

-Supplementary materials-

Anti-Virus Isoindolinone alkaloids with rare oxocyclopenta[*f*]isoindole frameworks isolated from the stems of flue cured tobacco

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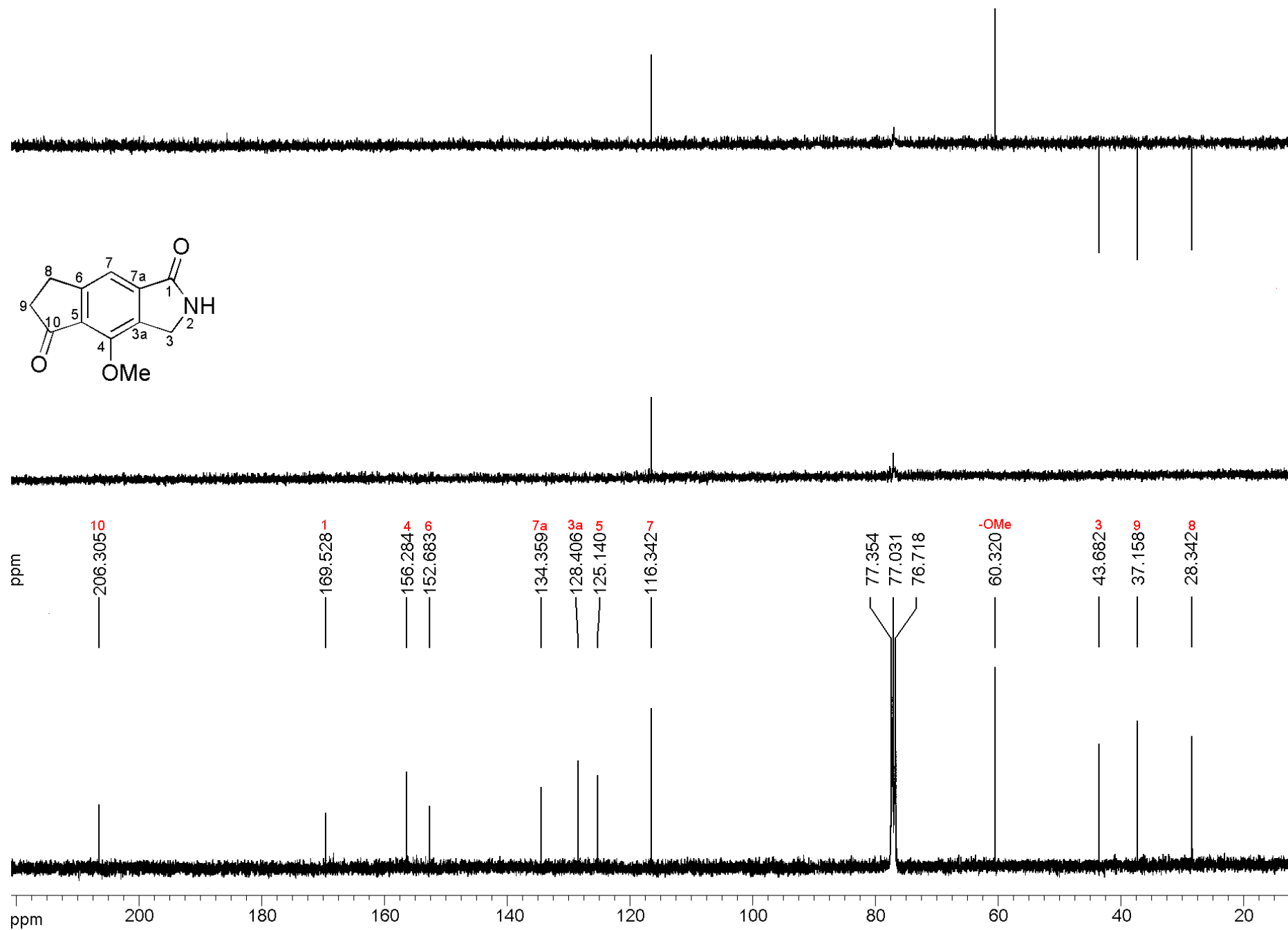


Figure S1. ^{13}C and DEPT NMR spectrum tobindole A (1)

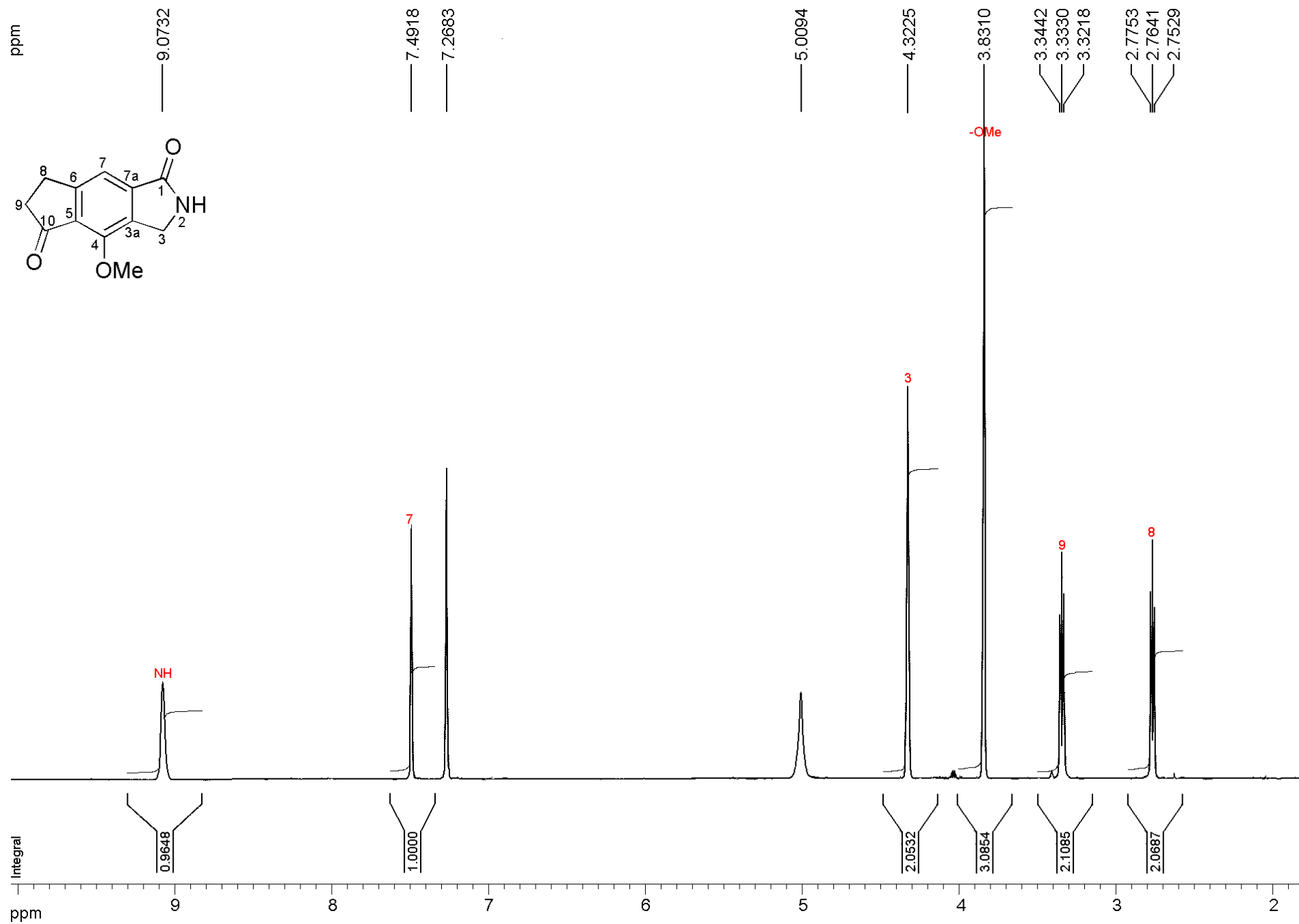


Figure S2. ^1H NMR spectrum of tobindole A (1)

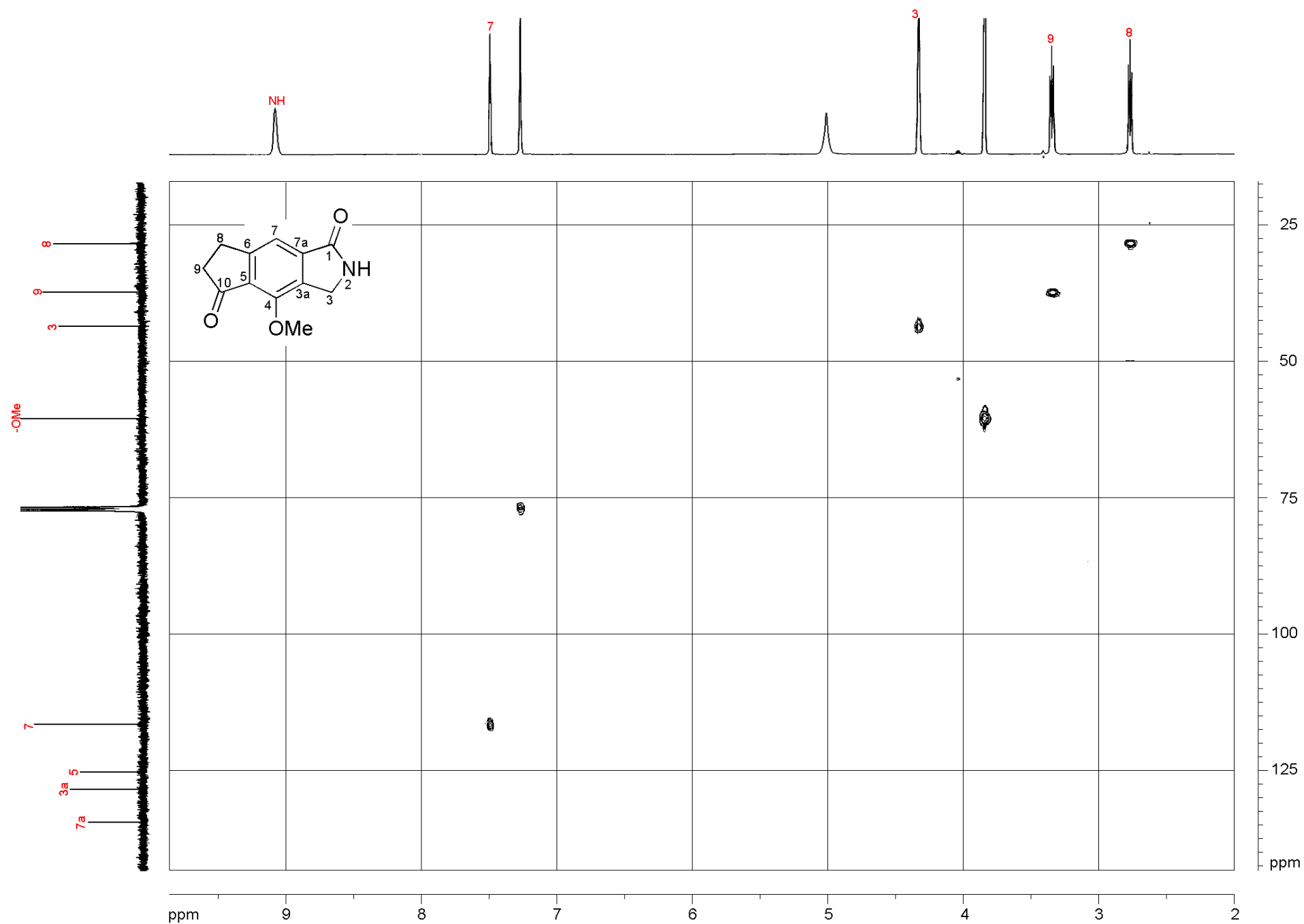


Figure S3. HSQC NMR spectrum of tobindole A (1)

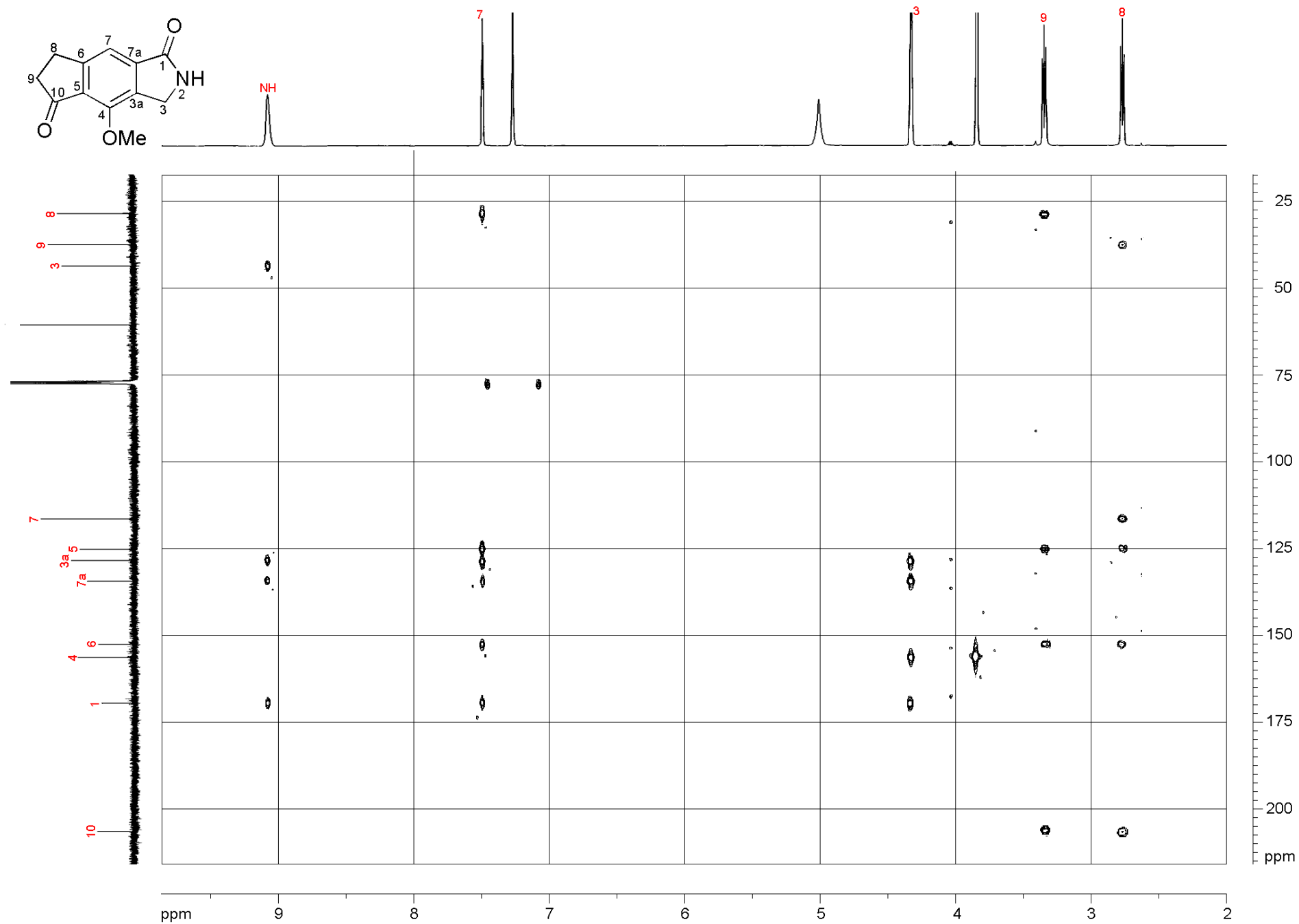
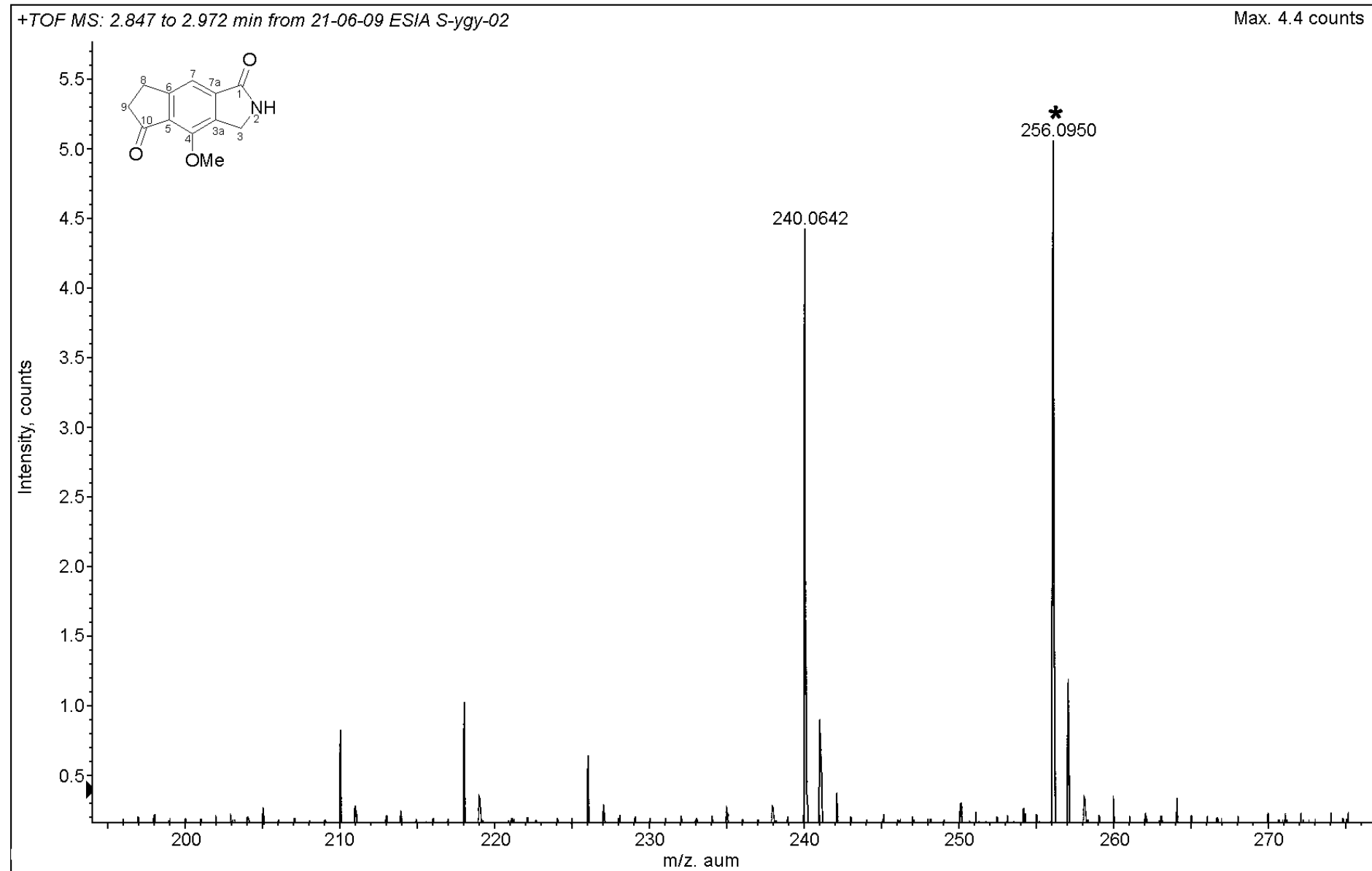


Figure S4. HMBC NMR spectrum of tobindole A (1)

**Figure S5.** HRMS spectrum of tobindole A (1)

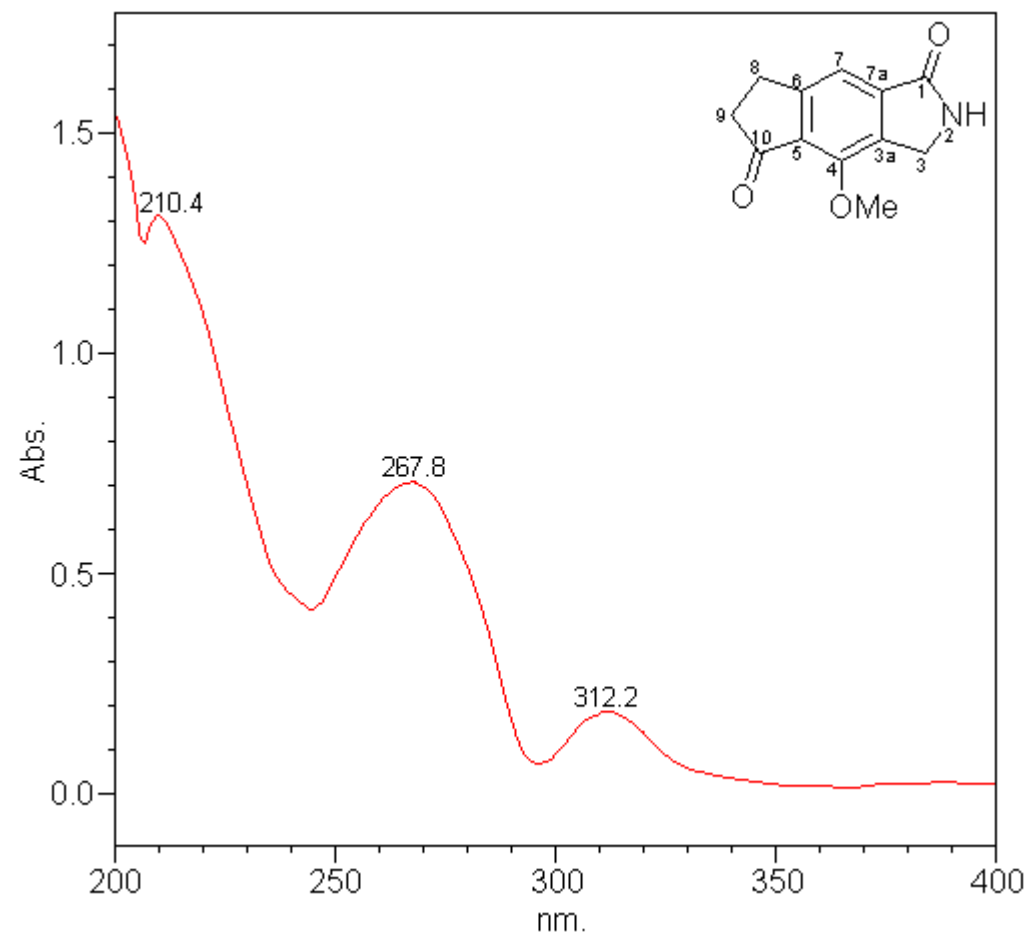


Figure S6. UV spectrum of tobindole A (1)

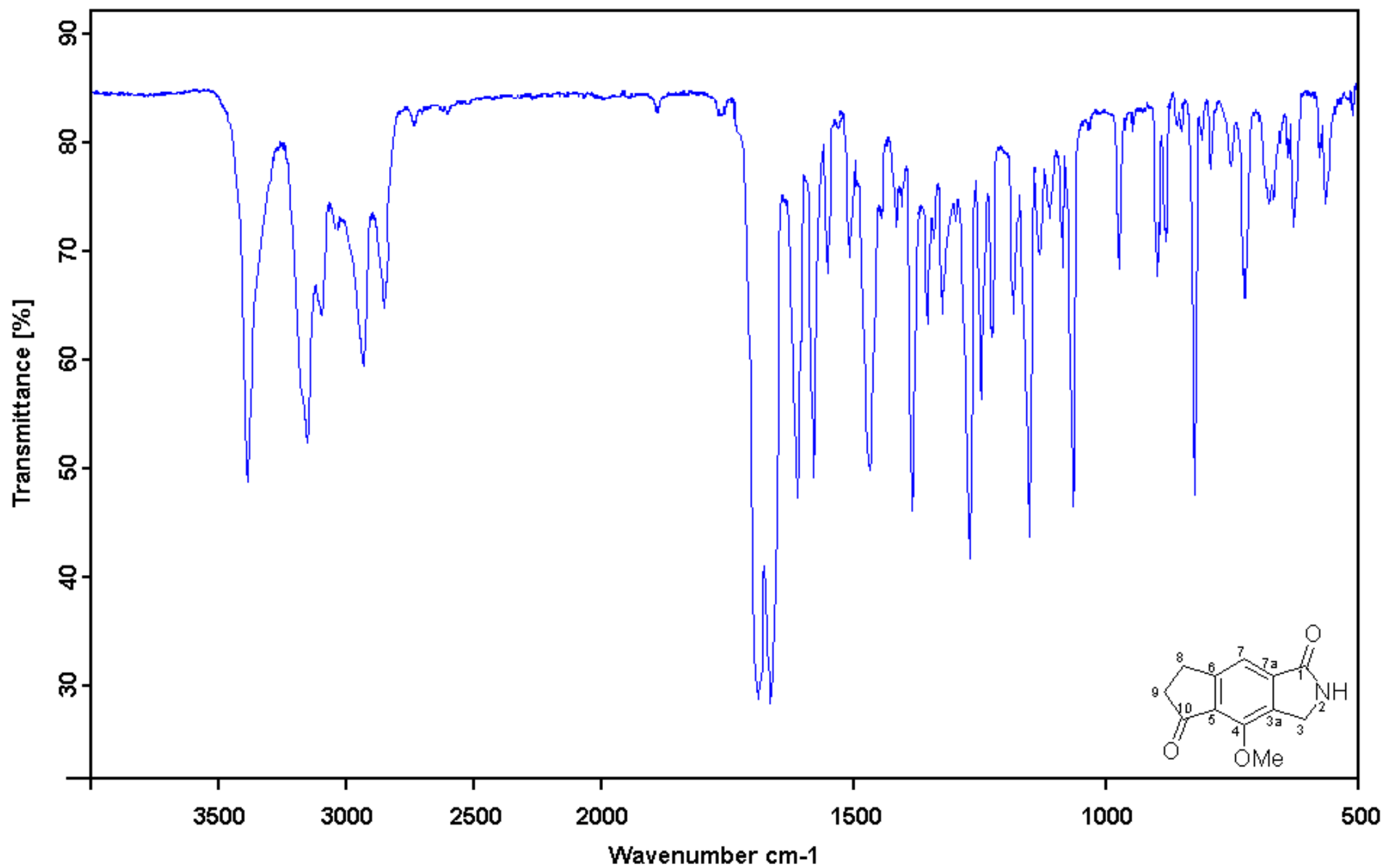


Figure S7. IR spectrum of tobindole A (1)

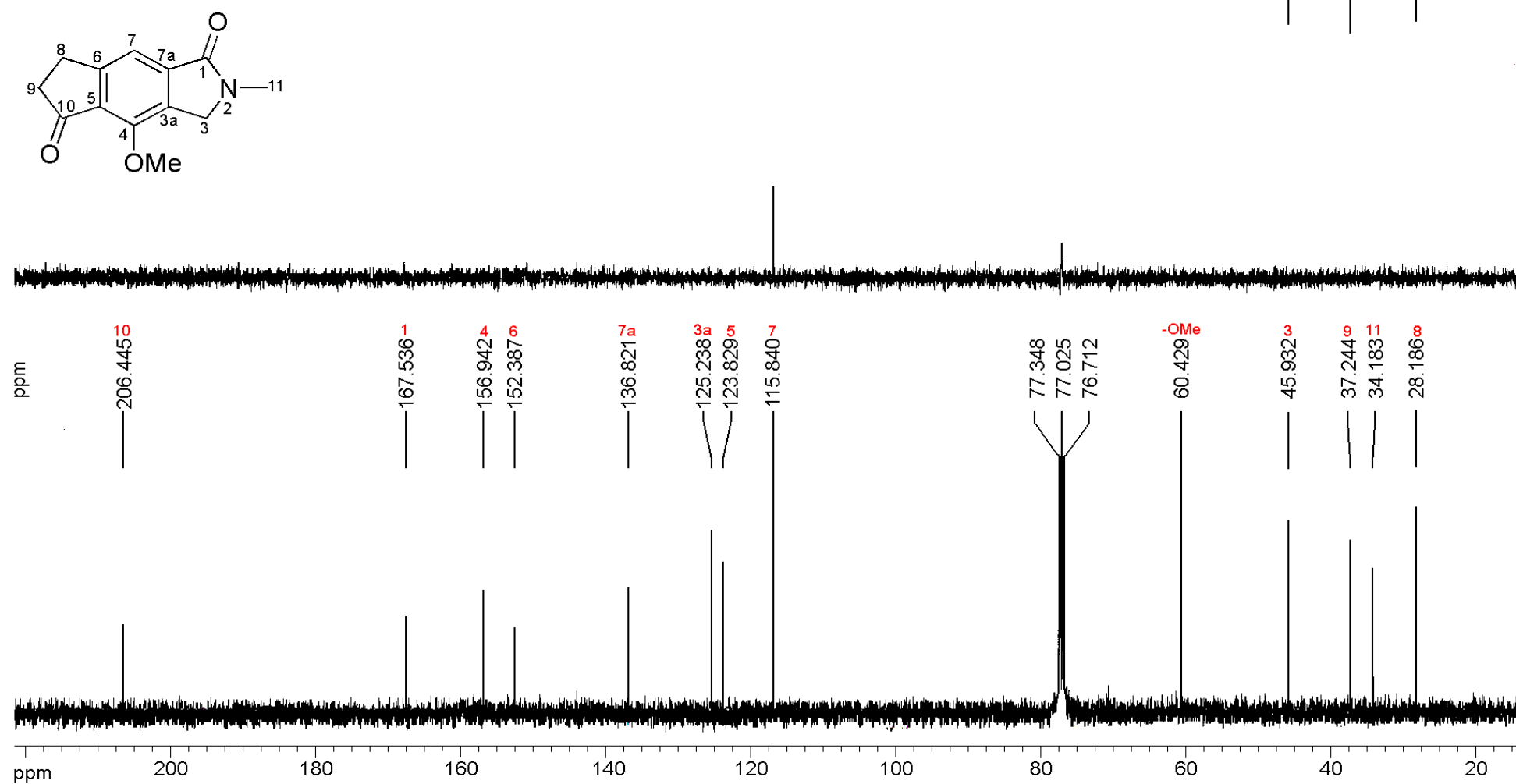


Figure S8. ¹³C and DEPT NMR spectrum tobindole B (2)

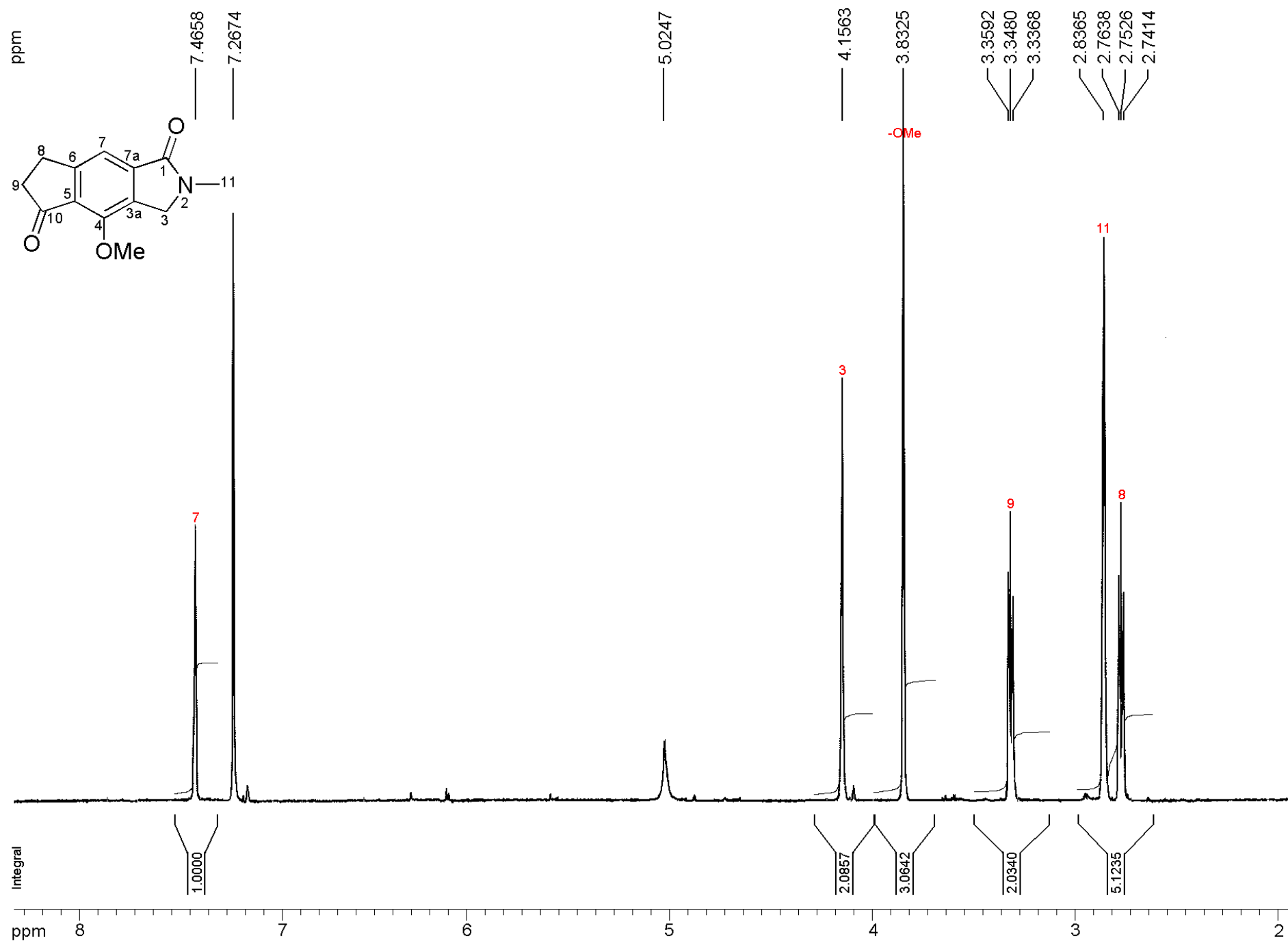


Figure S9. ^1H NMR spectrum of tobindole B (2)

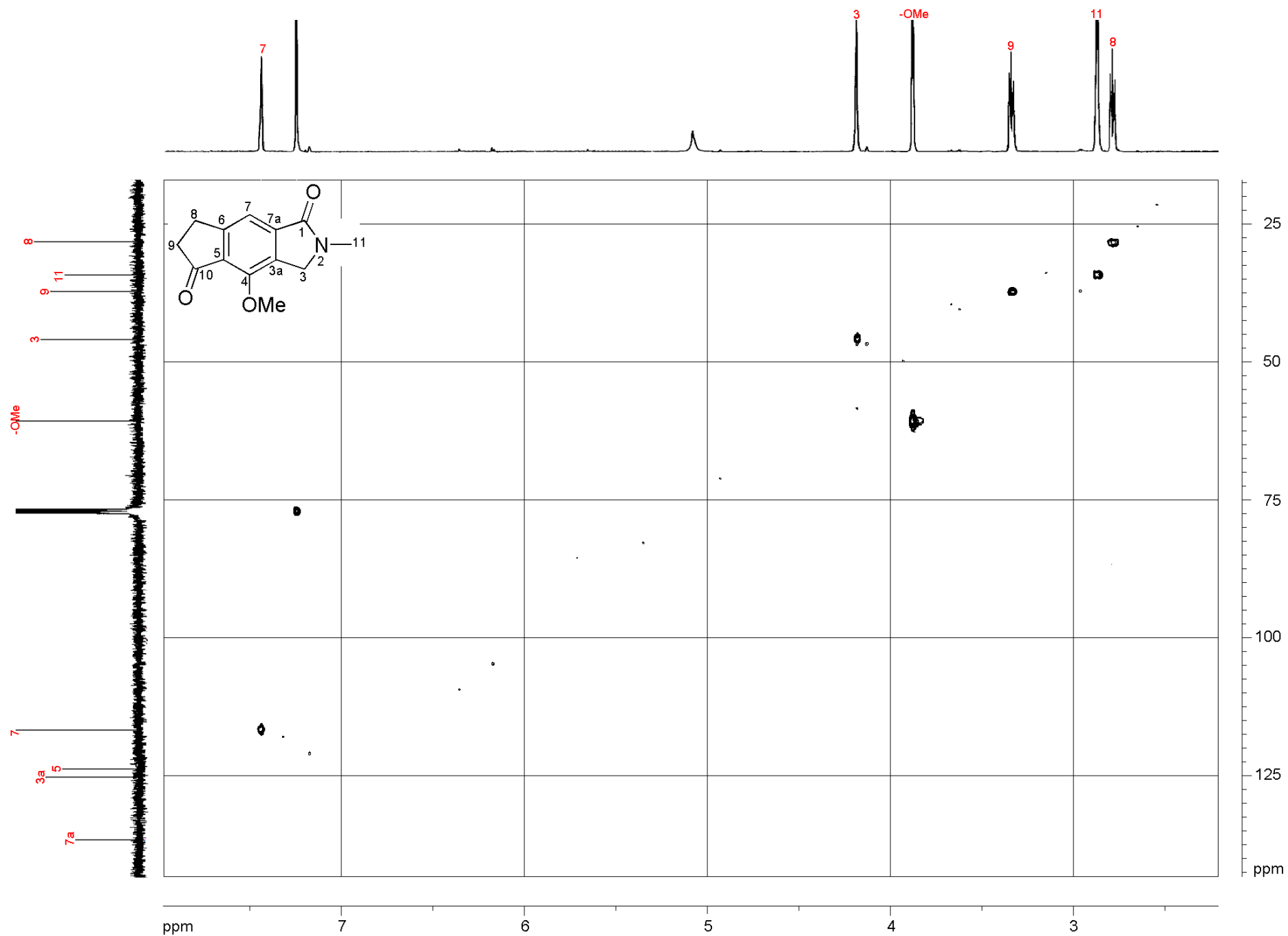


Figure S10. HSQC NMR spectrum of tobindole B (2)

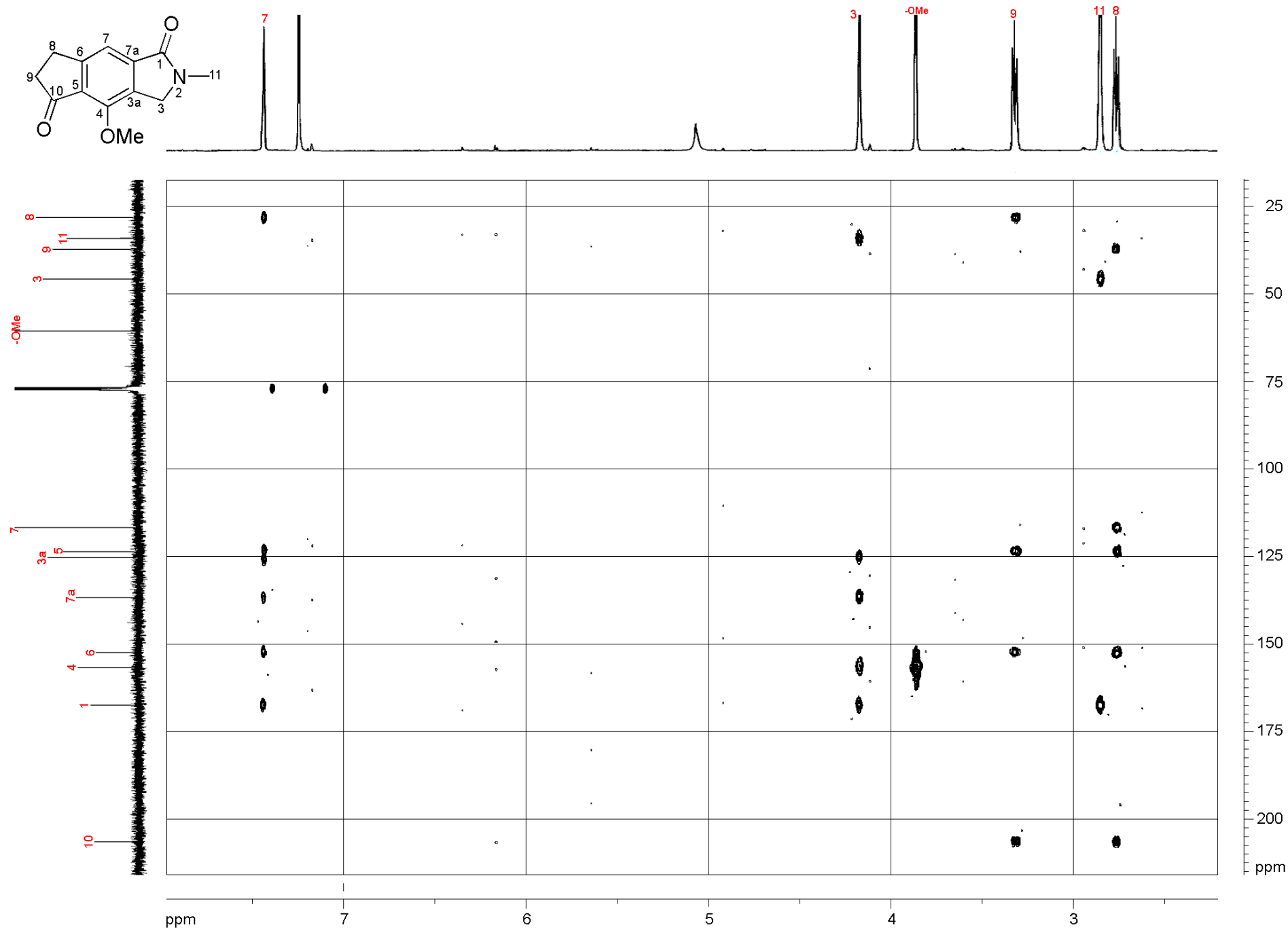


Figure S11. HMBC NMR spectrum of tobindole B (2)

Acq. Date: Wednesday, June 09, 2021
Sample Name: 21-06-09 ESIA S-ygy-03

Acq. Time: 10:32
Sample Comment:

Scan Mode: Zero Width

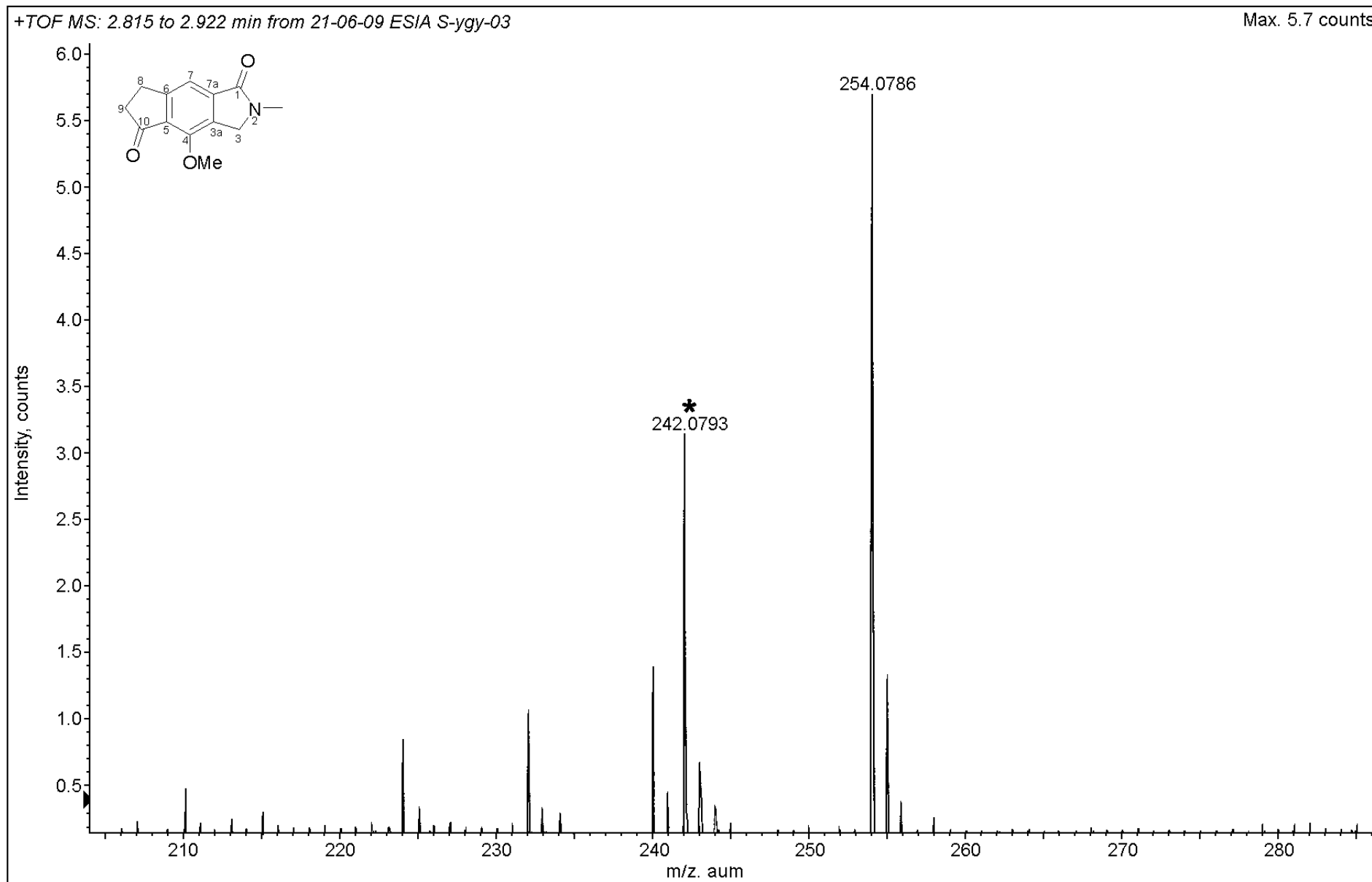


Figure S12. HRMS spectrum of tobindole B (2)

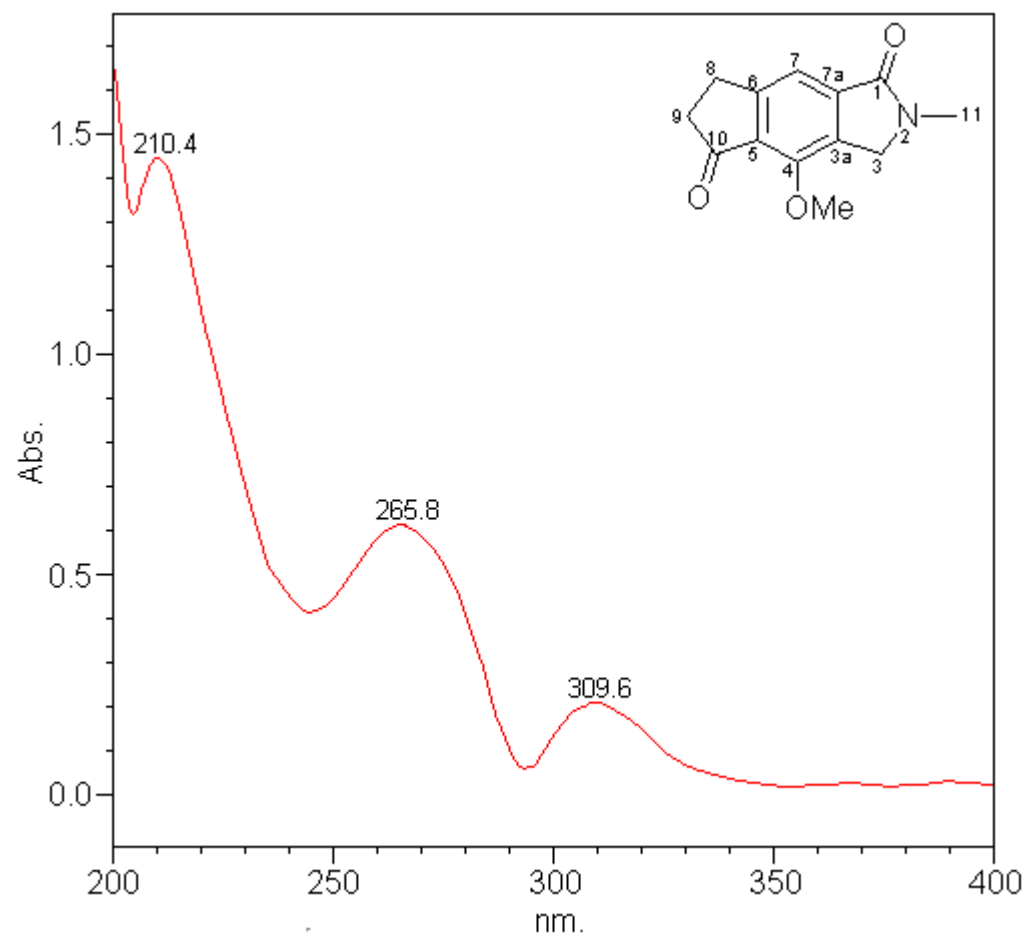


Figure S13. UV spectrum of tobindole B (2)

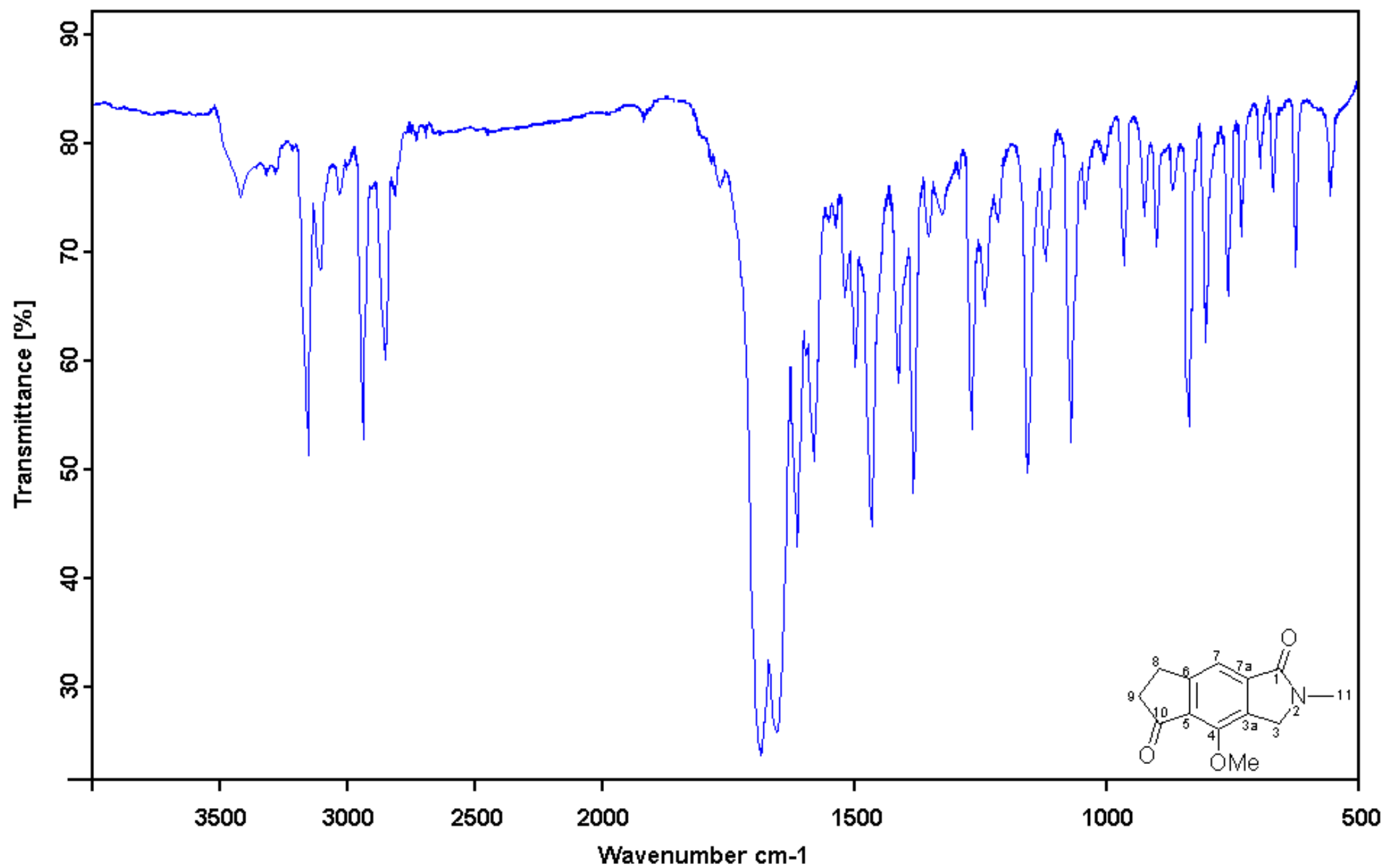


Figure S14. IR spectrum of tobindole B (2)

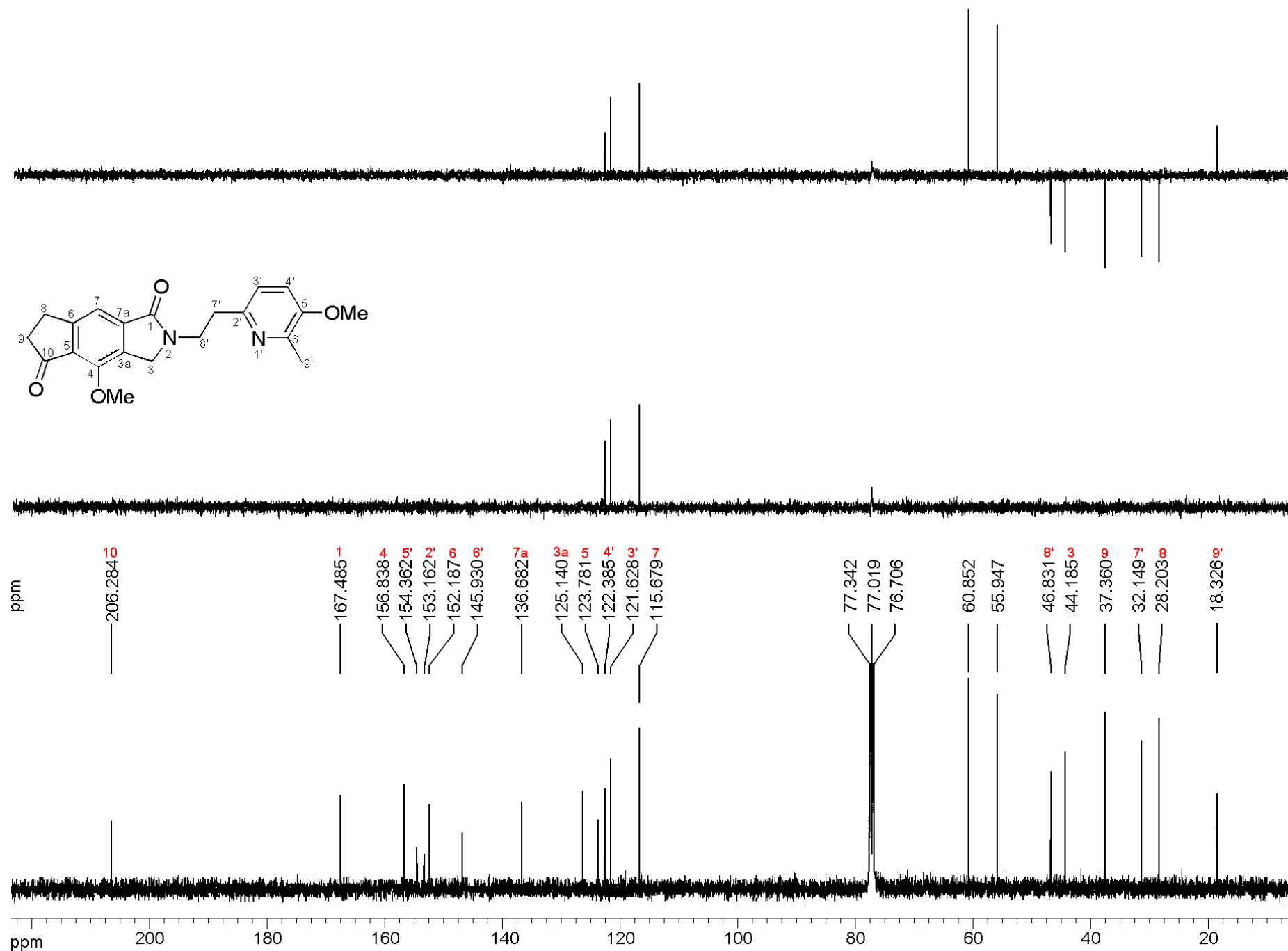


Figure S15. ^{13}C and DEPT NMR spectrum tobindole C (3)

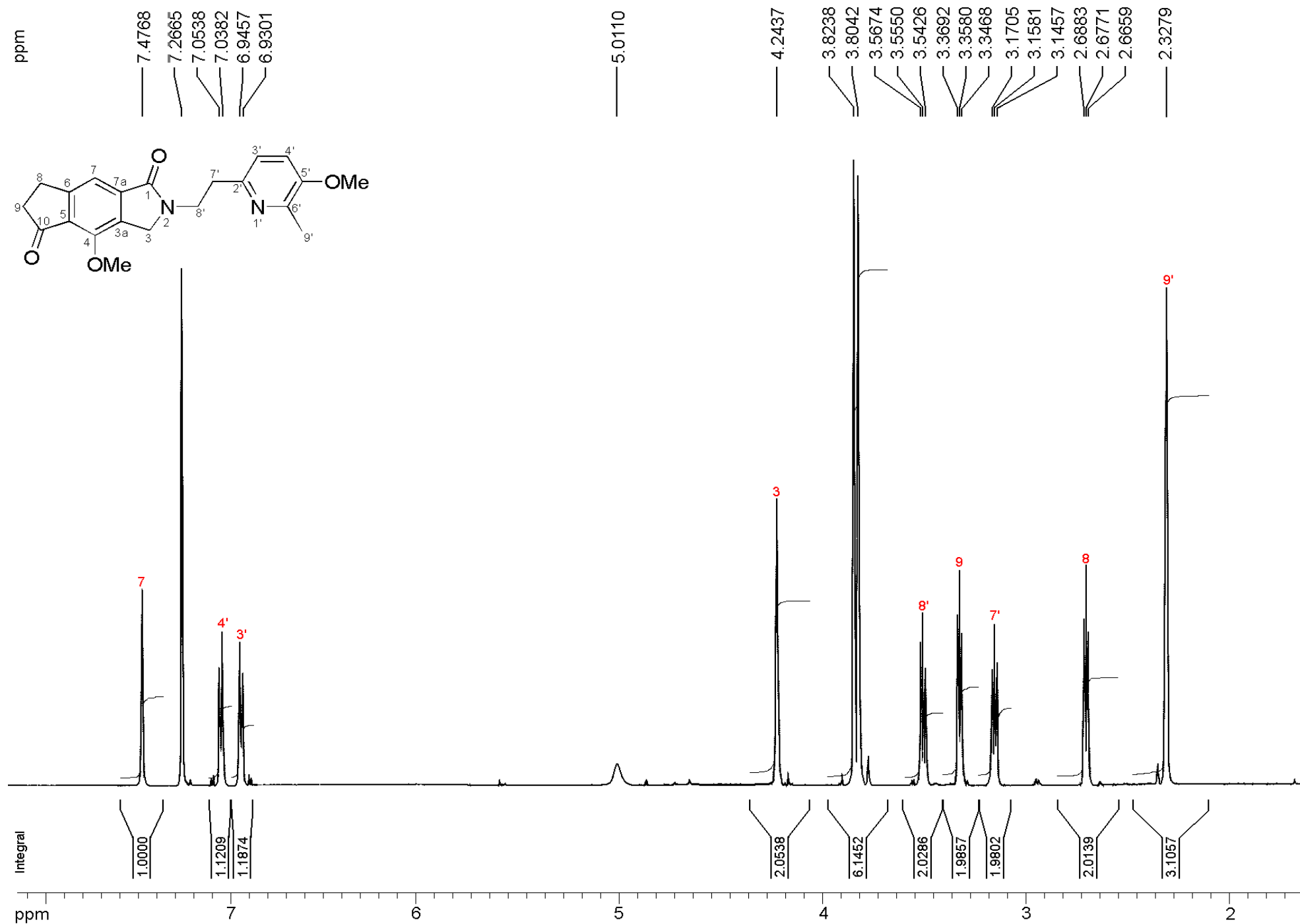


Figure S16. ^1H NMR spectrum of tobindole C (3)

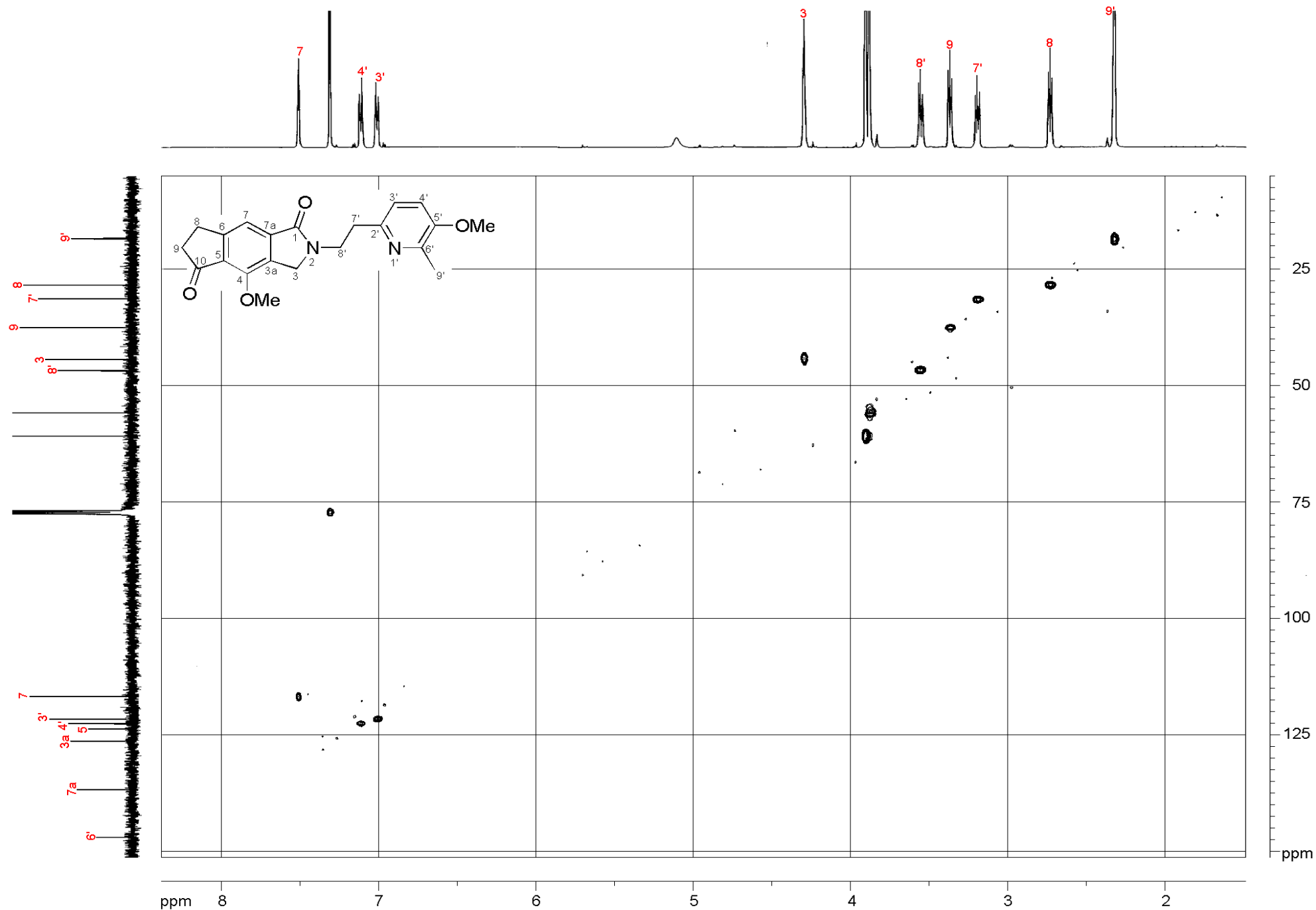


Figure S17. HSQC NMR spectrum of tobindole C (3)

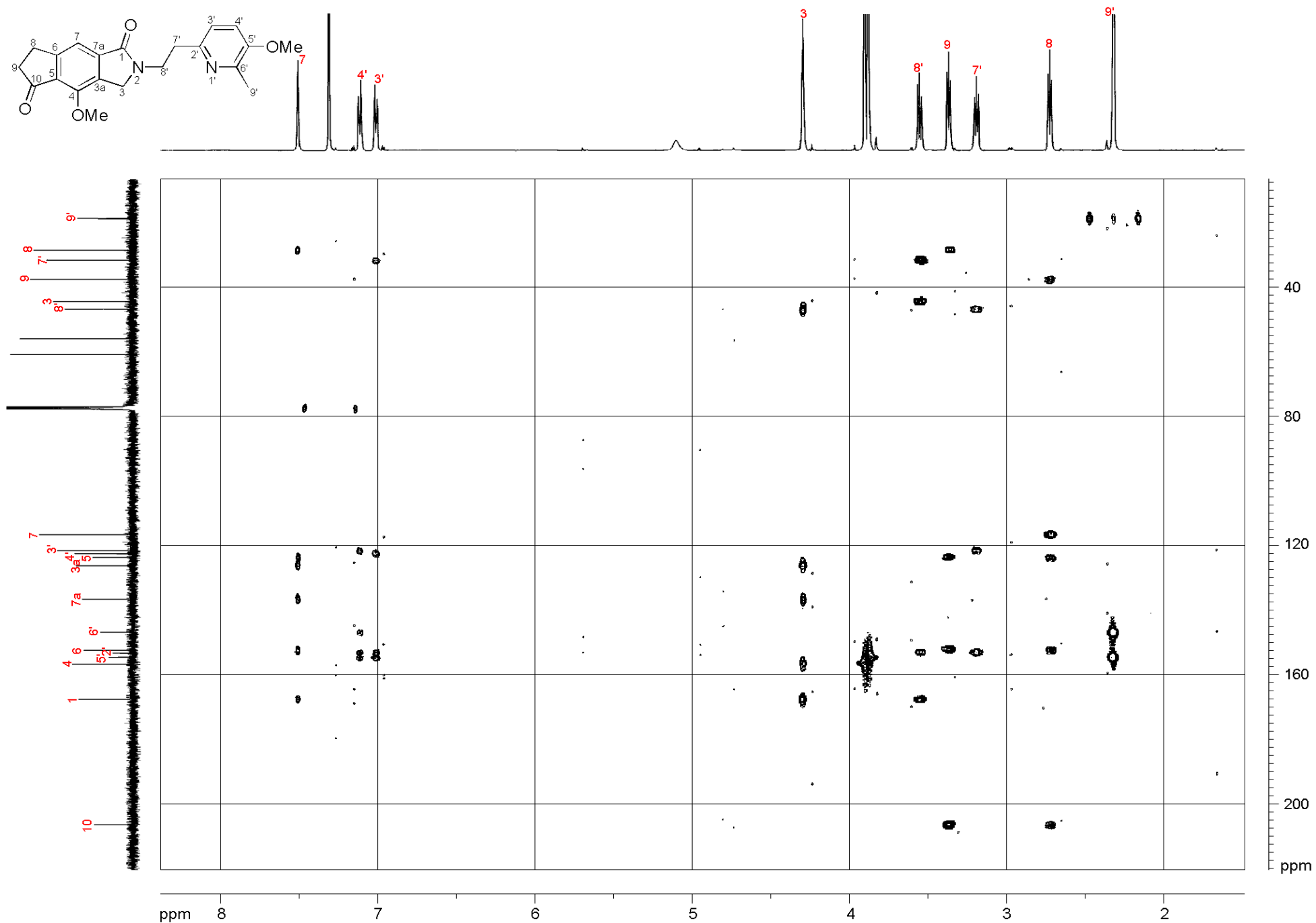
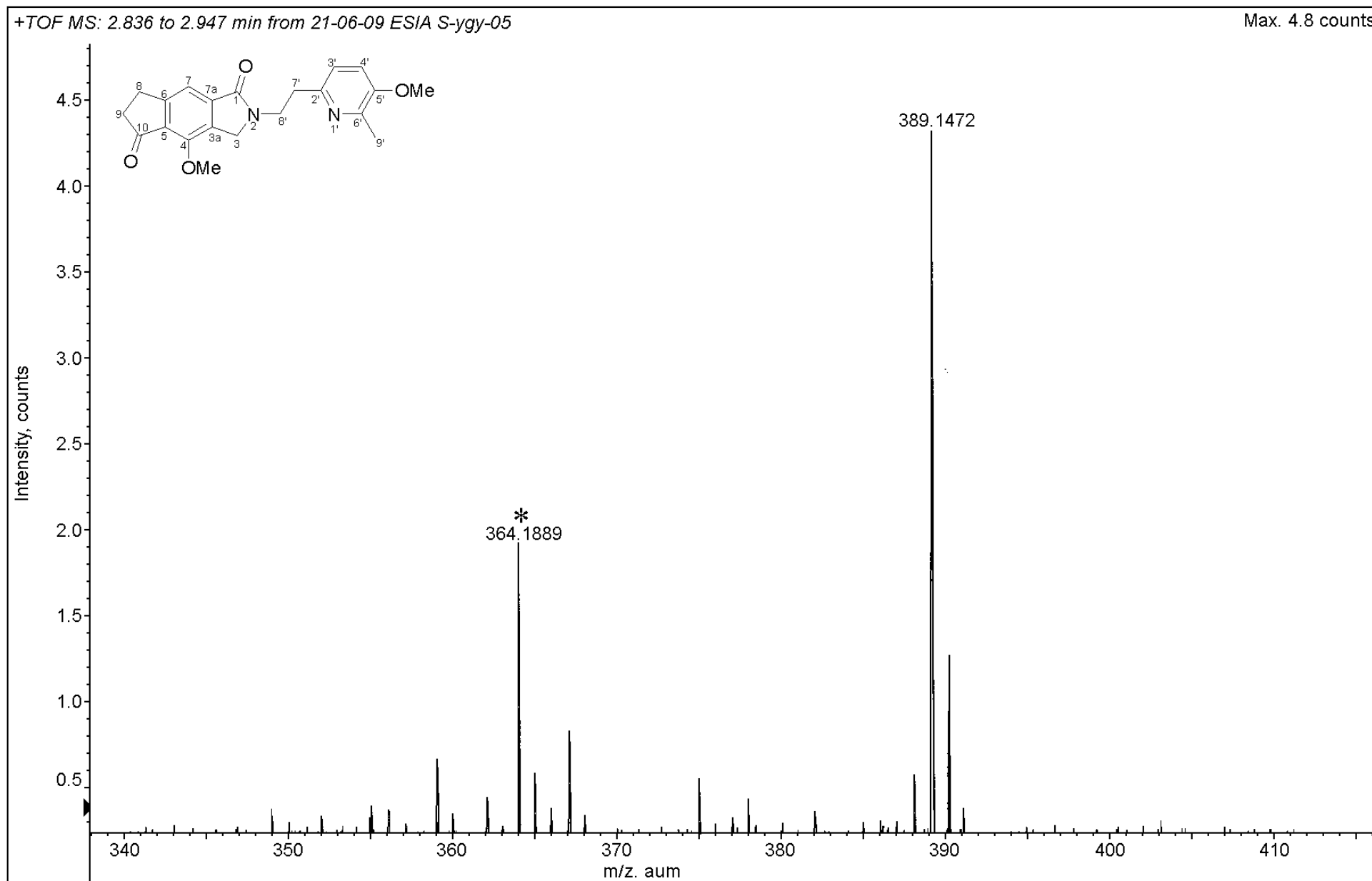


Figure S18. HMBC NMR spectrum of tobindole C (3)

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Sample Name: 21-06-09 ESIA S-ygy-05

Acq. Time: 10:38
Sample Comment:

Scan Mode: Zero Width



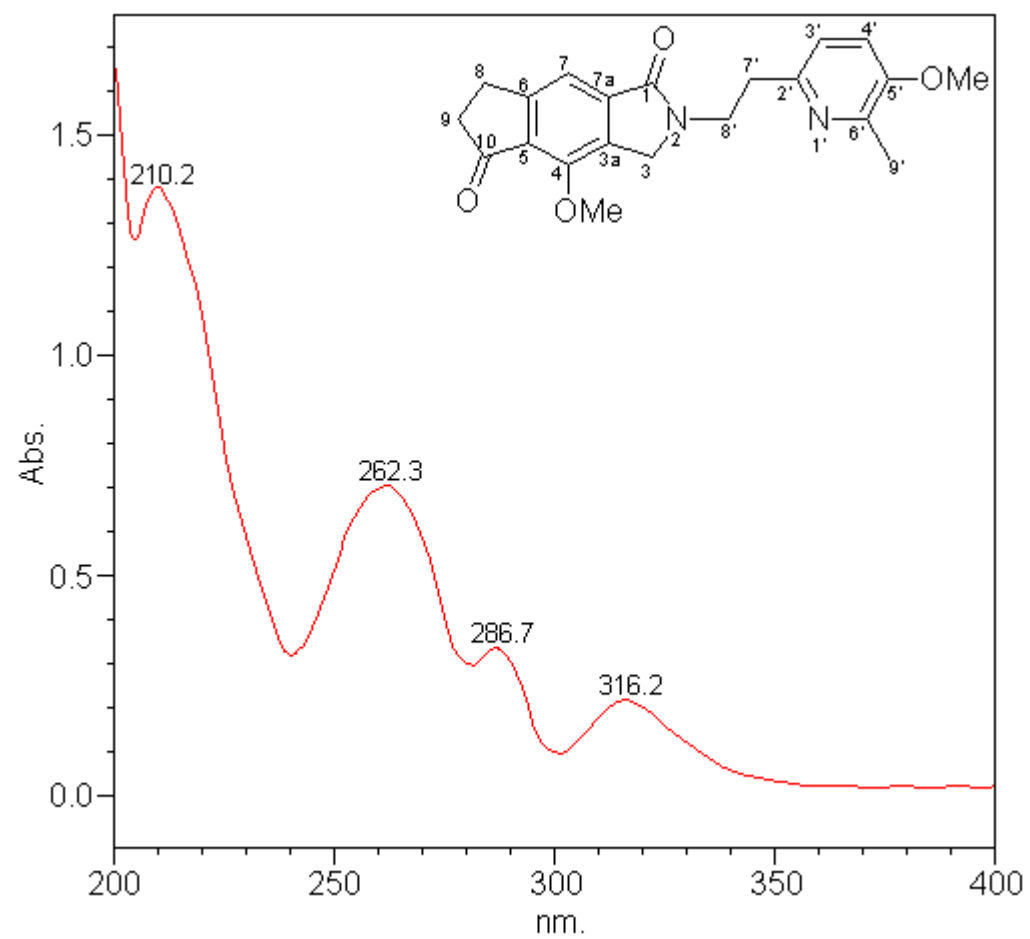


Figure S20. UV spectrum of tobindole C (3)

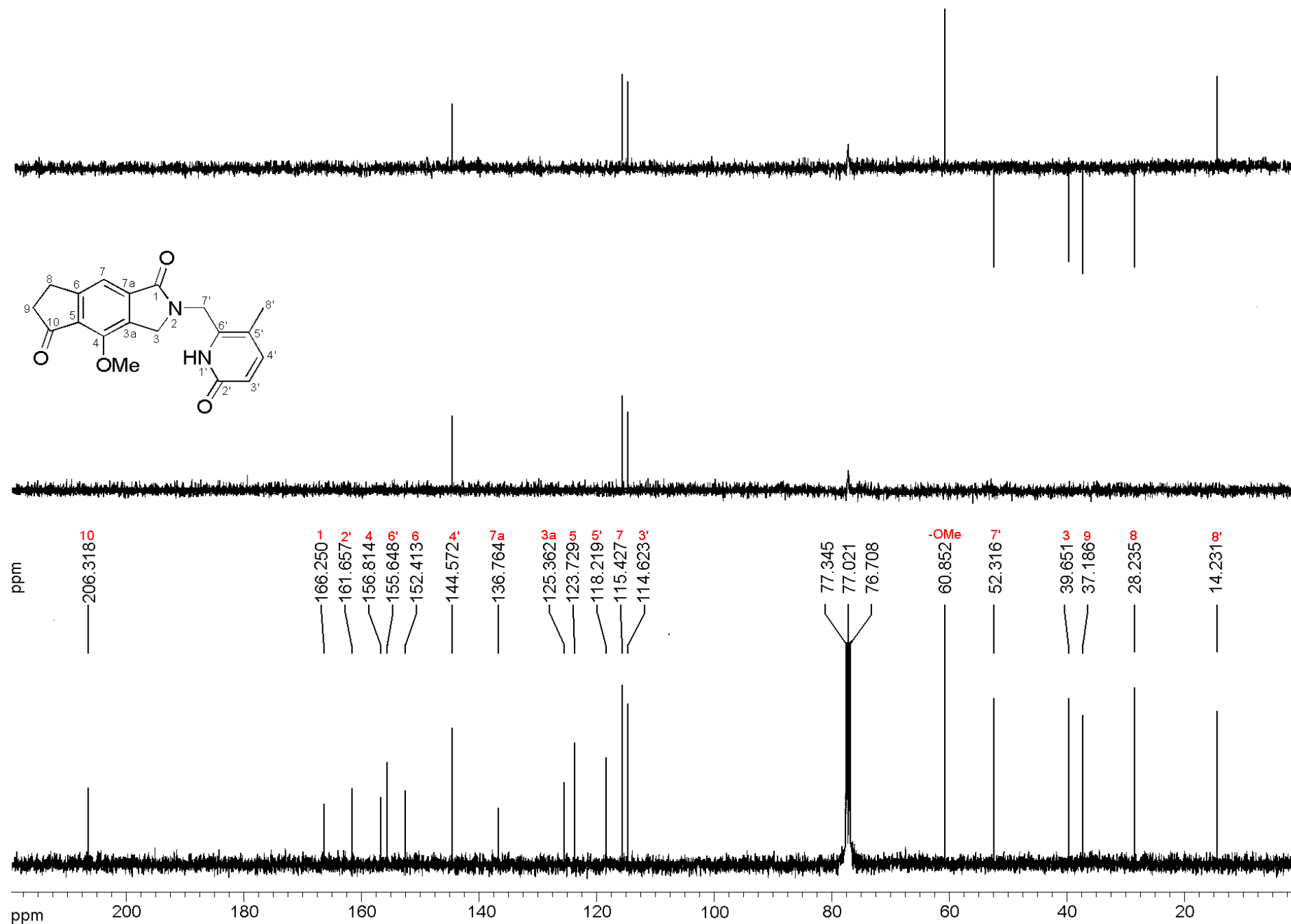


Figure S22. ^{13}C and DEPT NMR spectrum tobindole D (4)

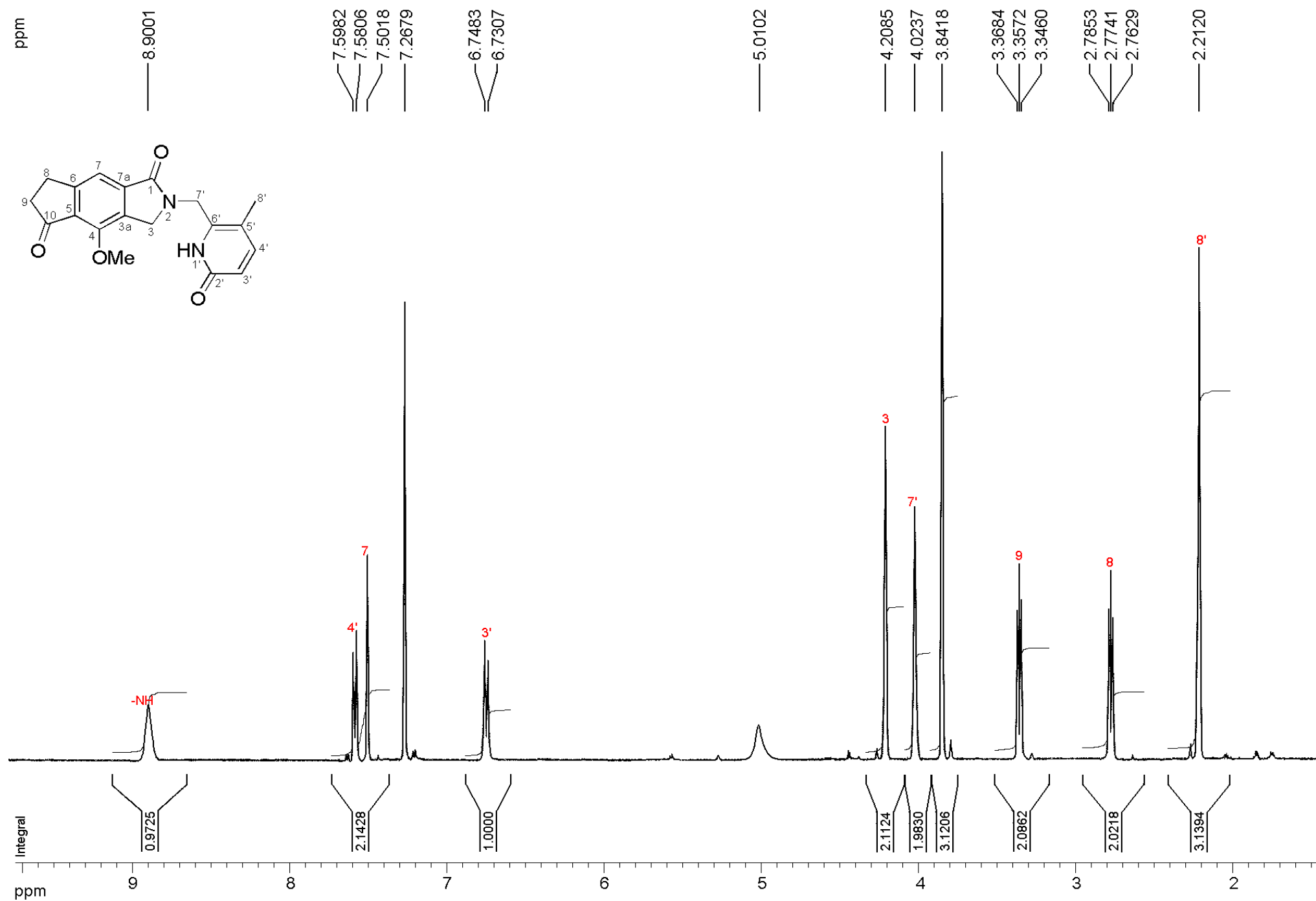


Figure S23. ¹H NMR spectrum of tobindole D (4)

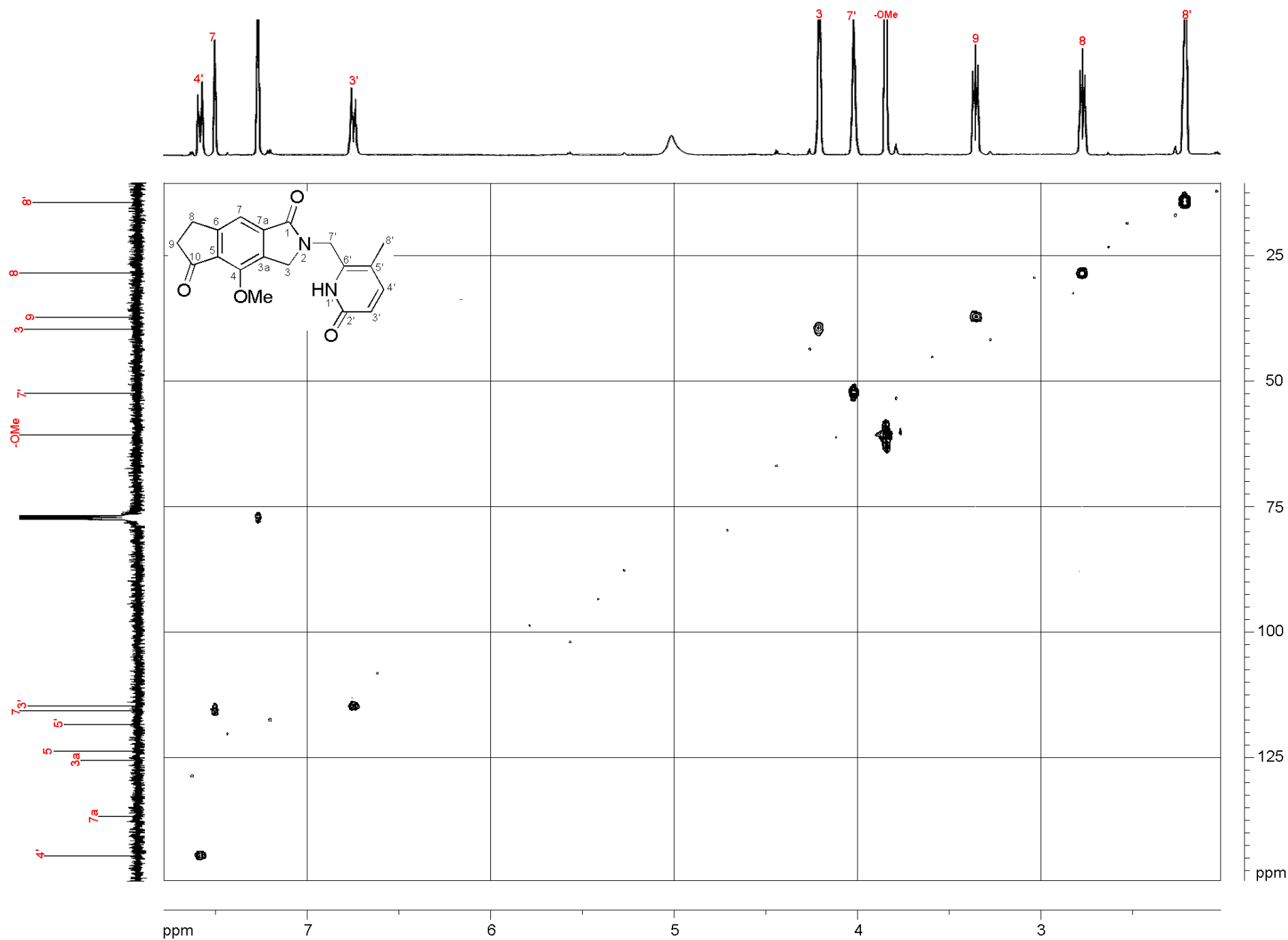


Figure S24. HSQC NMR spectrum of tobindole D (4)

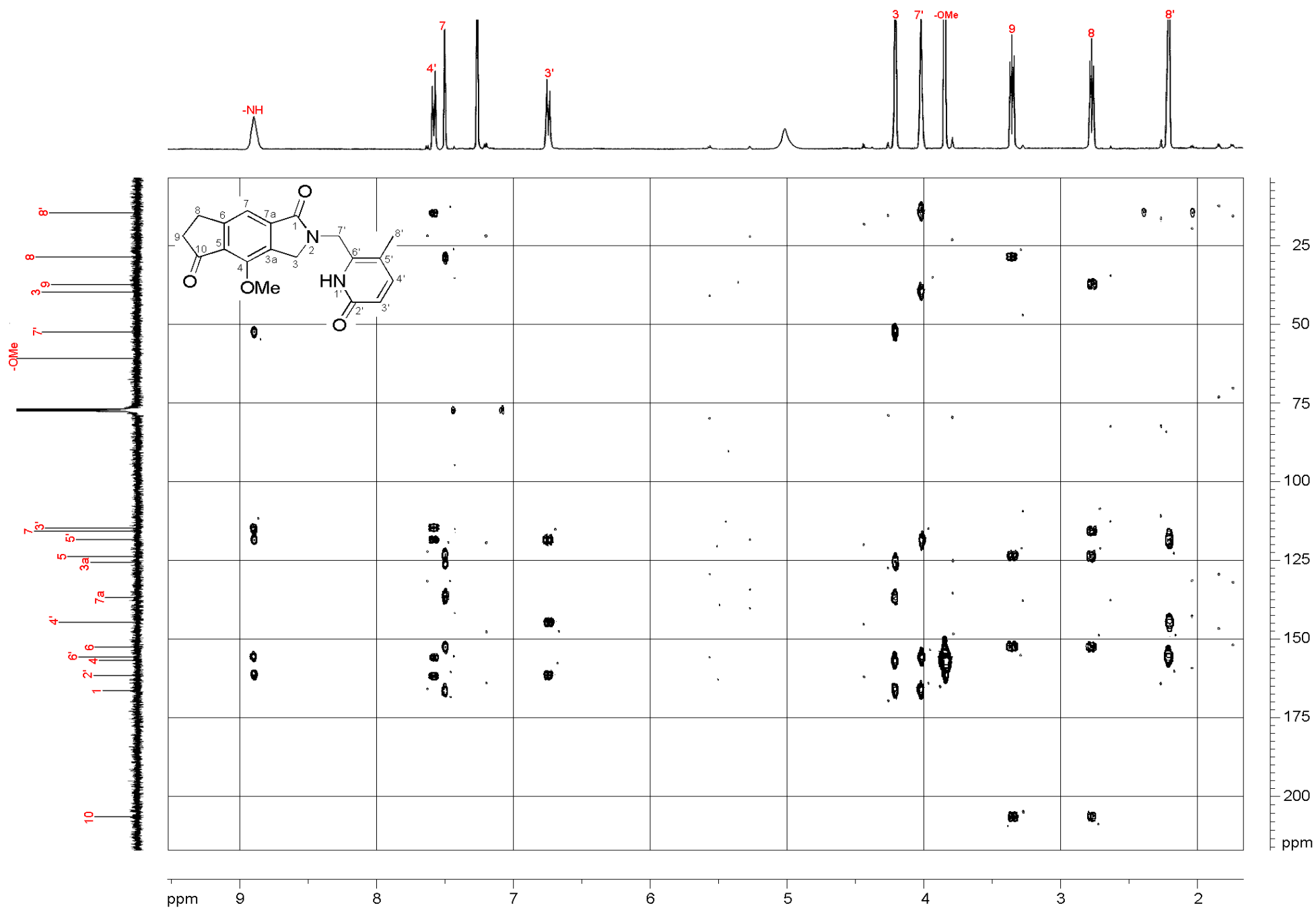


Figure S25. HMBC NMR spectrum of tobindole D (4)

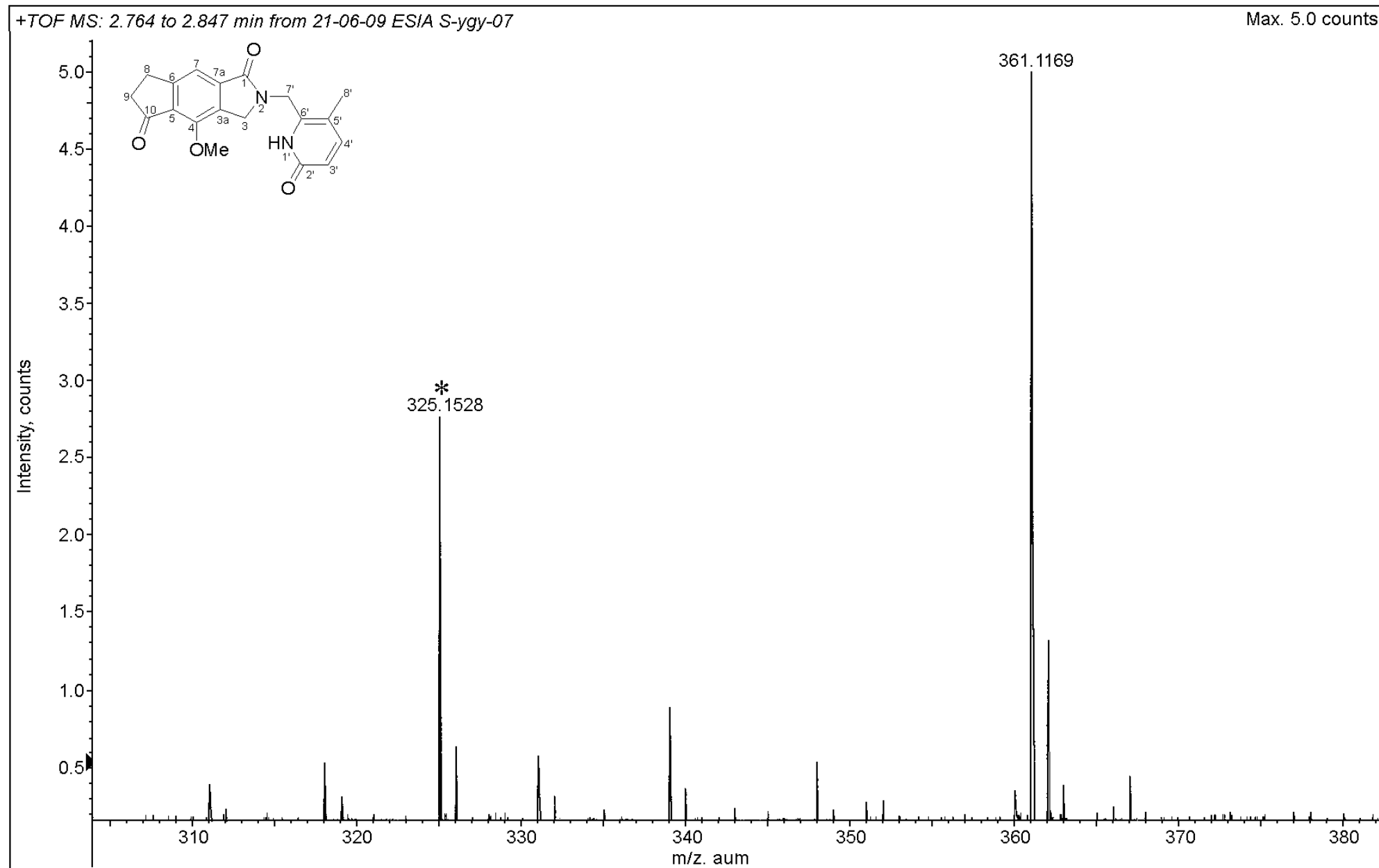


Figure S26. HRMS spectrum of tobindole D (4)

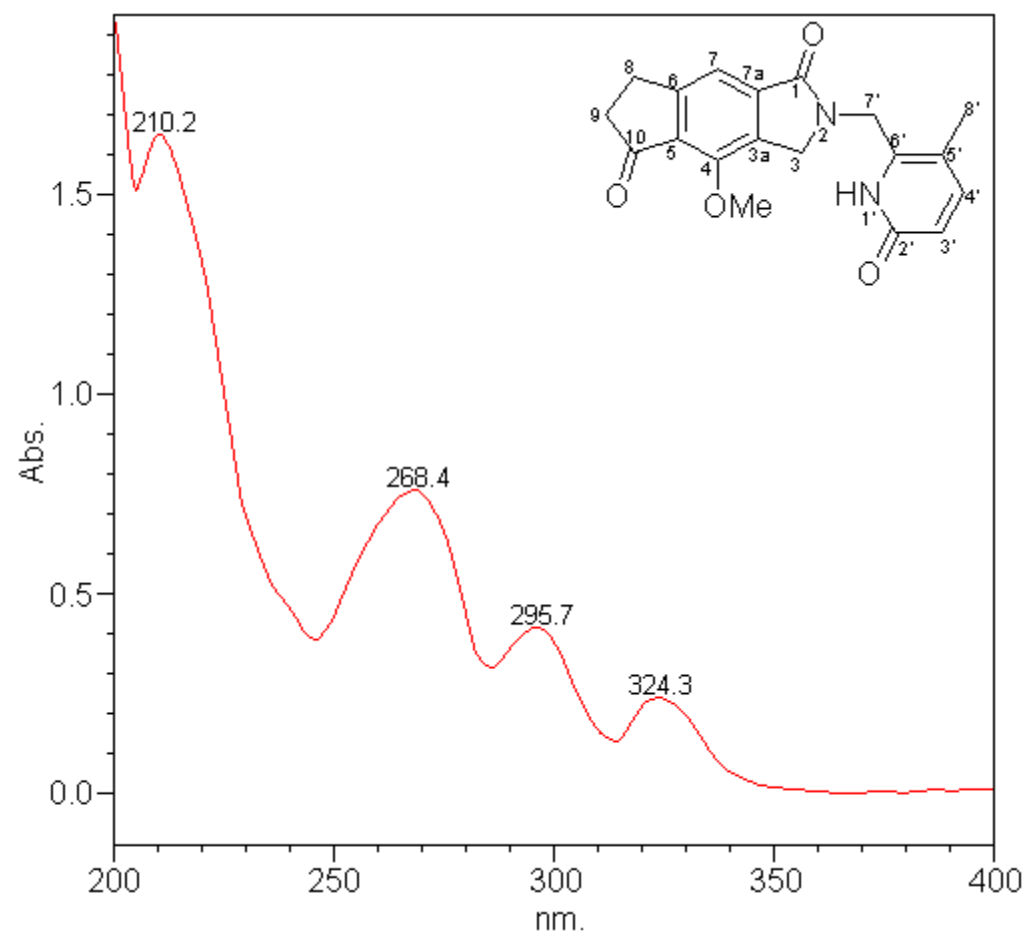


Figure S27. UV spectrum of tobindole D (4)

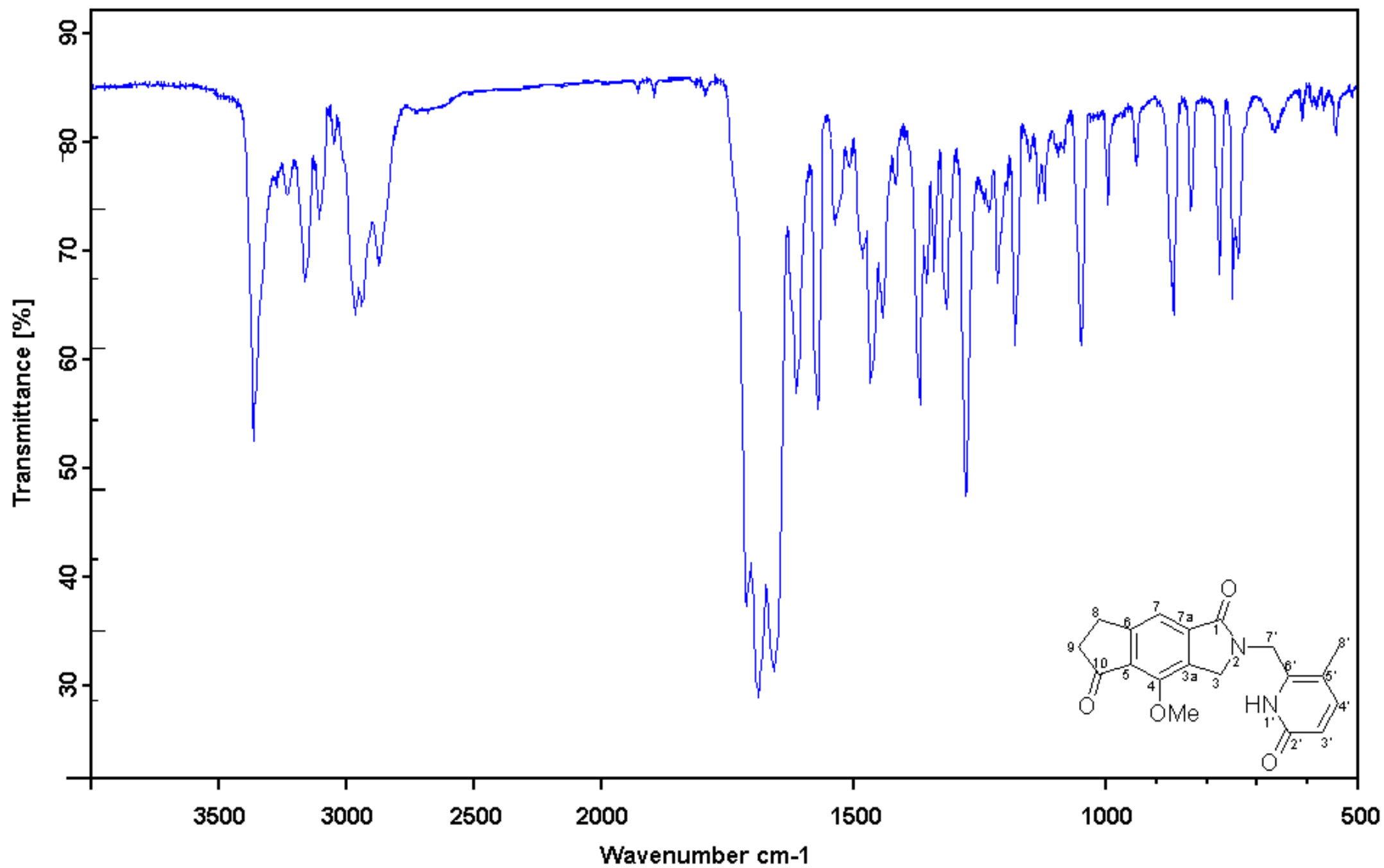


Figure S28. IR spectrum of tobindole D (4)

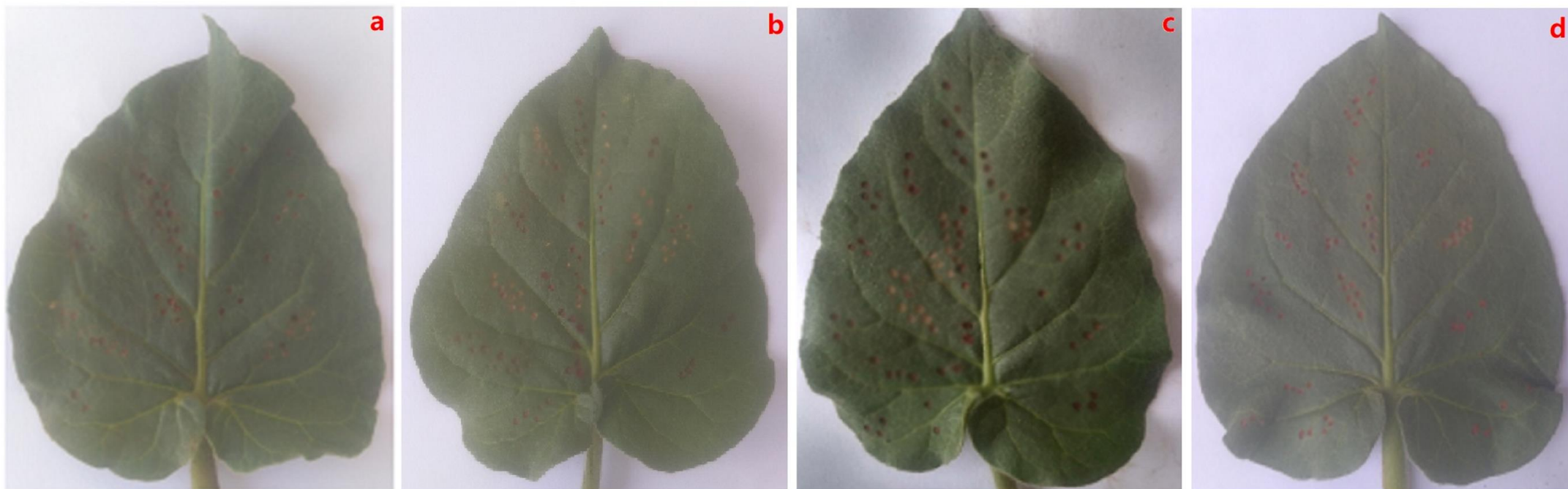
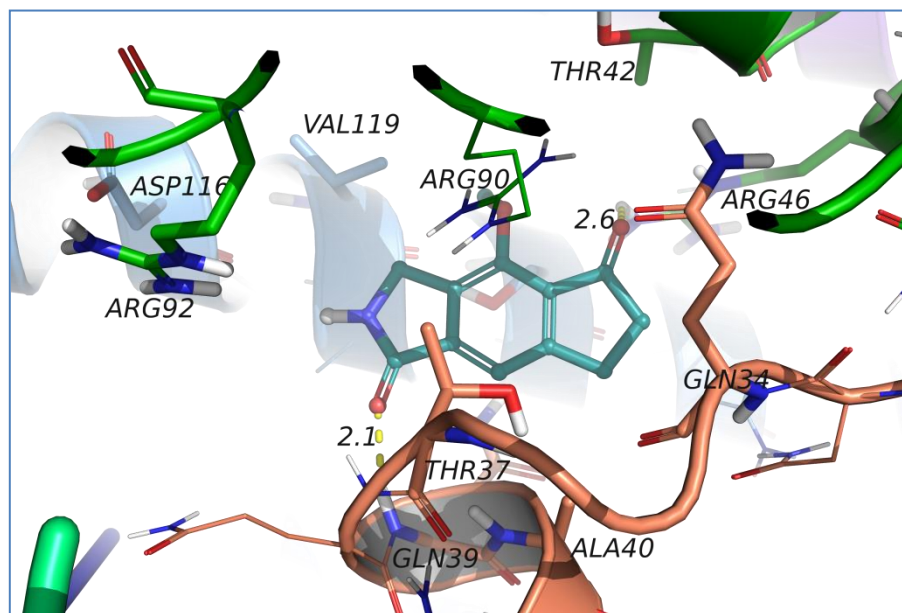


Figure S29. The antiviral inhibition rates tested by half-leaf method for ningnanmycin, compounds **1**, **3**, and **4**

[**a.** ningnanmycin (control); **b.** tobindole A (**1**); **c.** tobindole C (**3**); **d.** tobindole D (**4**)]

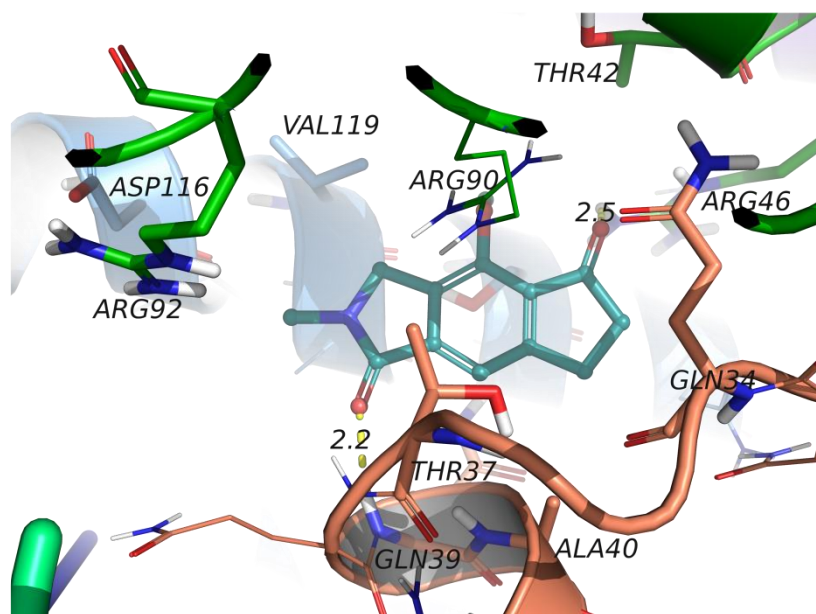


Figure S30. The protective effects of compounds **3** and **4** on TMV
(**a.** control; **b.** pretreating the *N. glutinosa* with **3**; **c.** pretreating the *N. glutinosa* with **4**.)



- ❑ H-bond with Gln39 and Arg46
- ❑ The –NH of lactam may form water bridge with Arg92.
- ❑ The red circle has space not occupied by small molecules, and this region is highly polarized, so water will occupy the pocket, and thus the water bridge

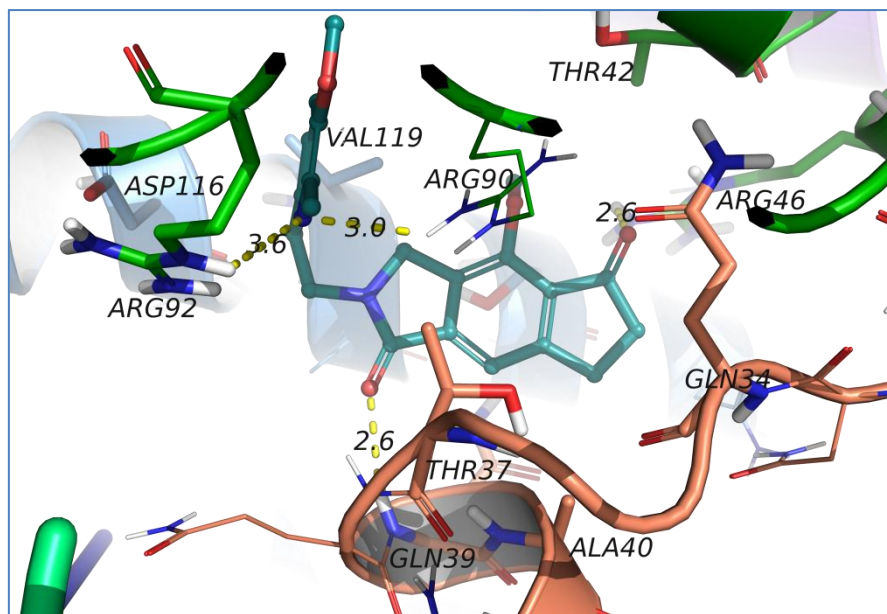
Figure S31. Interactions of compound **1** and TMV-helicase.



- H-bond with Arg92 and Arg46
- Lost water bridge with Arg92, so potency drops.
- N-methyl only form Hydrophobic interactions with protein, will replace waters, so lost water bridge interaction, potency drops.

Figure S32. Interactions of compound 2 and TMV-helicase.

□



- H-bond with Gln39, Arg92, Arg90 and Arg46
- The N of pyridine group could form H-bond with Arg46 and Arg90, so potency improve.

Figure S33. Interactions of compound **3** and TMV-helicase.

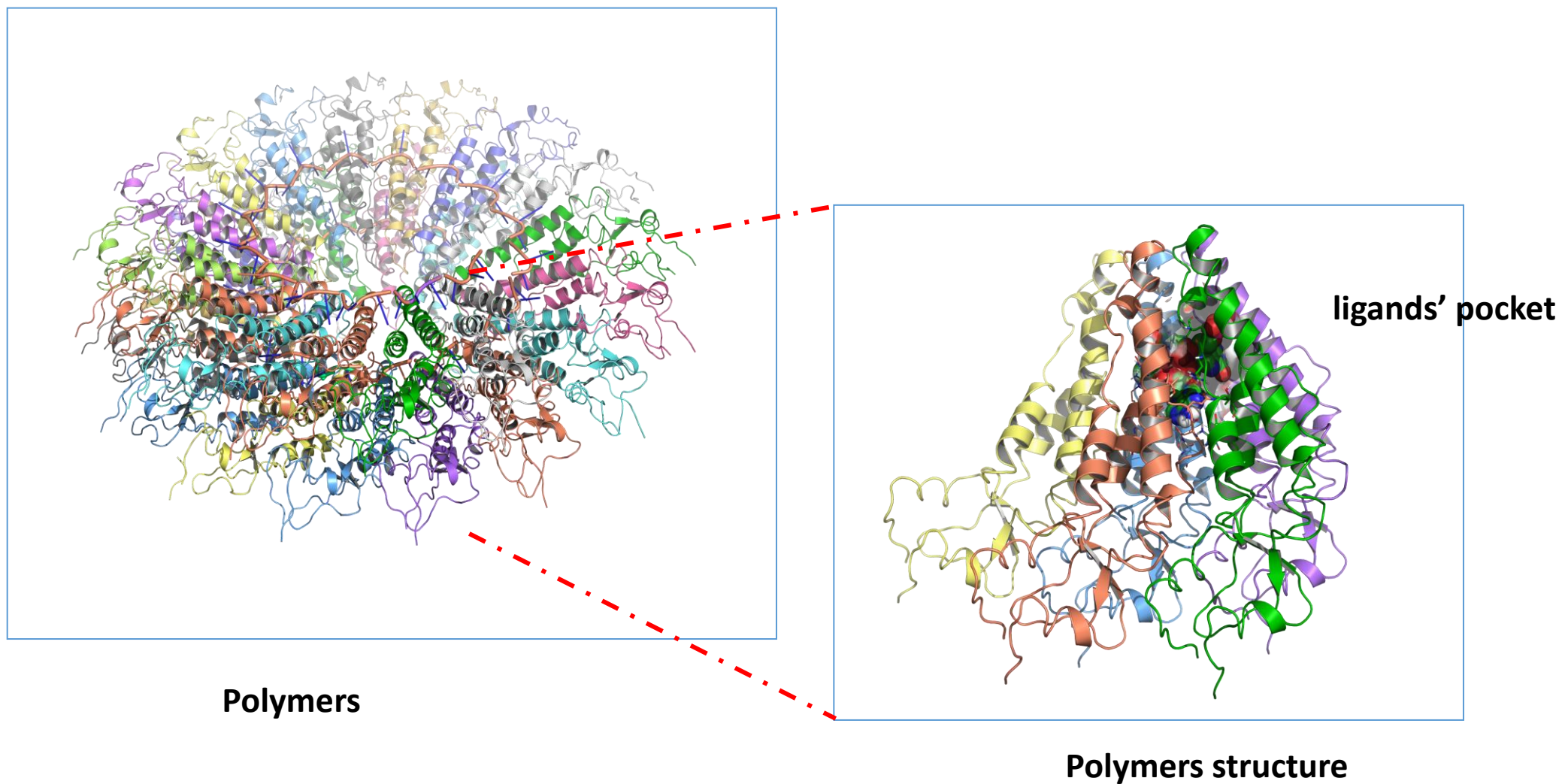


Figure S34. Polymers and ligands' pocket of TMV-helicase.