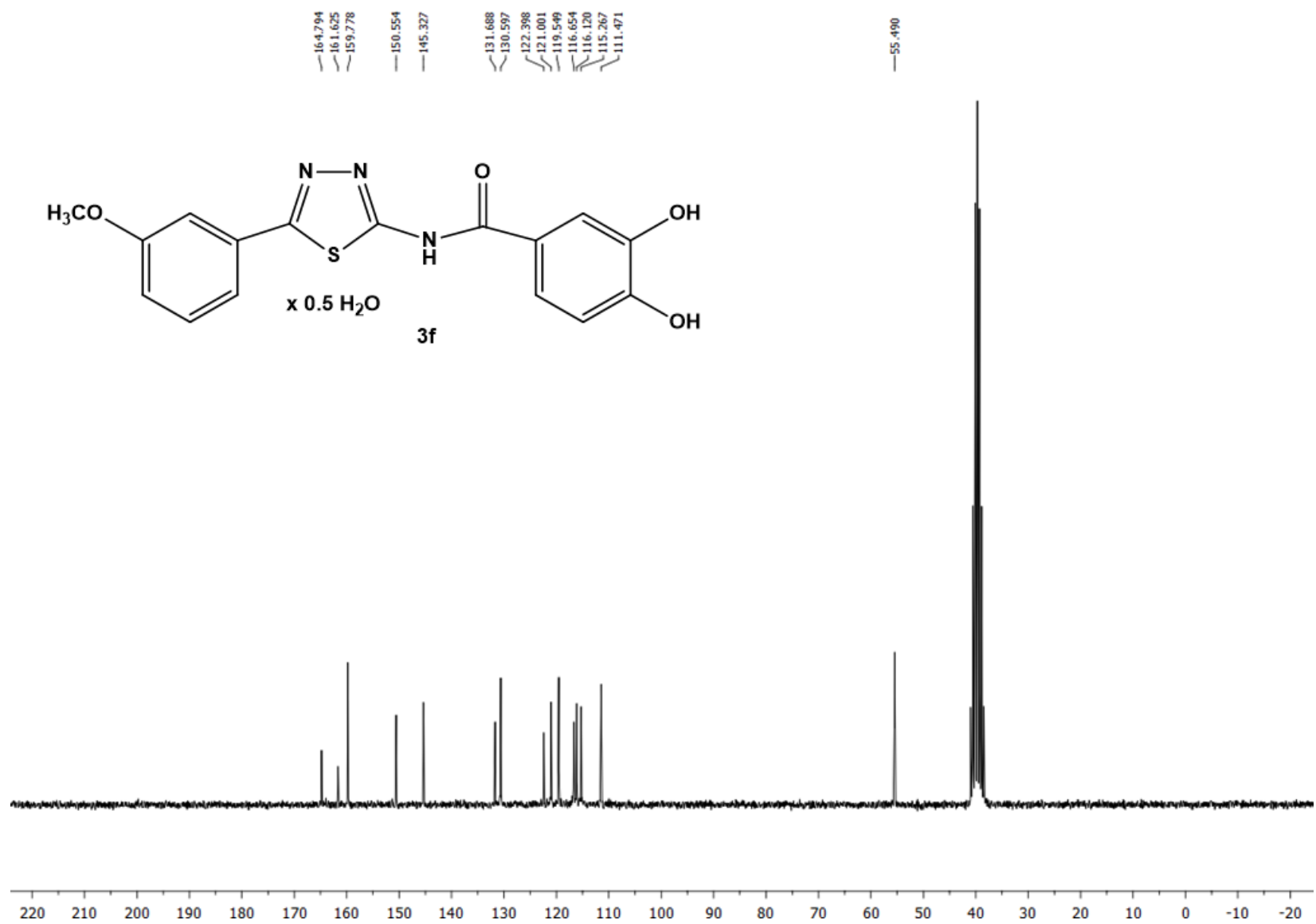


Figure S12. ¹³C NMR spectrum of **3f** in DMSO-d₆ (50 MHz).

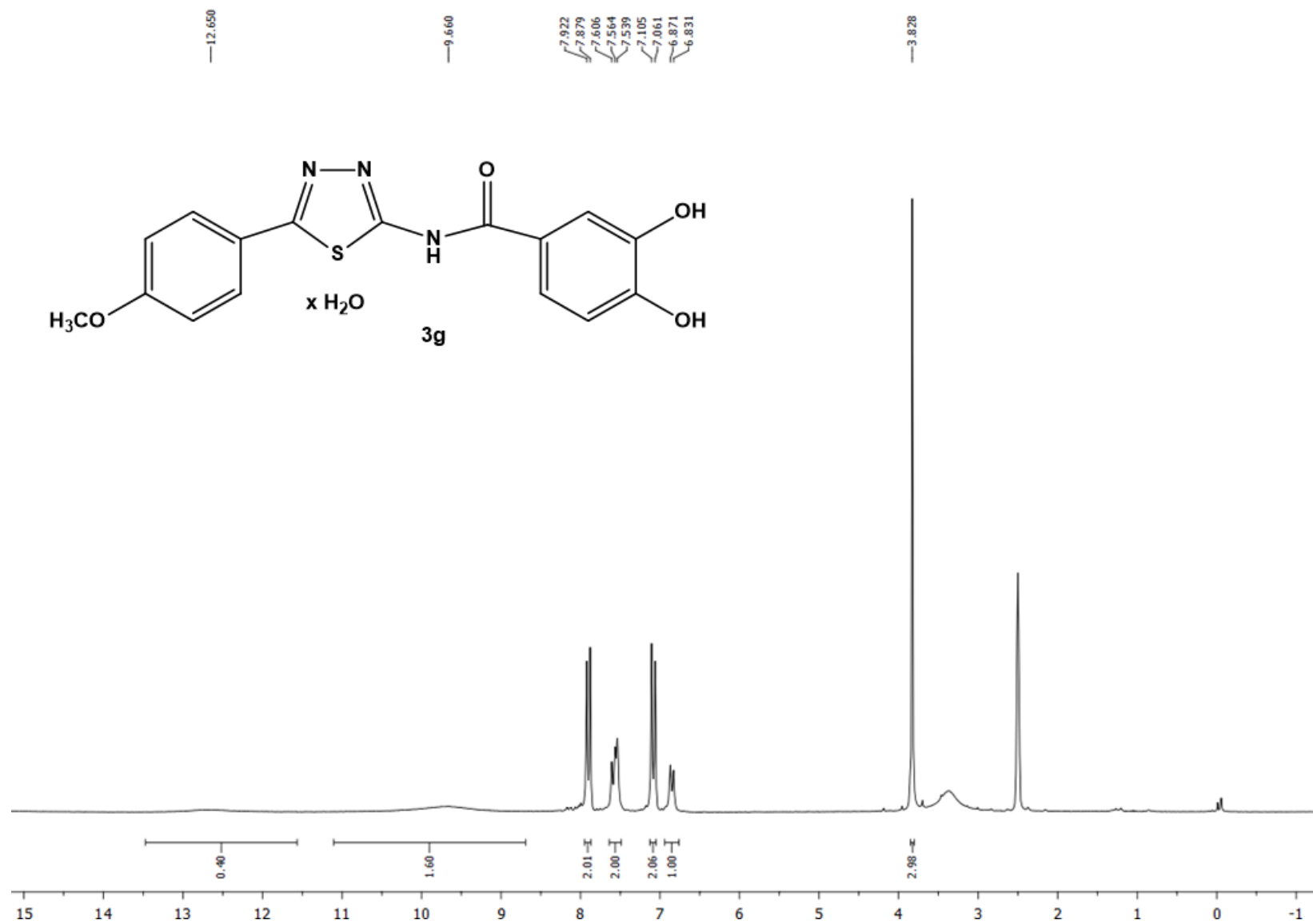


Figure S13. ¹H NMR spectrum of **3g** in DMSO-d₆ (200 MHz).

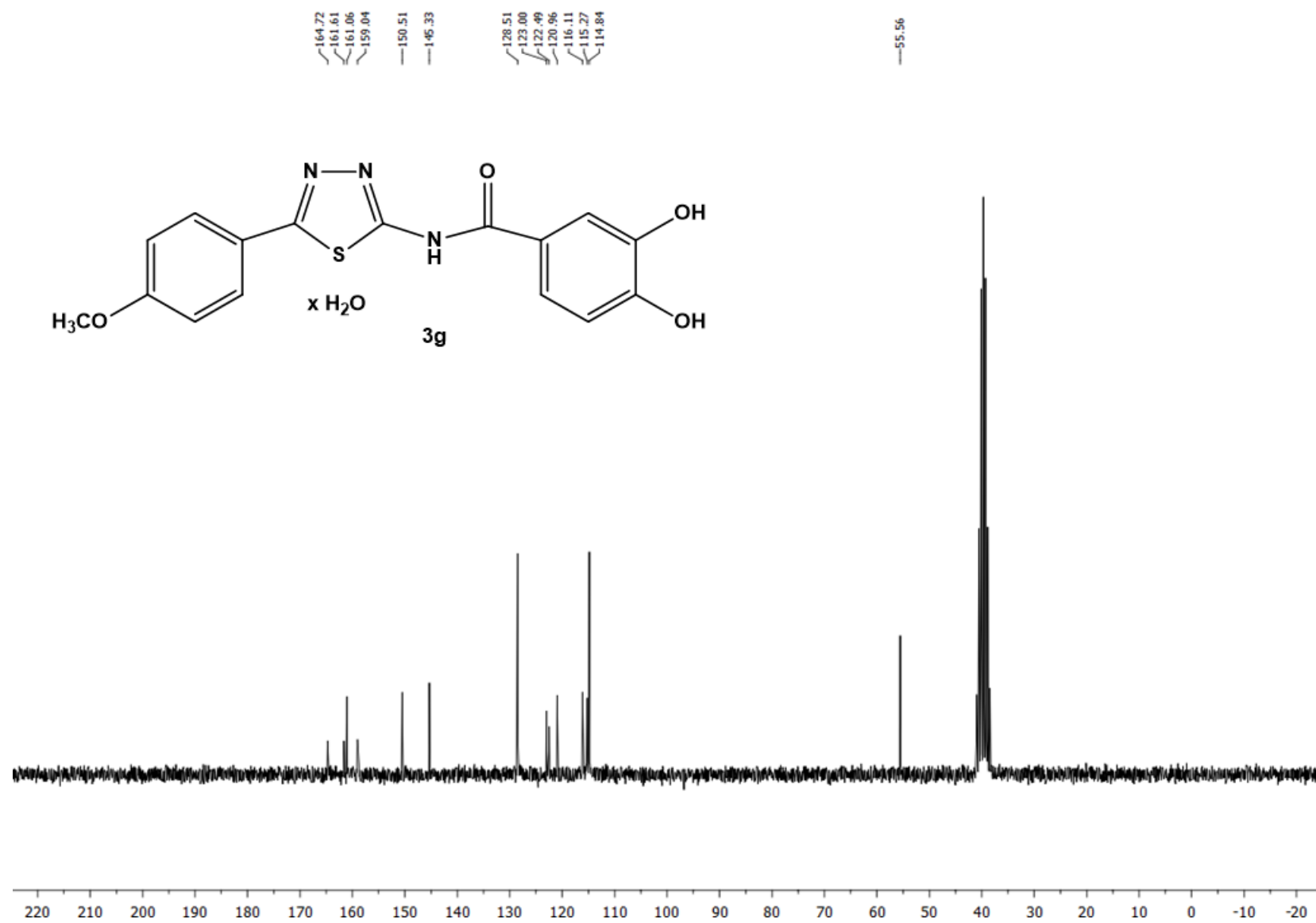


Figure S14. ^{13}C NMR spectrum of **3g** in DMSO-d_6 (50 MHz).

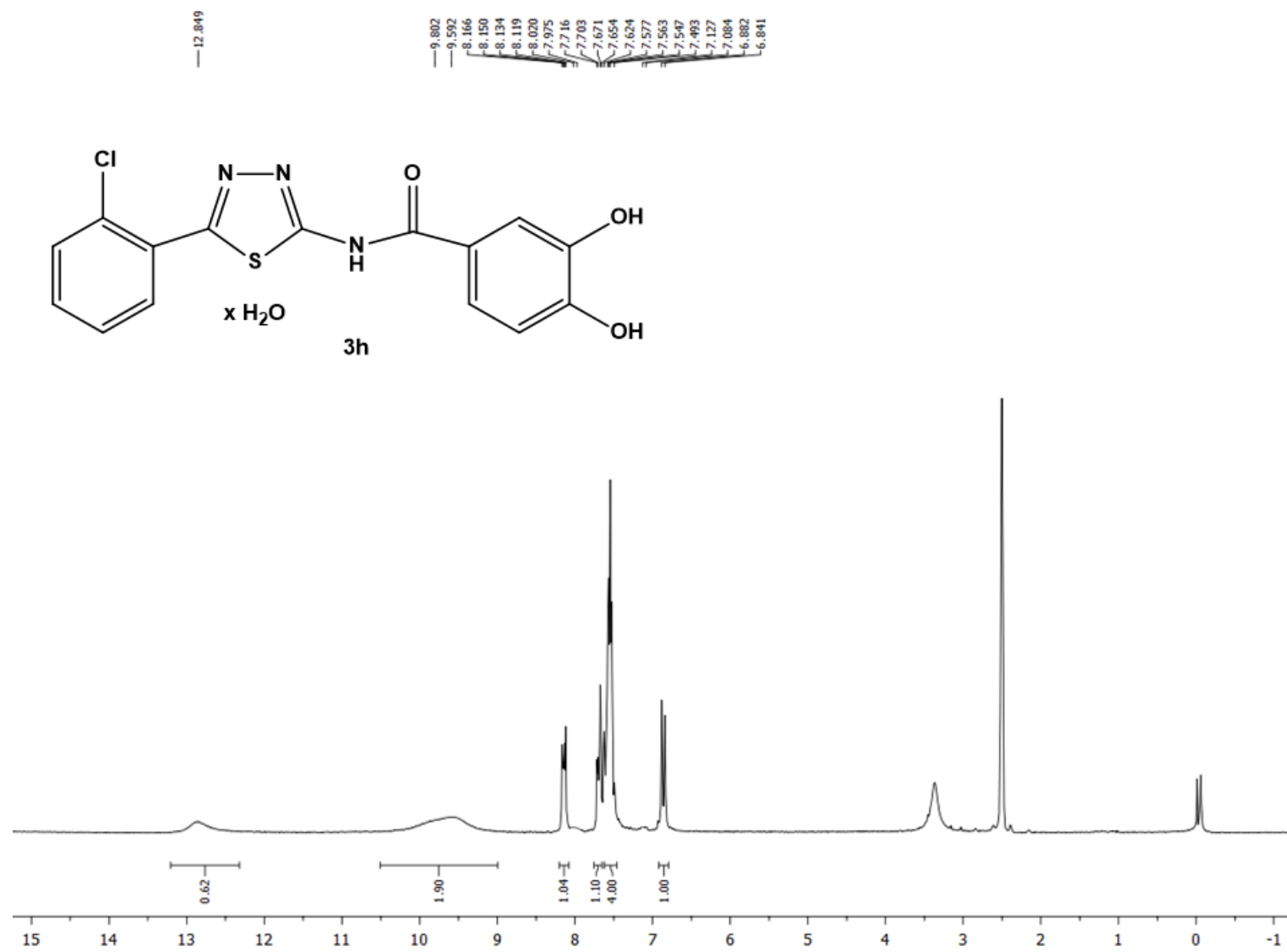


Figure S15. ¹H NMR spectrum of **3h** in DMSO-d₆ (200 MHz).

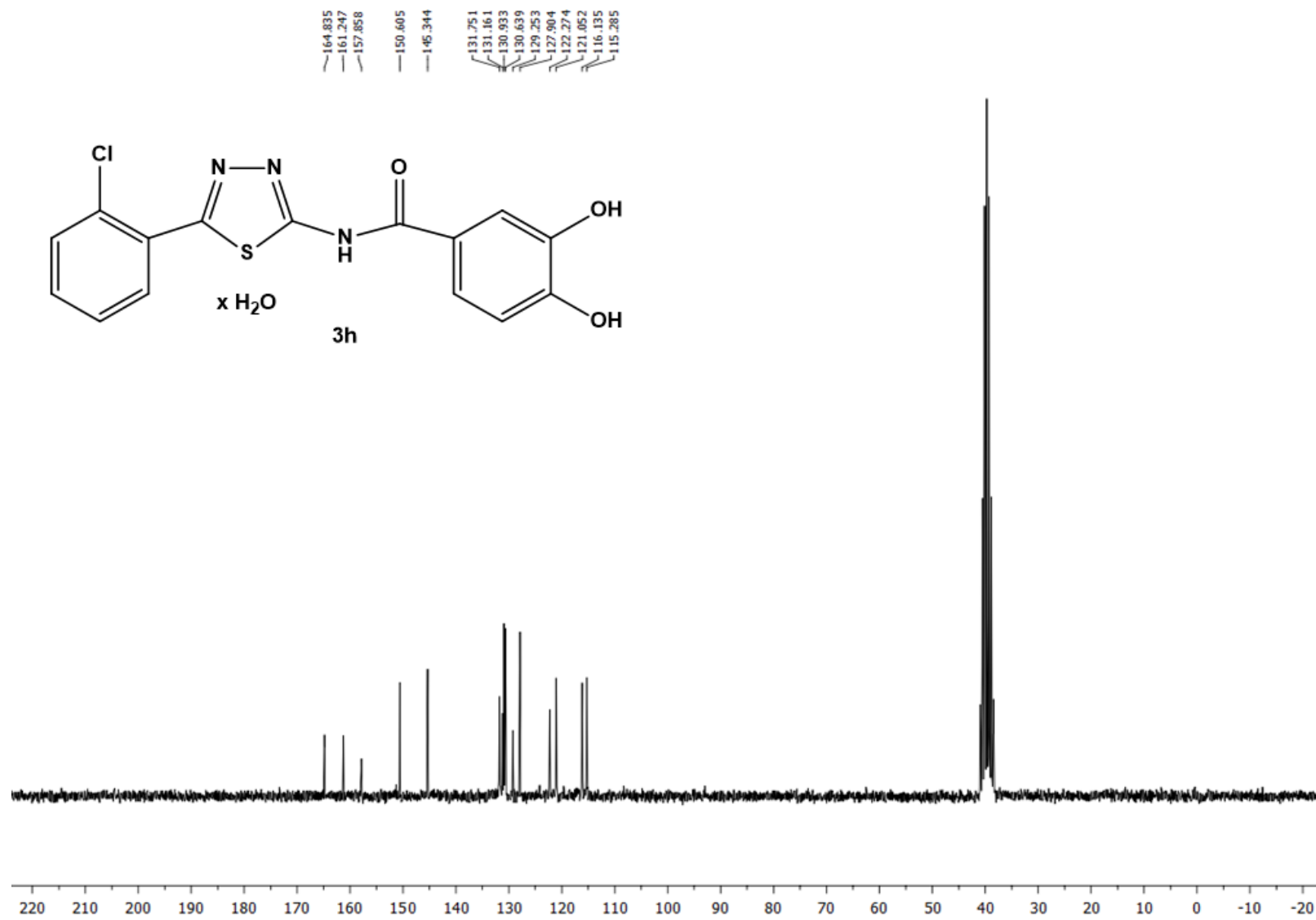


Figure S16. ¹³C NMR spectrum of **3h** in DMSO-d₆ (50 MHz).

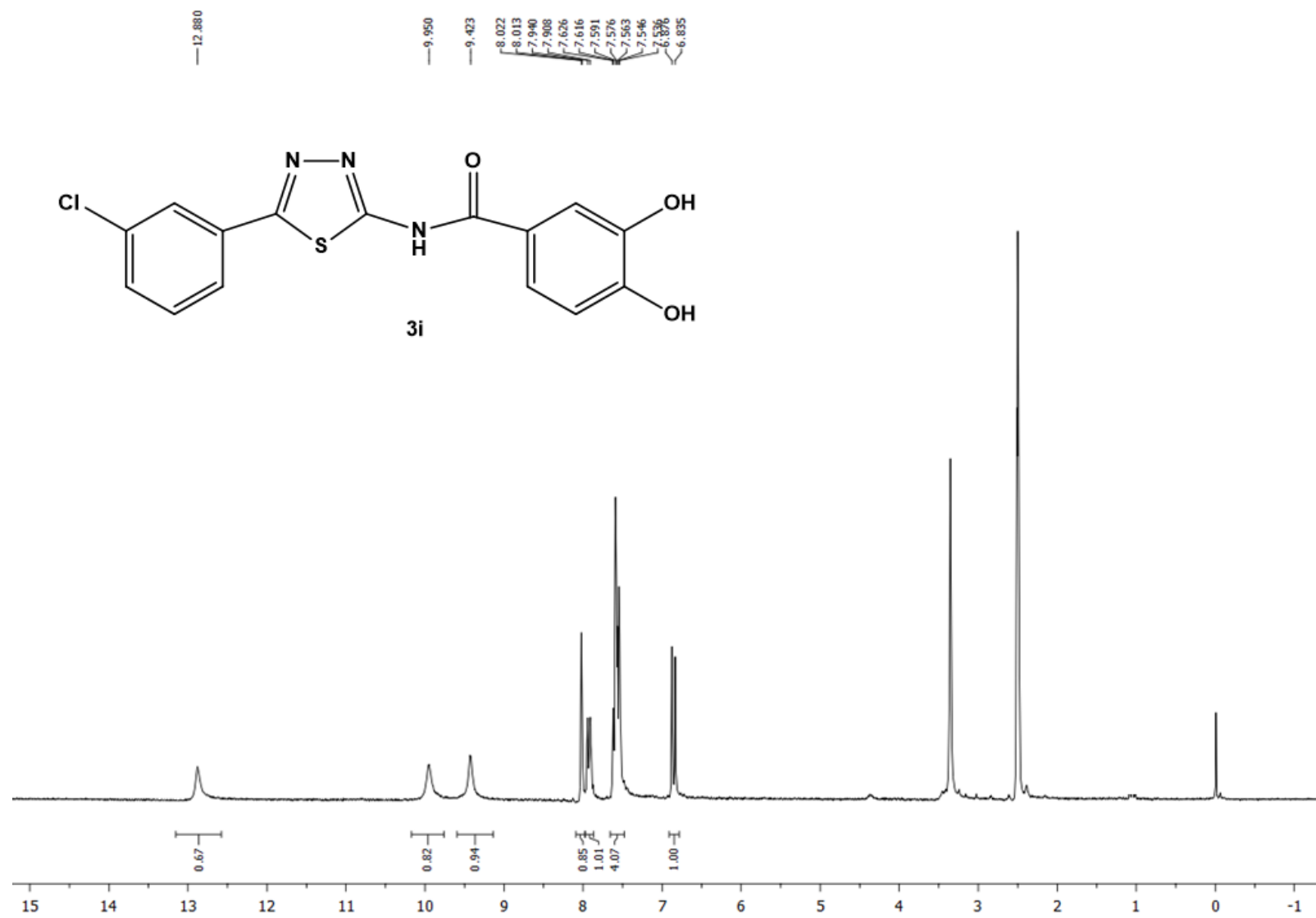


Figure S17. ¹H NMR spectrum of **3i** in DMSO-d₆ (200 MHz).

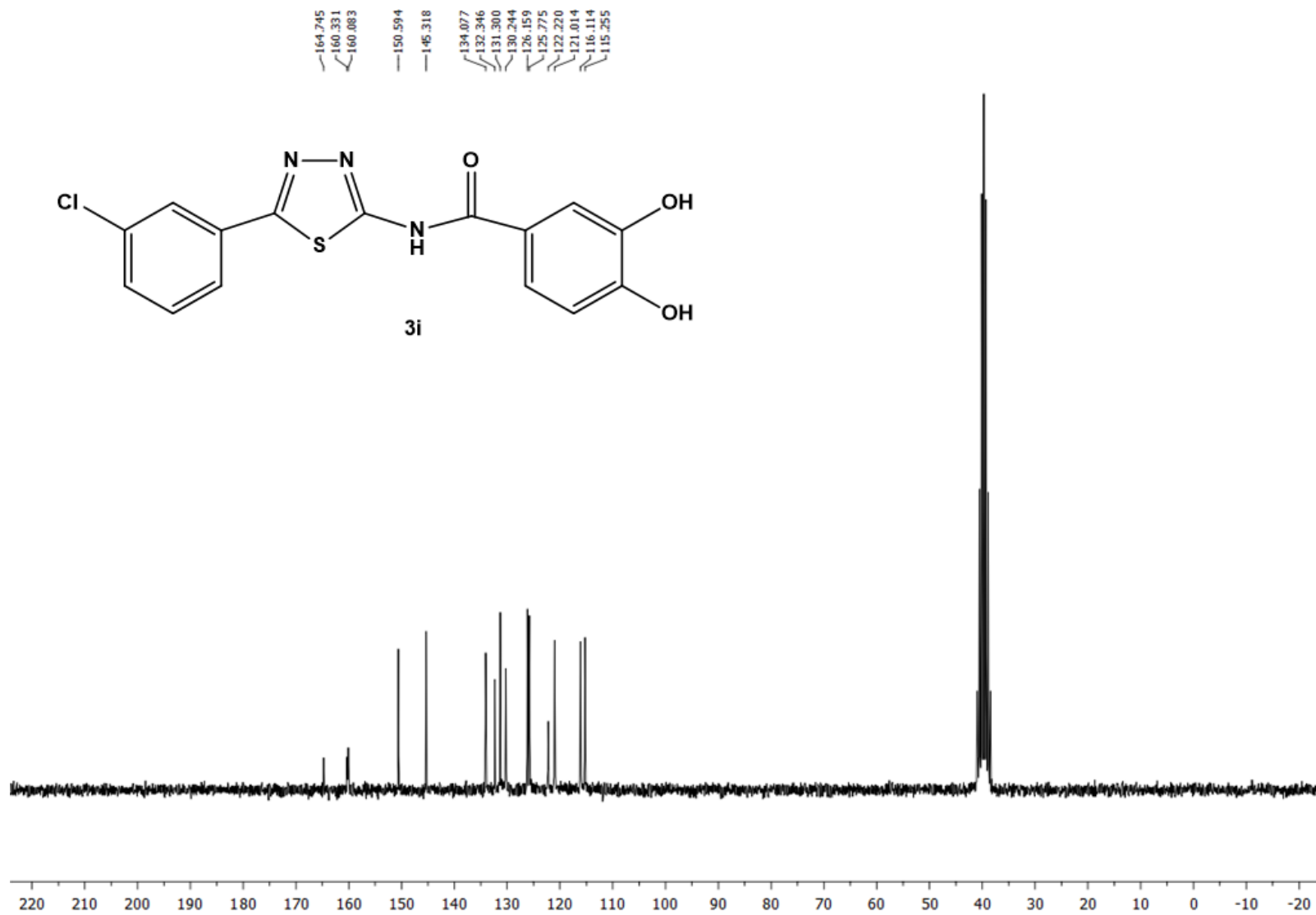


Figure S18. ^{13}C NMR spectrum of **3i** in DMSO-d_6 (50 MHz).

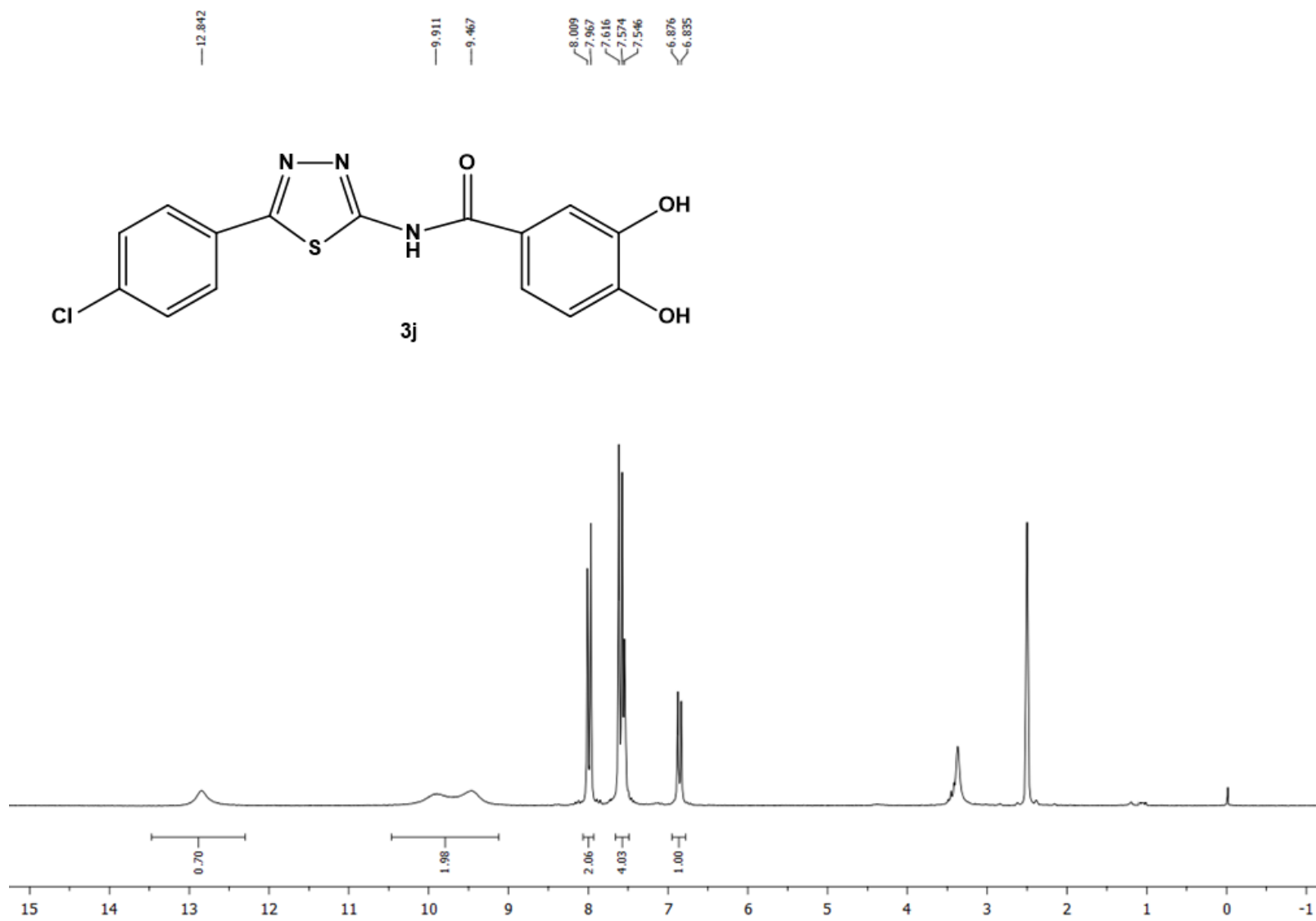


Figure S19. ¹H NMR spectrum of **3j** in DMSO-d₆ (200 MHz).

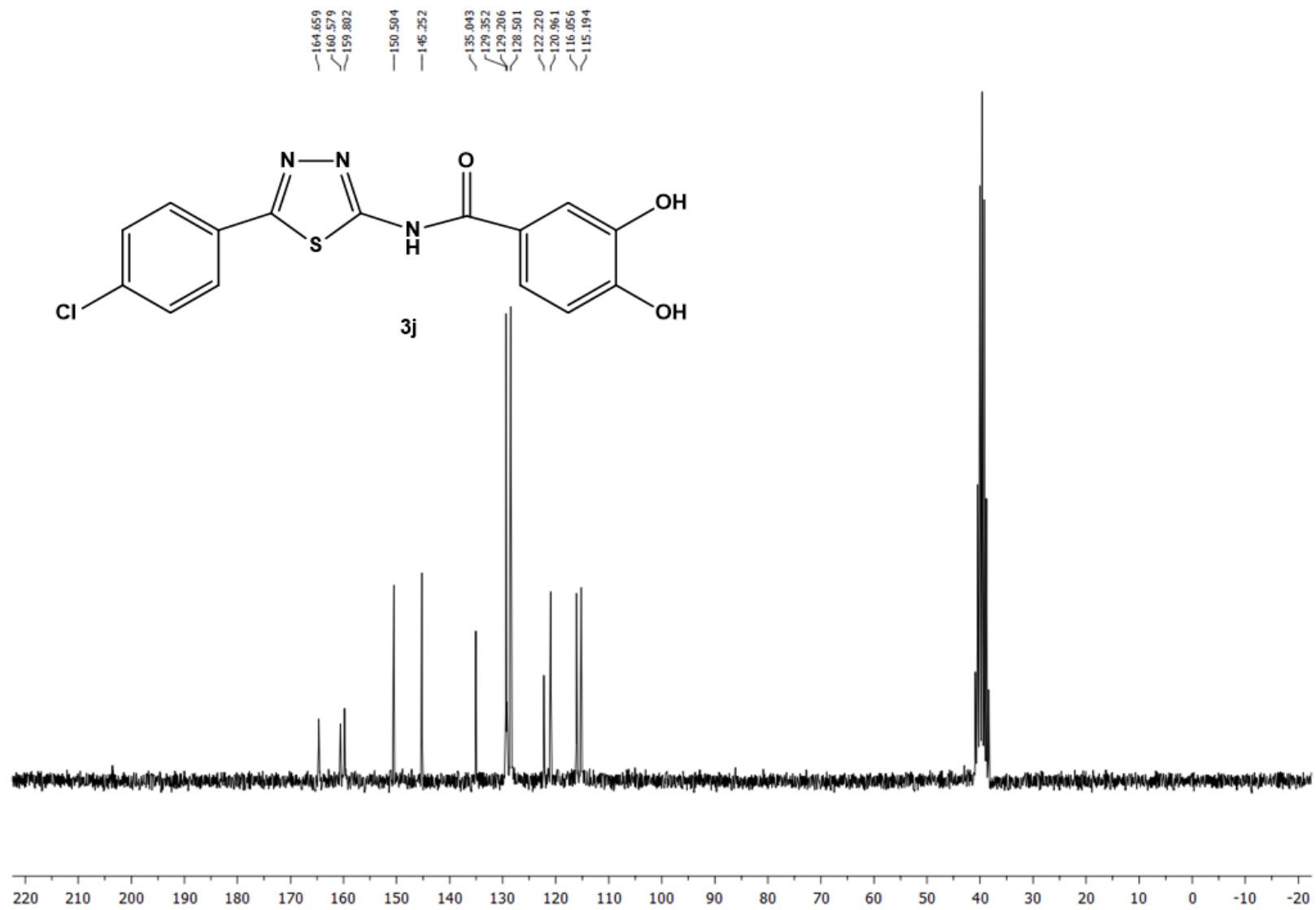


Figure S20. ¹³C NMR spectrum of **3j** in DMSO-d₆ (50 MHz).

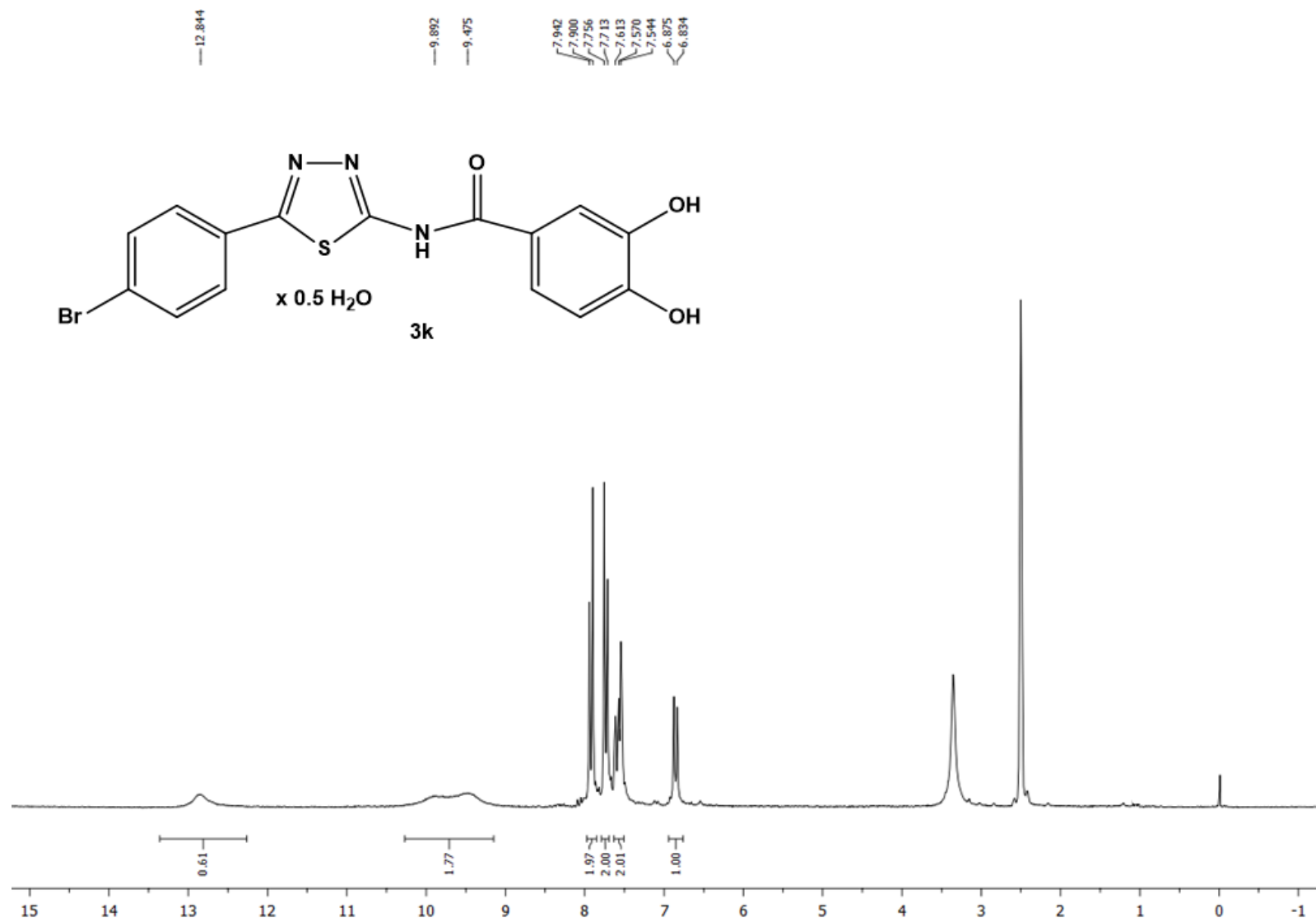


Figure S21. ¹H NMR spectrum of **3k** in DMSO-d₆ (200 MHz).

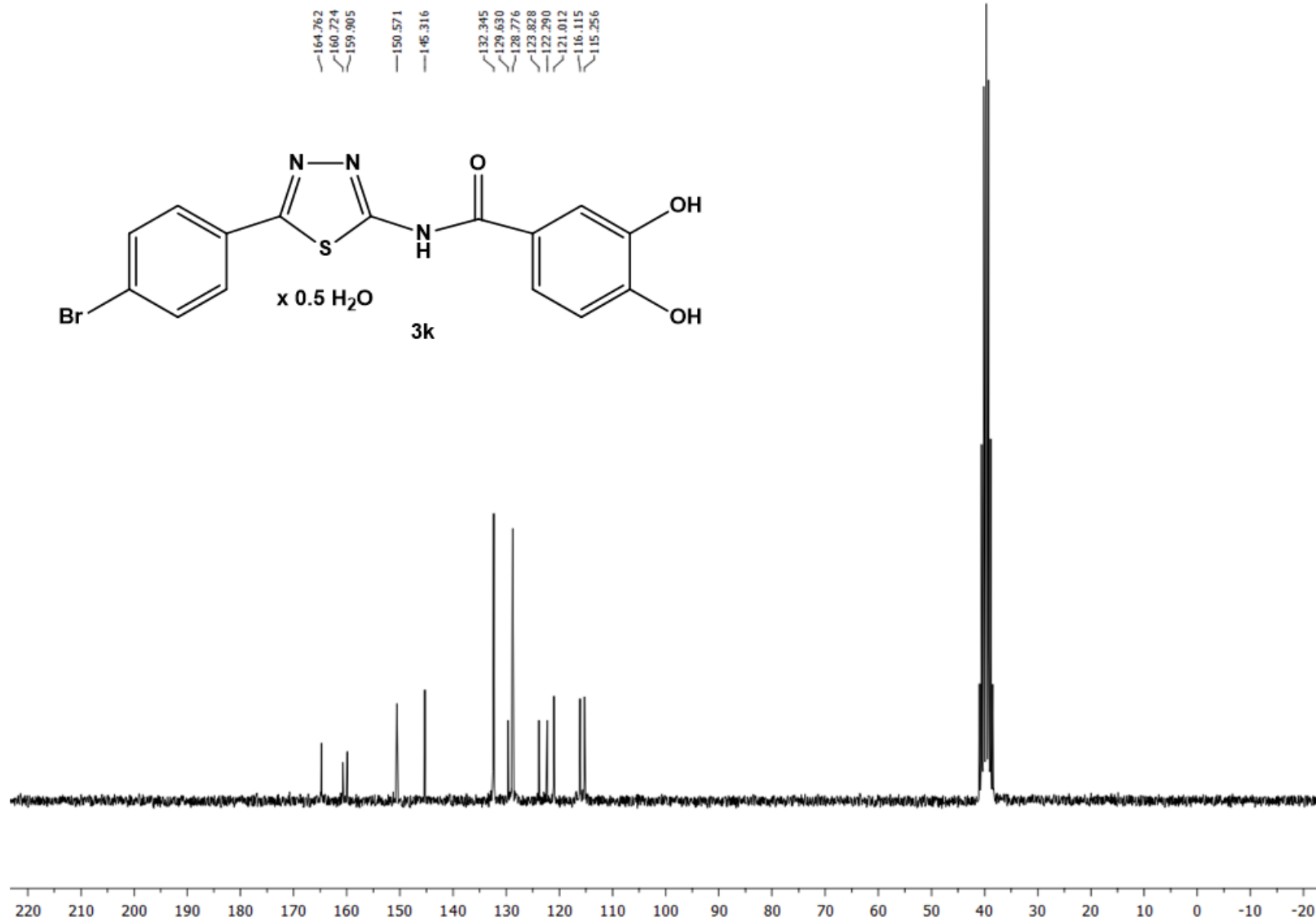


Figure S22. ¹³C NMR spectrum of **3k** in DMSO-d₆ (50 MHz).

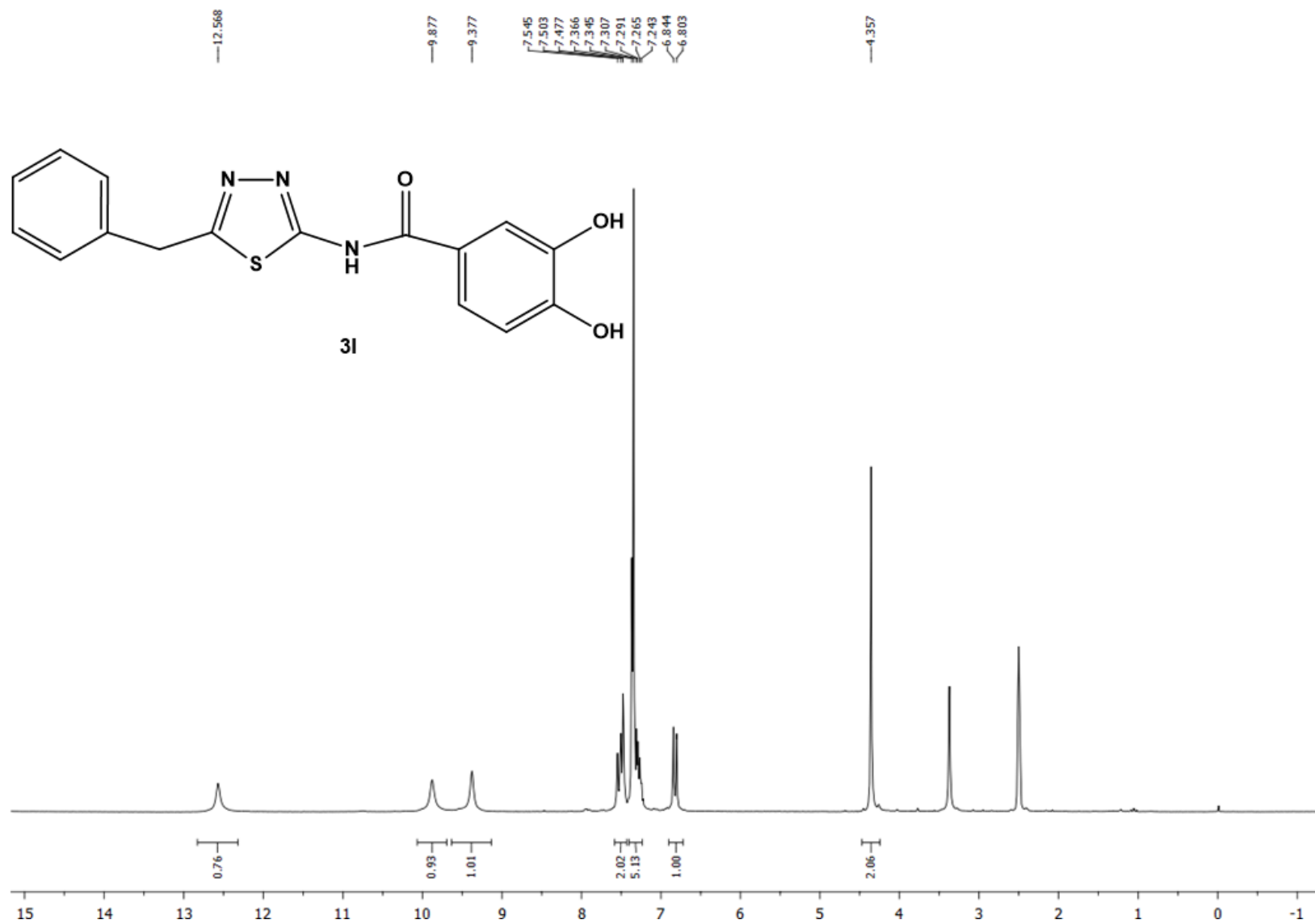


Figure S23. ¹H NMR spectrum of **3l** in DMSO-d₆ (200 MHz).

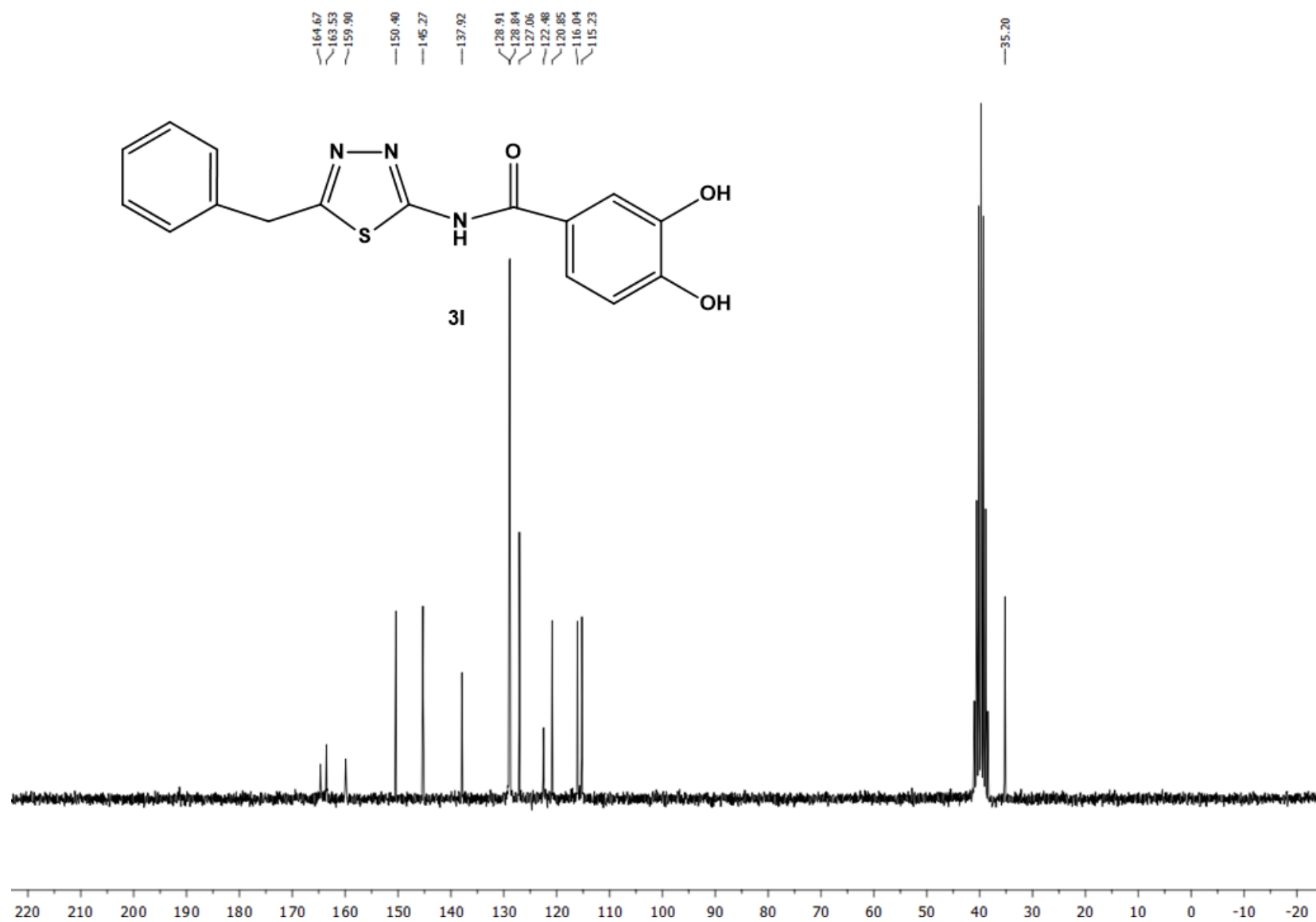


Figure S24. ¹³C NMR spectrum of **3I** in DMSO-d₆ (50 MHz).

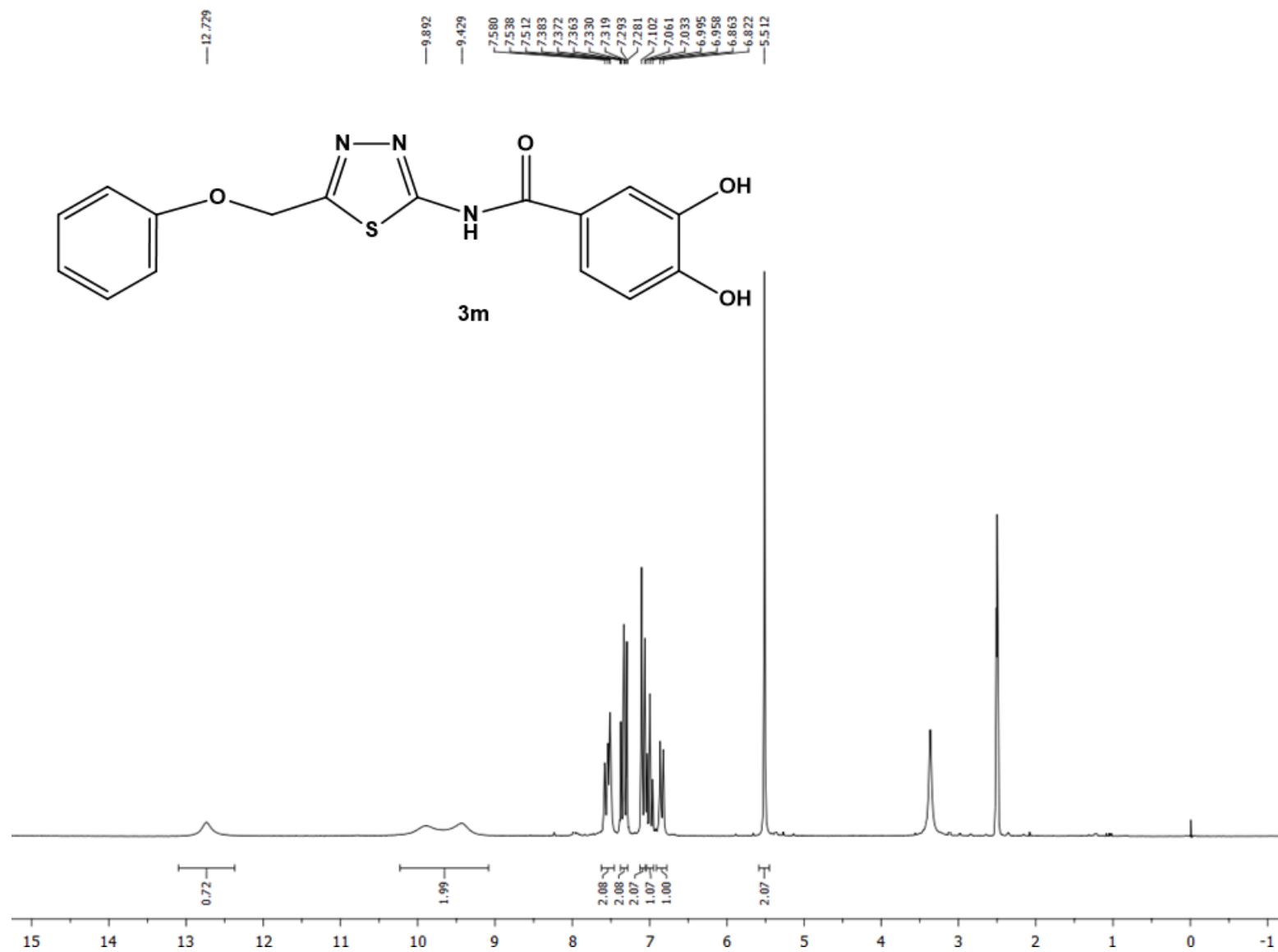


Figure S25. ¹H NMR spectrum of **3m** in DMSO-d₆ (200 MHz).

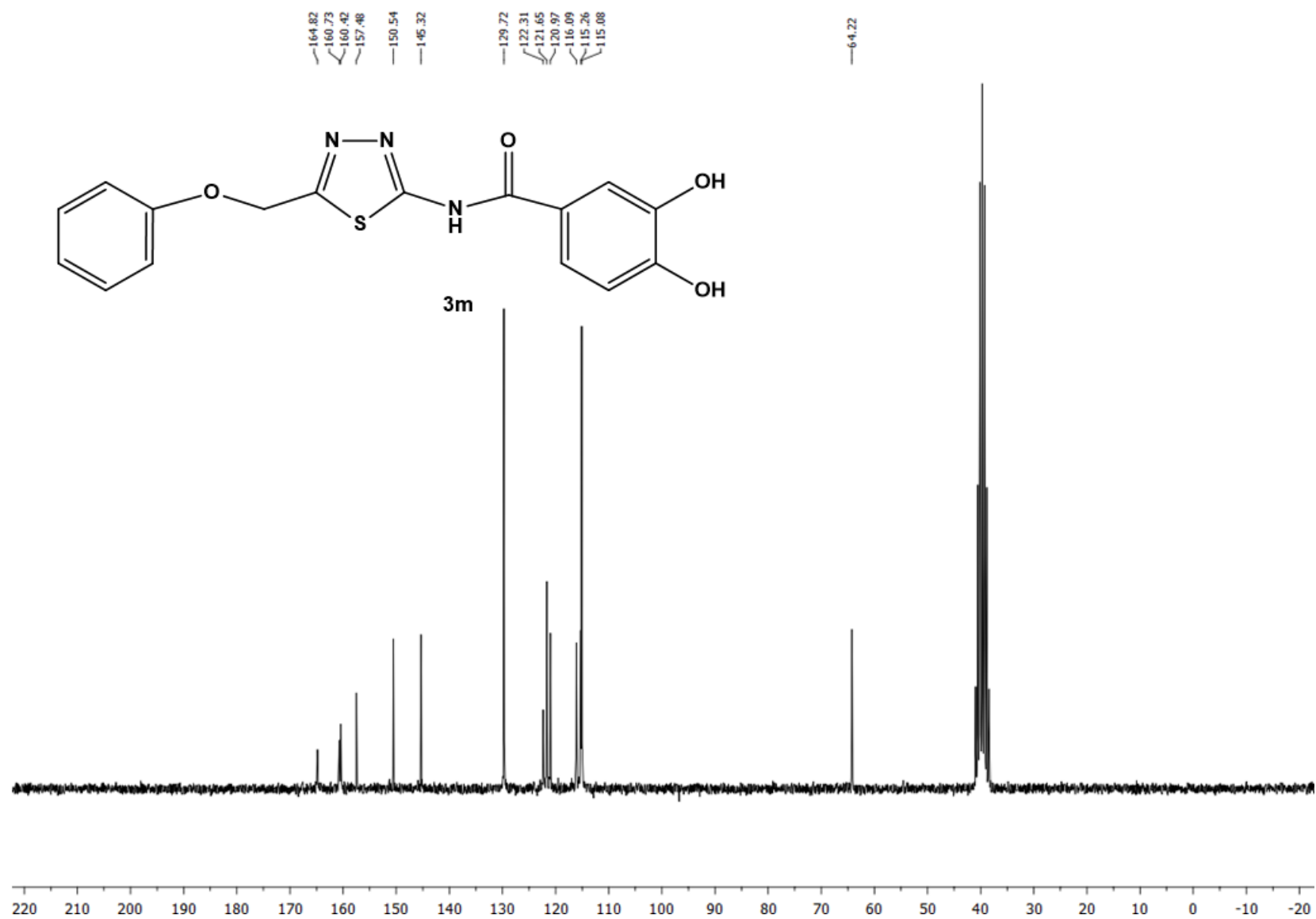


Figure S26. ^{13}C NMR spectrum of **3m** in DMSO- d_6 (50 MHz).

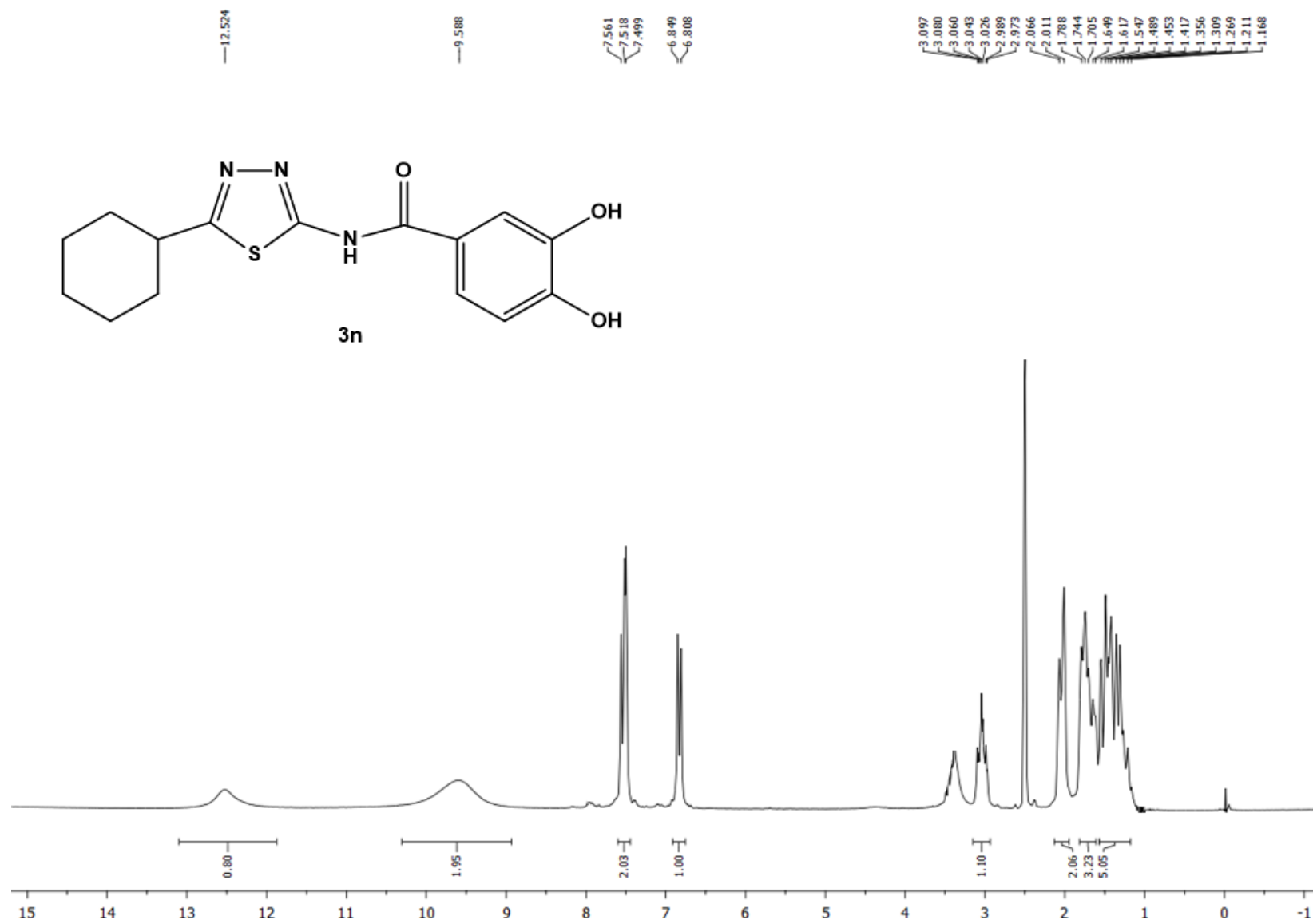


Figure S27. ¹H NMR spectrum of **3n** in DMSO-d₆ (200 MHz).

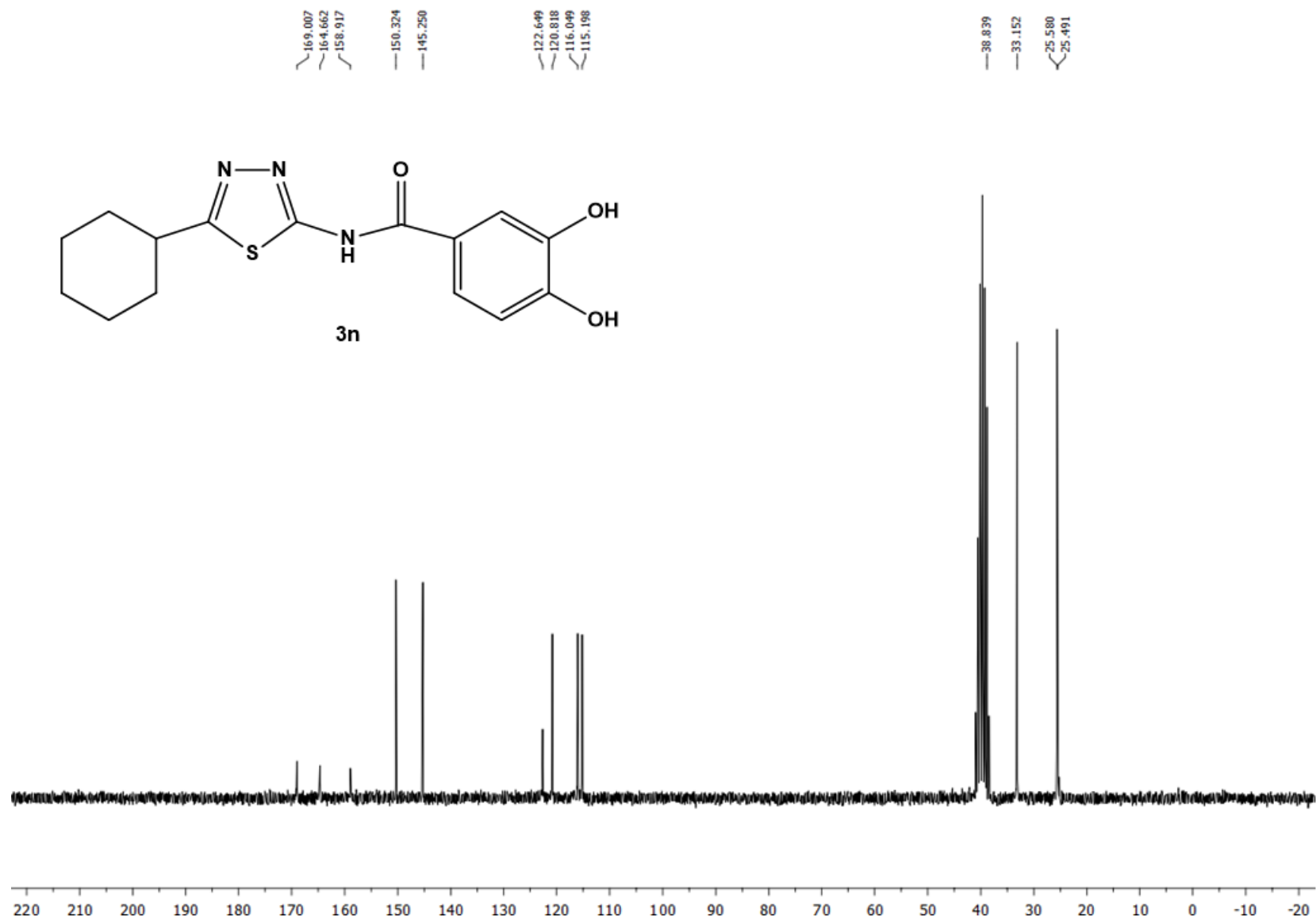


Figure S28. ^{13}C NMR spectrum of **3n** in DMSO-d_6 (50 MHz).

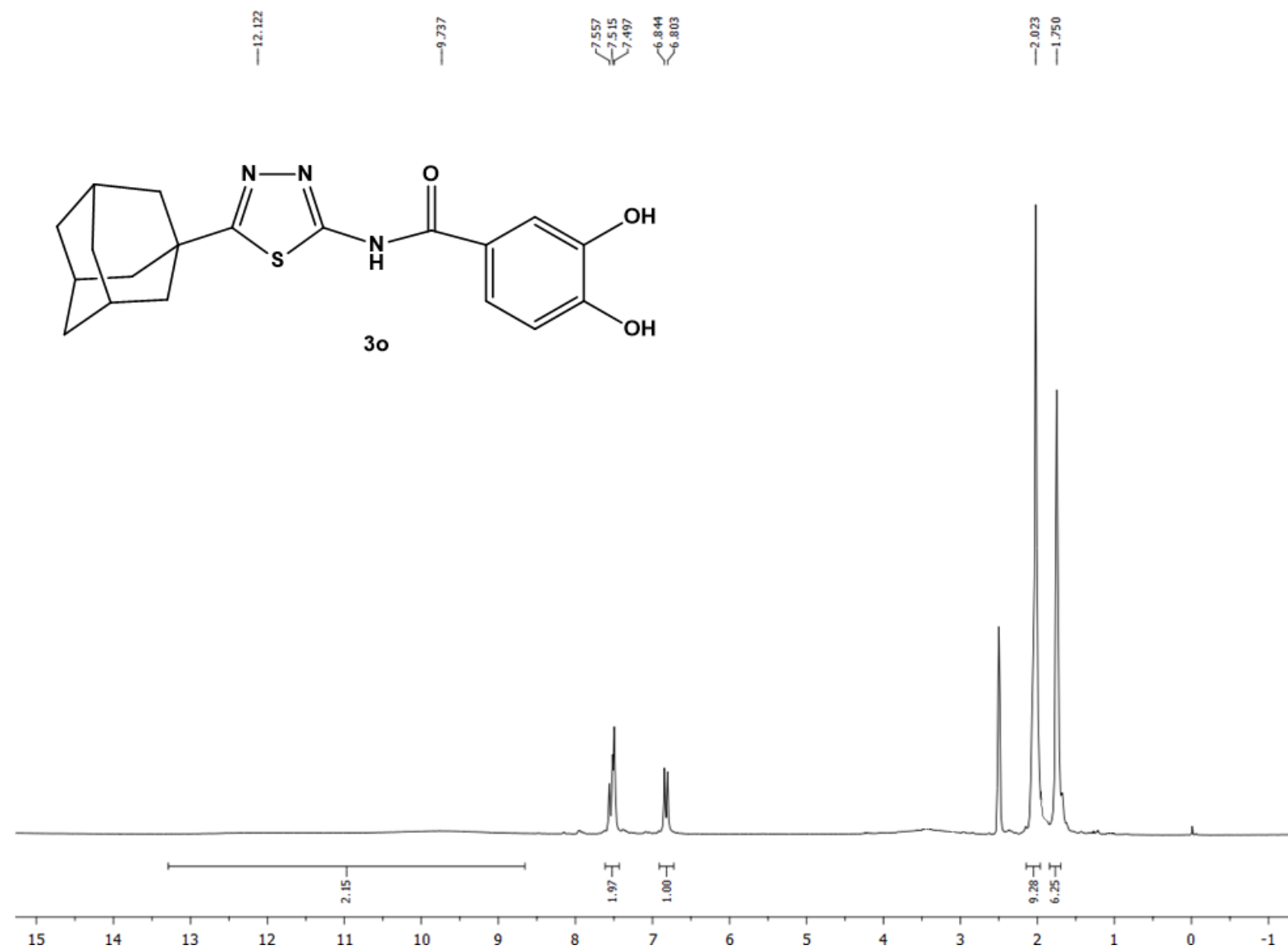


Figure S29. ^1H NMR spectrum of **3o** in DMSO-d_6 (200 MHz).

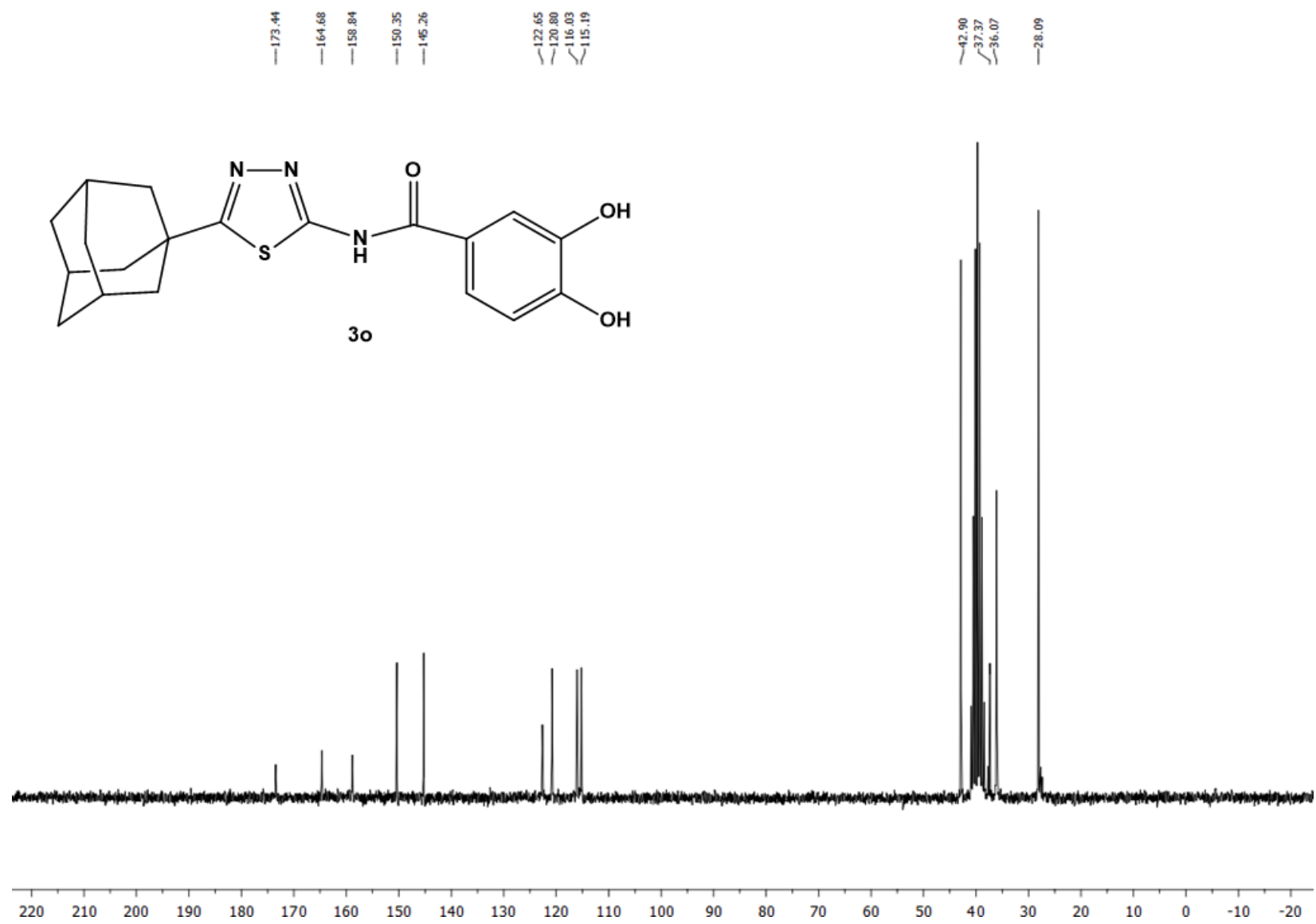


Figure S30. ¹³C NMR spectrum of **3o** in DMSO-d₆ (50 MHz).

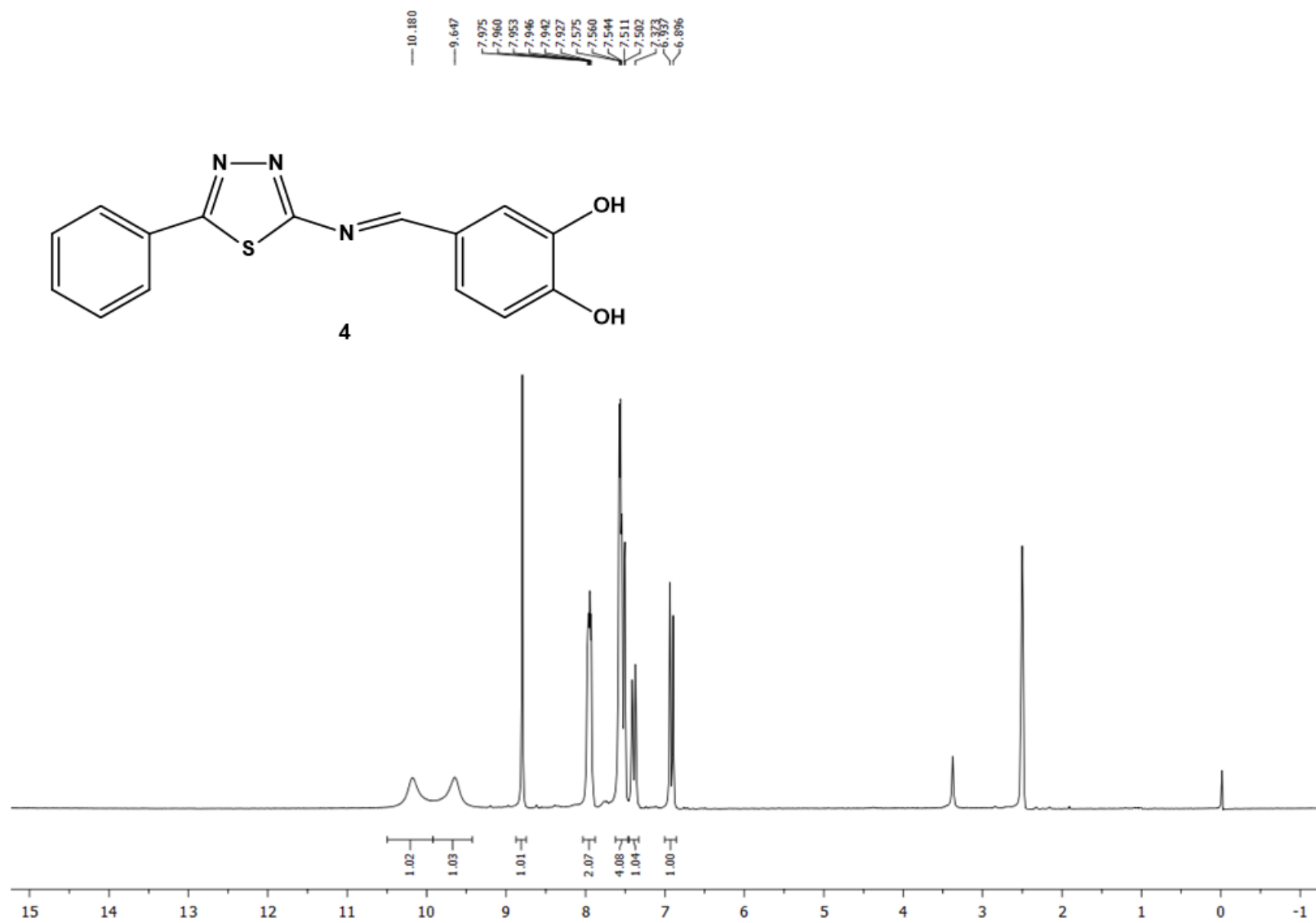


Figure S31. ¹H NMR spectrum of **4** in DMSO-d₆ (200 MHz).

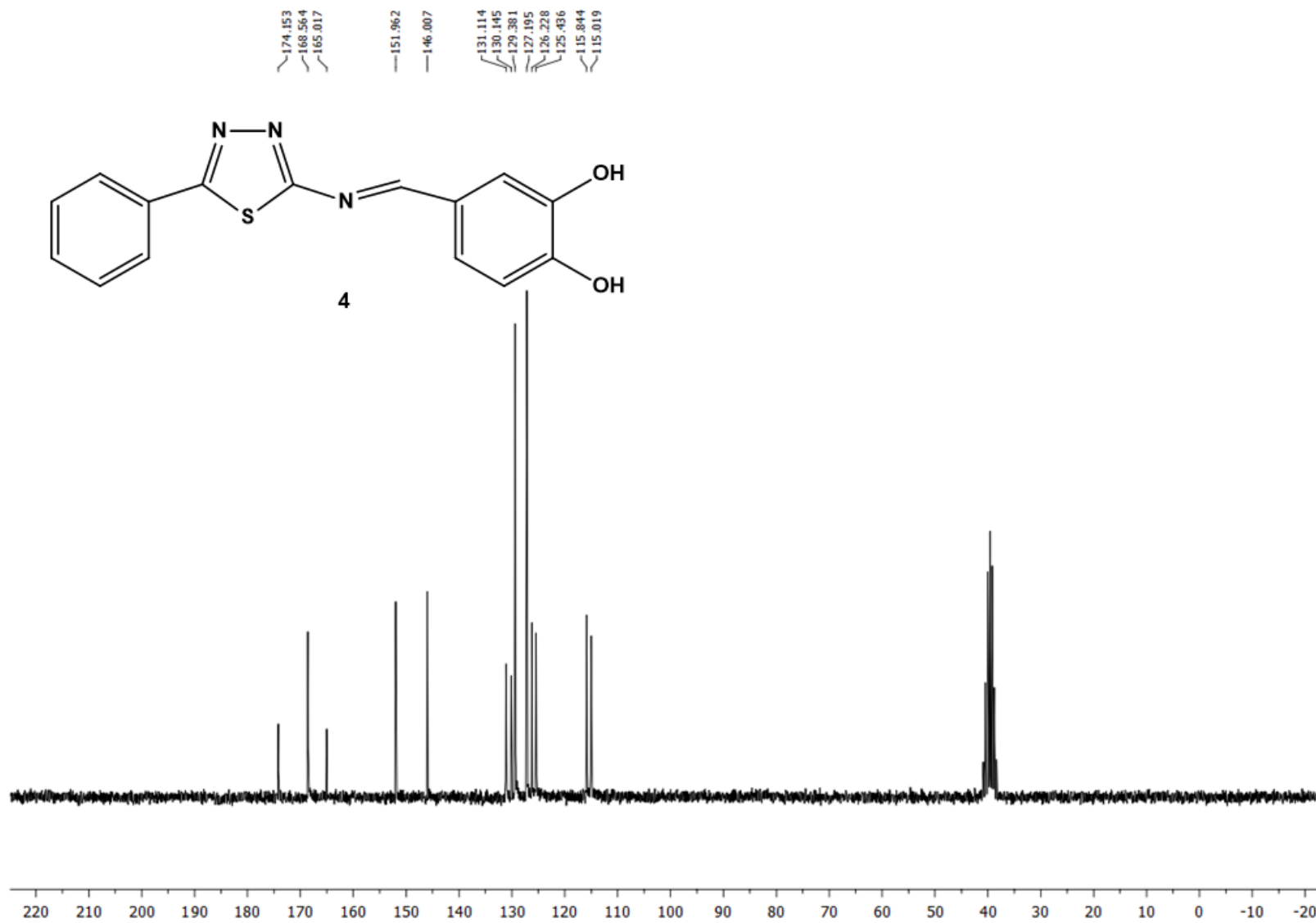


Figure S32. ^{13}C NMR spectrum of **4** in DMSO-d_6 (50 MHz).

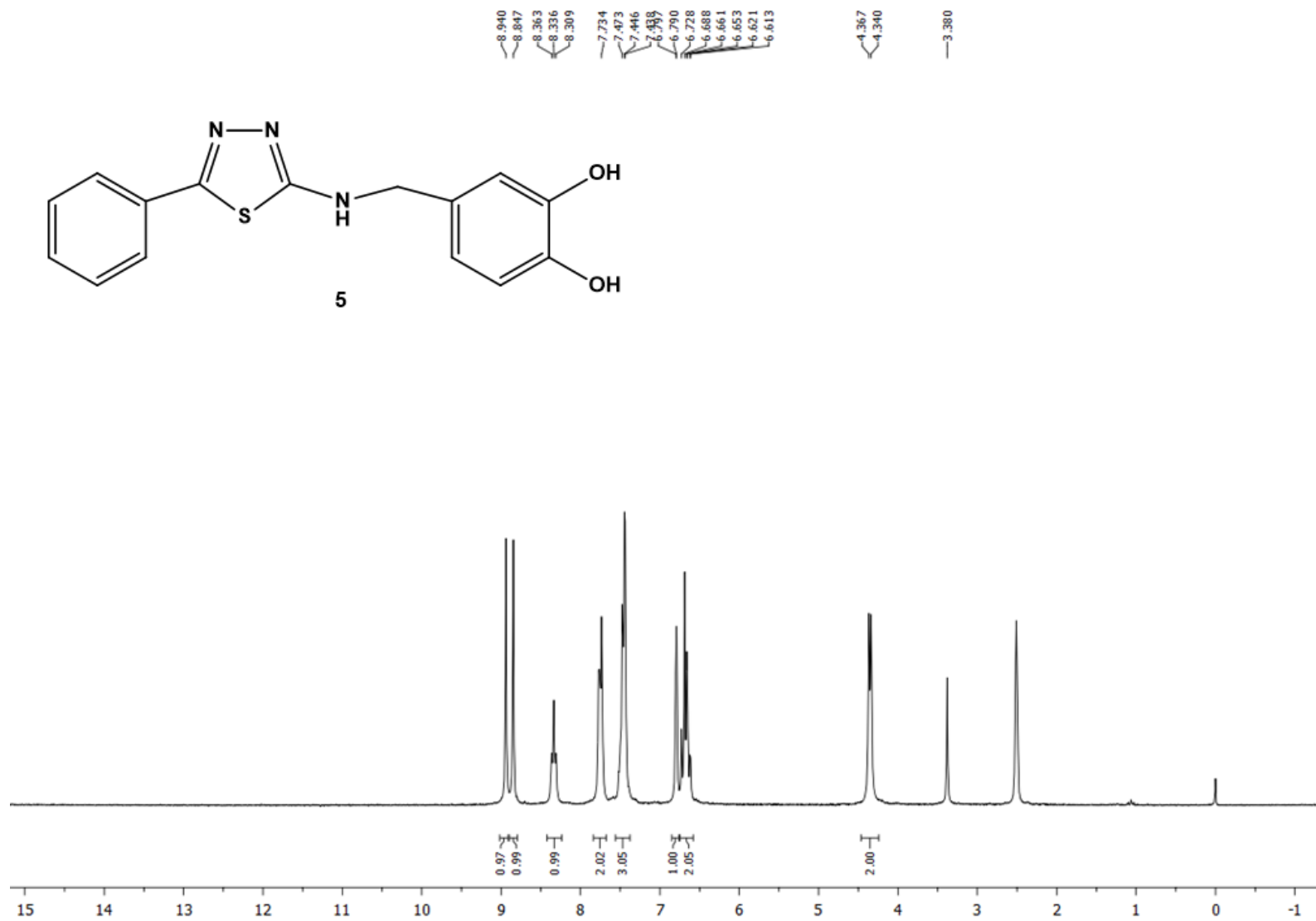


Figure S33. ¹H NMR spectrum of **5** in DMSO-d₆ (200 MHz).

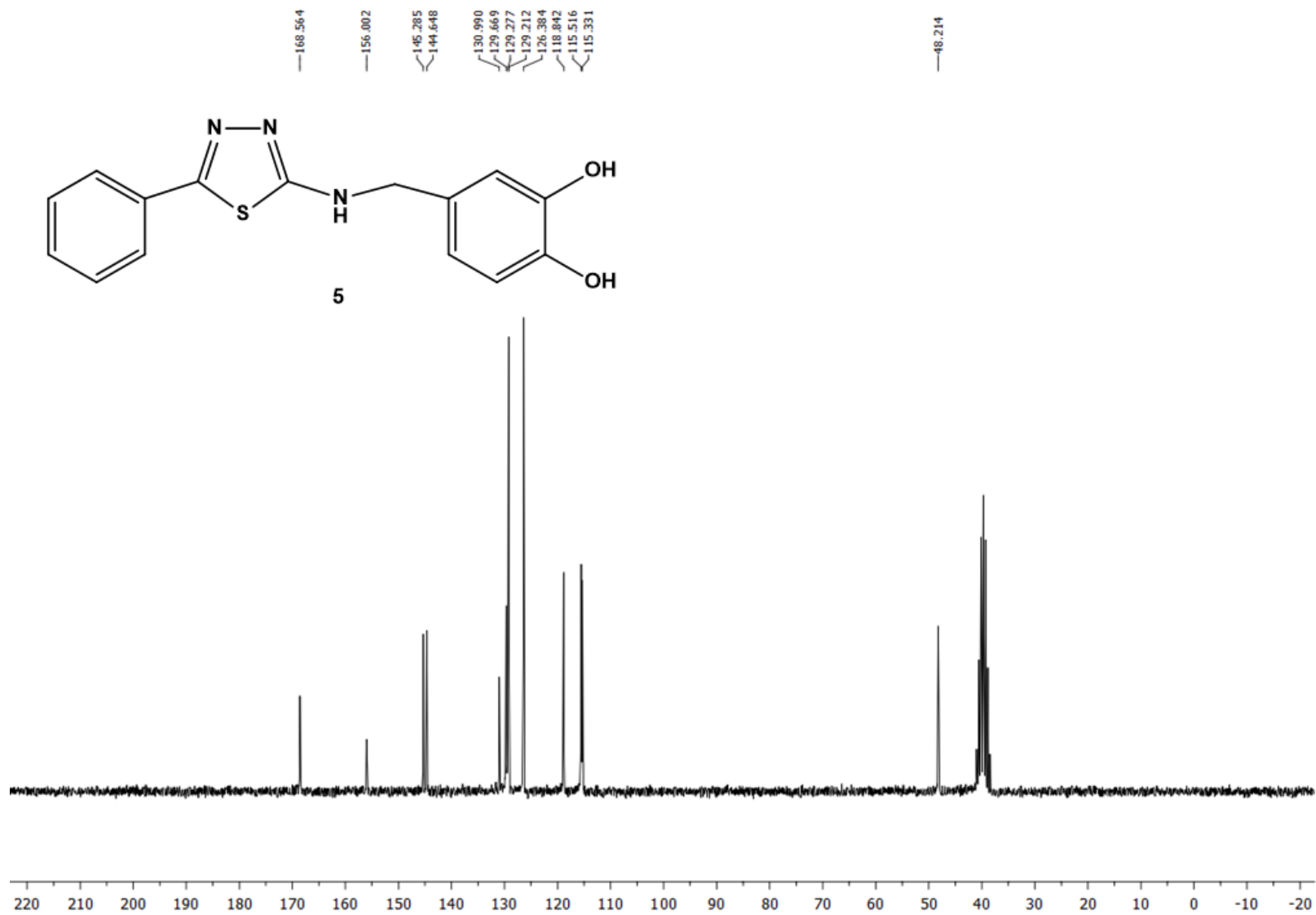


Figure S34. ¹³C NMR spectrum of **5** in DMSO-d₆ (50 MHz).

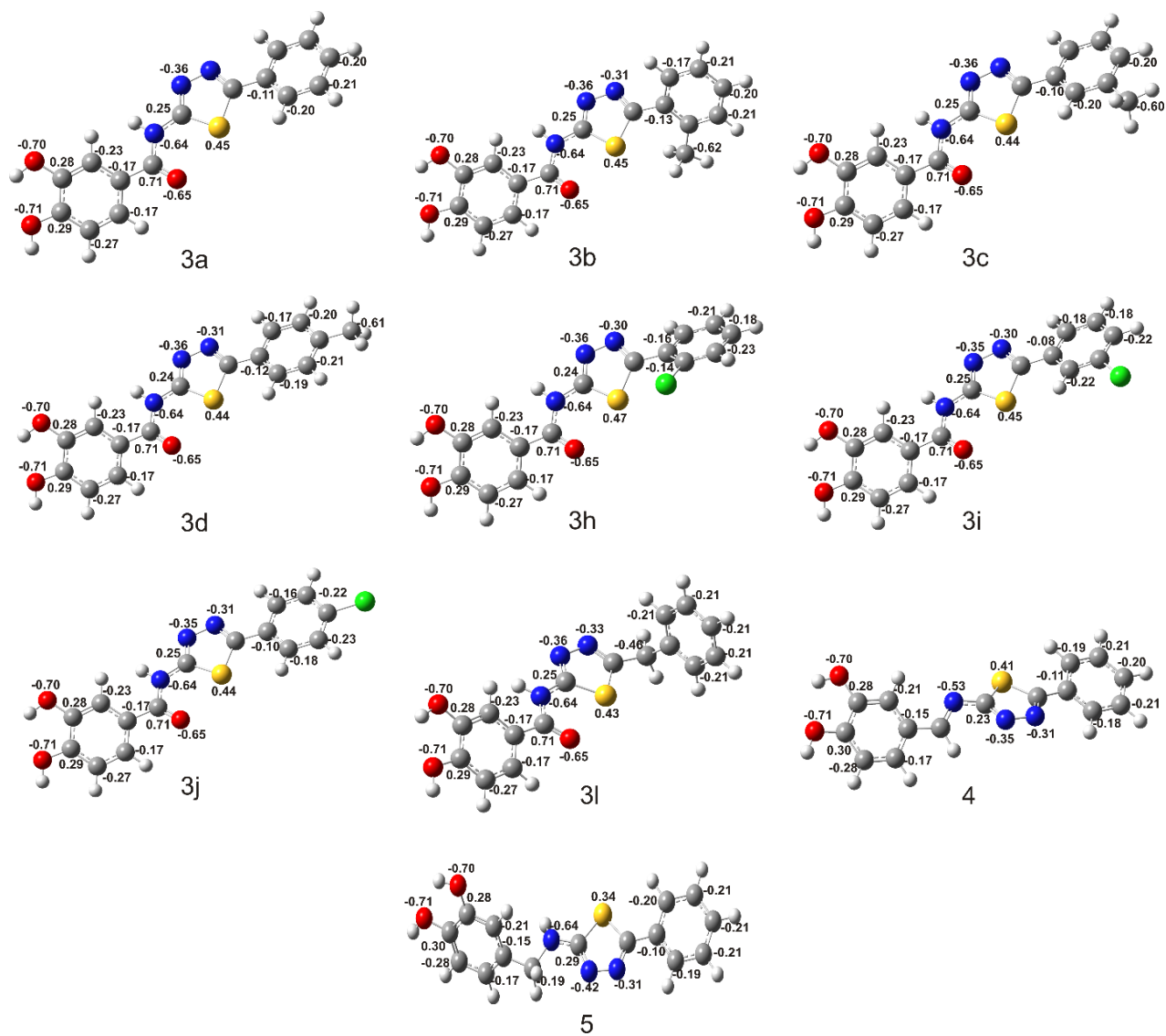


Figure S35. Structure of investigated compounds and corresponding atomic charge values

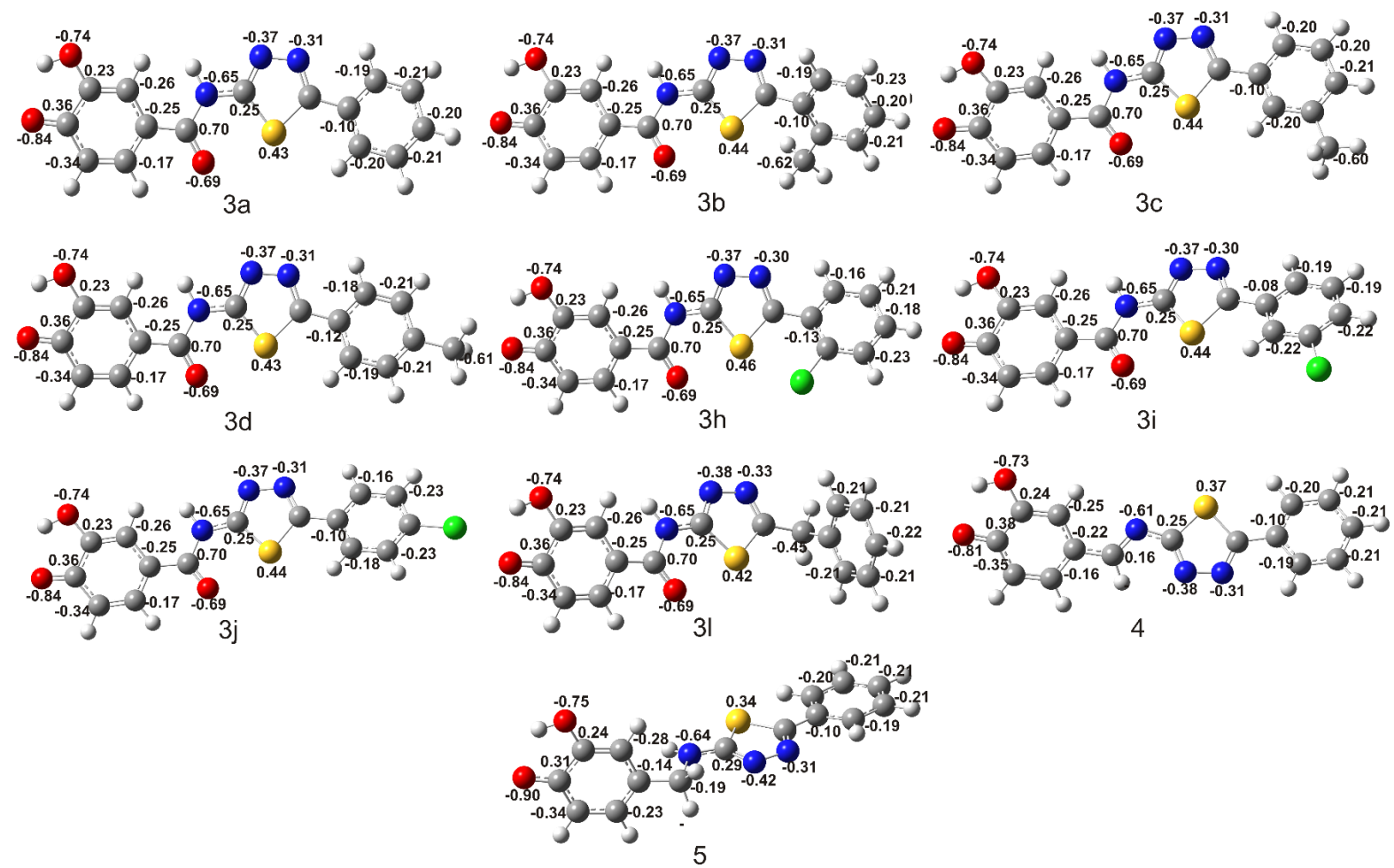


Figure S36. Values of atomic charges in all anions obtained from the 3, 4, and 5 in methanol.