

Supporting Information

Rational structural modification of isatin scaffold to develop new and potent antimicrobial agents targeting bacterial peptidoglycan glycosyltransferase

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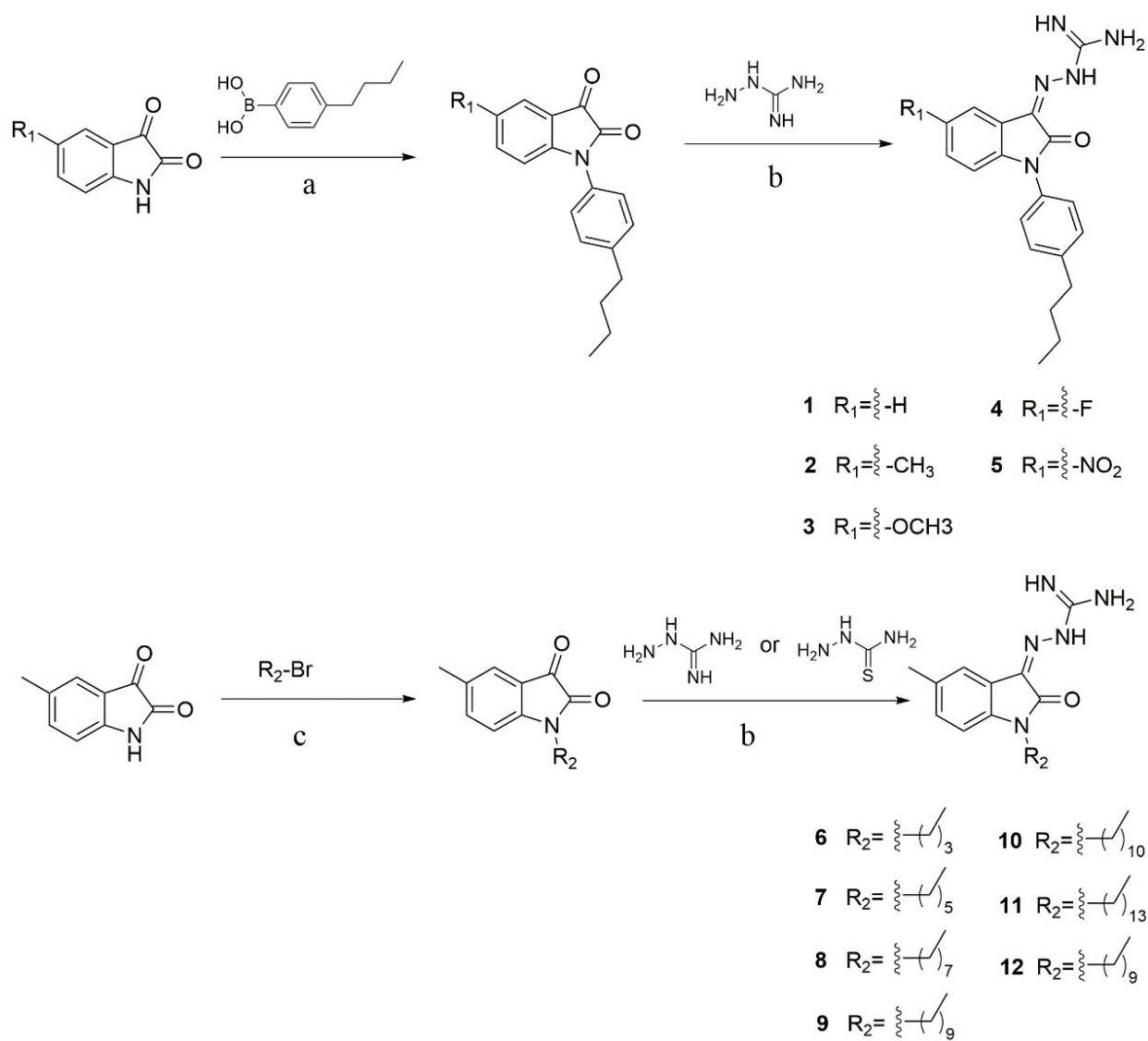
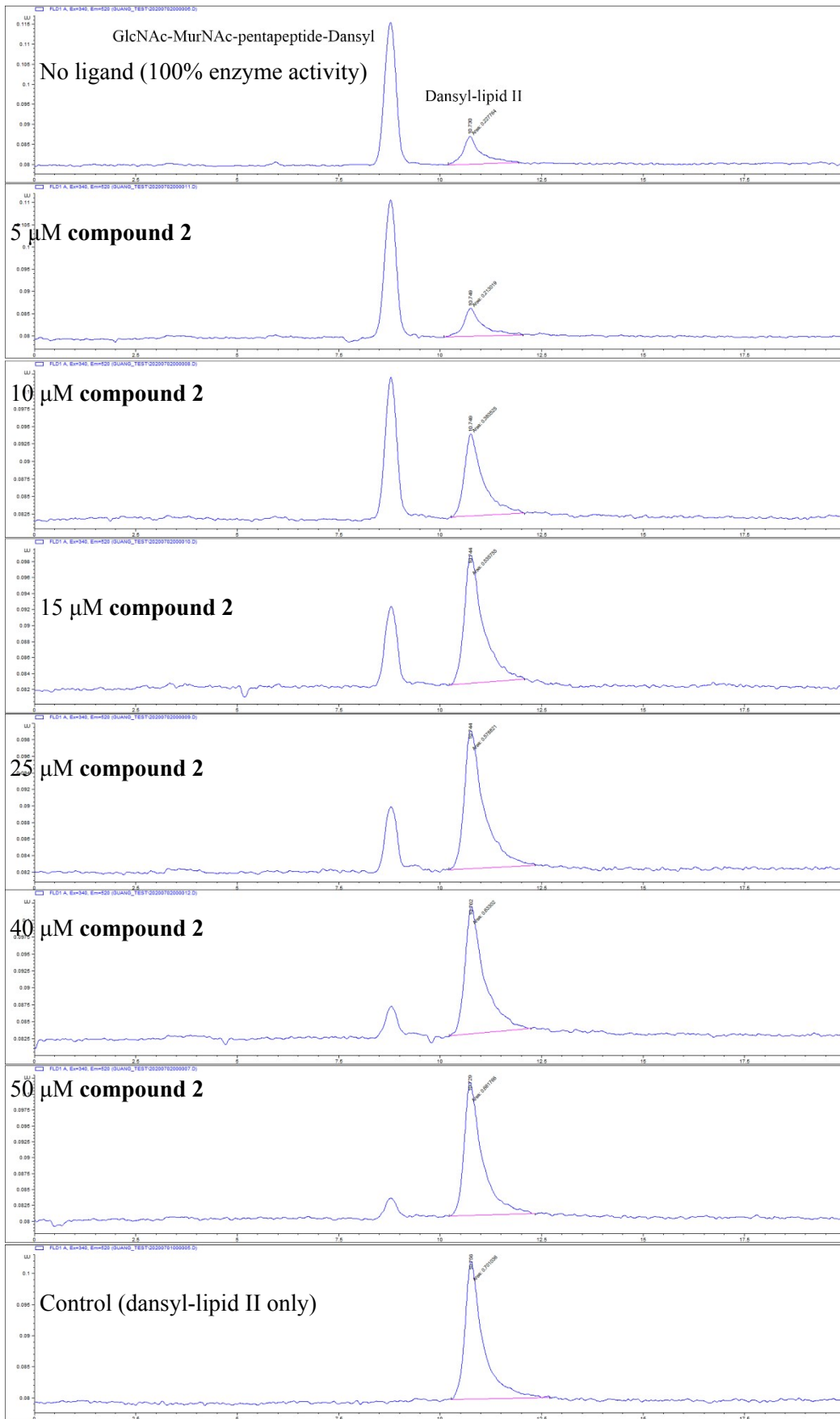
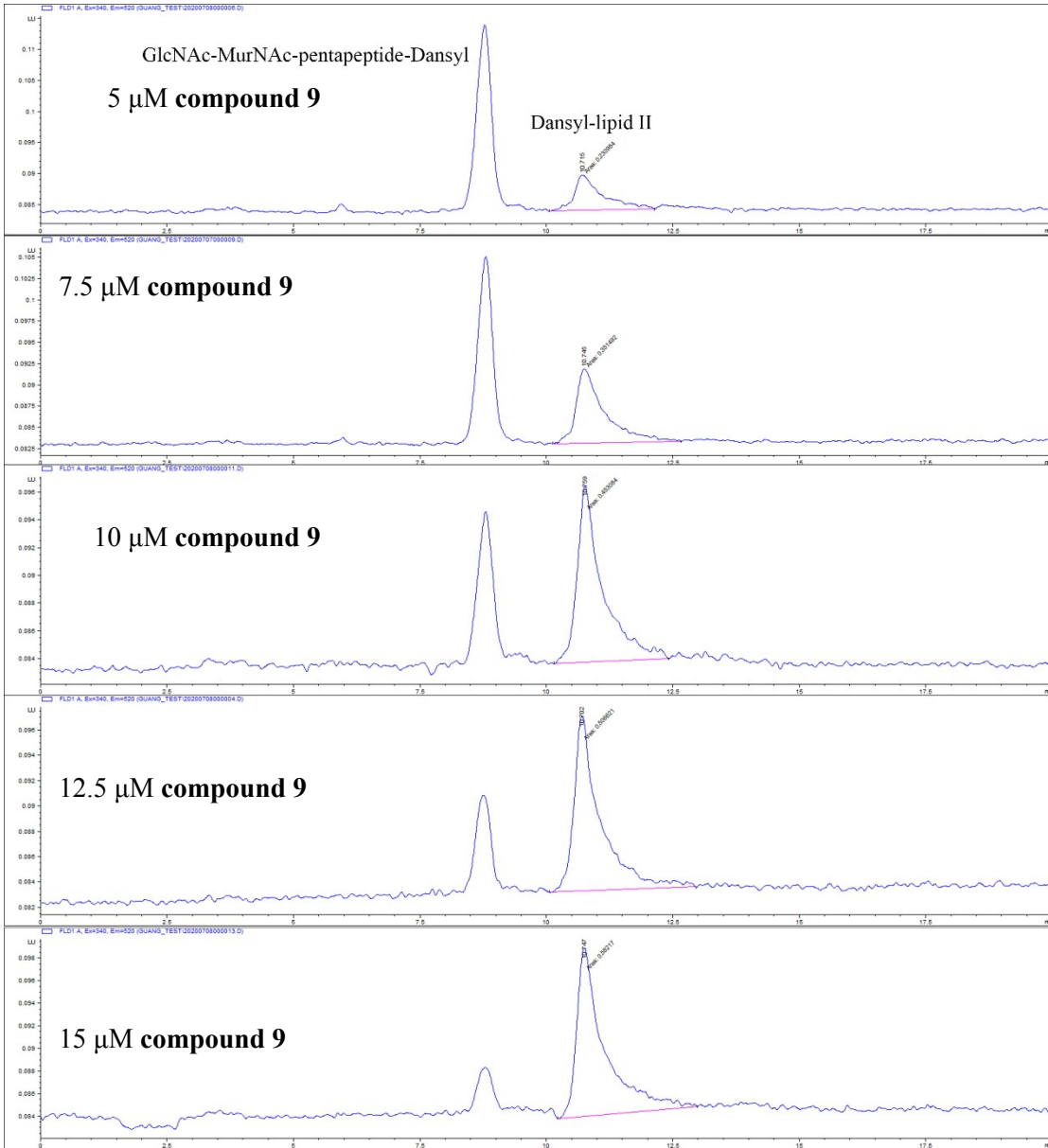


Figure S1. Synthetic routes for the new isatin-derivatives. Reaction conditions: (a) $\text{Cu}(\text{OAc})_2$, Et_3N , CH_2Cl_2 , 24–48h; (b) acetic acid reflux, 2 h; (c) DMF , K_2CO_3 , 80°C , 8 h





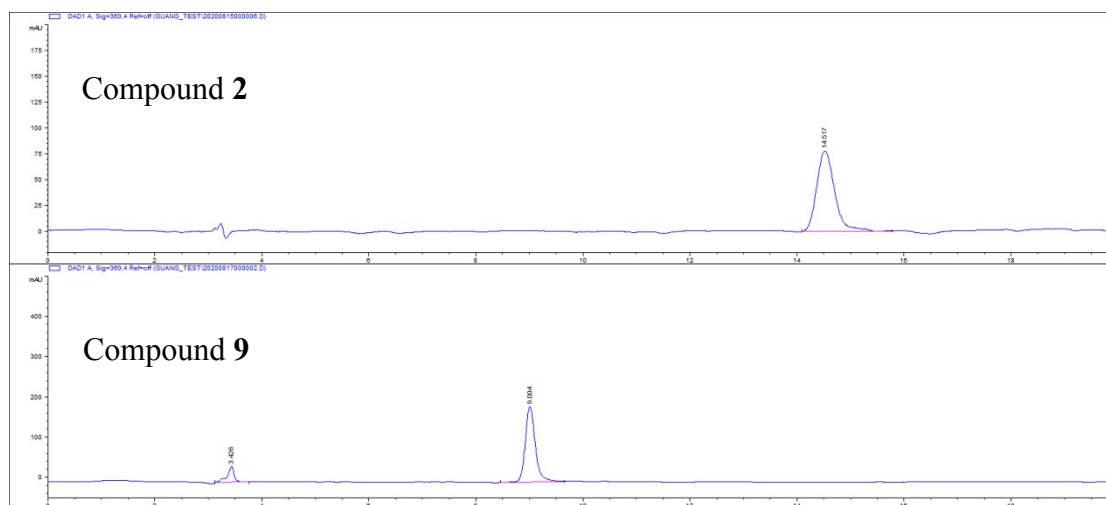


Figure S3. Purity studies of compound **2** and **9** by HPLC. Samples were injected into an Agilent 1200 series HPLC machine equipped with a Waters XBridge C₁₈ column (5 μ m, 4.6 \times 250 mm) and monitored at $\lambda = 360$ nm; mobile phase: 20% water in methanol for compound **2**, retention time = 14.5 min; 10% water in methanol for compound **9**, retention time = 9 min.

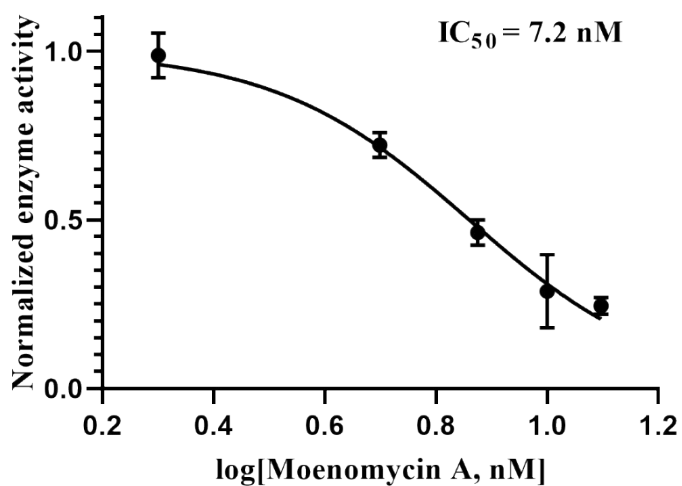
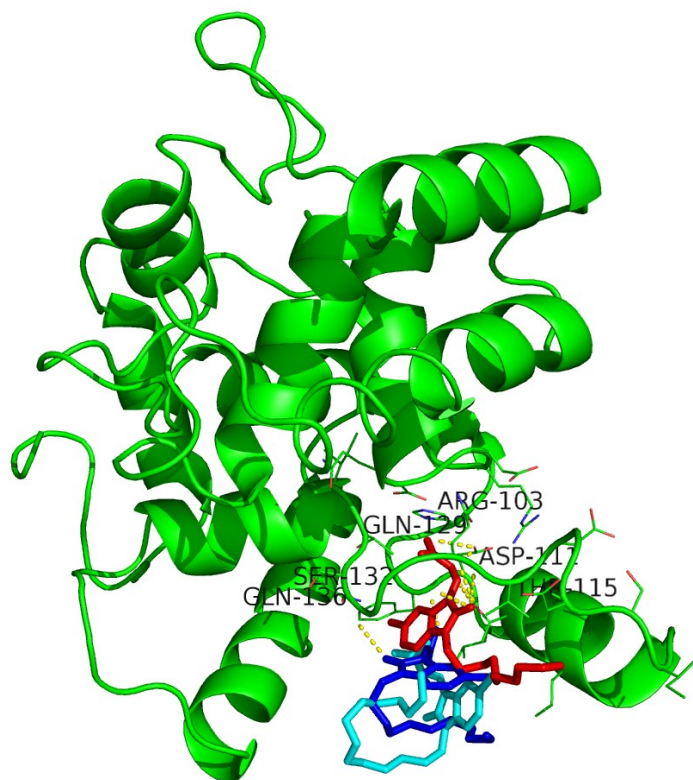


Figure S4. Half maximal inhibitory concentration of moenomycin A against *E. coli* PBP 1b.

(A)



(B)

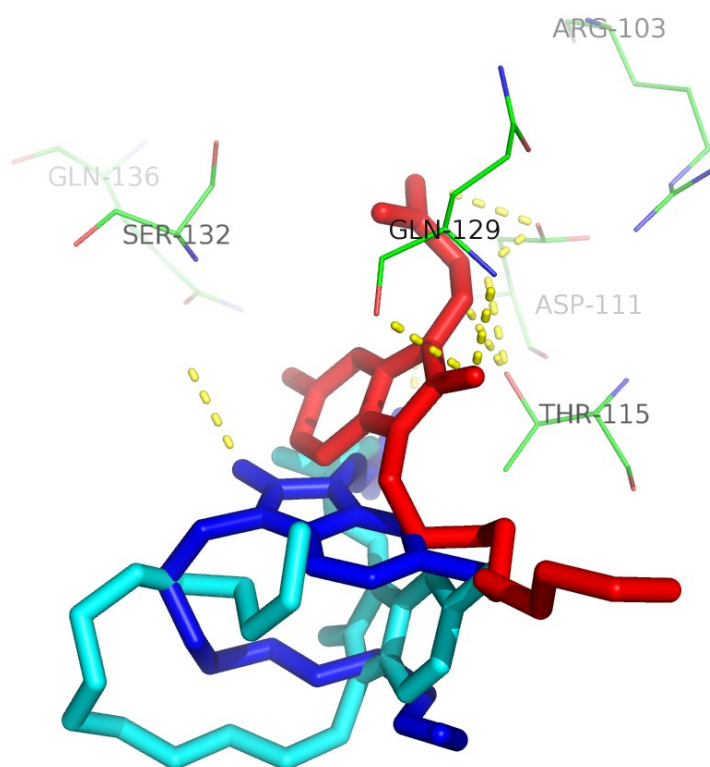


Figure S5. (A) Docking models between inhibitors (compound **9**, **10**, **11**) and *S. aureus* monofunctional glycosyltransferase (protein ID: 3HZS): compound **9** (red), **10** (blue), and **11** (cyan). (B) The interactions between **9**, **10**, **11** and *S. aureus* monofunctional glycosyltransferase were generated from AutoDock Tools.

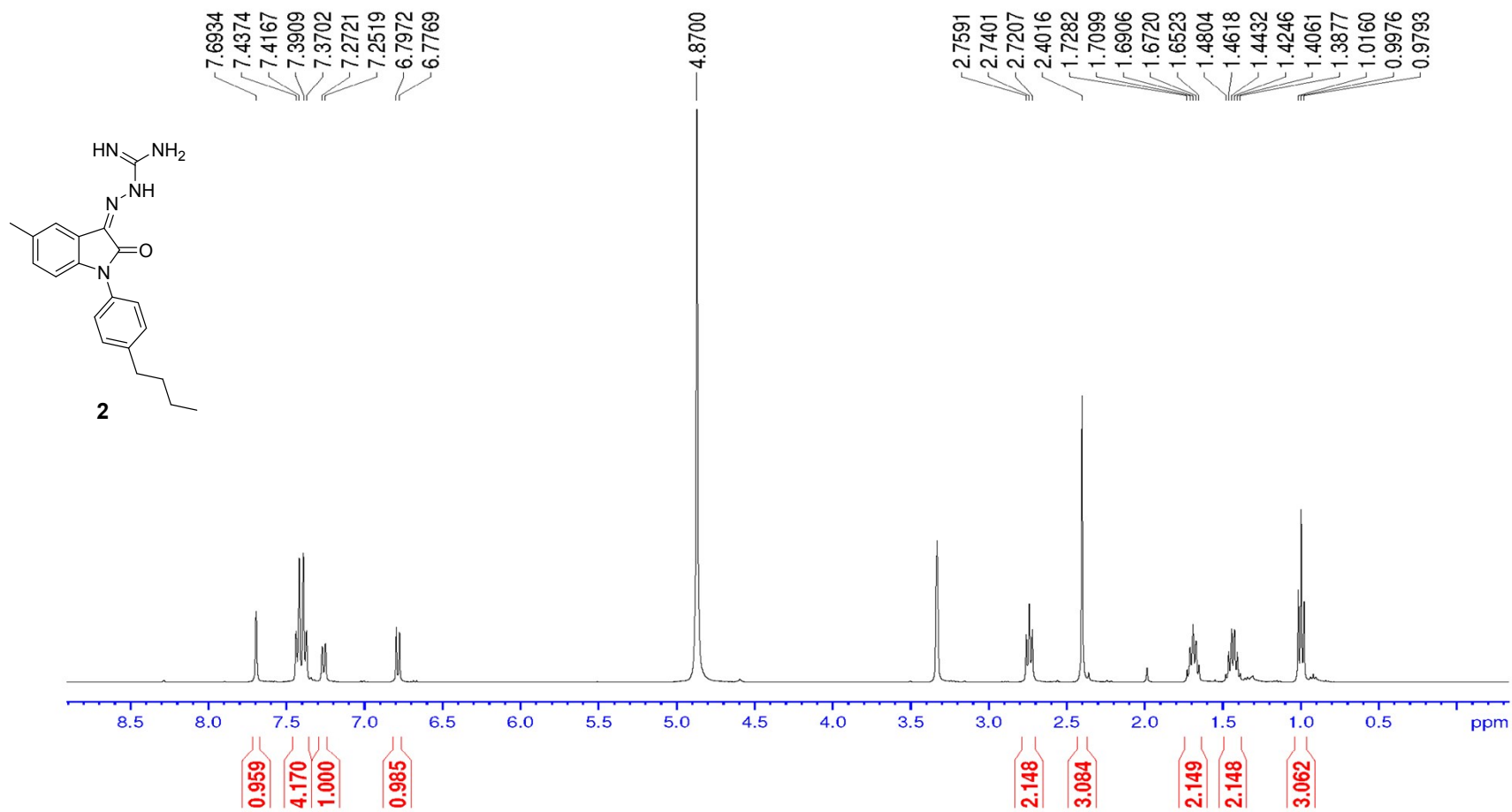


Figure S6. ¹H NMR (400 MHz, CD₃OD) for compound 2

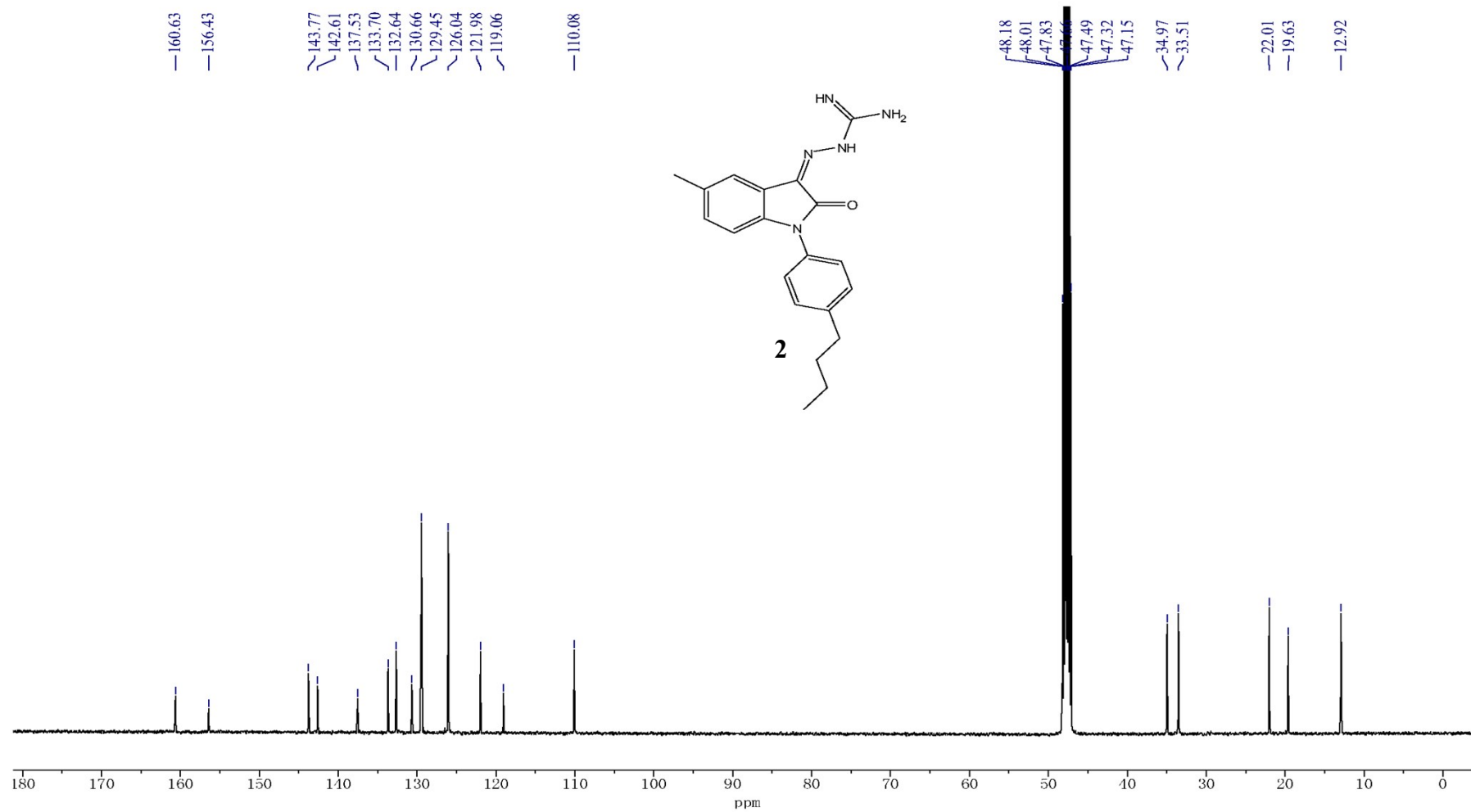


Figure S7. ¹³C NMR (125 MHz, CD₃OD) for compound 2

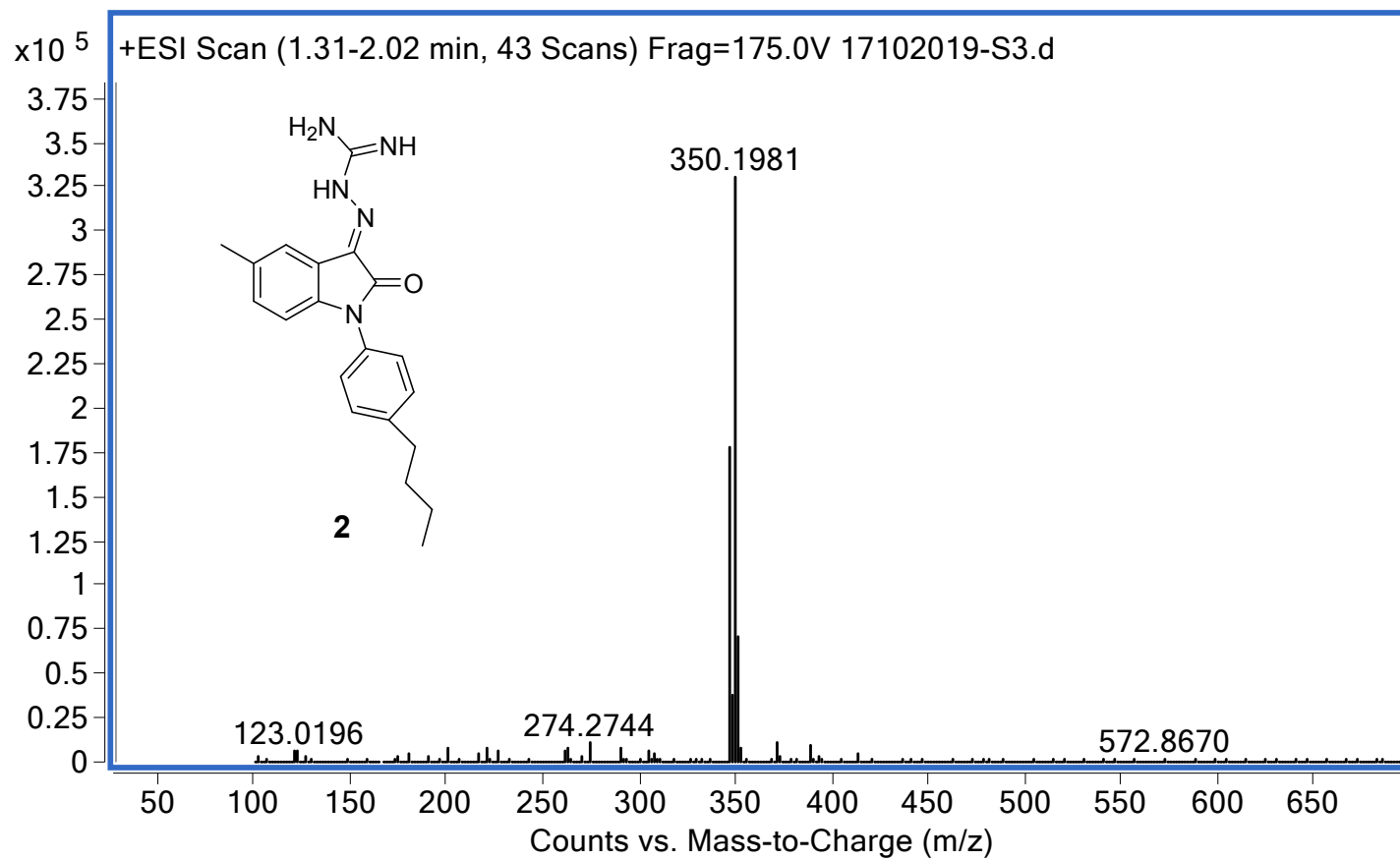


Figure S8. HRMS results for compound **2**

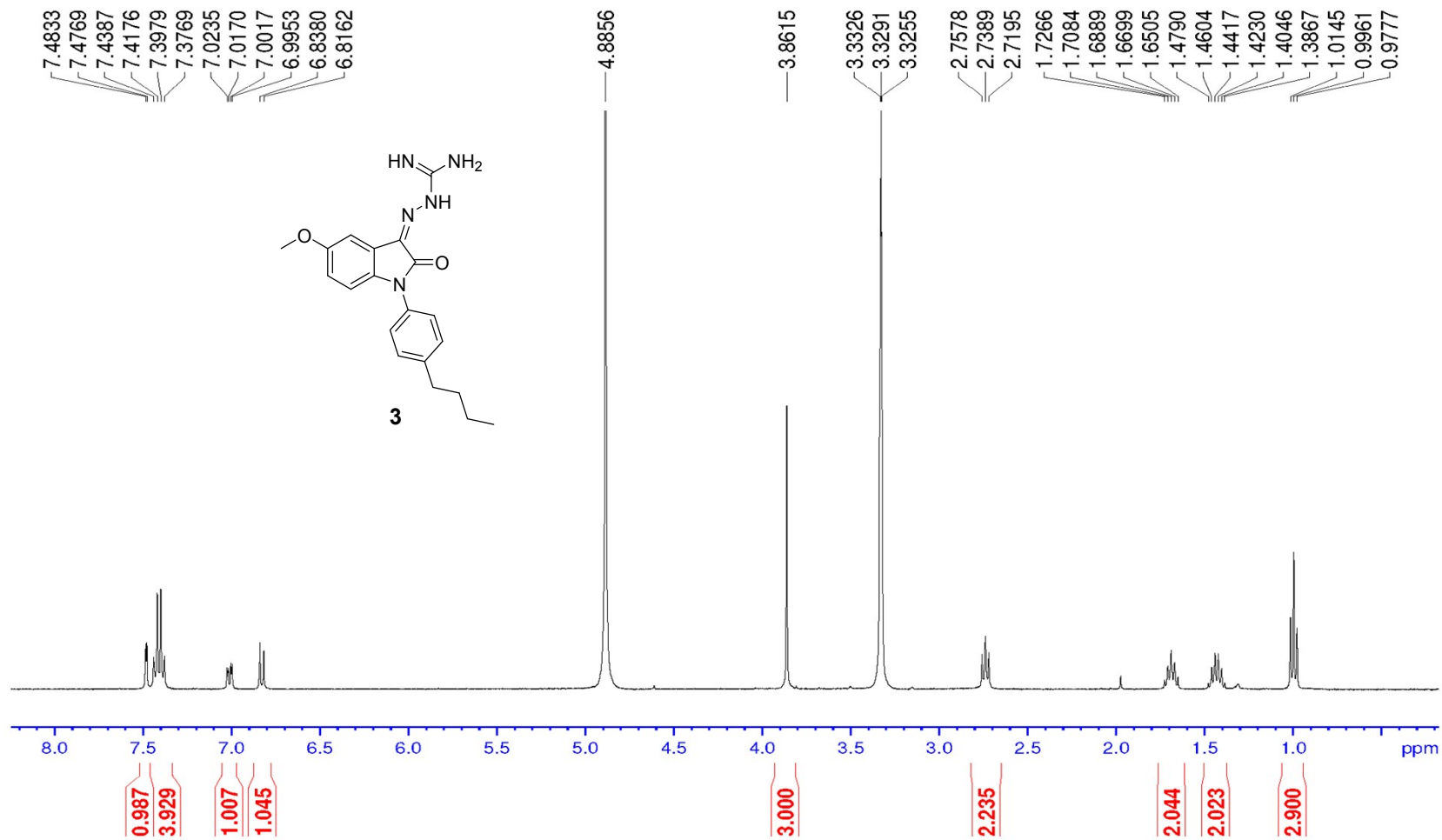


Figure S9. ¹H NMR (400 MHz, CD₃OD) for compound **3**

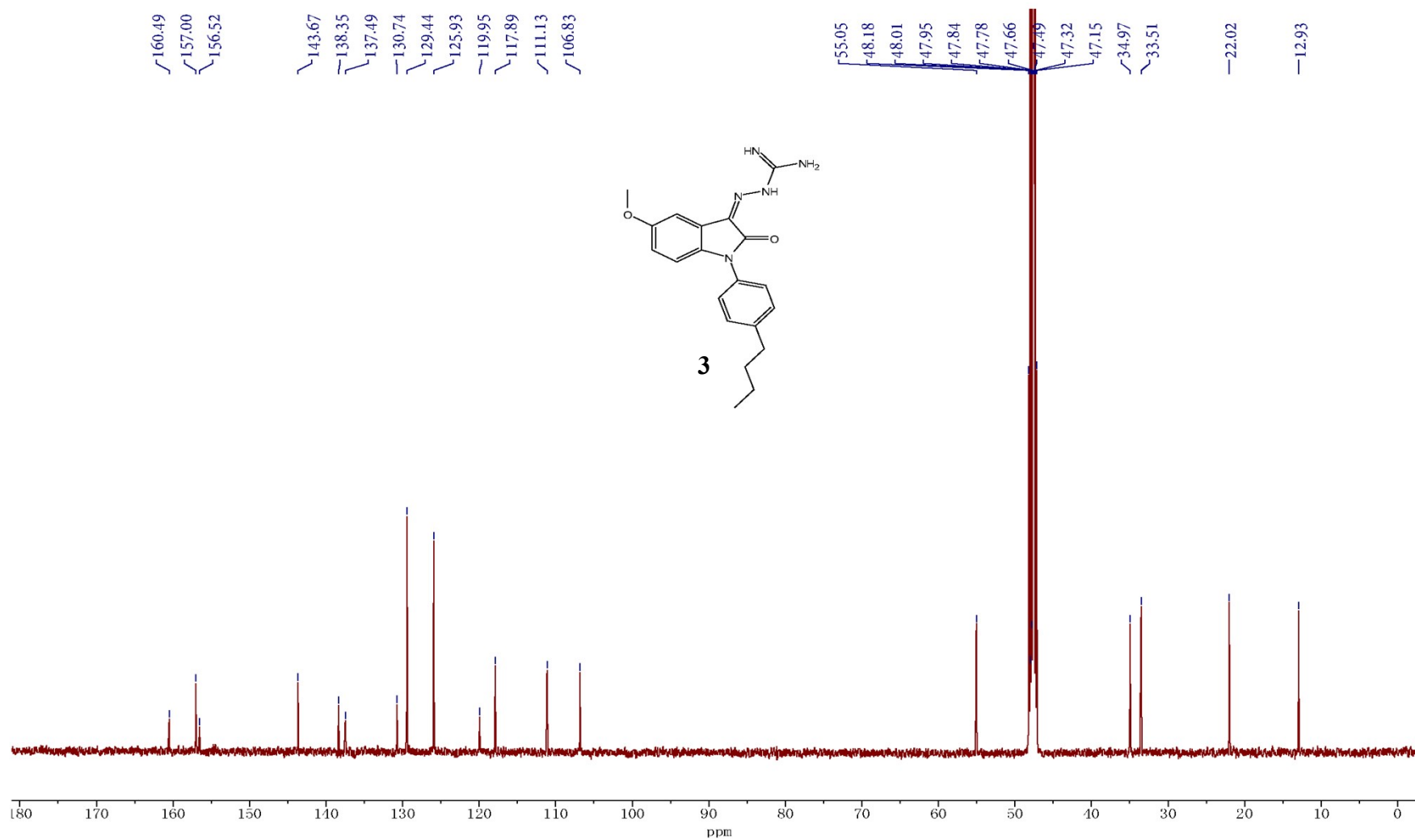


Figure S10. ¹³C NMR (125 MHz, CD₃OD) for compound **3**

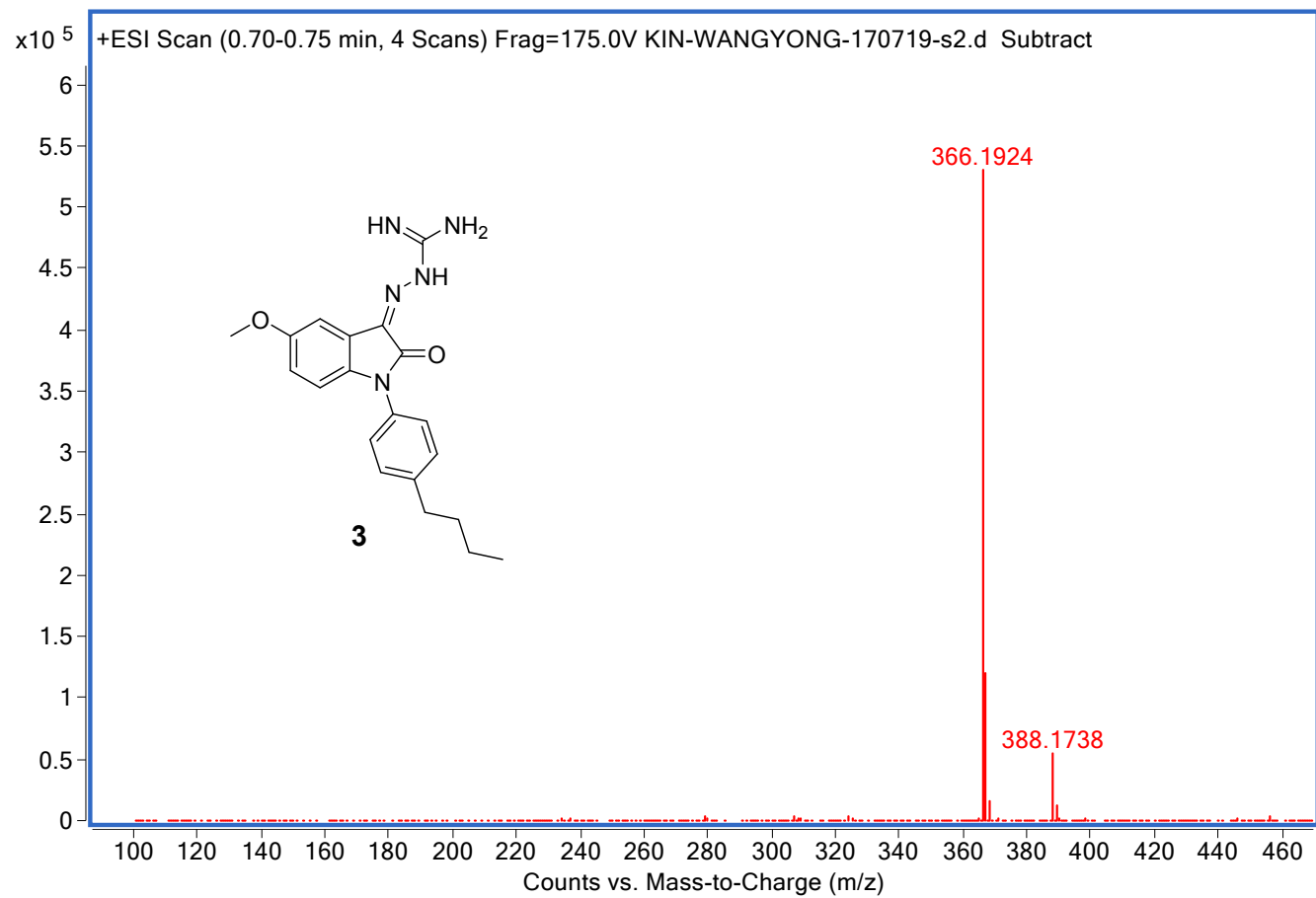
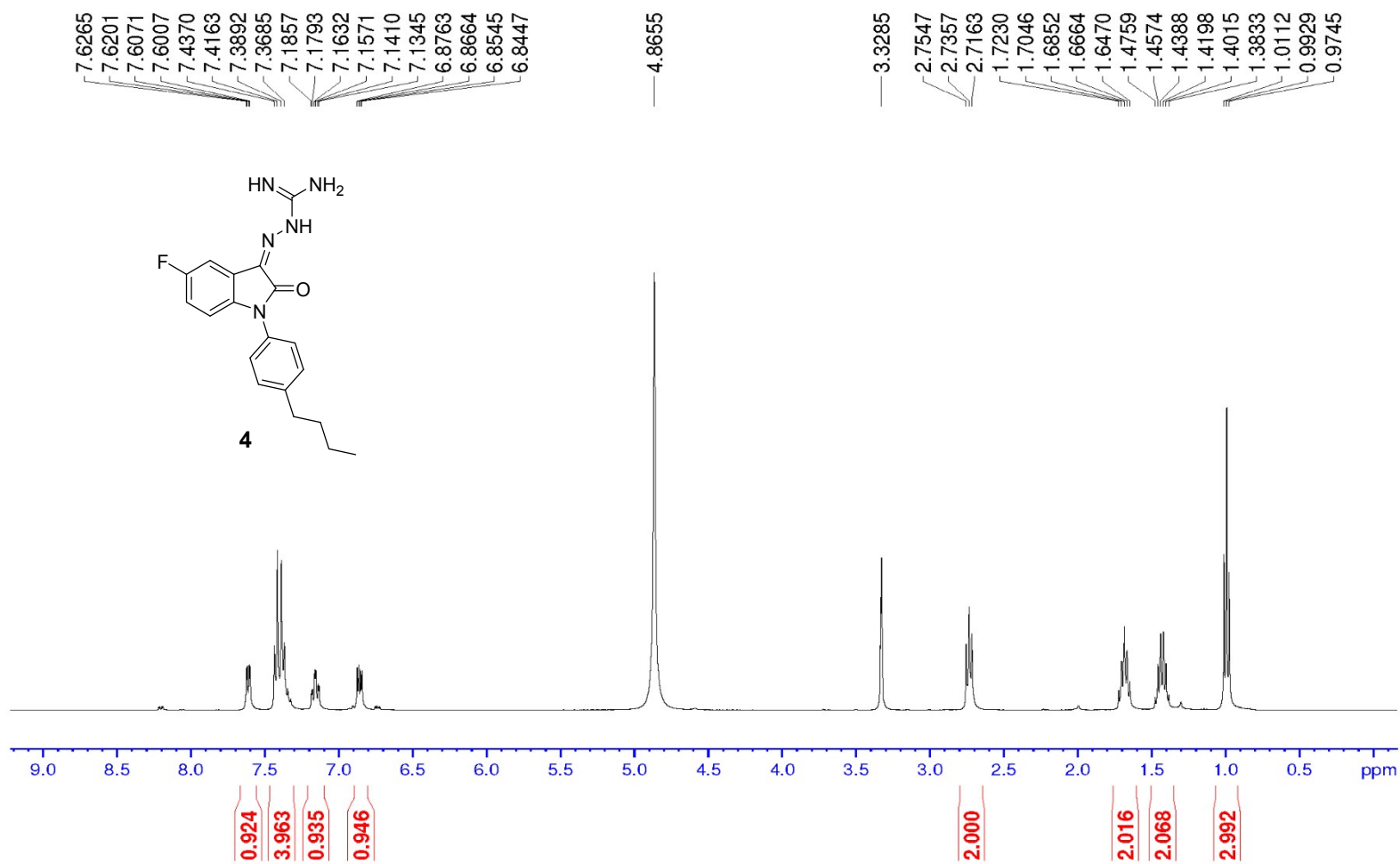


Figure S11. HRMS results for compound **3**



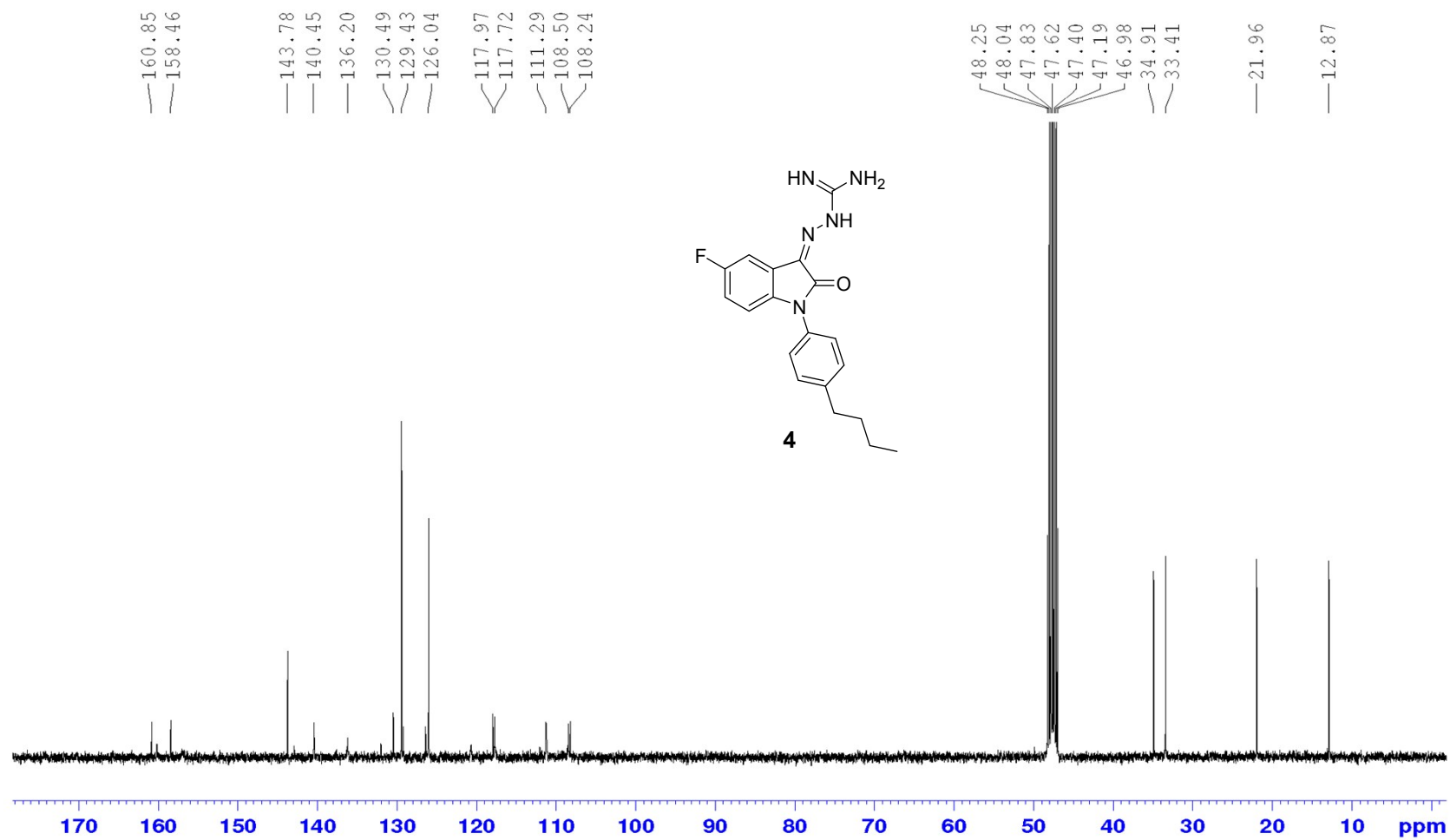


Figure S13. ¹³C NMR (125 MHz, CD₃OD) for compound 4

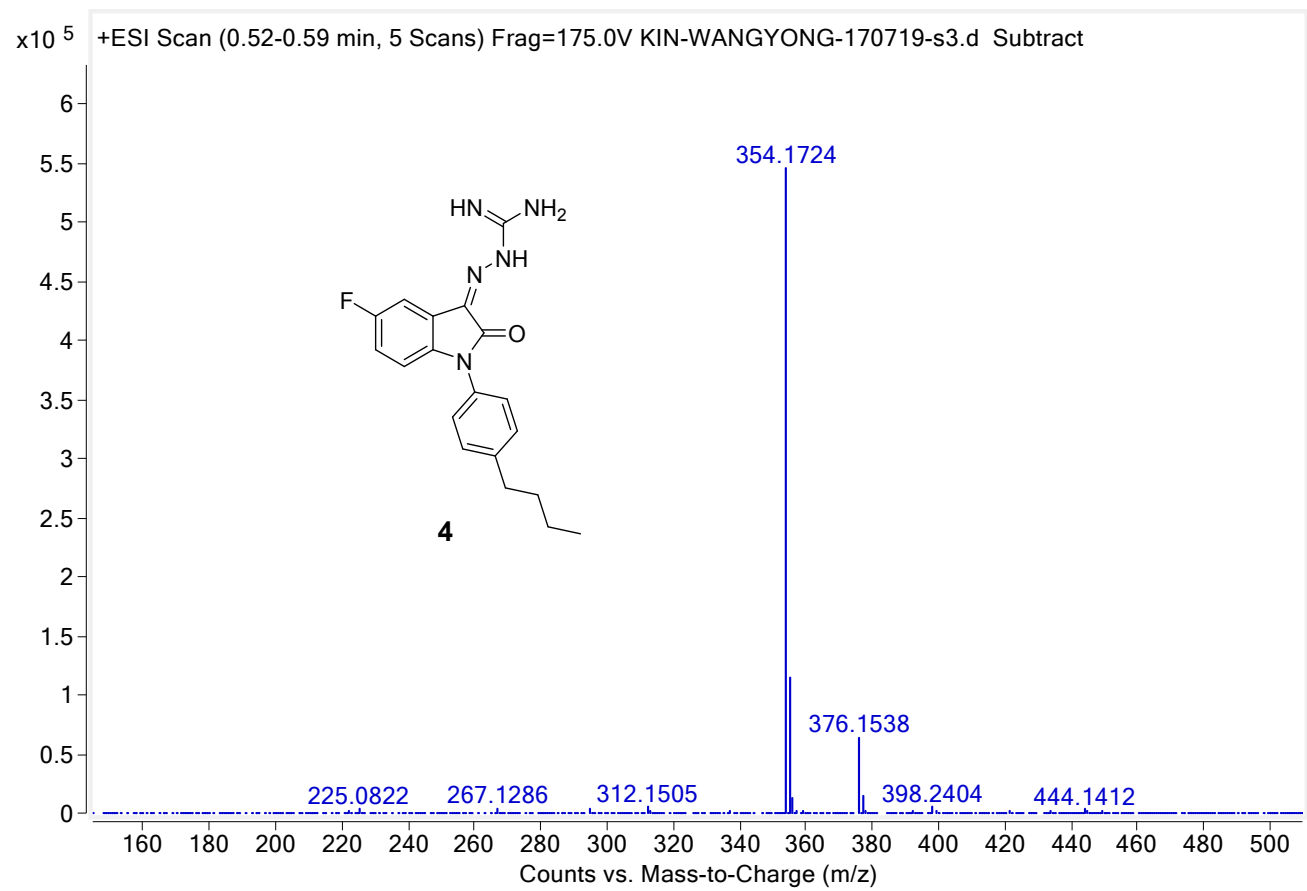


Figure S14. HRMS results for compound **4**

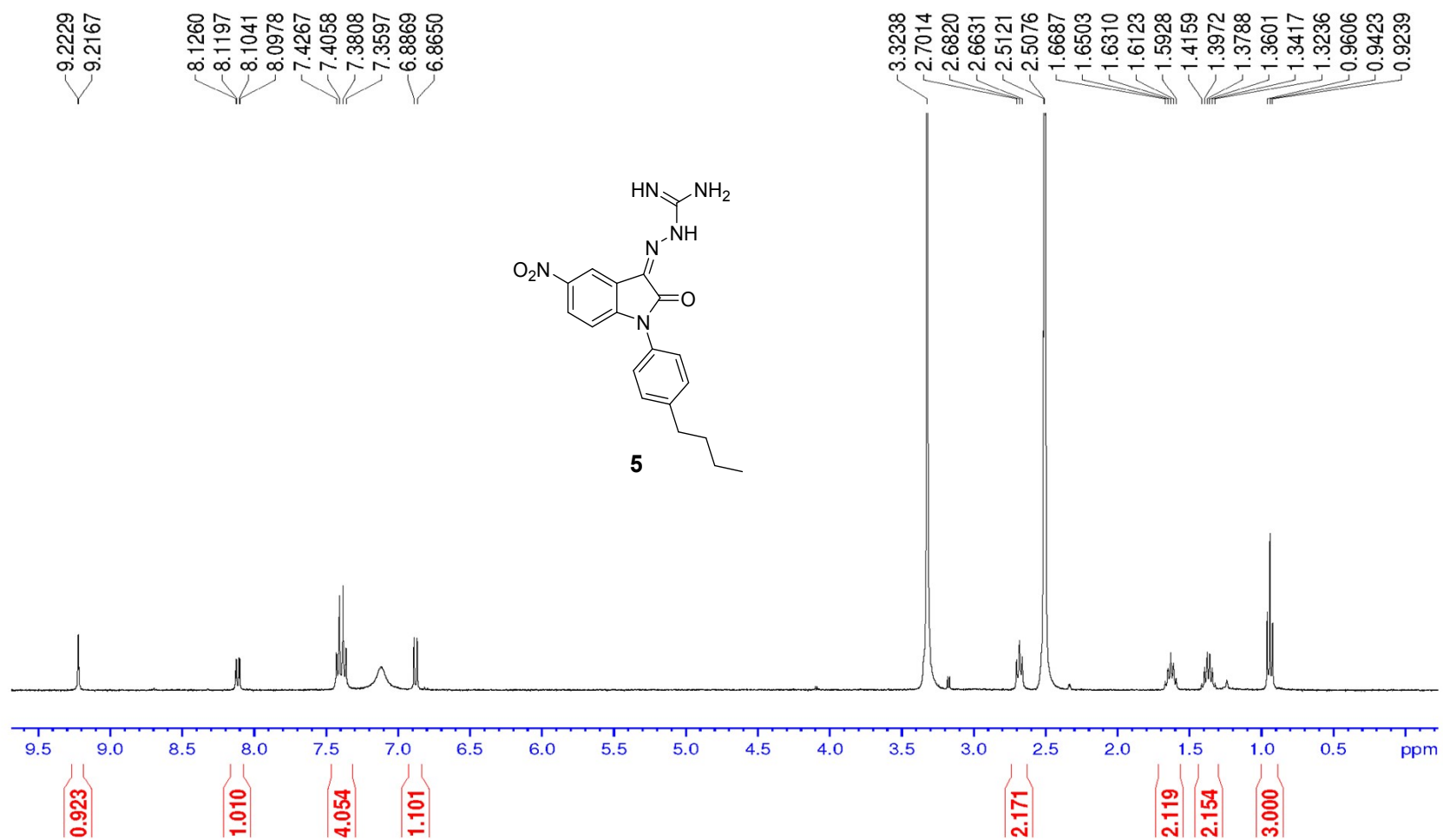


Figure S15. ¹H NMR (400 MHz, CD₃OD) for compound 5

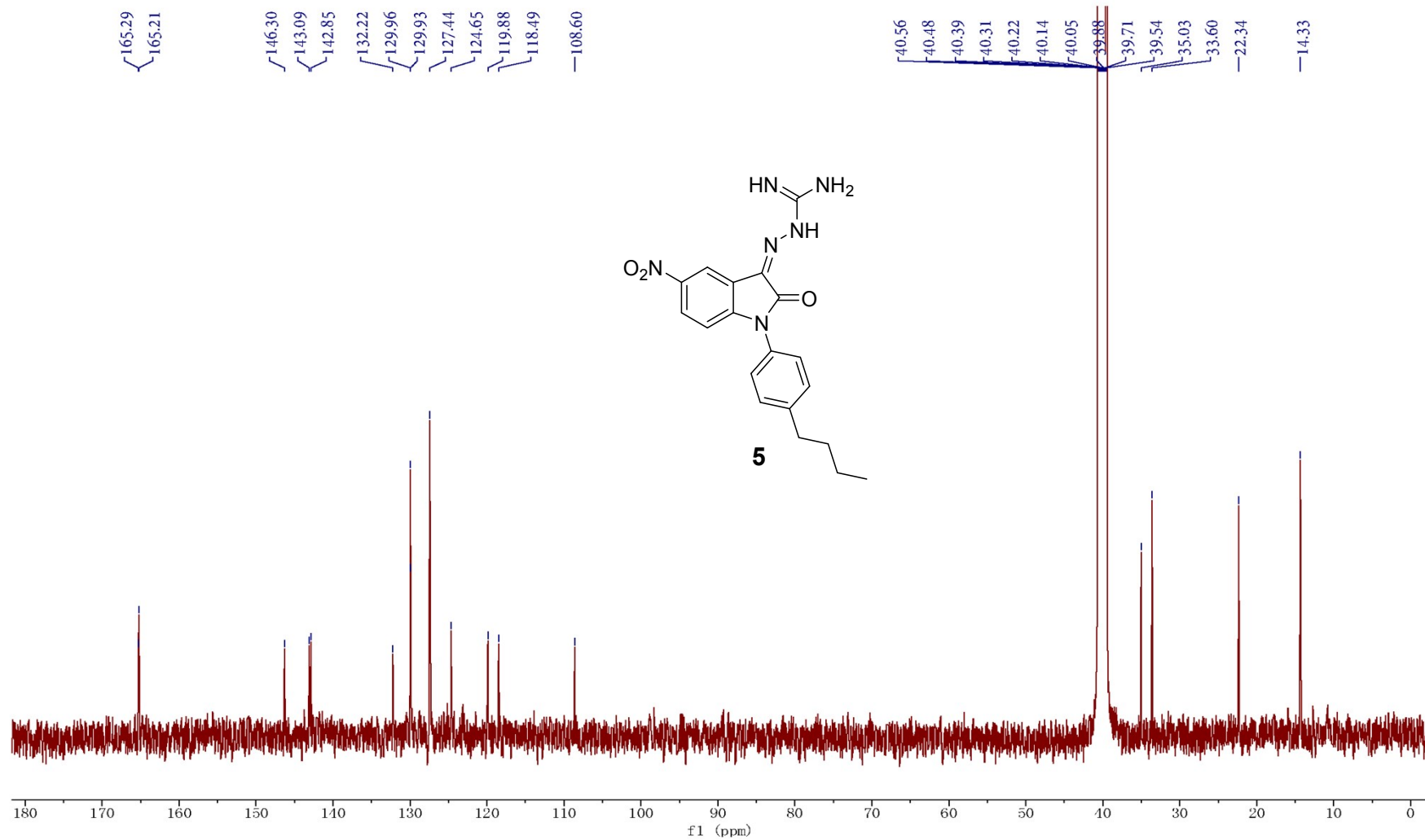


Figure S16. ¹³C NMR (125 MHz, CD₃OD) for compound **5**

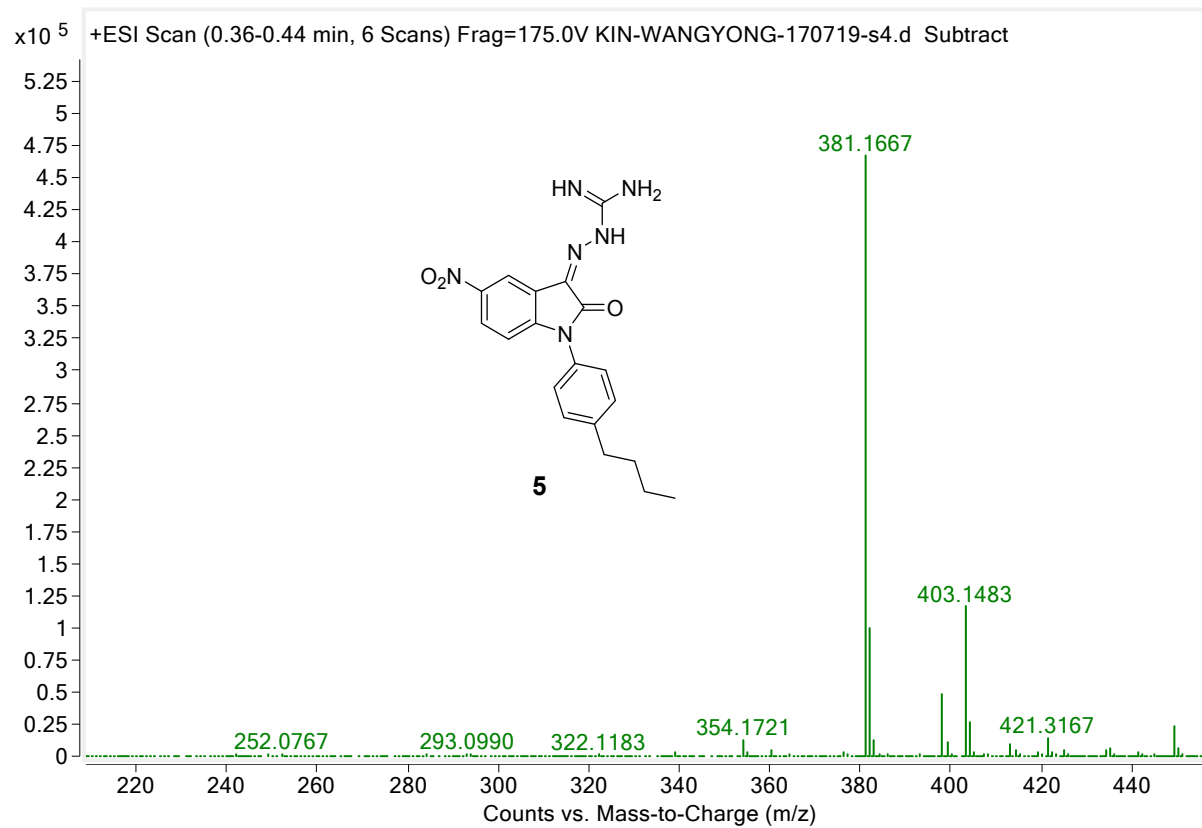


Figure S17. HRMS results for compound **5**

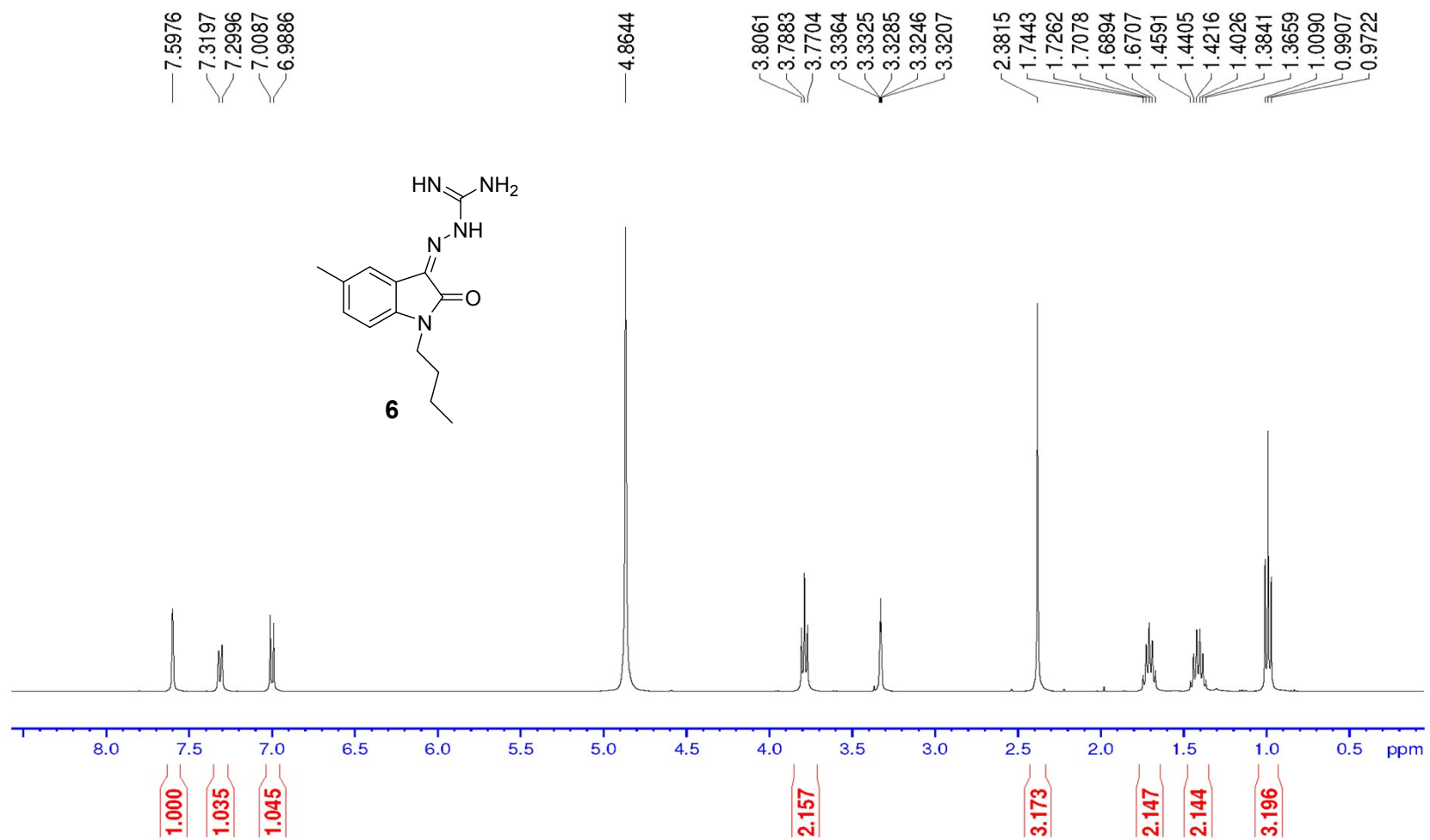
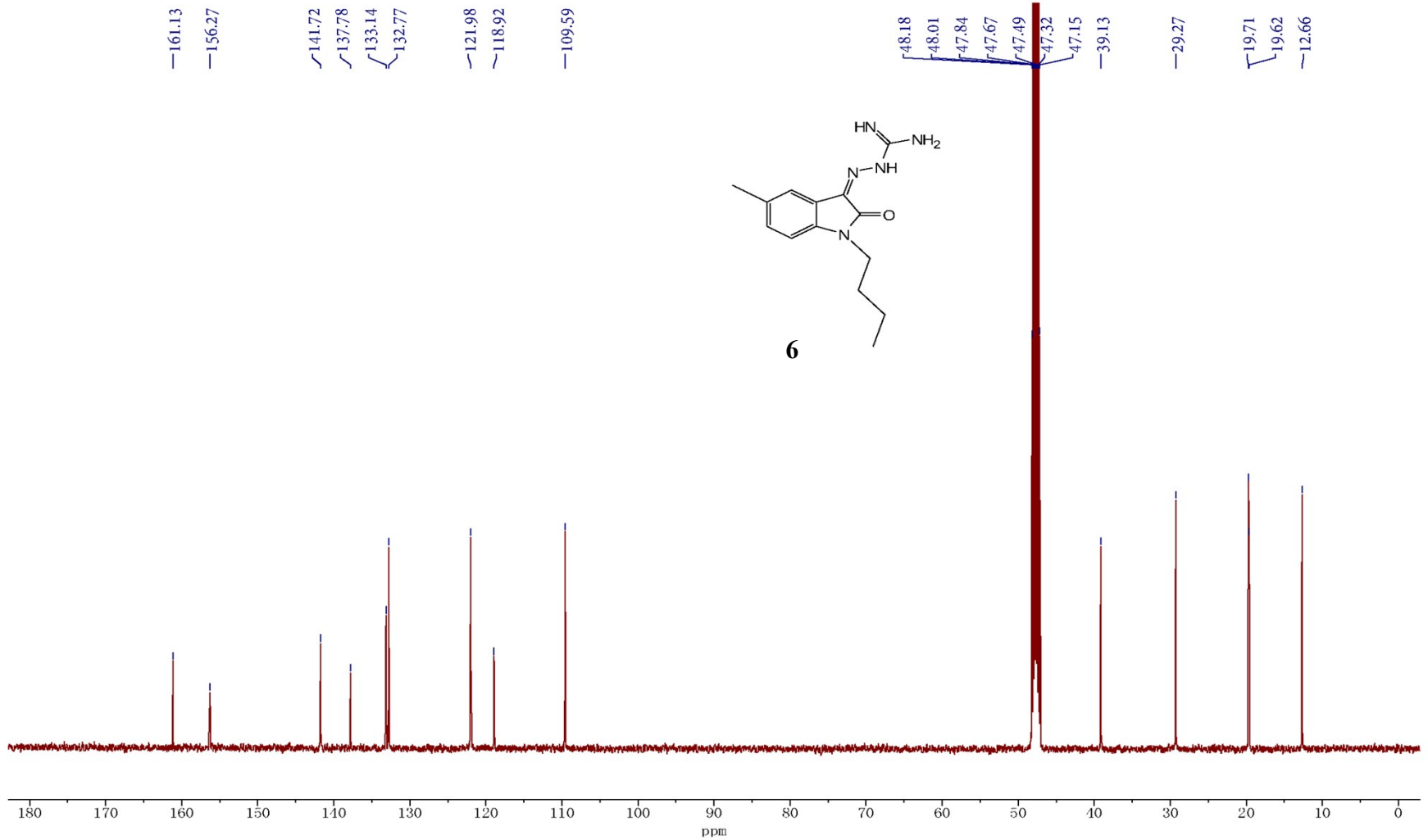


Figure S18. ¹H NMR (400 MHz, CD₃OD) for compound 6



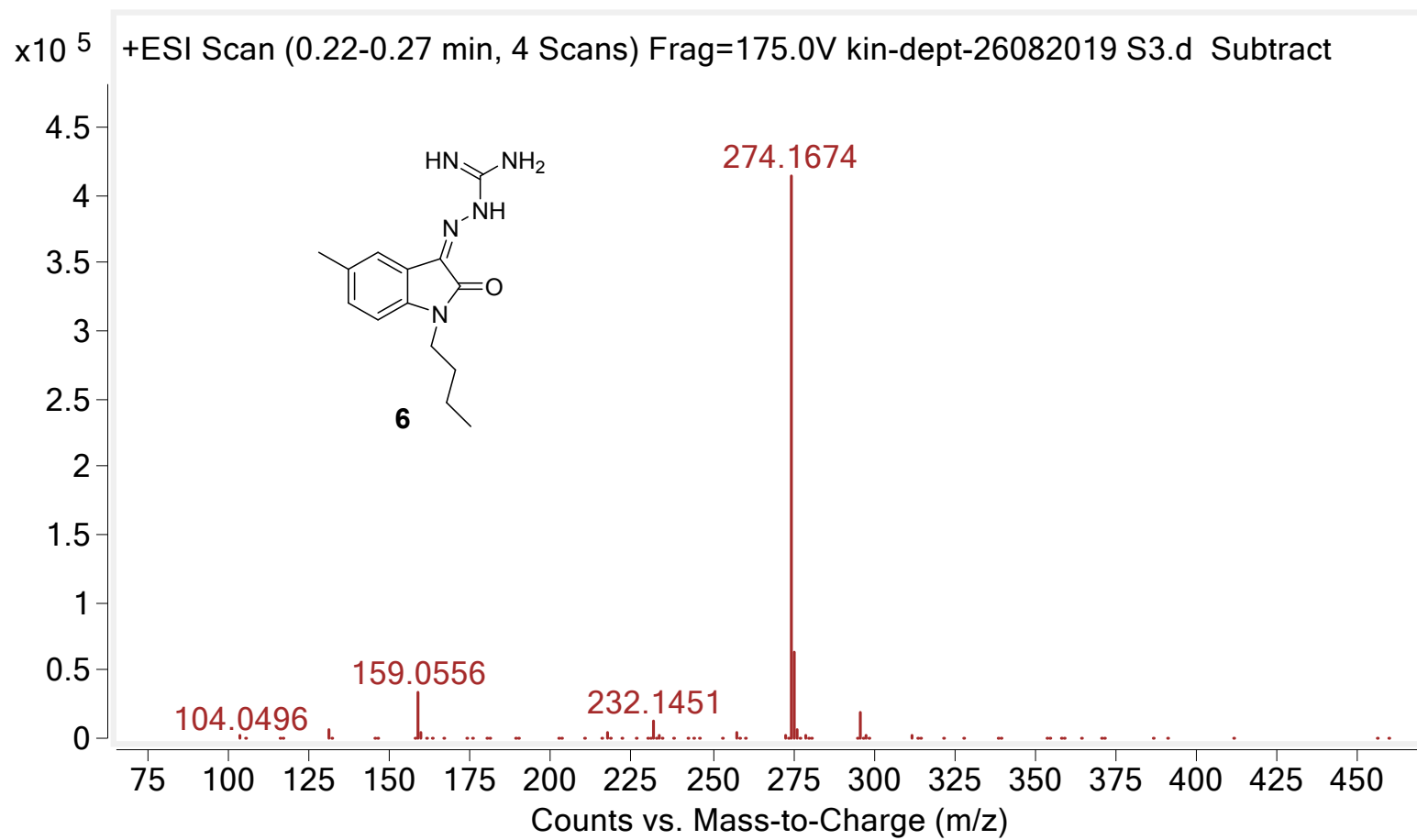


Figure S20. HRMS results for compound **6**

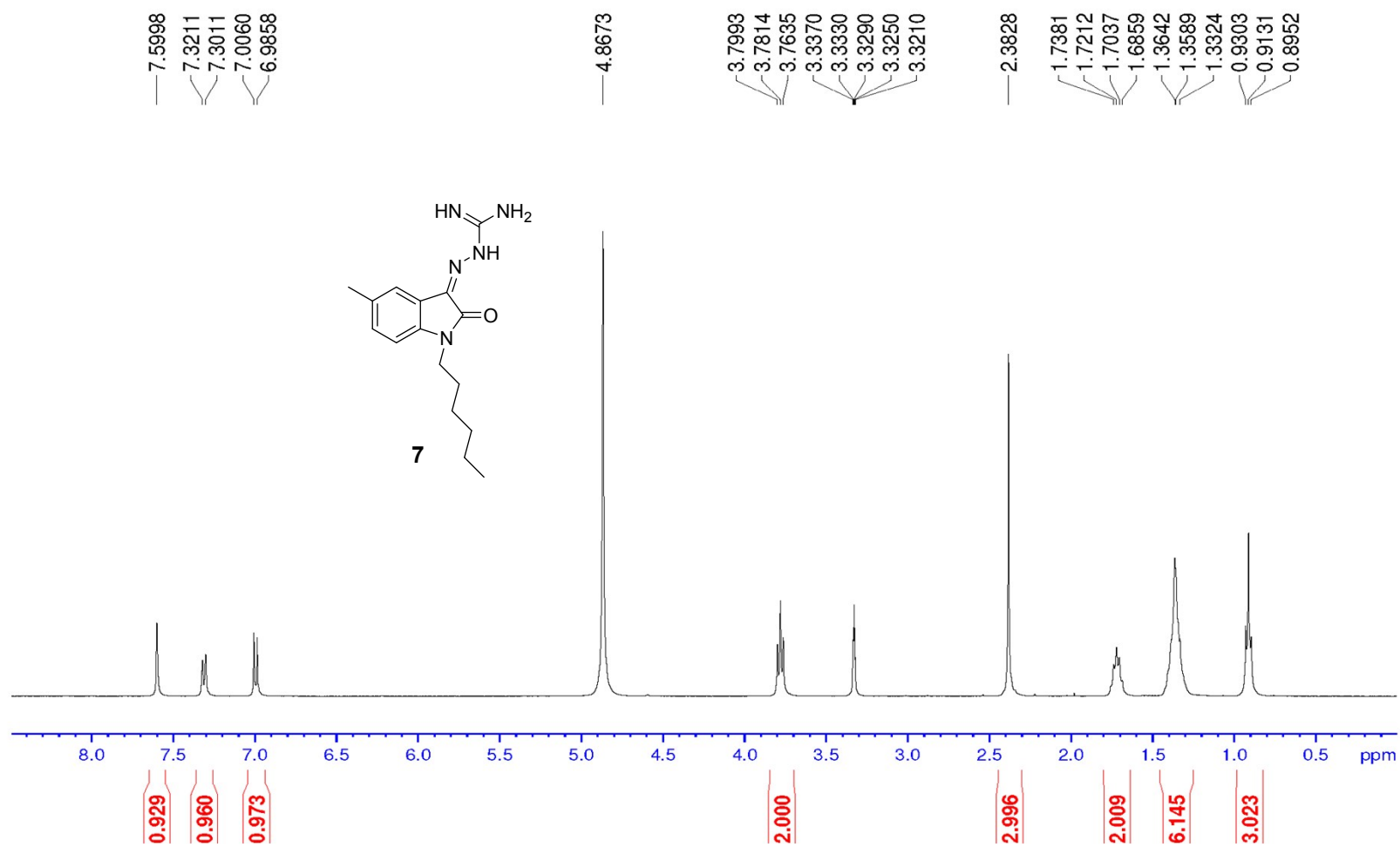


Figure S21. ^1H NMR (400 MHz, CD_3OD) for compound **7**

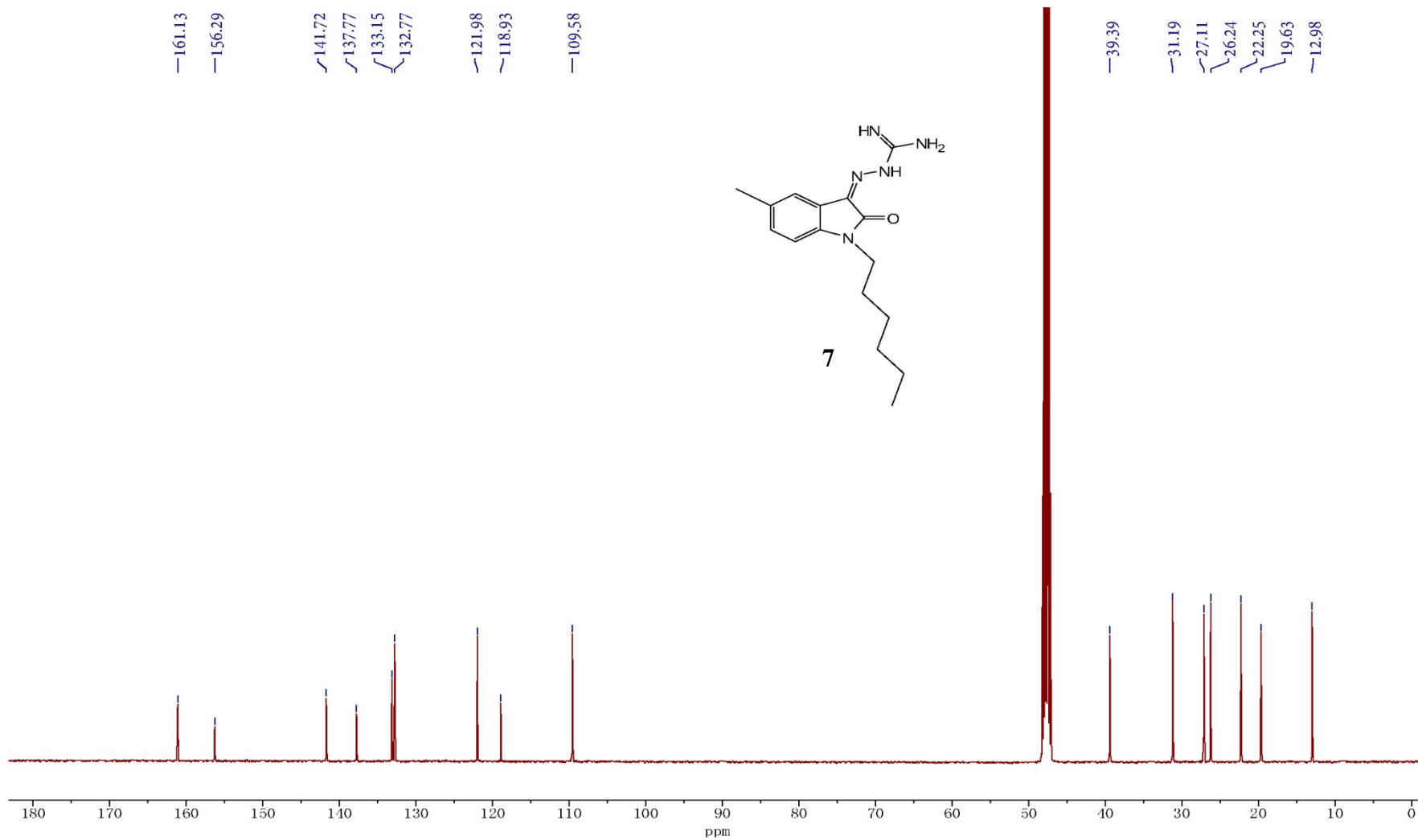


Figure S22. ^{13}C NMR (125 MHz, CD_3OD) for compound 7

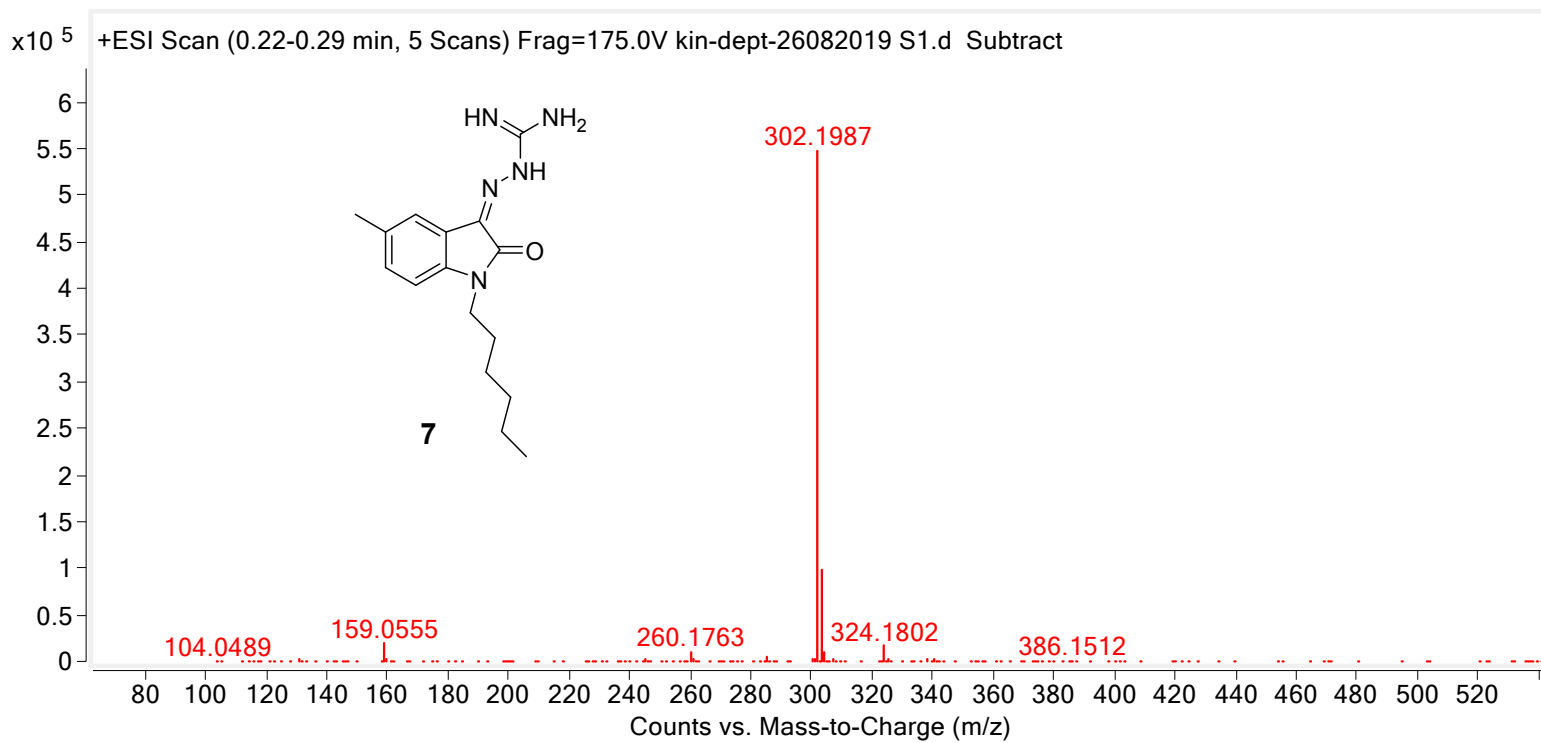


Figure S23. HRMS results for compound 7

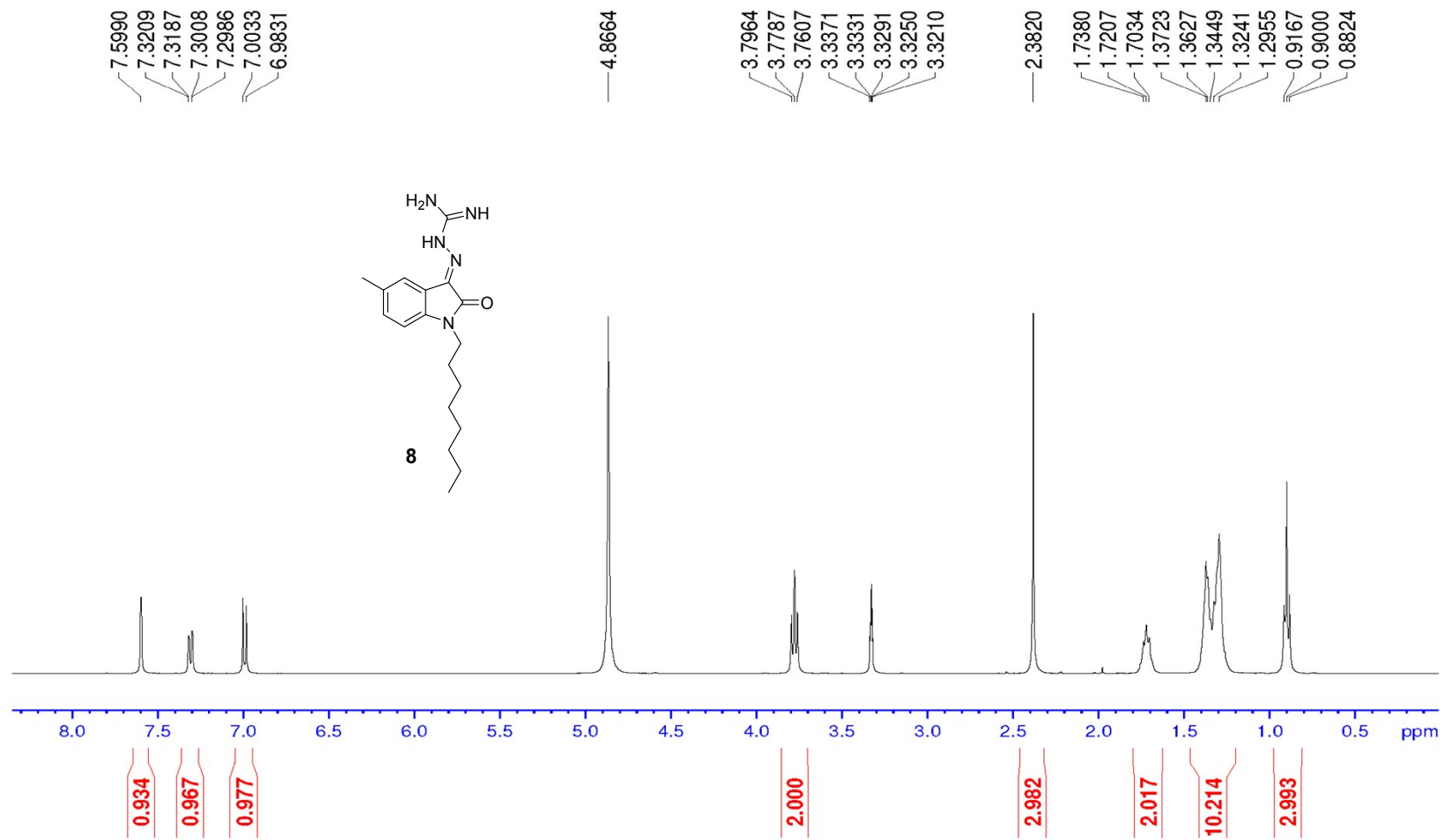


Figure S24. ^1H NMR (400 MHz, CD_3OD) for compound **8**

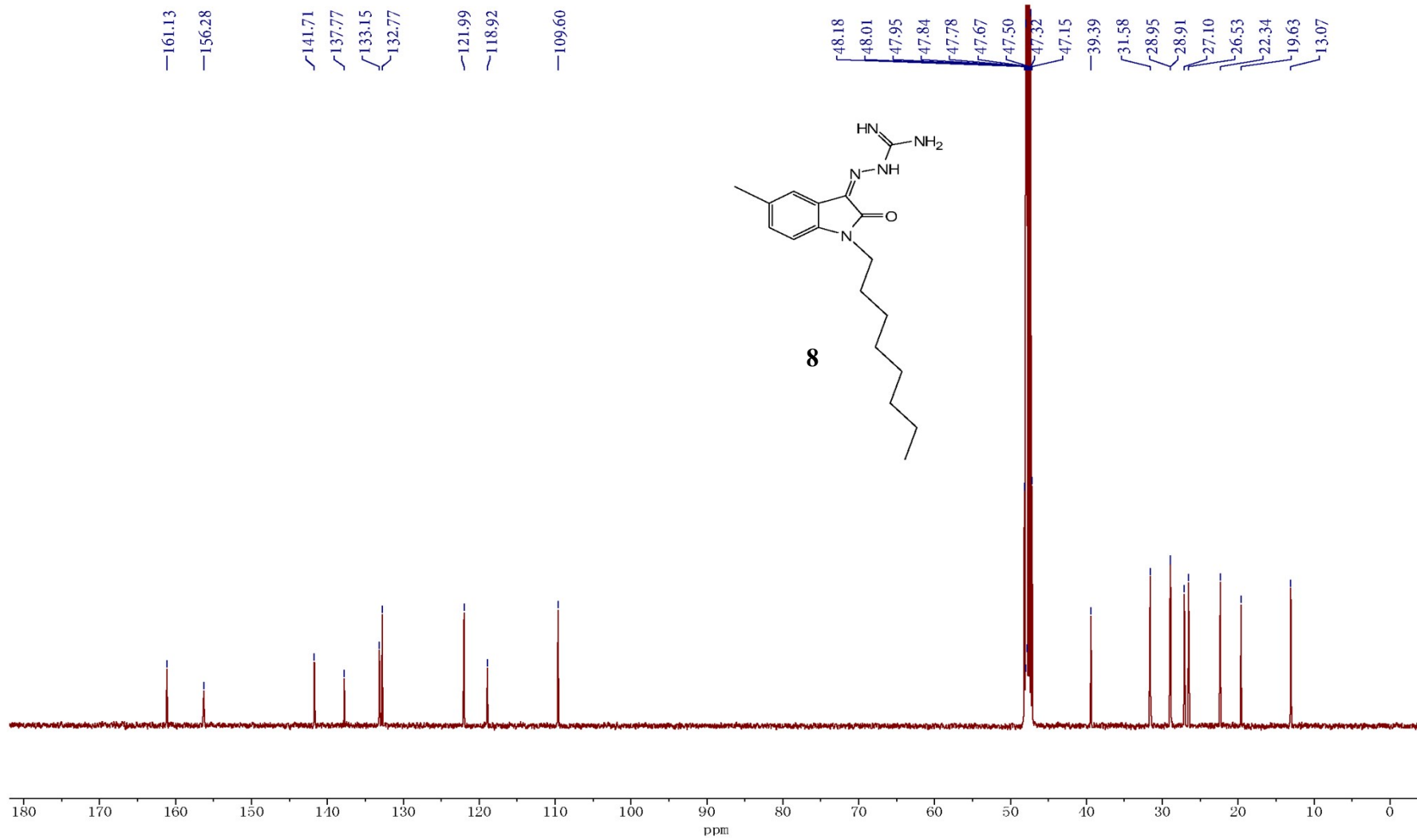


Figure S25. ¹³C NMR (125 MHz, CD₃OD) for compound **8**

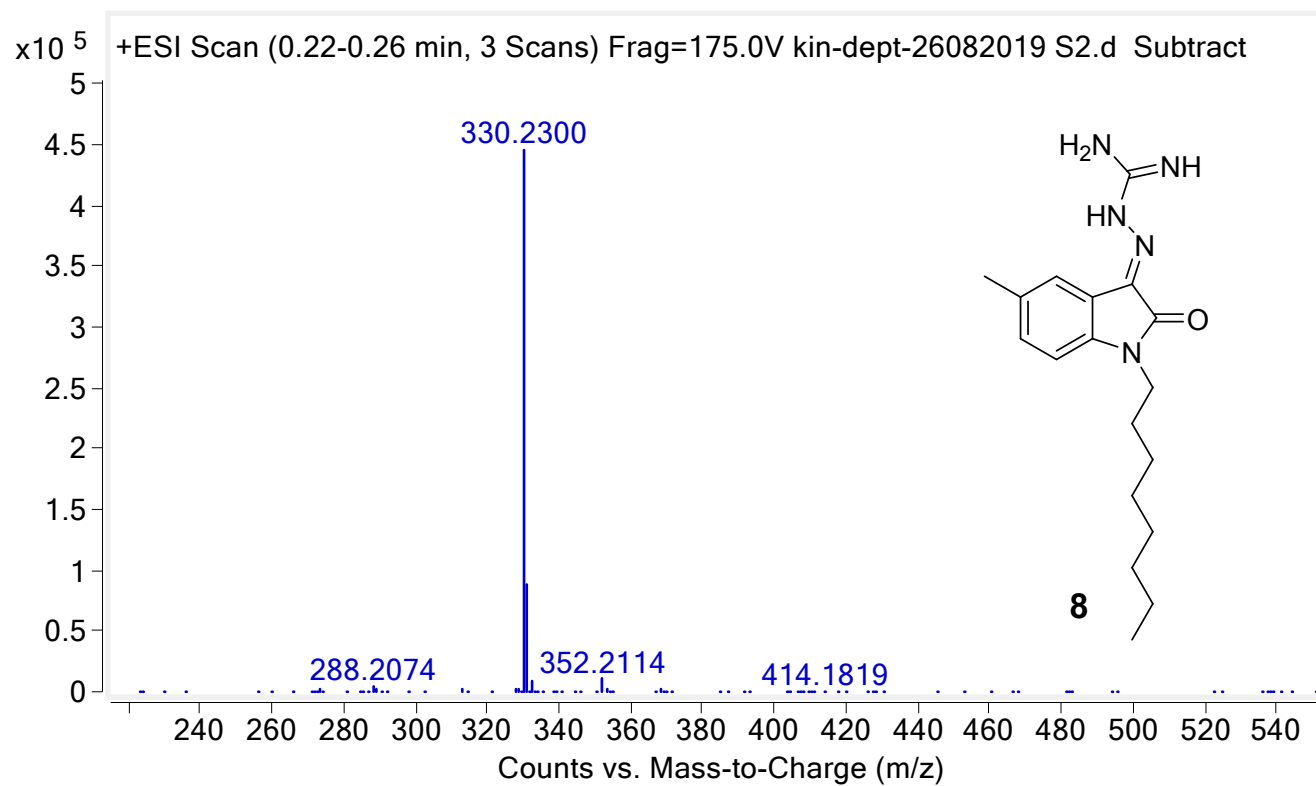


Figure S26. HRMS results for compound **8**

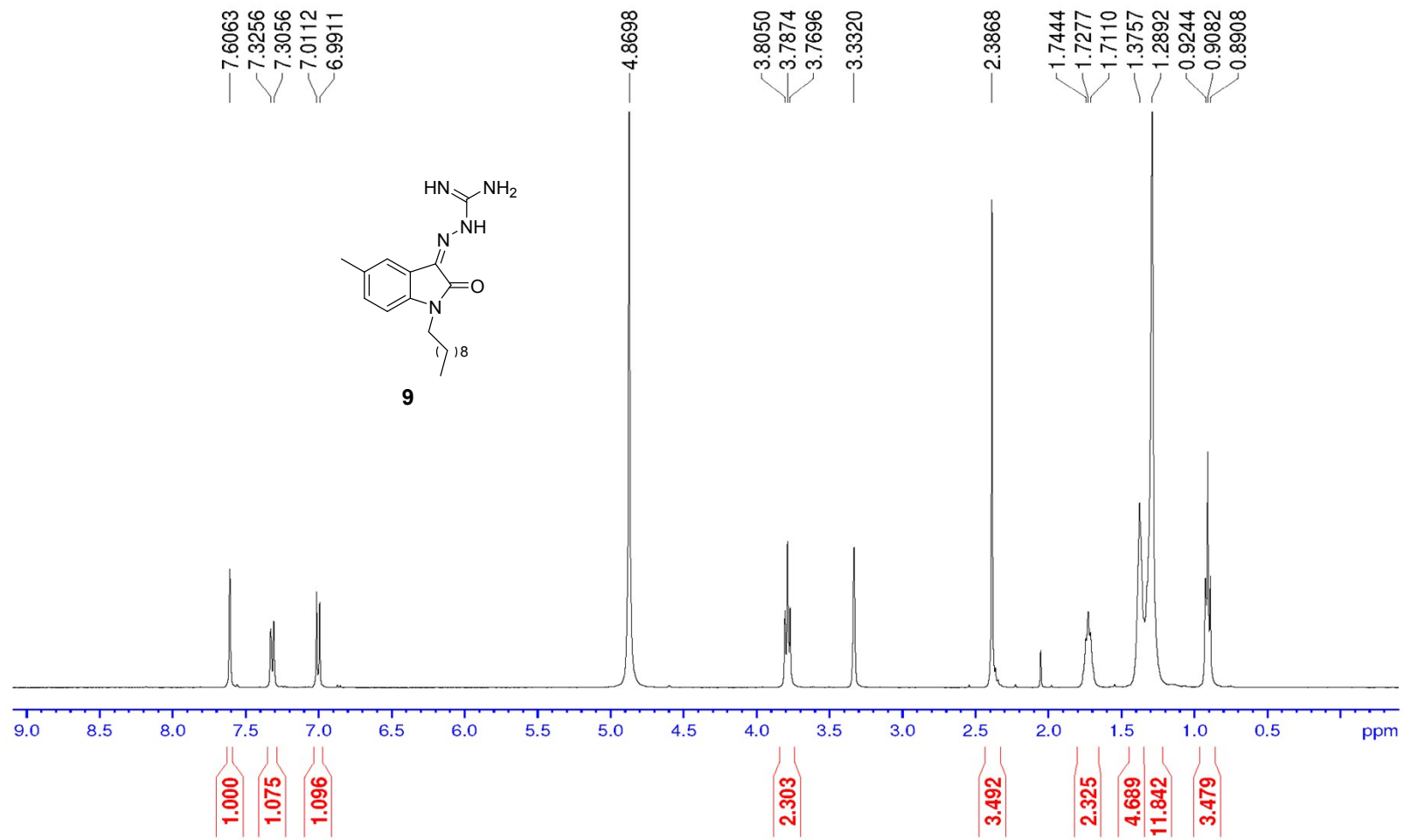


Figure S27. ¹H NMR (400 MHz, CD₃OD) for compound **9**

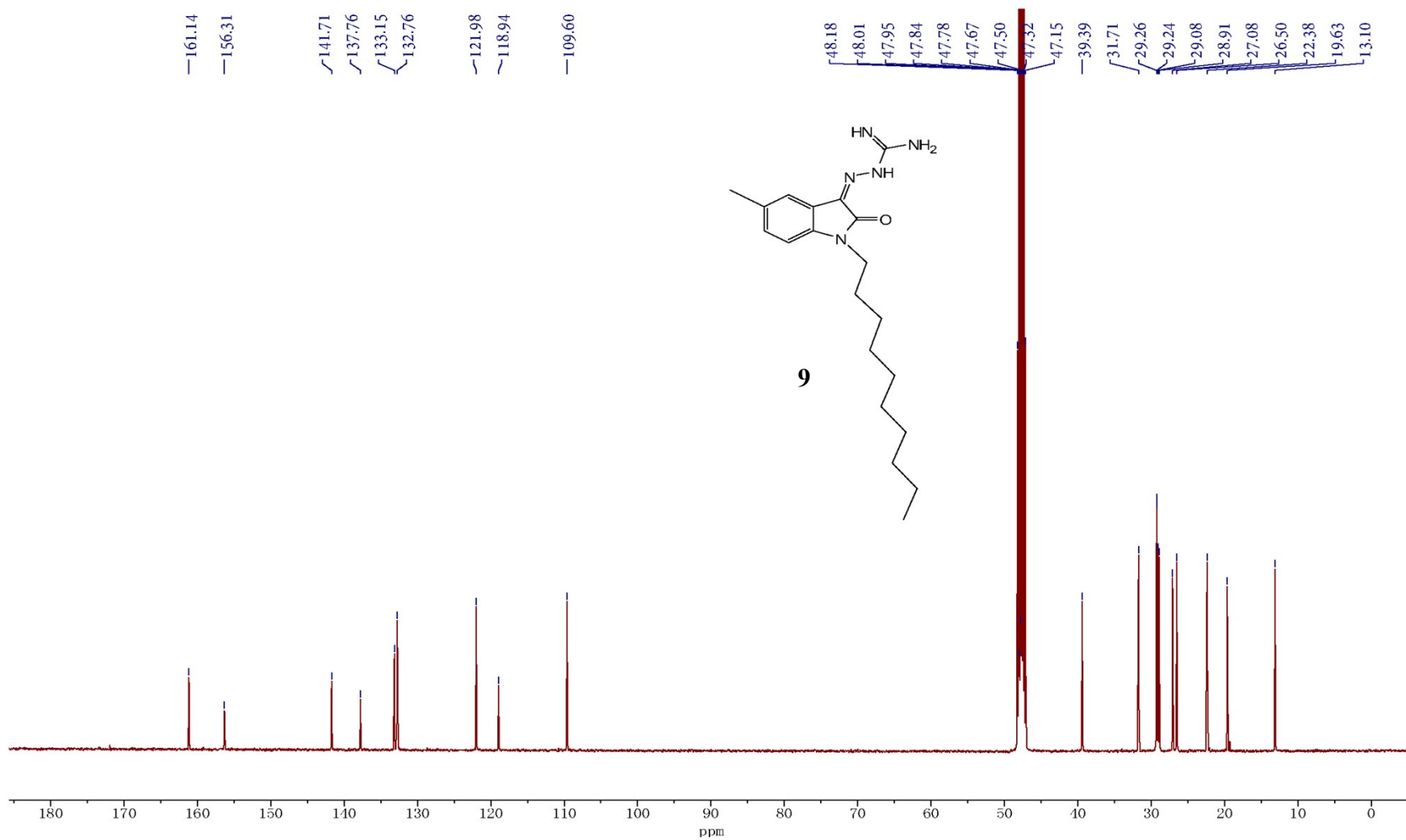


Figure S28. ^{13}C NMR (125 MHz, CD_3OD) for compound 9

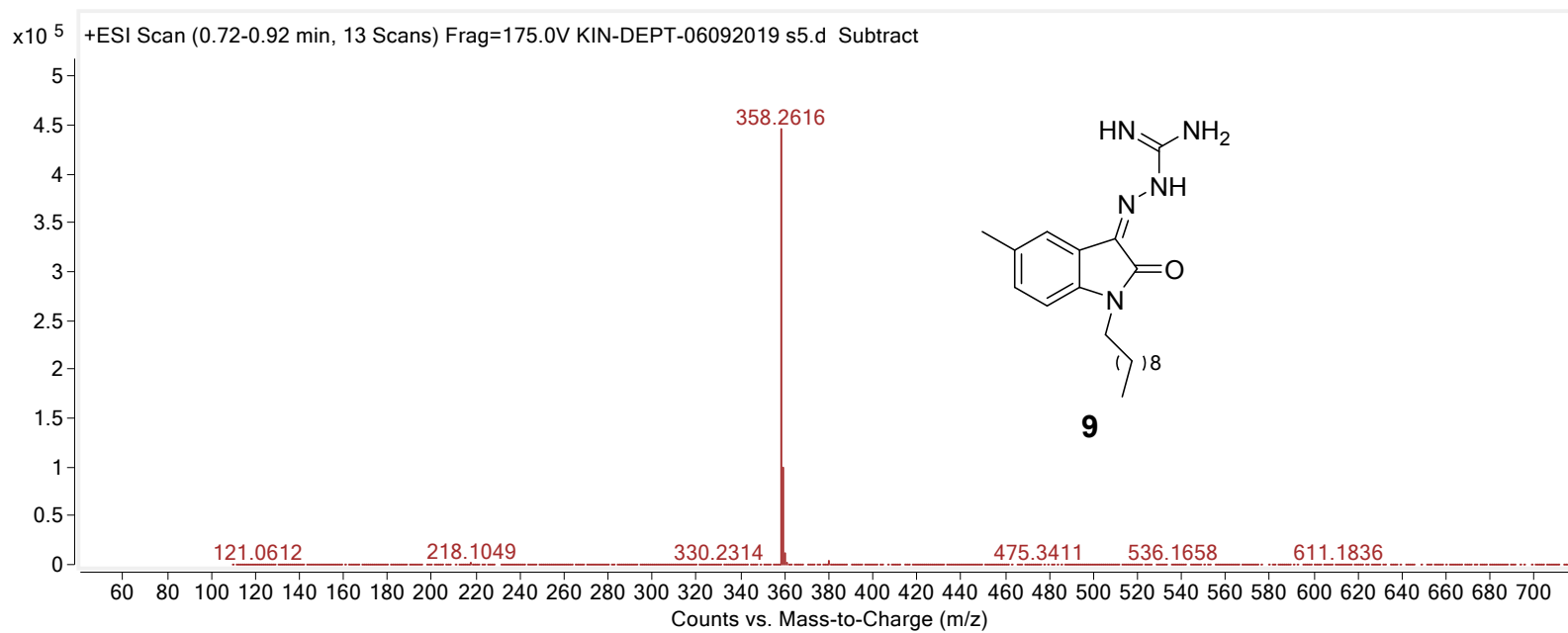


Figure S29. HRMS results for compound **9**

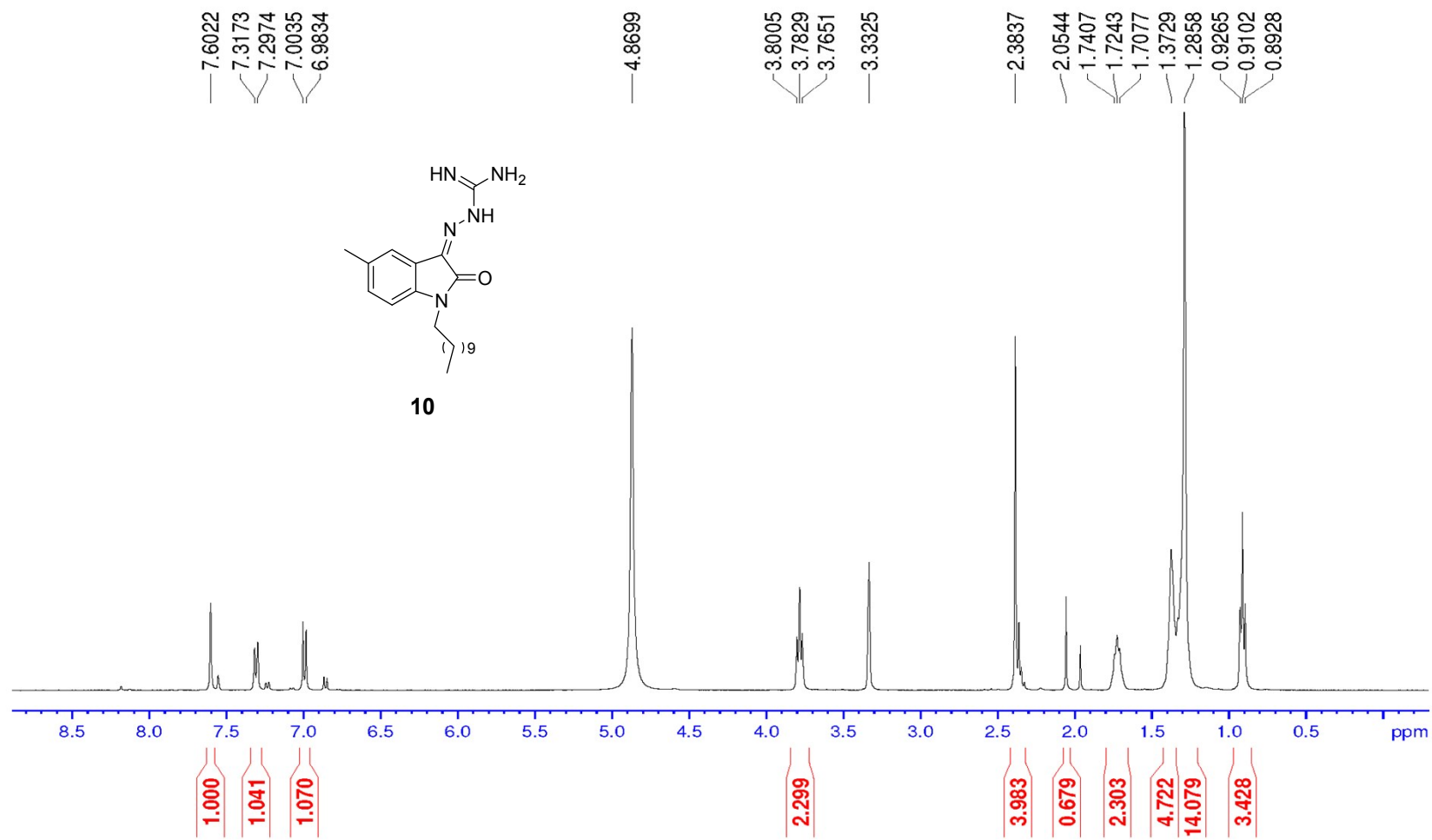


Figure S30. ¹H NMR (400 MHz, CD₃OD) for compound **10**

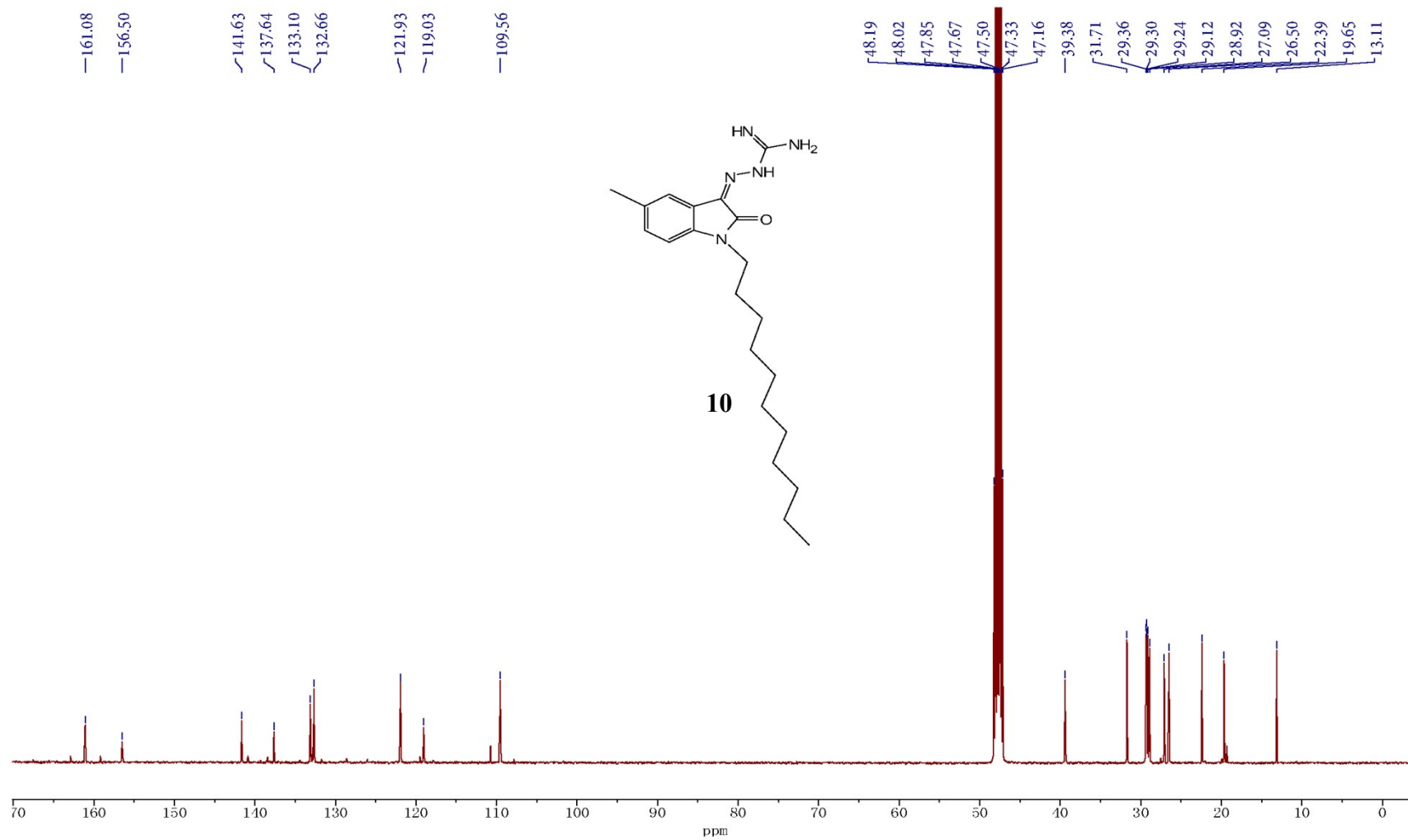


Figure S31. ^{13}C NMR (125 MHz, CD_3OD) for compound **10**

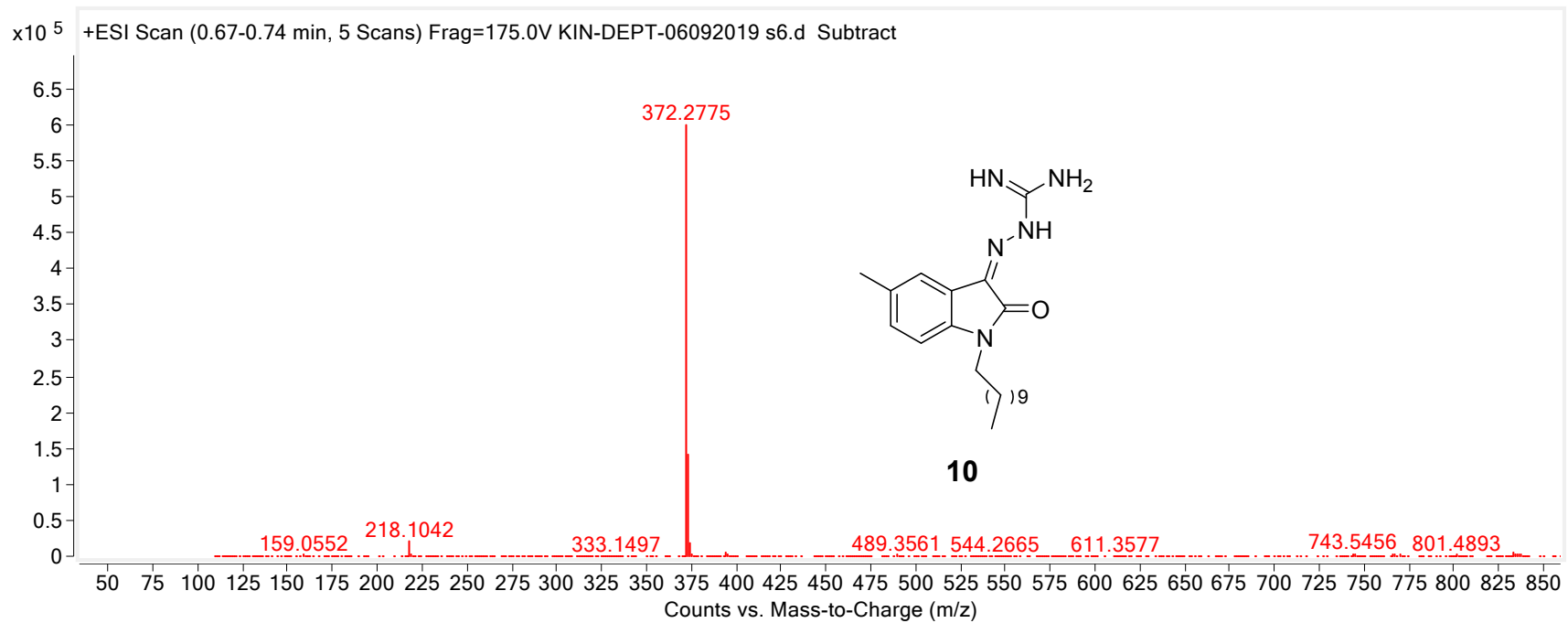


Figure S32. HRMS results for compound **10**

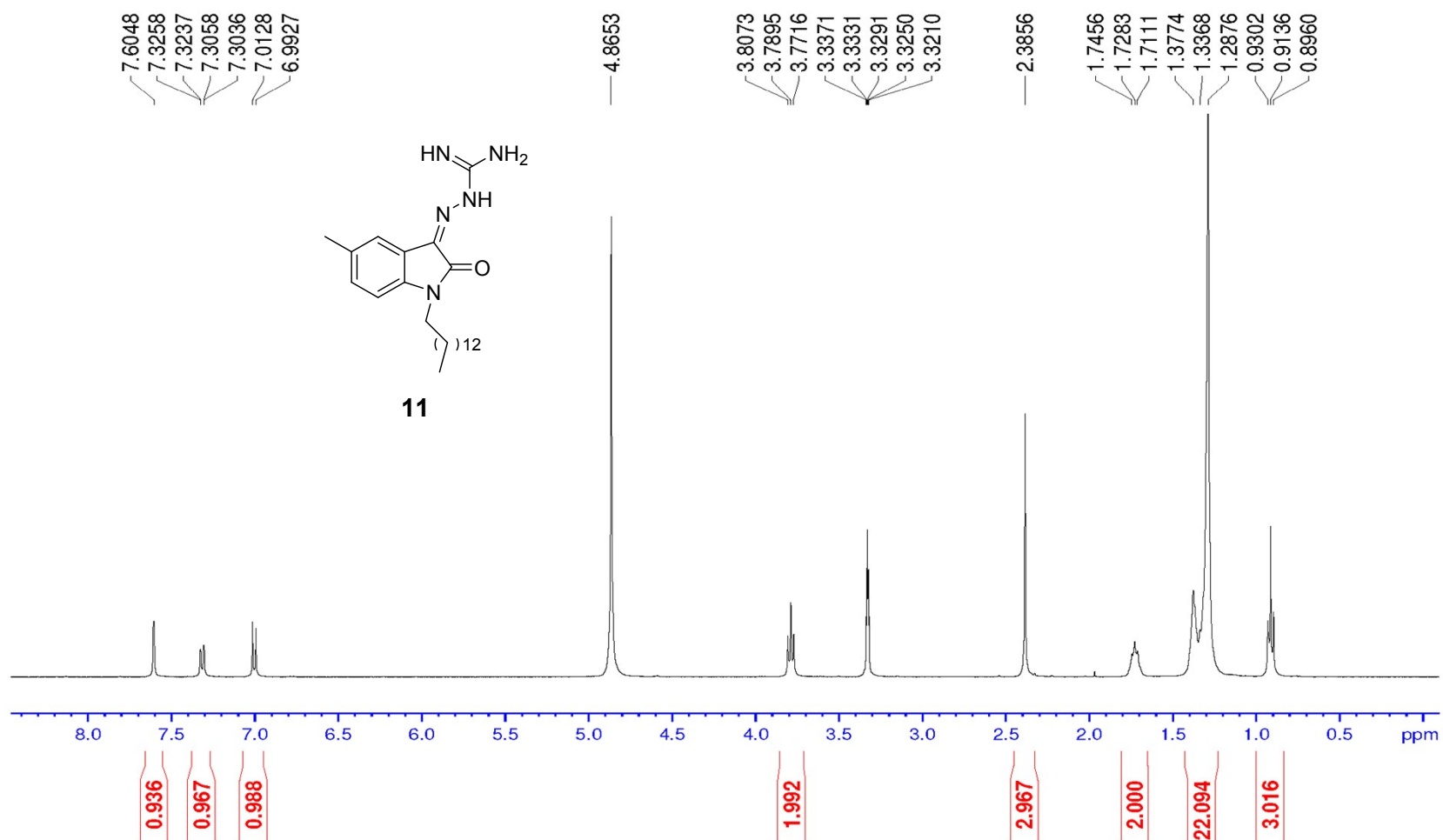


Figure S33. ^1H NMR (400 MHz, CD_3OD) for compound **11**

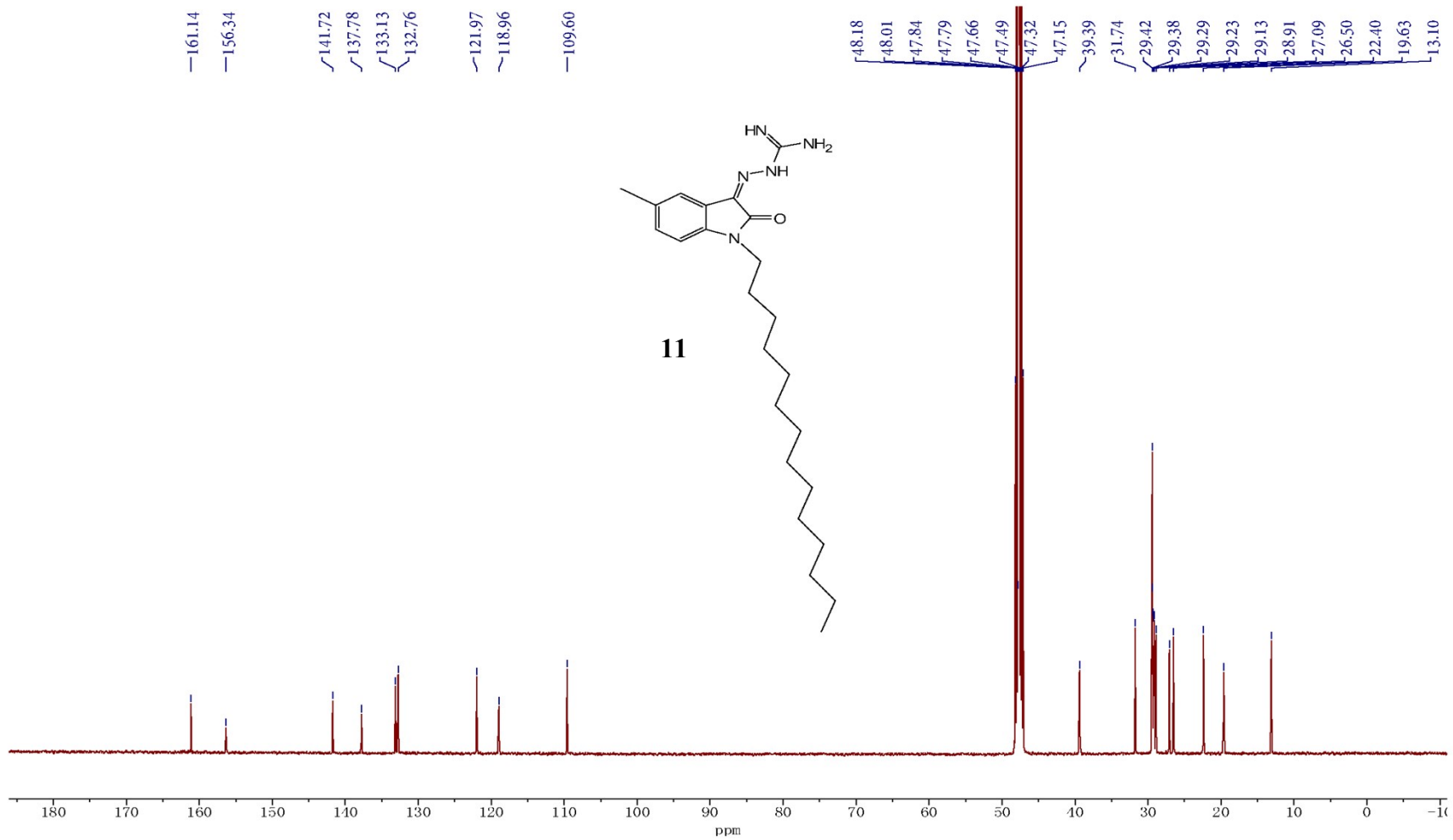


Figure S34. ^{13}C NMR (125 MHz, CD_3OD) for compound **11**

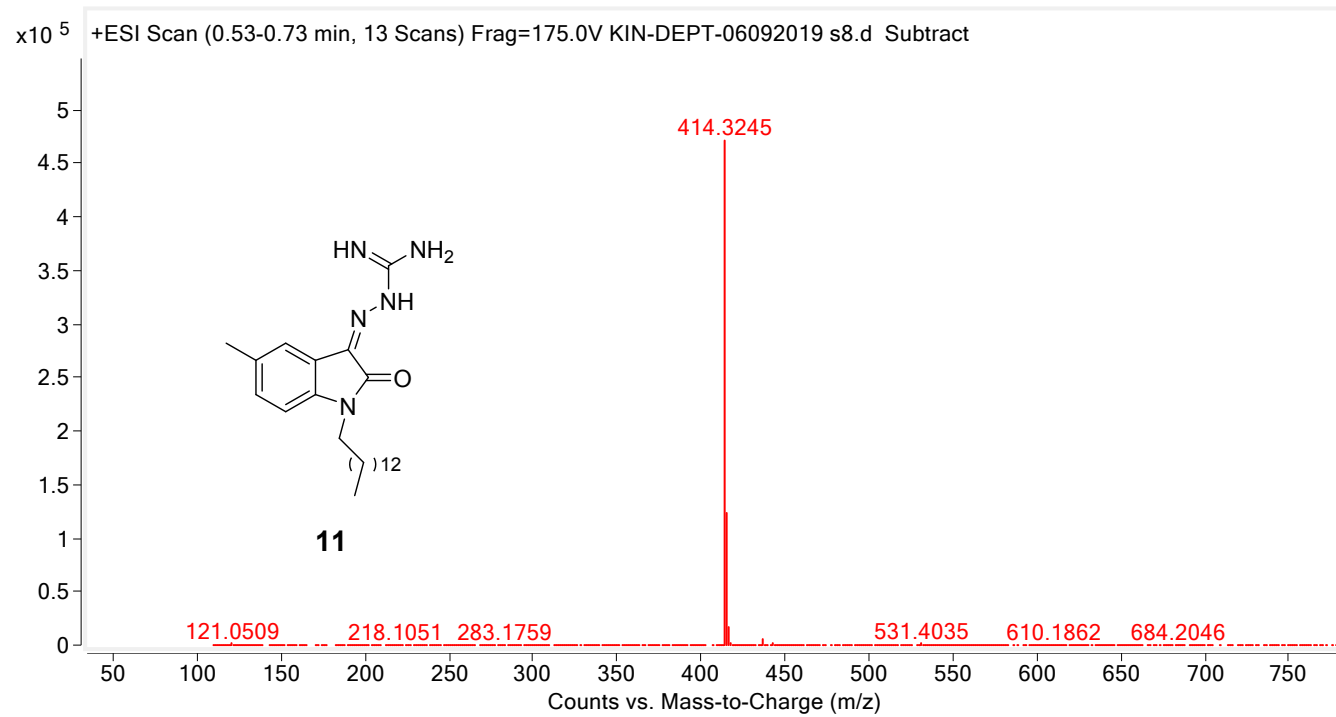


Figure S35. HRMS results for compound **11**

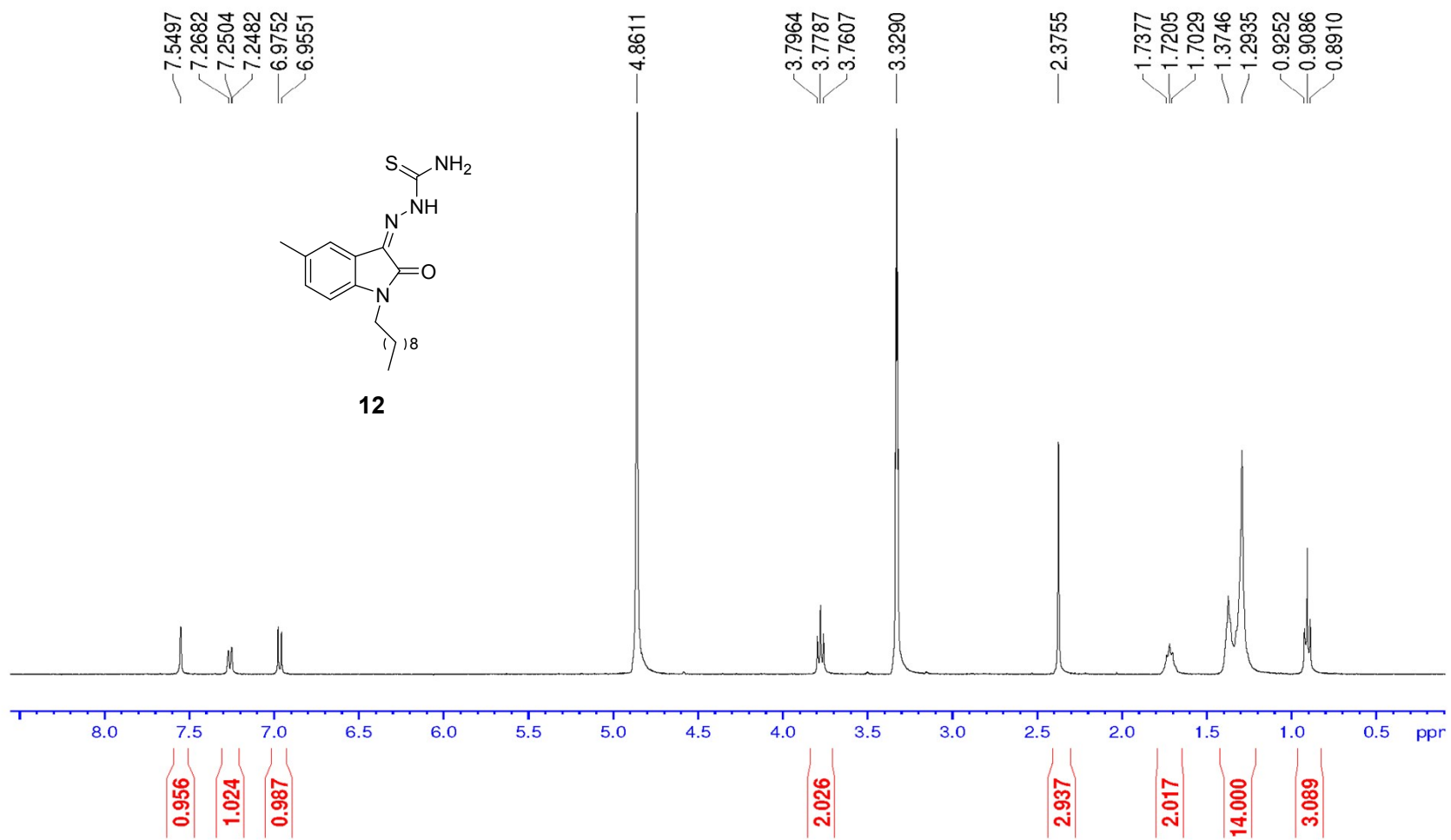


Figure S36. ¹H NMR (400 MHz, CD₃OD) for compound **12**

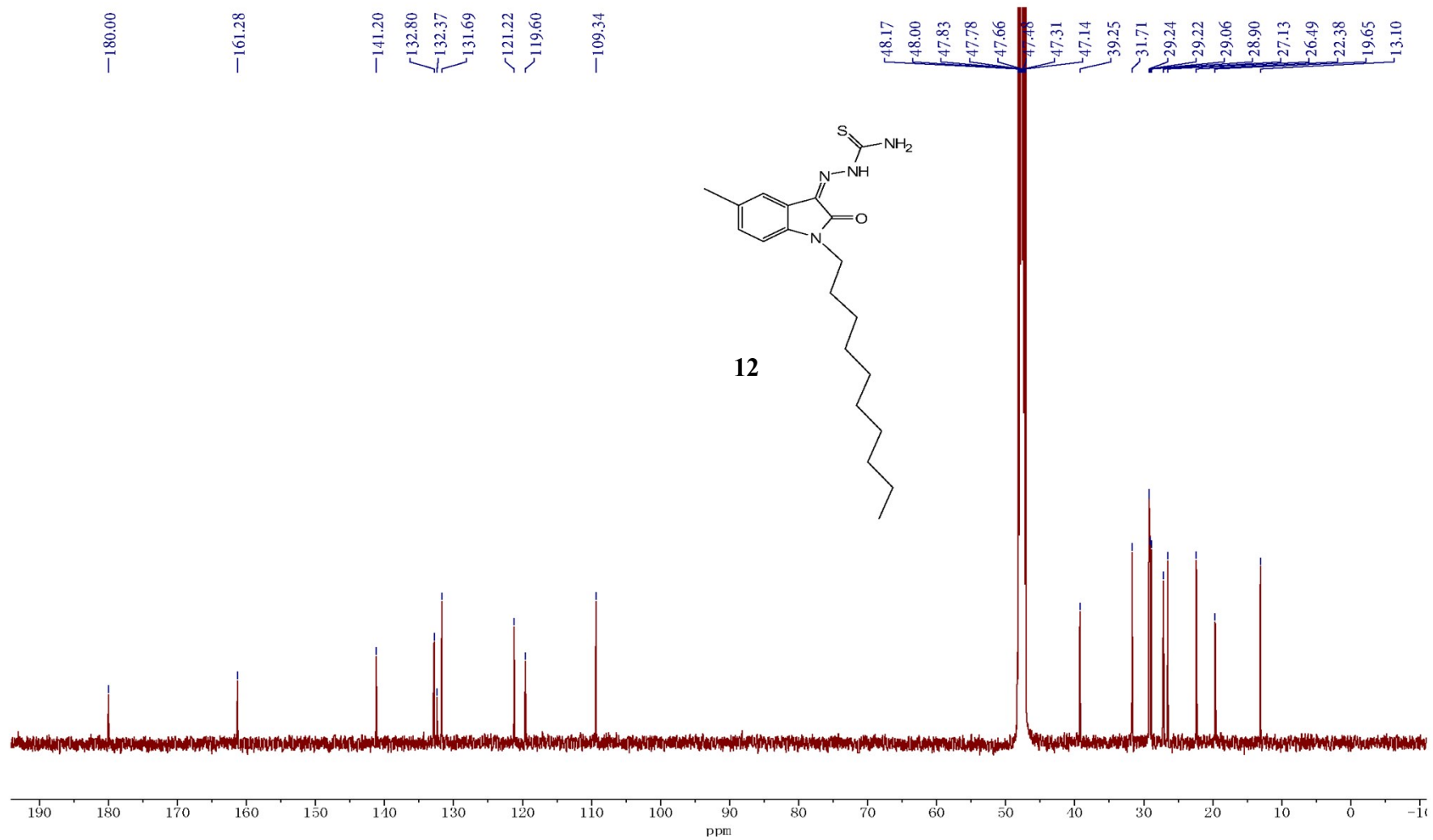


Figure S37. ¹³C NMR (125 MHz, CD₃OD) for compound 12

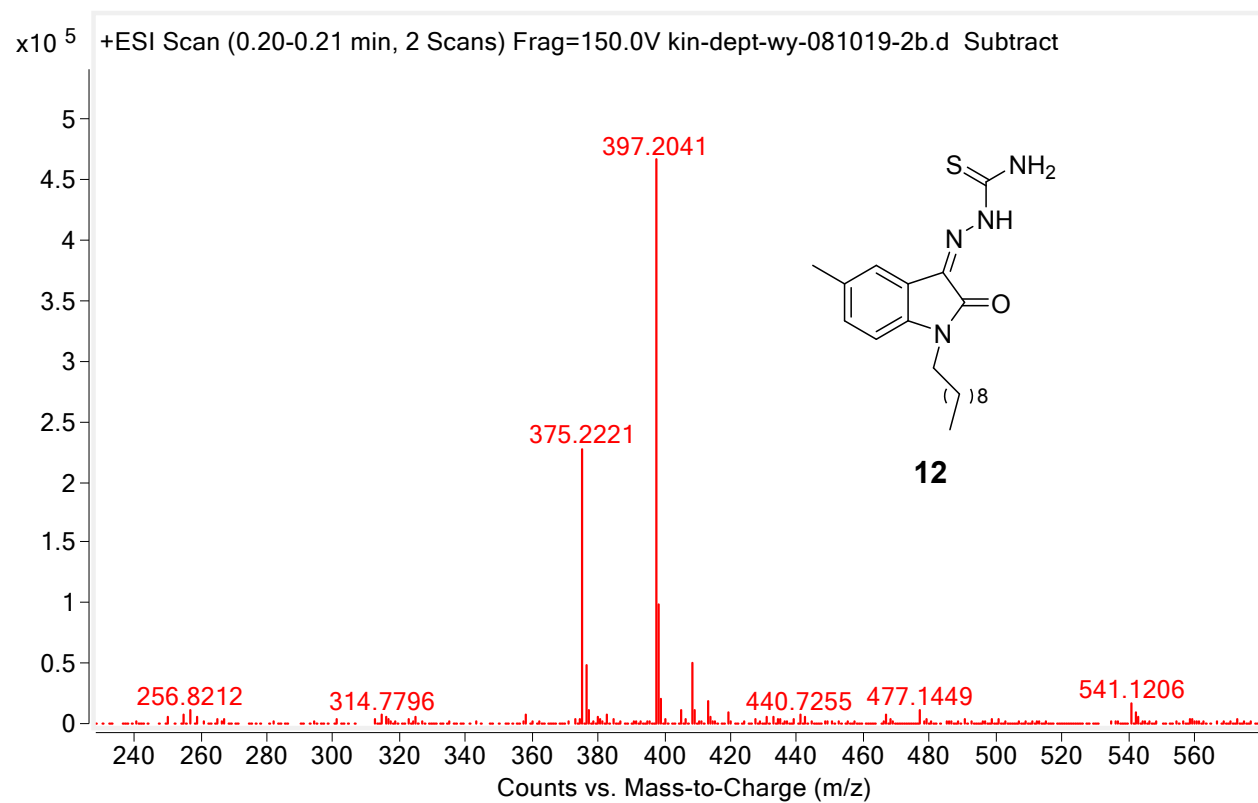


Figure S38. HRMS results for compound **12**