Supplementary Material

Bioactive Brominated Oxindole Alkaloids from the Red Sea Sponge *Callyspongia siphonella*

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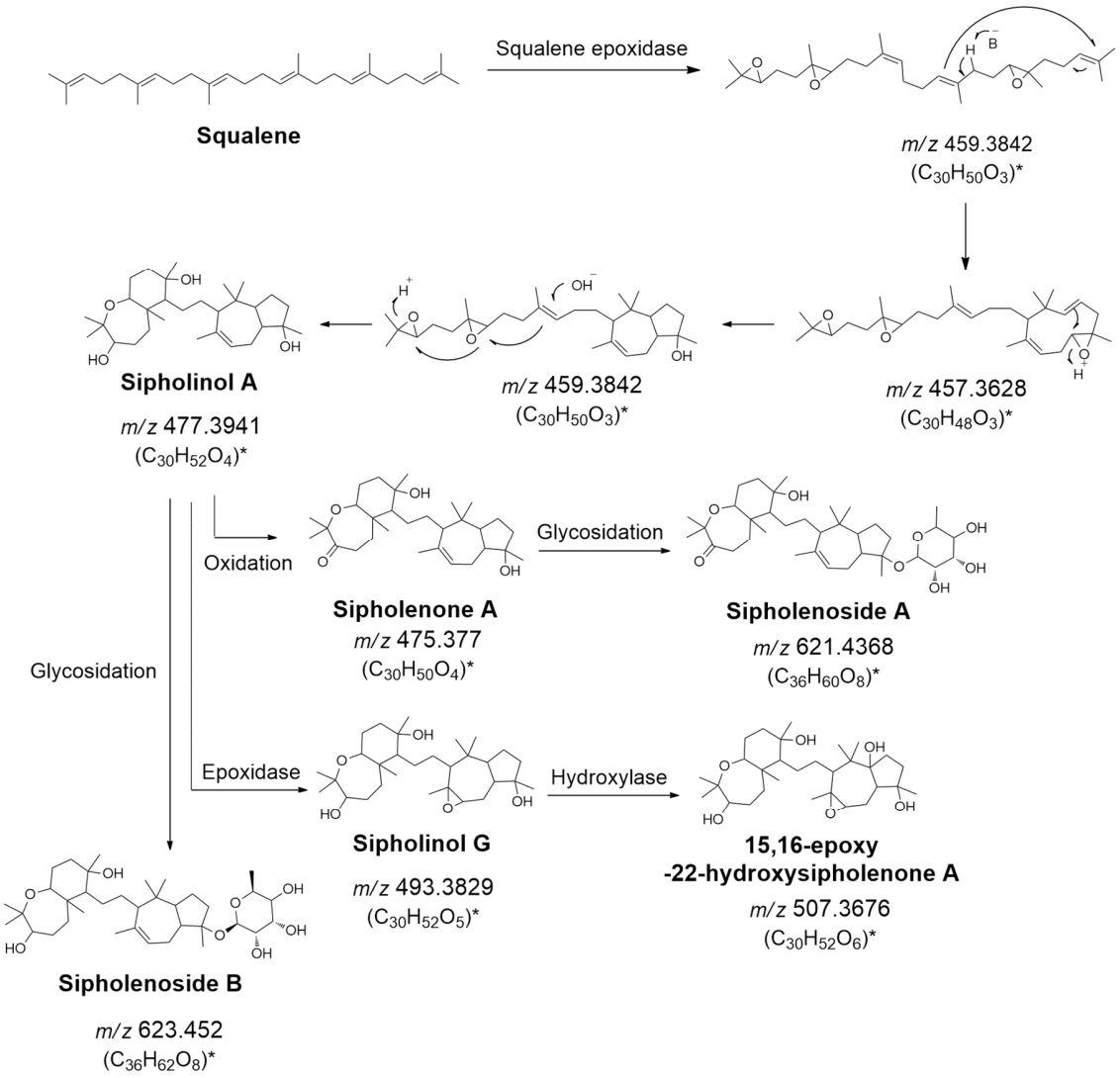
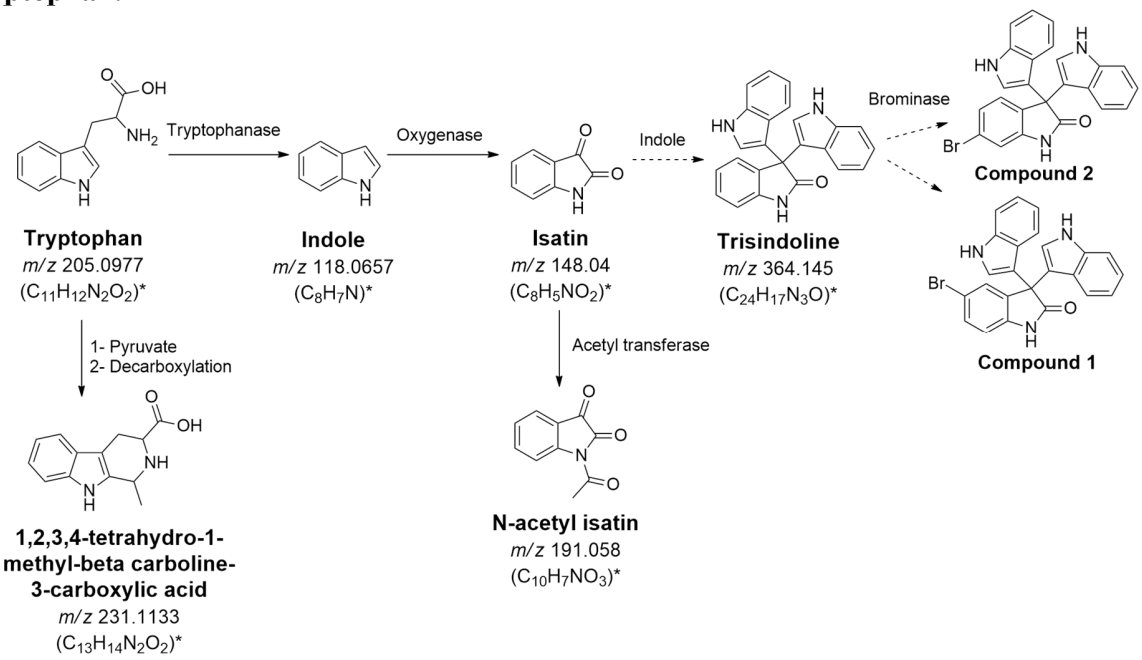
Scheme S1. Proposed biogenesis of sipholane triterpenes in *C. siphonella* originating from squalane.



* indicate metabolites identified in the organic extracts of *C. siphonella*.

Scheme S2. Proposed biogenesis of indole alkaloids in *C. siphonella* originating from tryptophan.



* indicate metabolites identified in the organic extracts of *C. siphonella*.

Arrows with solid line indicate pathway confirmed by enzyme assays (Found in the Kyoto Encyclopedia of Genes and Genomes (KEGG), arrows with dashed line indicate pathway proposed based on previous literatures.

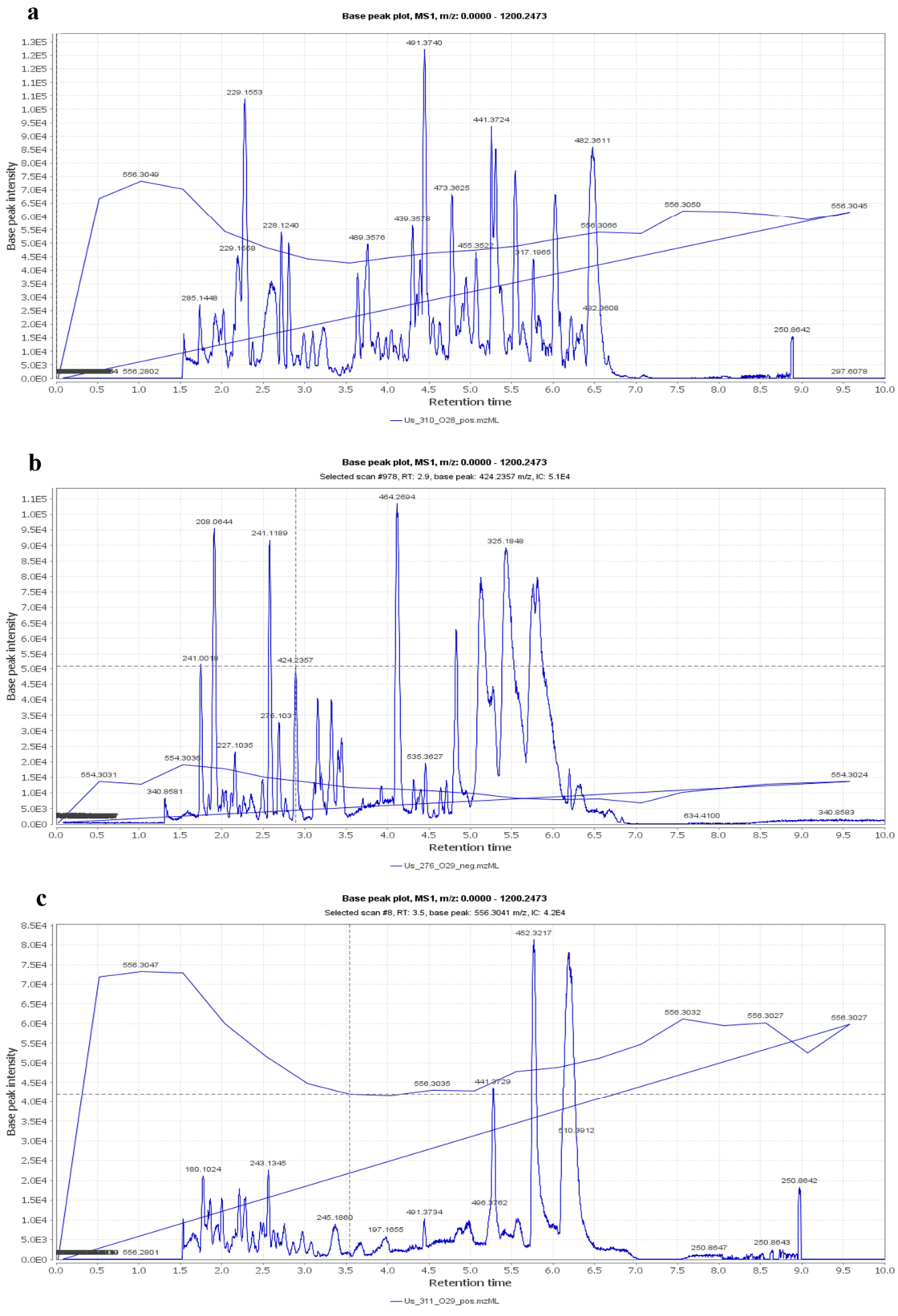


Fig.S1. Base peak chromatograms of the crude ethanol extract (a), ethyl acetate fraction (b), and *n*-hexane fraction (c).

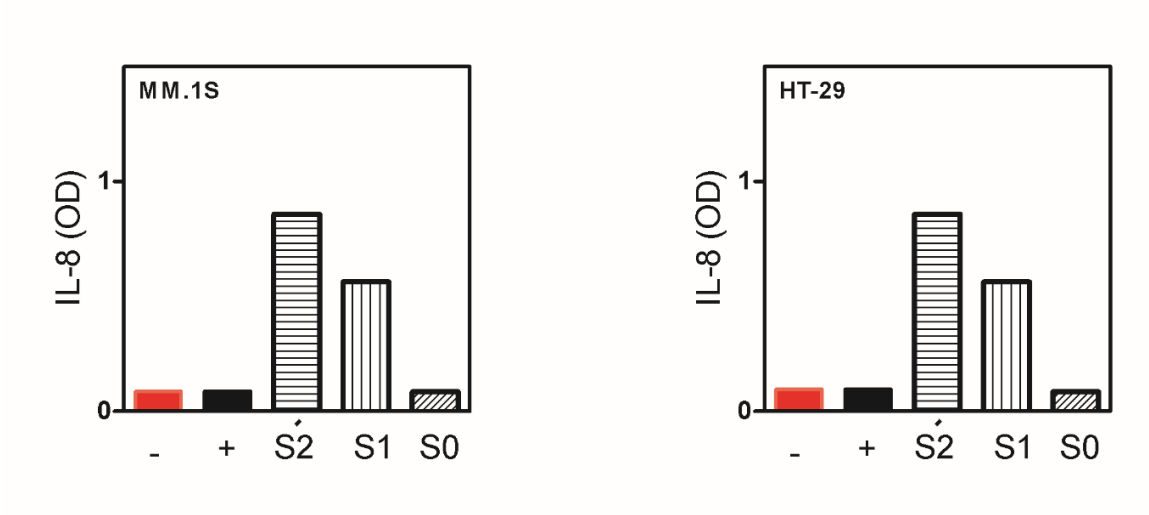


Fig.S2. Compound number **1** was not able to induce IL8 production in MM.1S and HT-29 cell lines. Cells were stimulated in triplicates with compound number 1. Next day, IL8 production was evaluated in the supernatant by ELISA. For control, IL8 standards with different concentrations 0, 1, and 2 ng/ml were used.

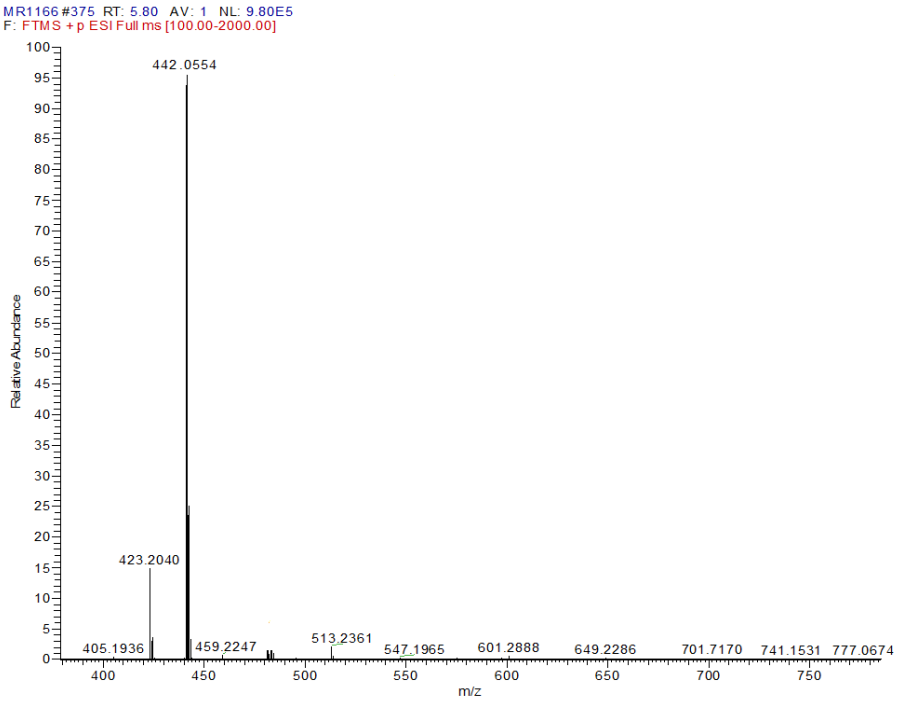


Fig.S3. HRESIMS spectrum of **1**.

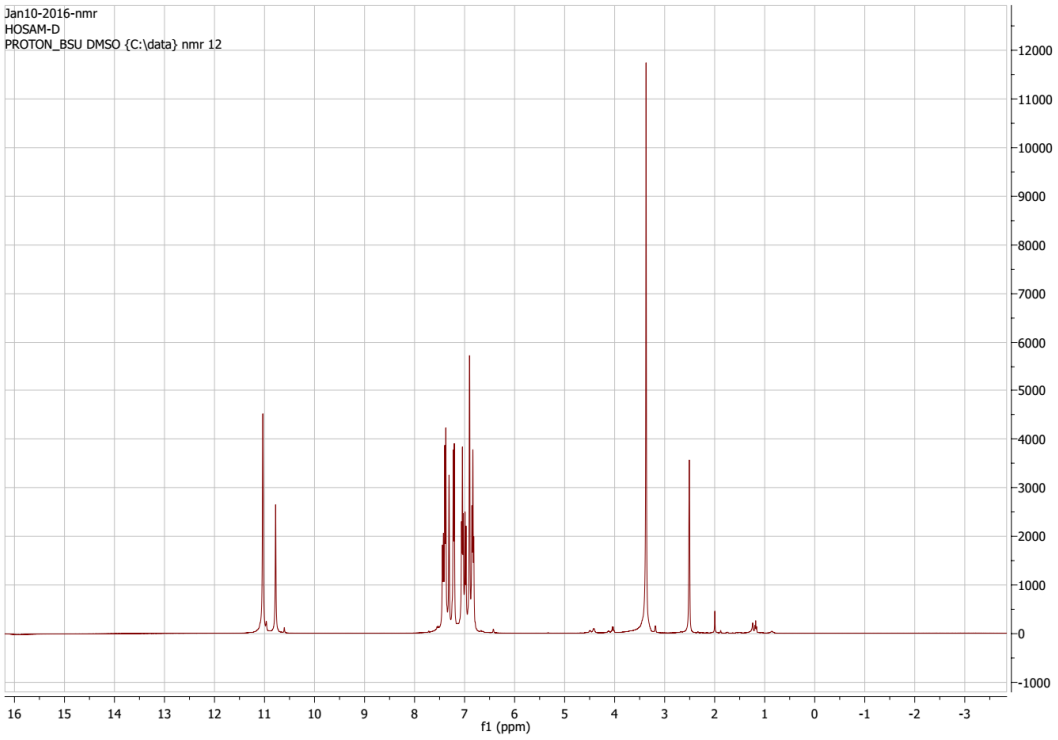


Fig.S4.[1]H NMR spectrum (400 MHz, DMSO-d_6) of compound **1**.

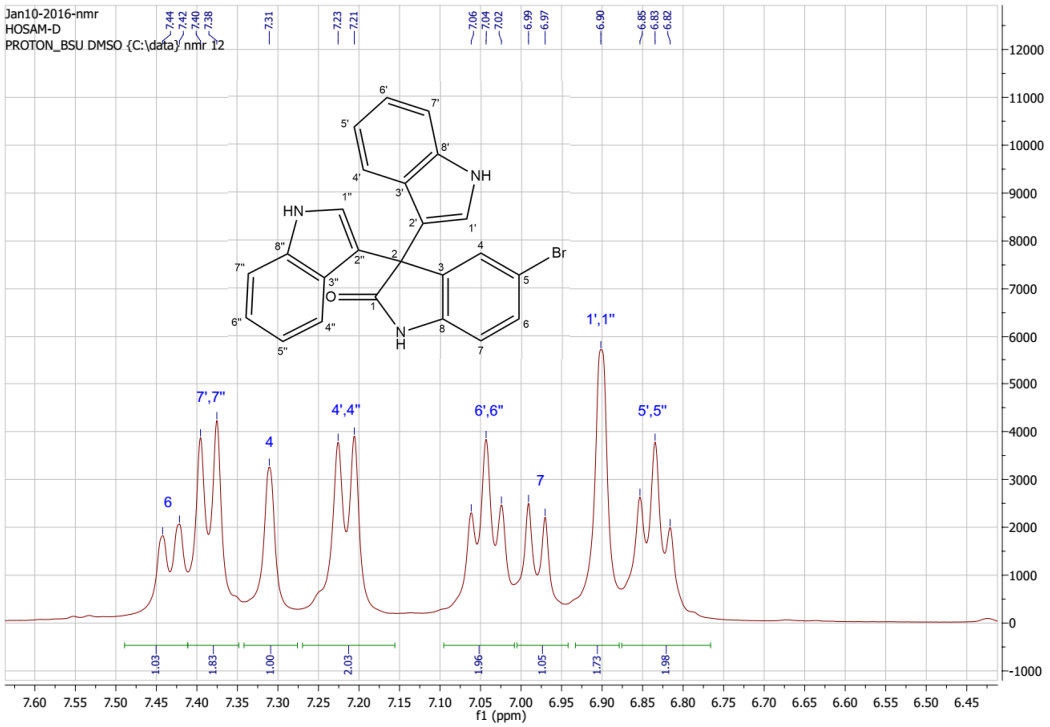


Fig.S5.[1]H NMR (400 MHz, DMSO-d_6)spectrum expansion of compound **1.**

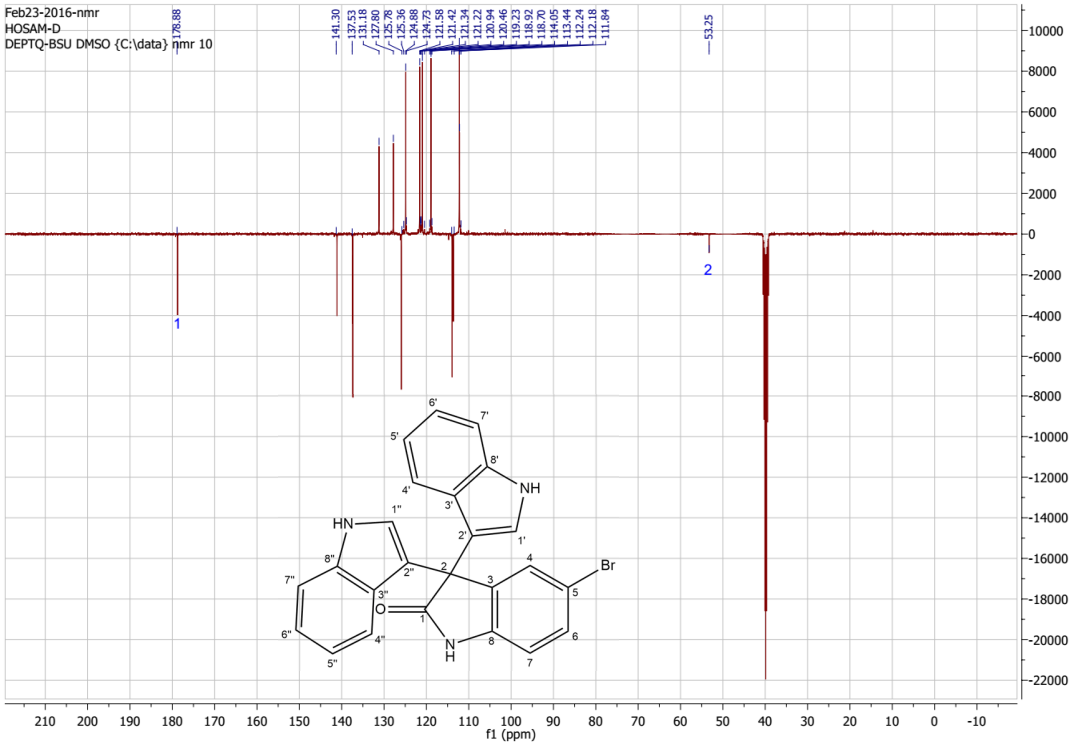


Fig.S6. DEPTQ (100 MHz, DMSO-d_6) spectrum of compound **1**.

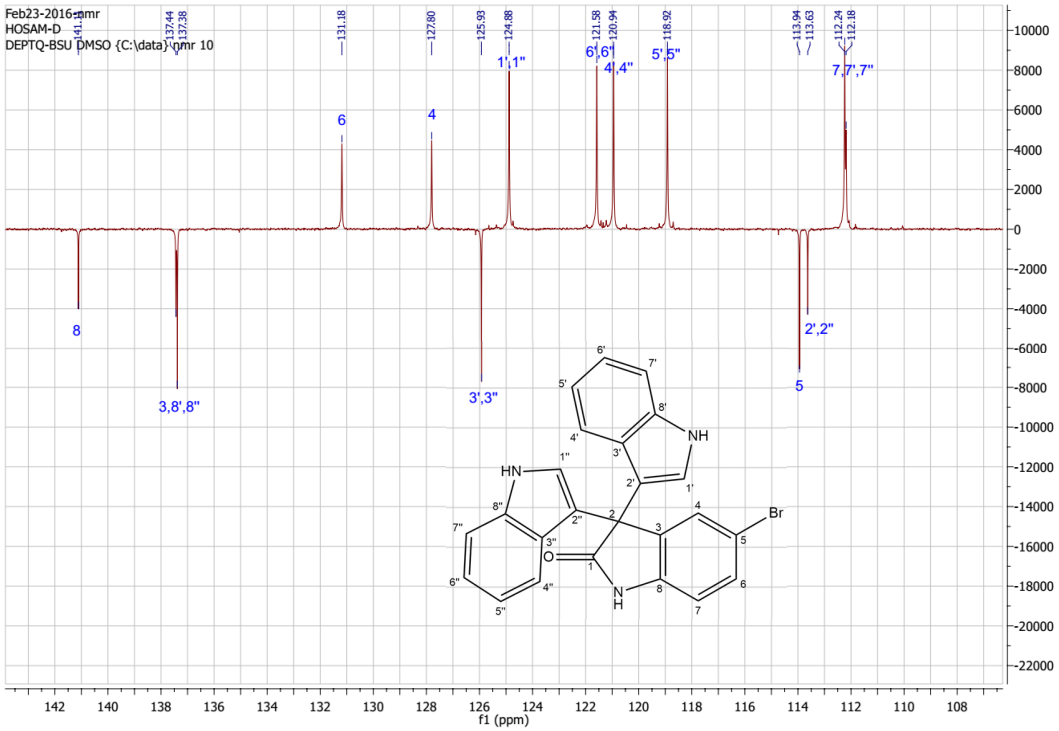


Fig.S7. DEPTQ (100 MHz, DMSO-d_6) spectrum expansion of compound **1**.

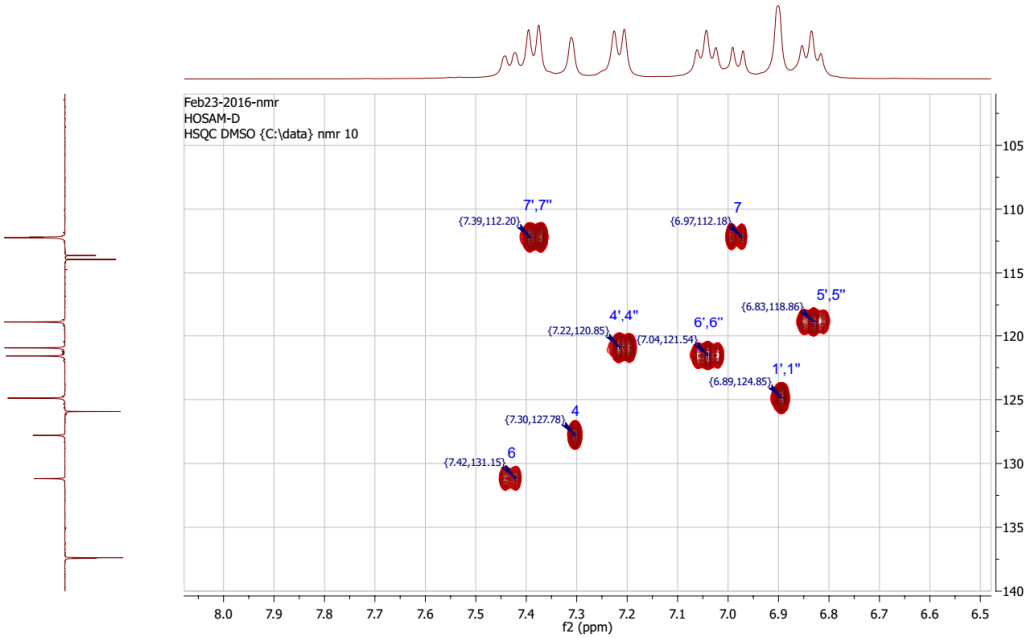


Fig.S8. HSQC spectrum expansion of compound **1**.

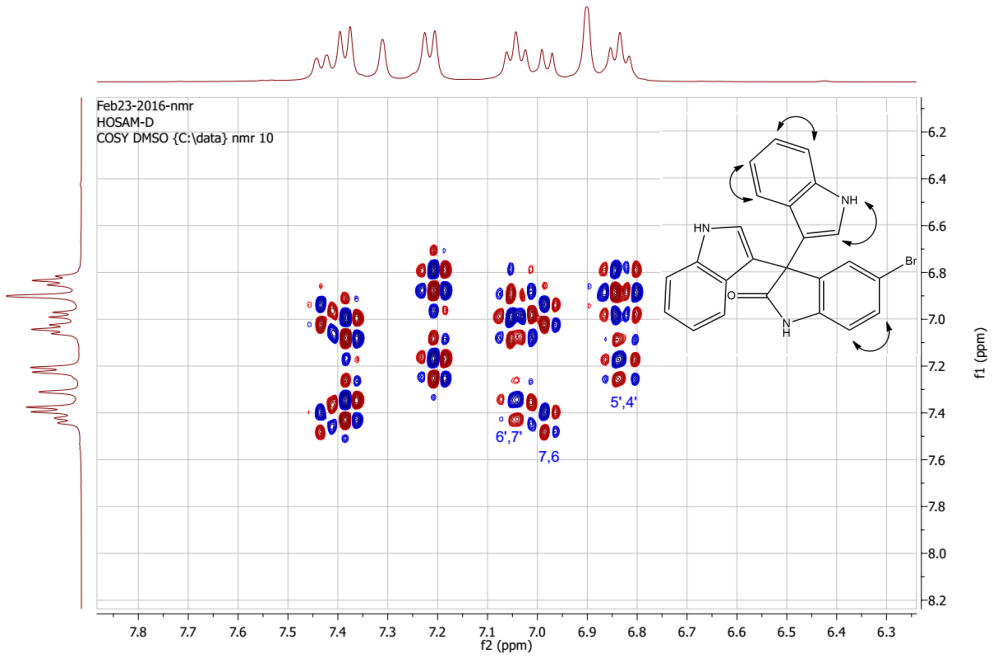


Fig.S9. ^{1}H-^{1}H COSY spectrum expansion of compound **1**.

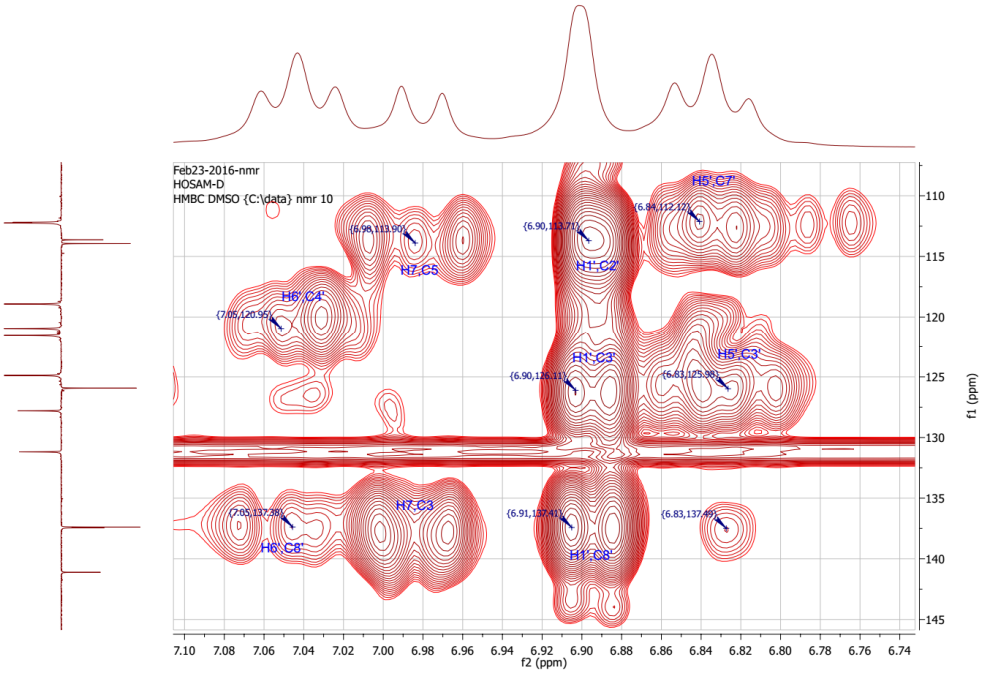


Fig.S10. HMBC spectrum of compound **1**.

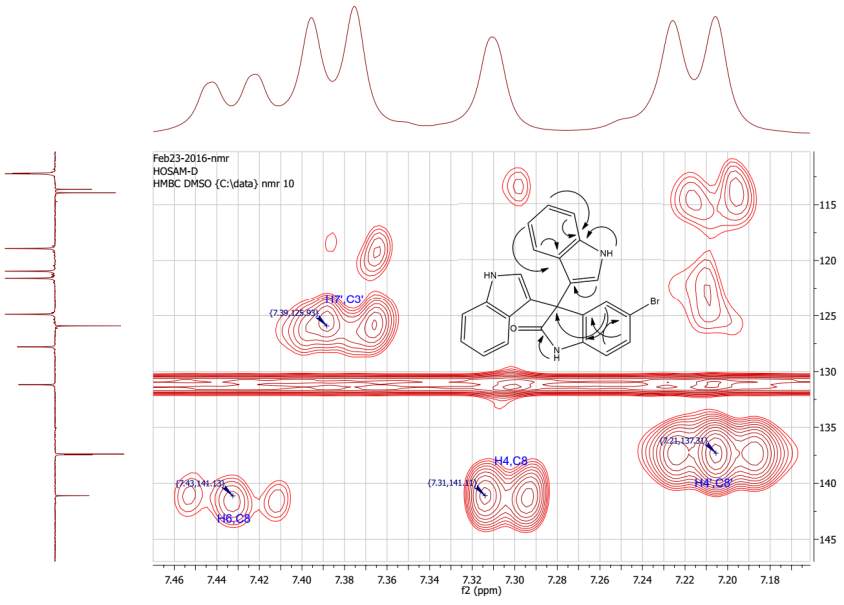


Fig.S11. HMBC spectrum expansion of compound **1**.

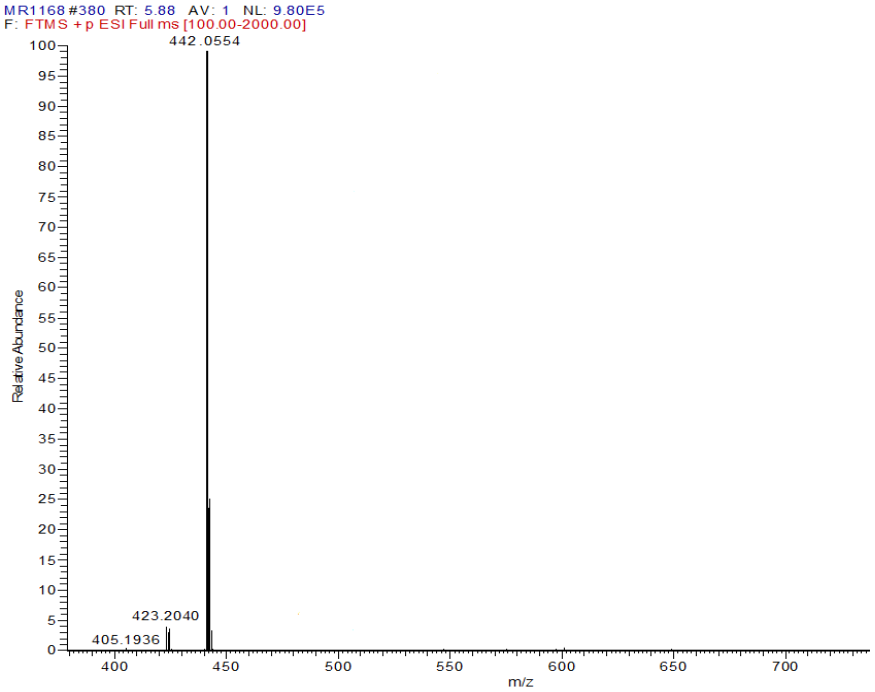


Fig.12S. HRESIMS spectrum of **2**.

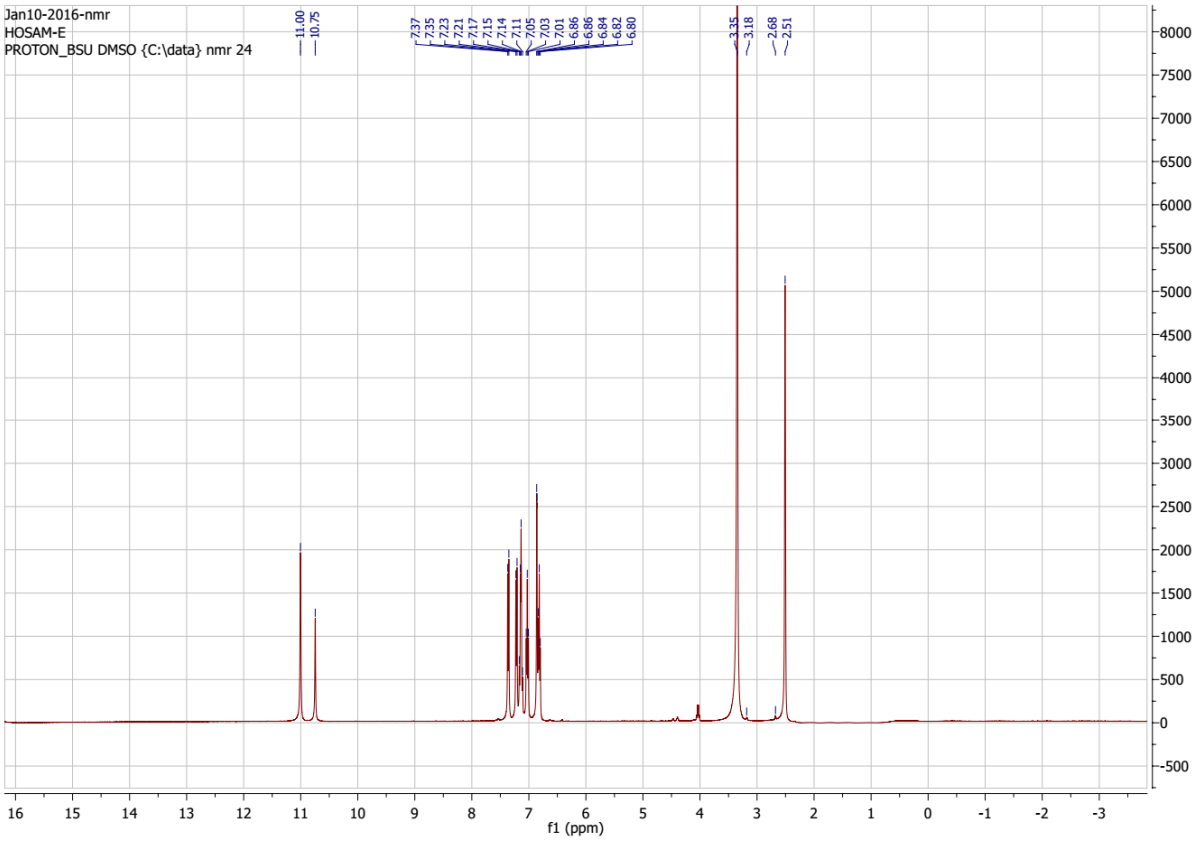


Fig.S13.[1]H NMR (400 MHz, DMSO-*d*6) spectrum of compound **2**.

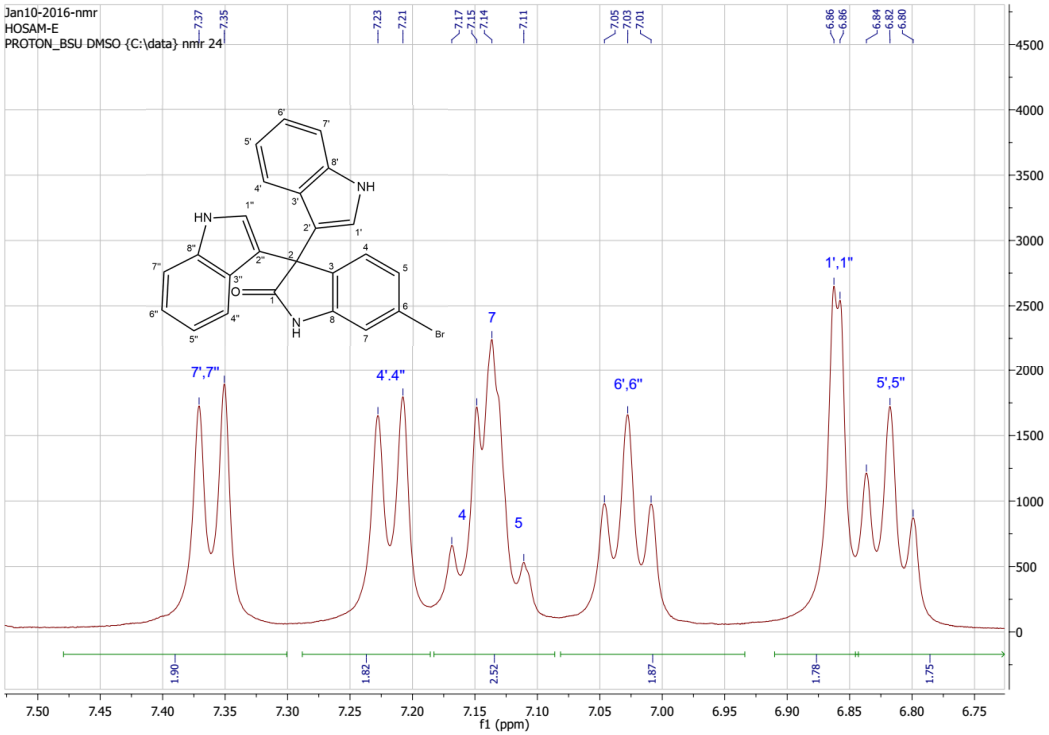


Fig.S14.[1]H NMR (400 MHz, DMSO-d_6) spectrum expansion of compound **2**.

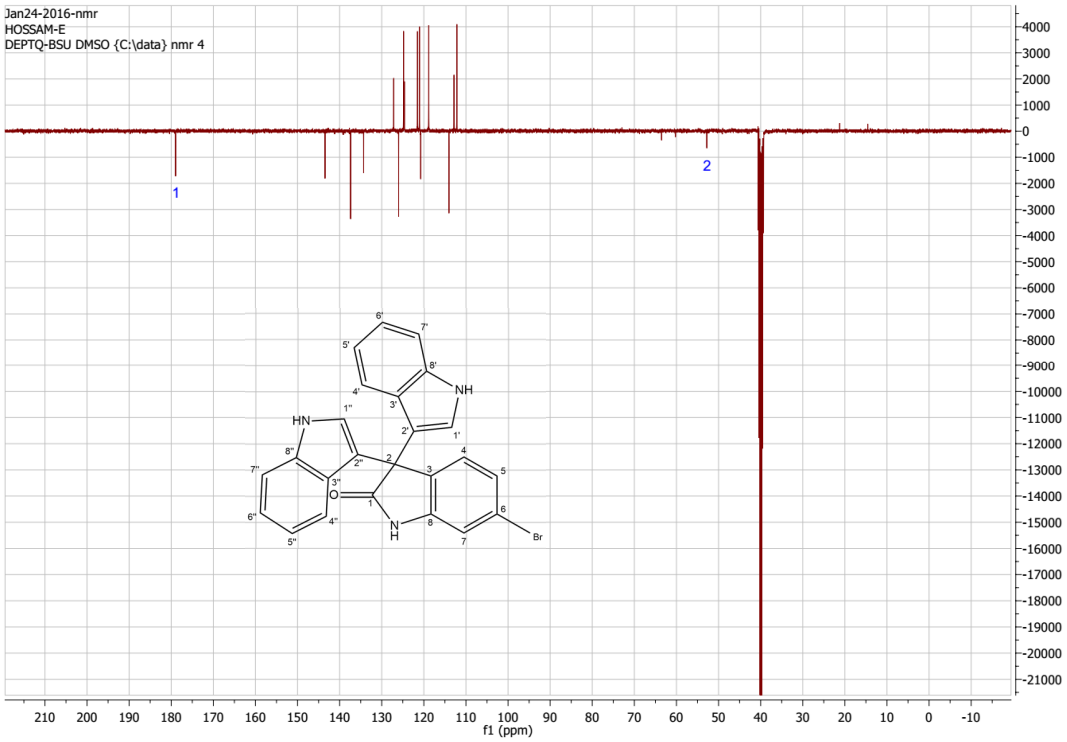


Fig.S15. DEPTQ (100 MHz, DMSO-d_6) spectrum of compound **2**.

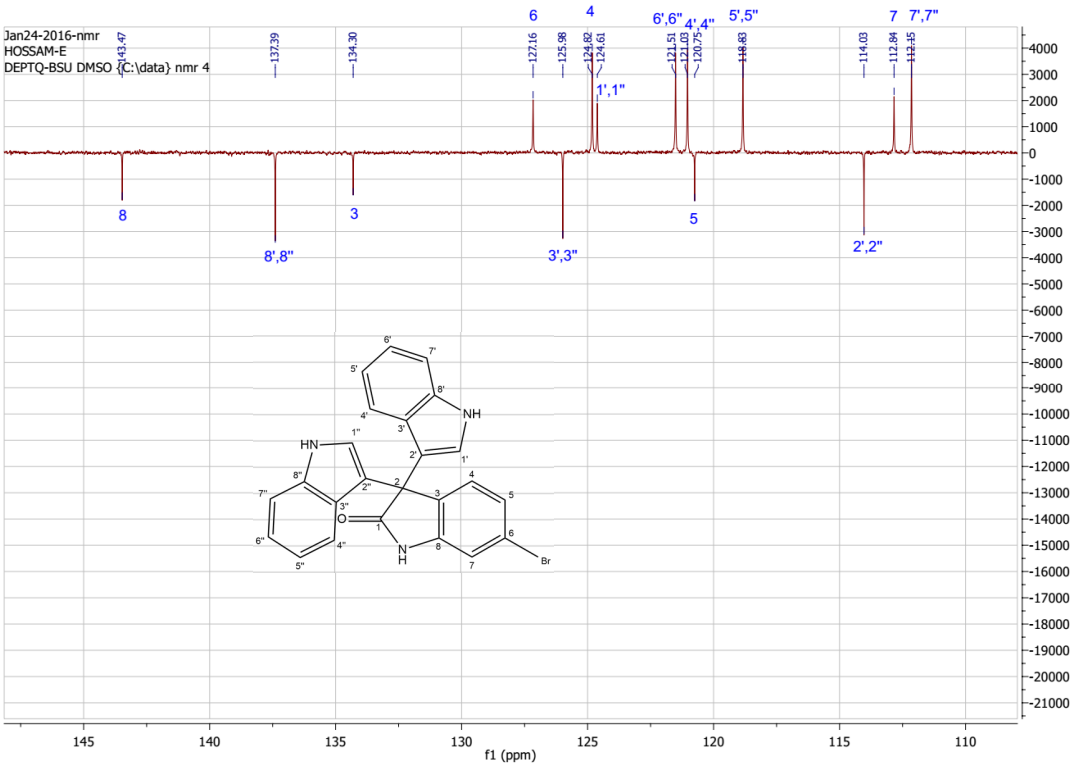


Fig.S16. DEPTQ (100 MHz, DMSO-d_6) spectrum expansion of compound **2.**

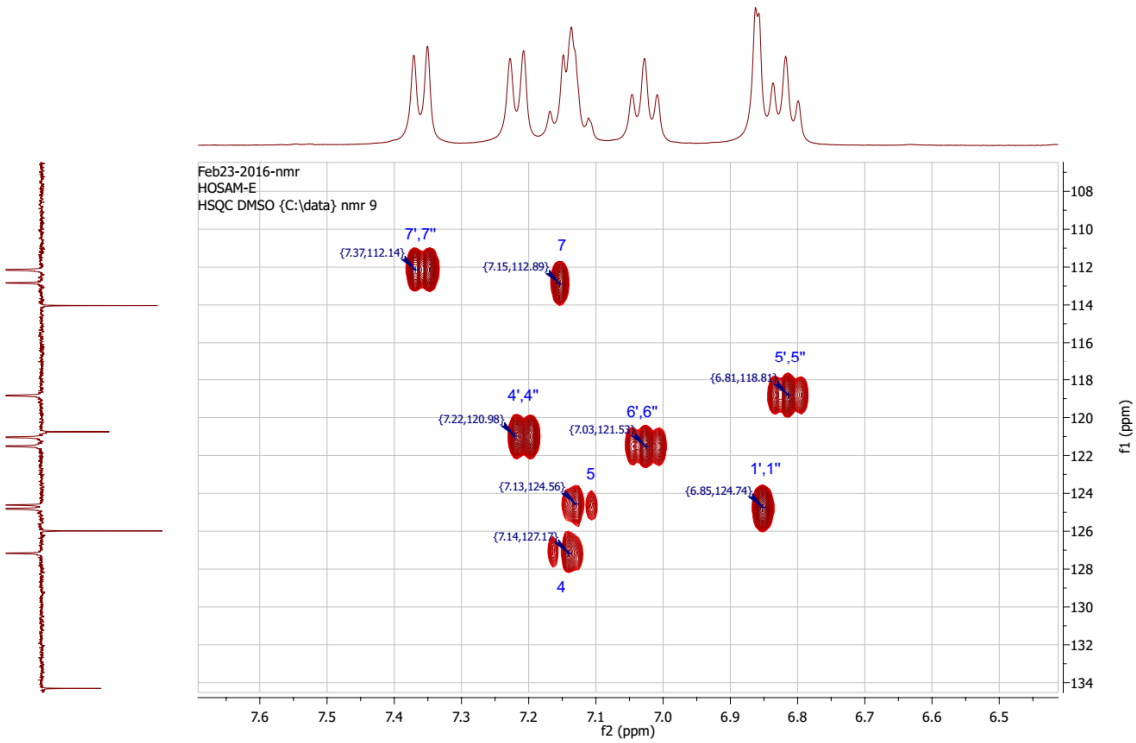


Fig.S17. HSQC spectrum expansion of compound **2**.

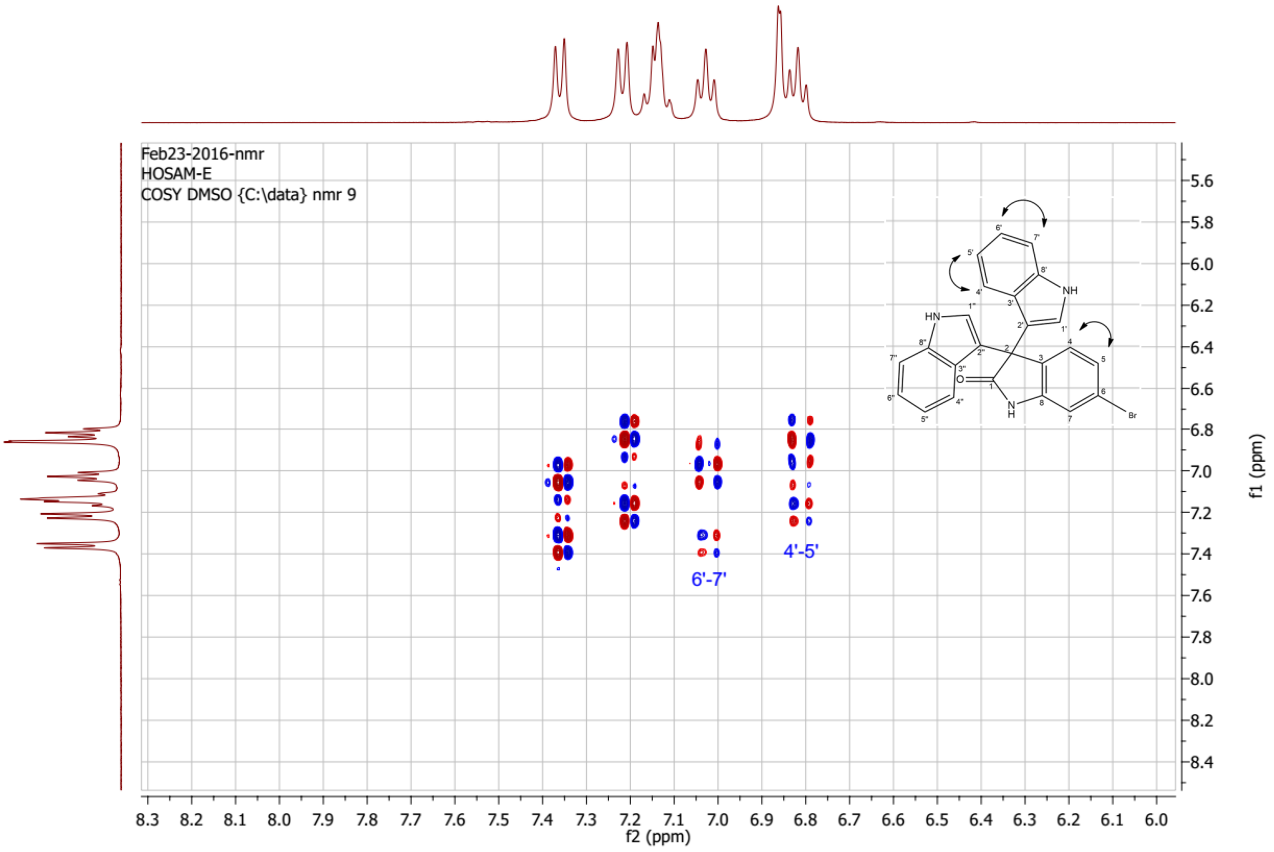


Fig.S18. ^{1}H-^{1}H COSY spectrum expansion of compound **2**.

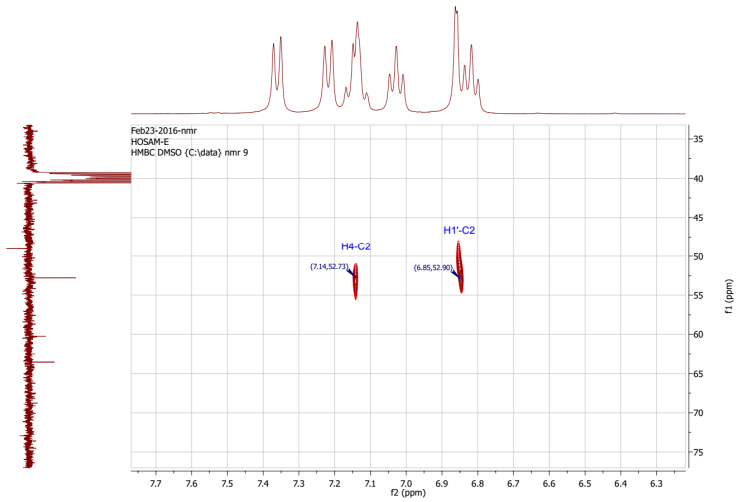


Fig.S19. HMBC spectrum 1st expansion of compound **2**.

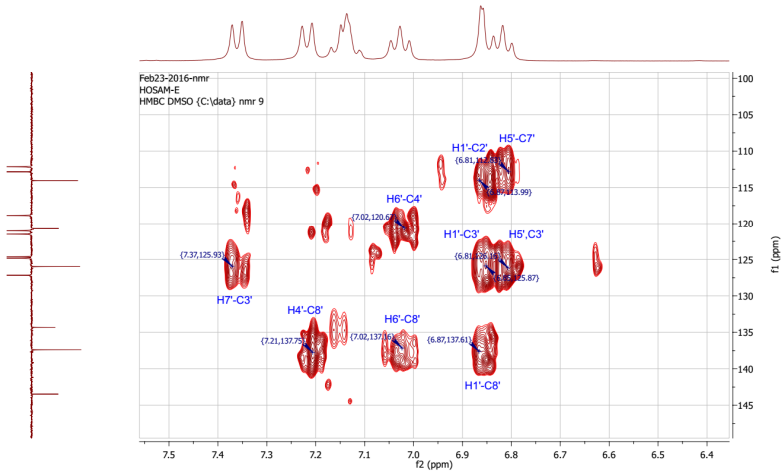


Fig.S20. HMBC spectrum 2nd expansion of compound **2**.

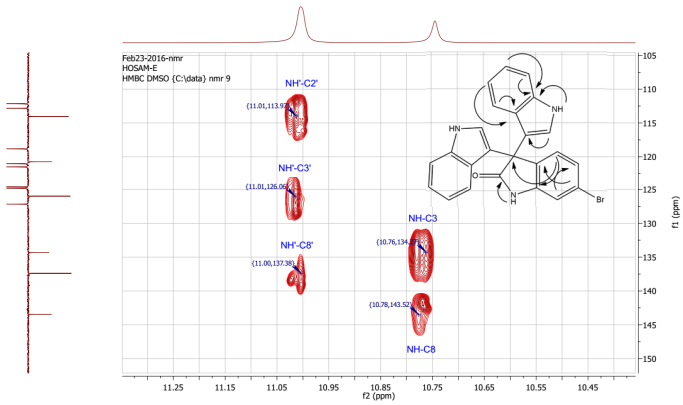


Fig.S21. HMBC spectrum 3rd expansion of compound **2**.

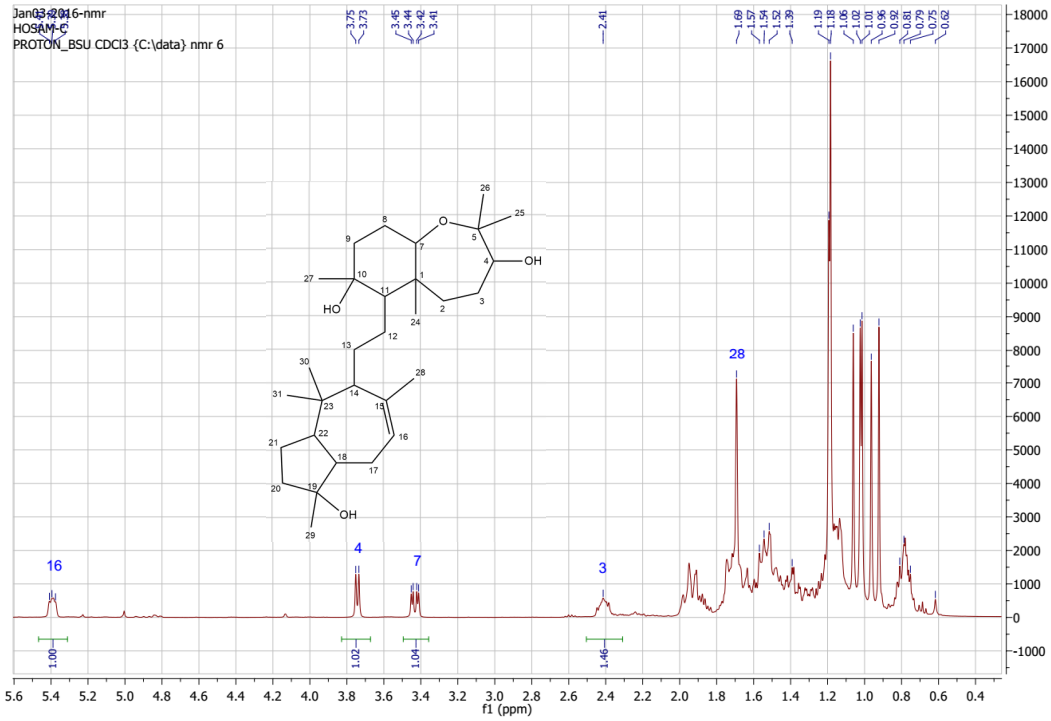


Fig.S22.^{1}H NMR (400 MHz, $CDCl_3$) spectrum of compound **3**.

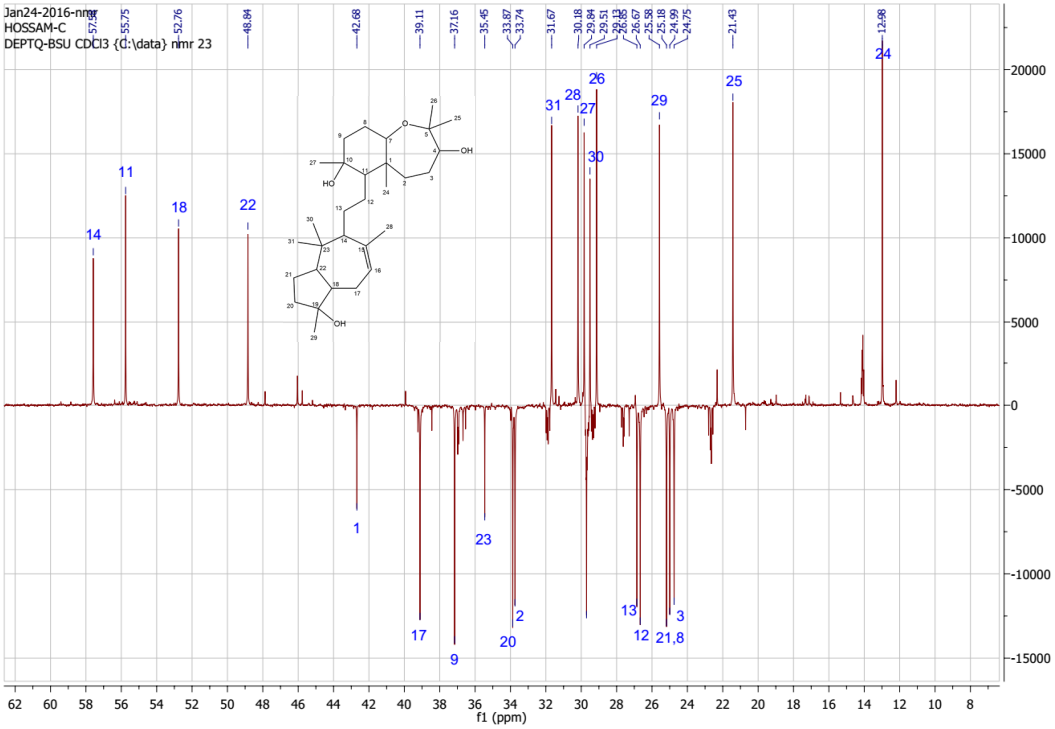


Fig.S23. DEPTQ (100 MHz, $CDCl_3$) spectrum of compound **3**.

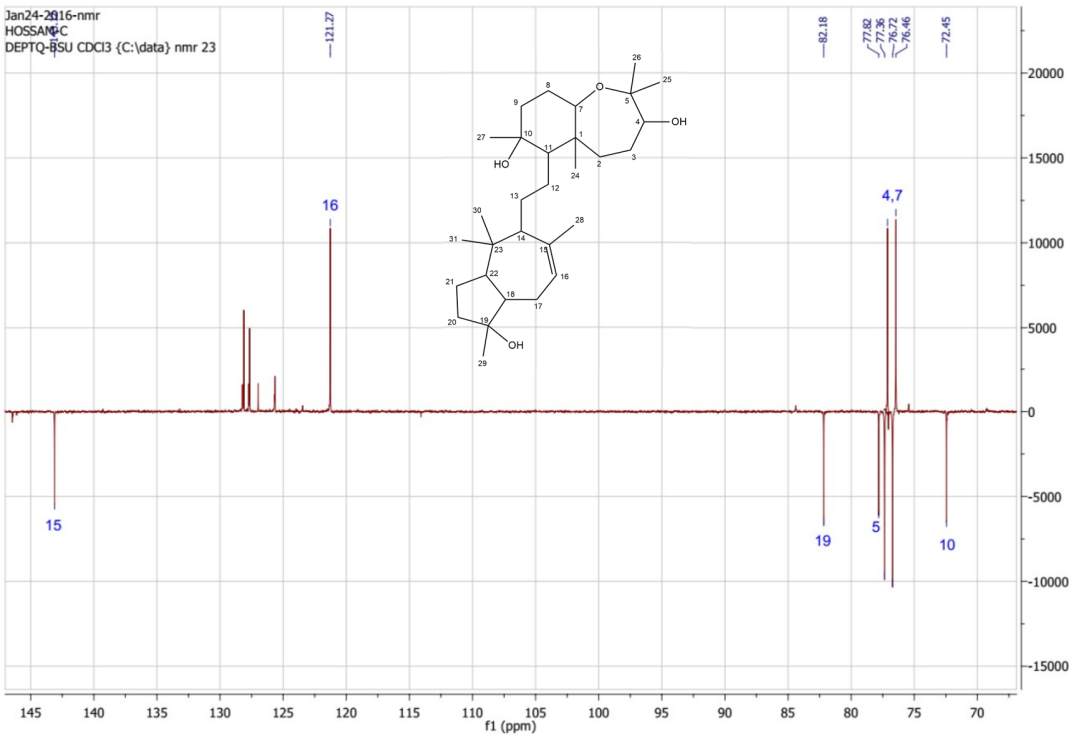


Fig.S24. DEPTQ (100 MHz, $CDCl_3$) spectrum expansion of compound **3**.

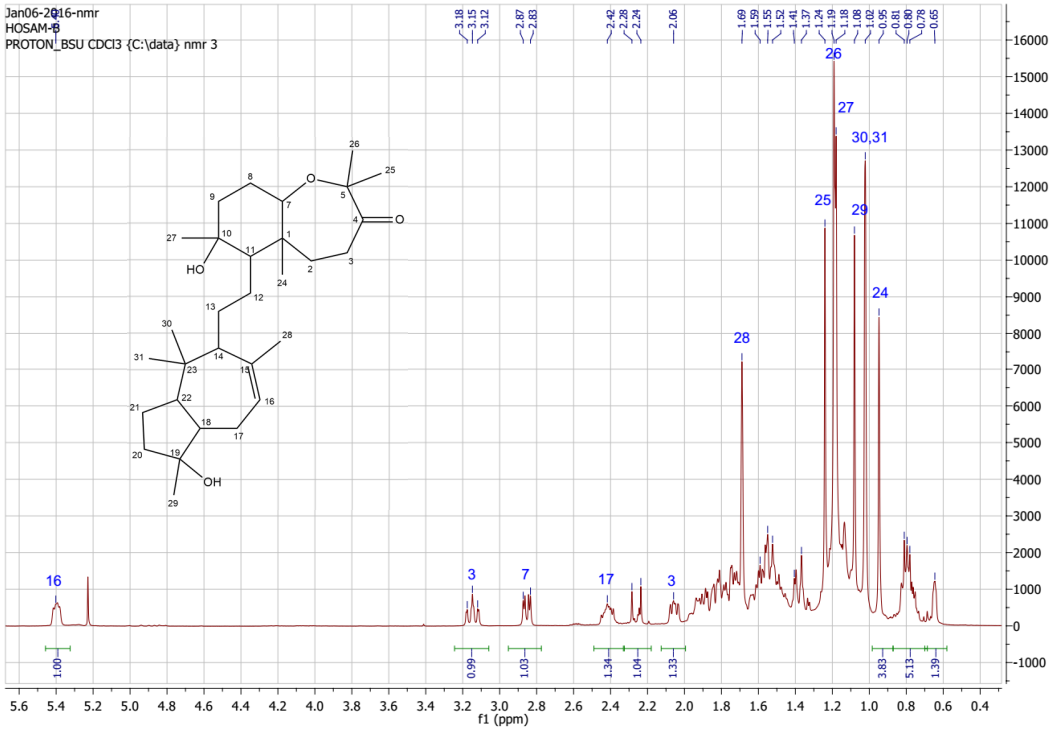


Fig.S25.^{1}H NMR (400 MHz, $CDCl_3$) spectrum of compound **4**.

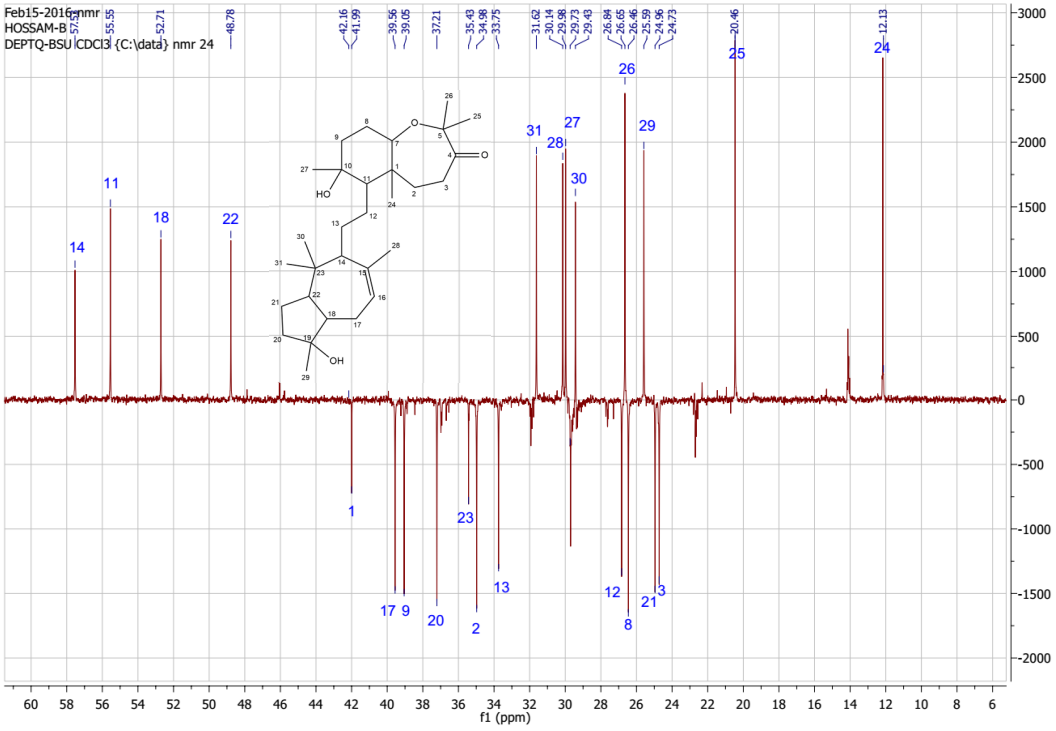


Fig.S26. DEPTQ (100 MHz, $CDCl_3$) spectrum of compound **4**.

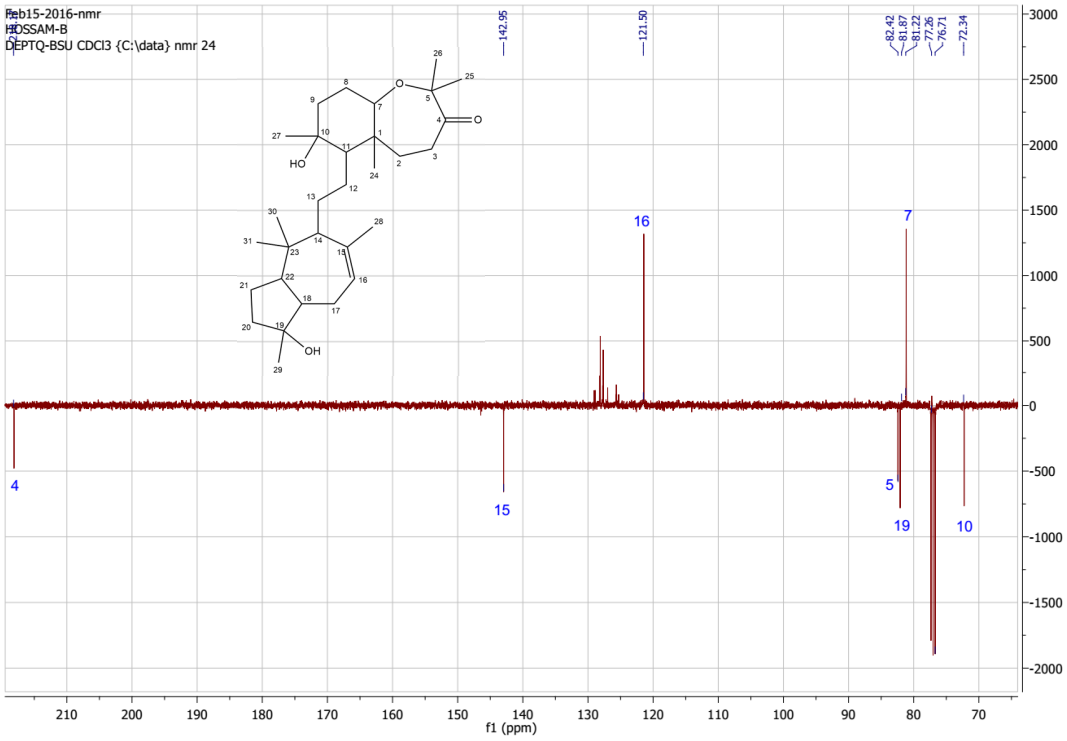


Fig.S27. DEPTQ (100 MHz, $CDCl_3$) spectrum expansion of compound **4**.

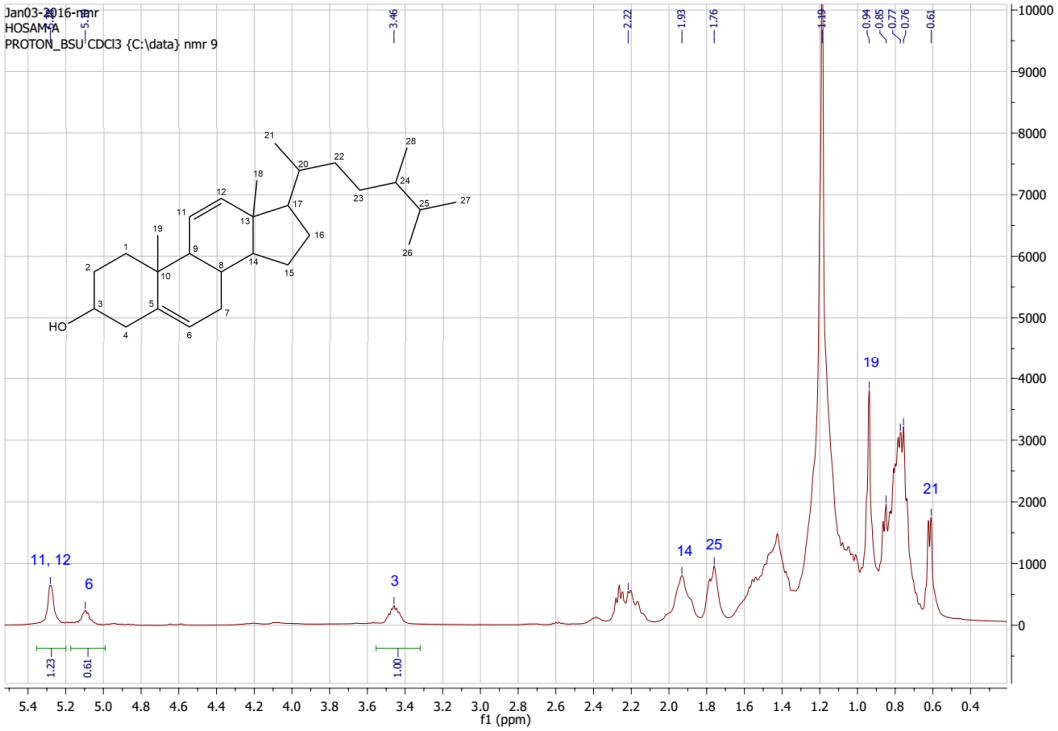


Fig.S28. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of compound **5**.

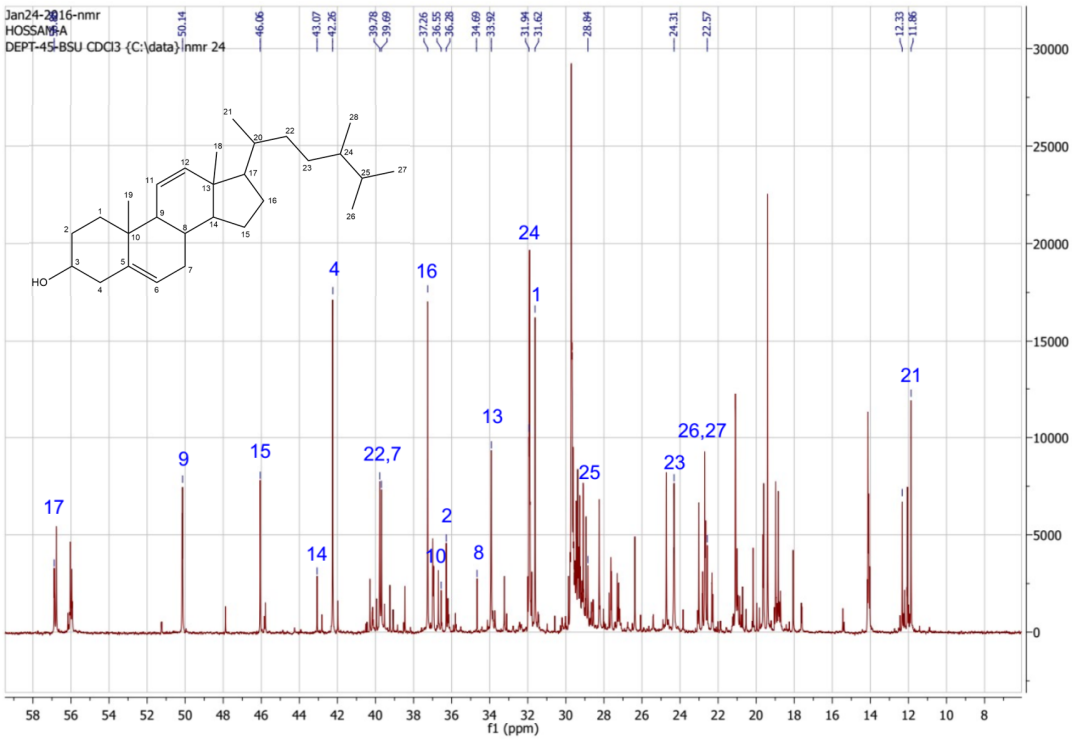


Fig.S29. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum of compound **5.**

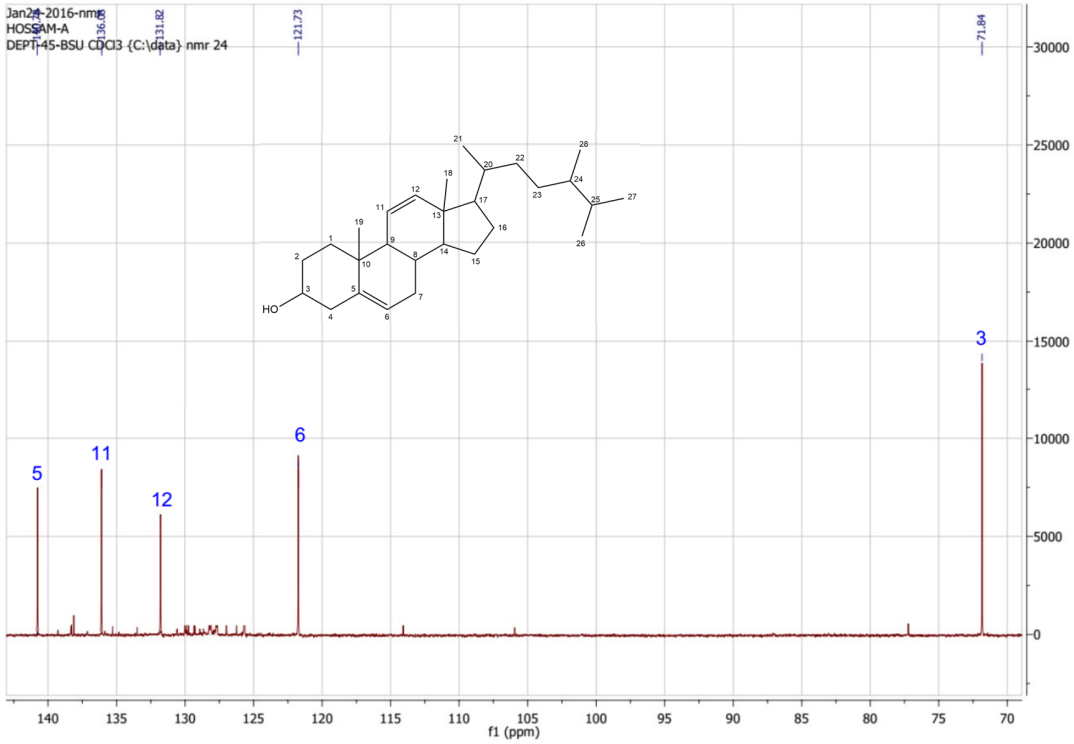


Fig.S30. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **5.**

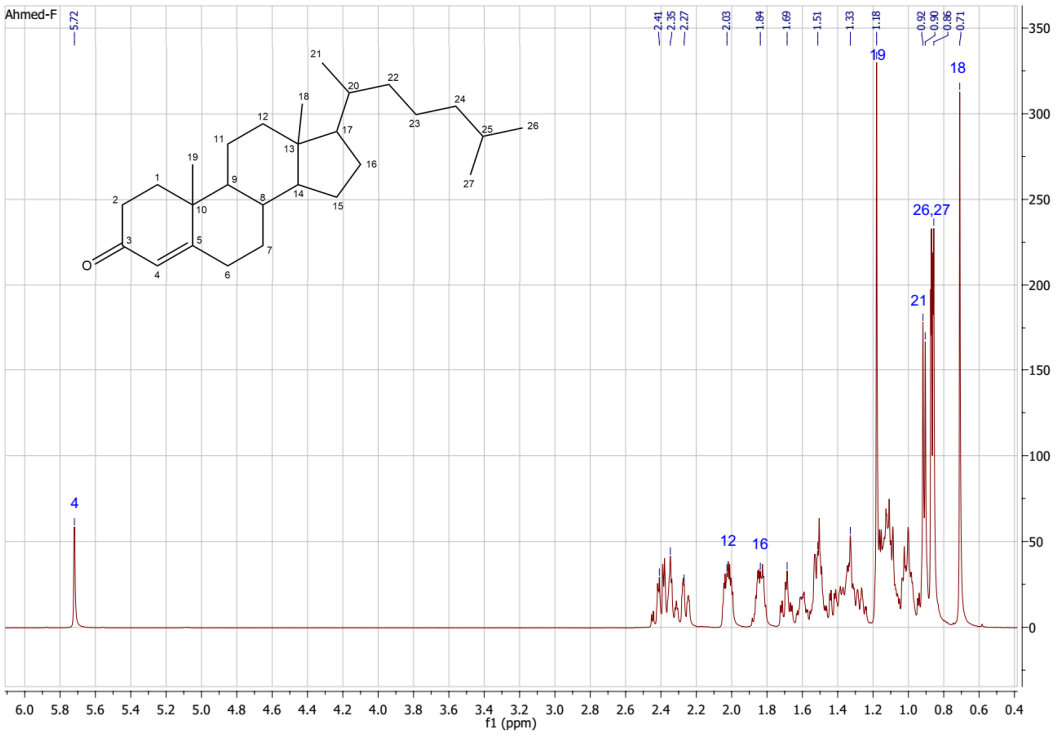


Fig.S31. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of compound **6.**

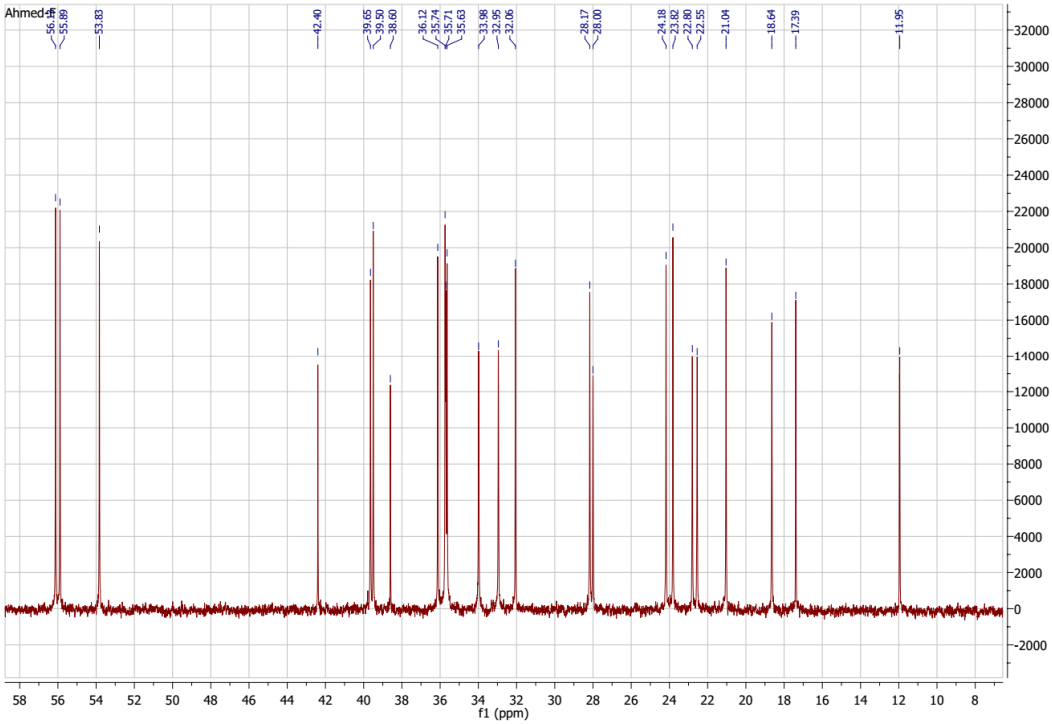


Fig.S32. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **6.**

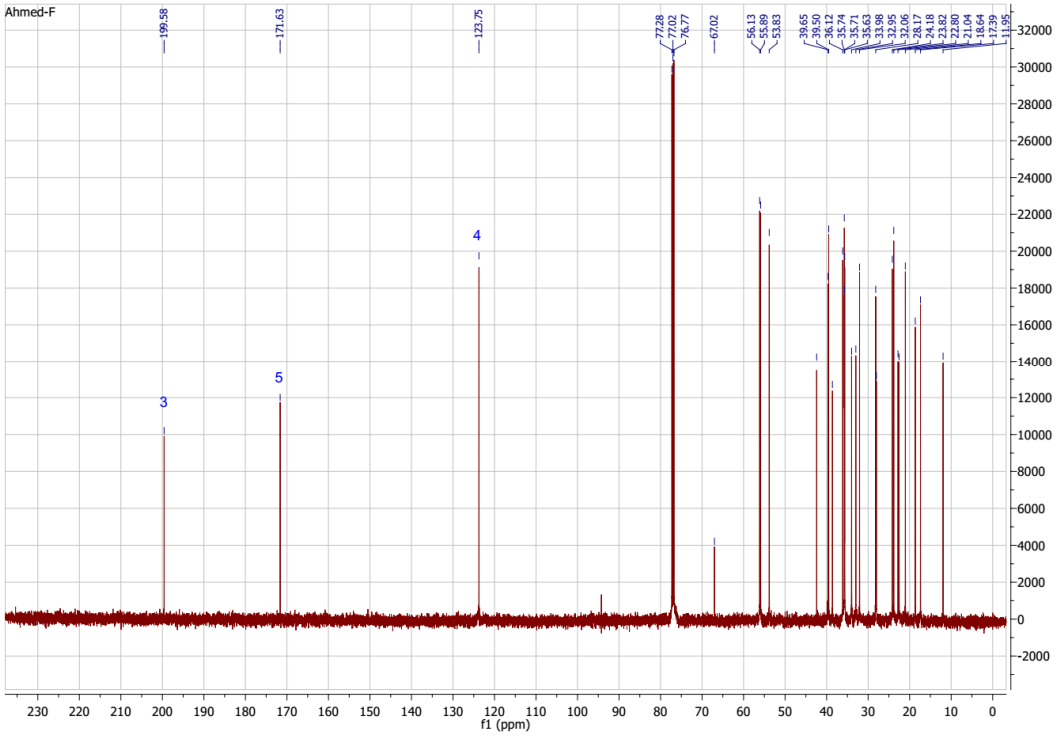


Fig.S33. ^{13}C NMR (400 MHz, $CDCl_3$) spectrum expansion of compound **6.**

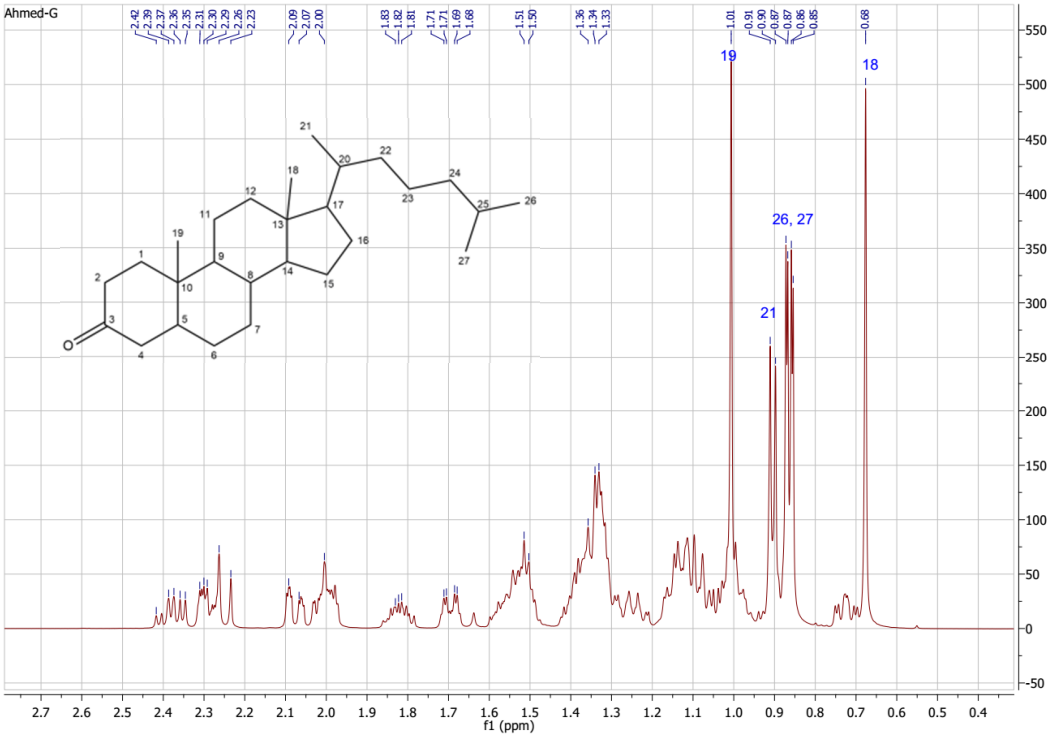


Fig.S34. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of compound **7.**

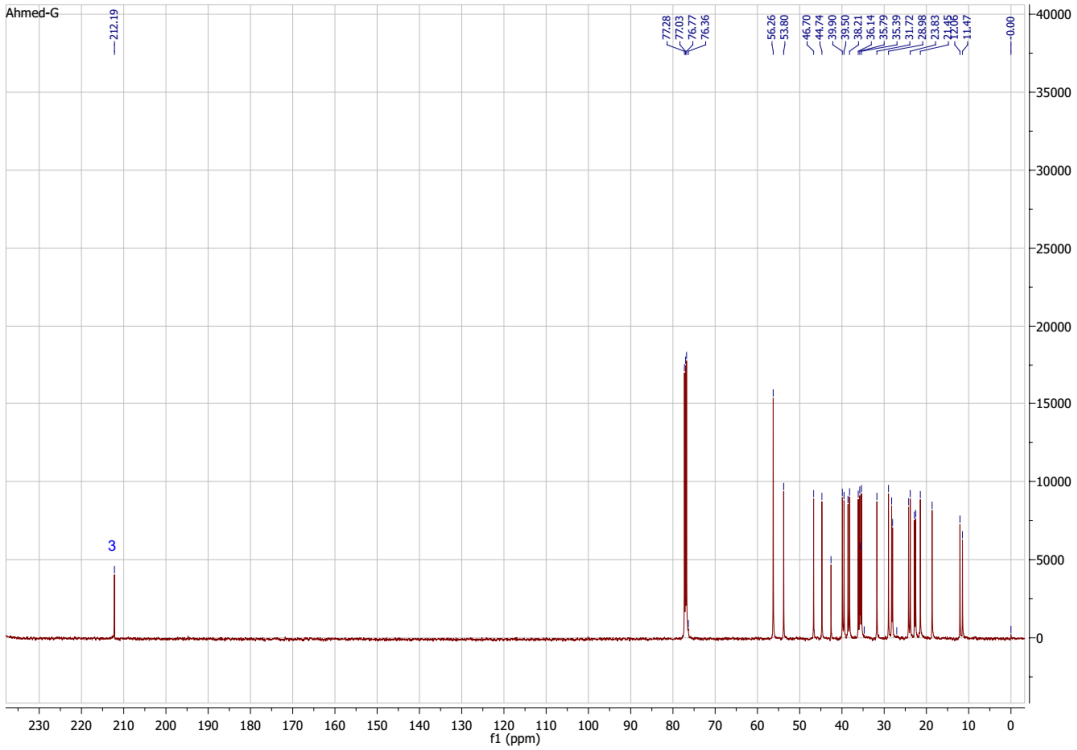


Fig.S35. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **7.**

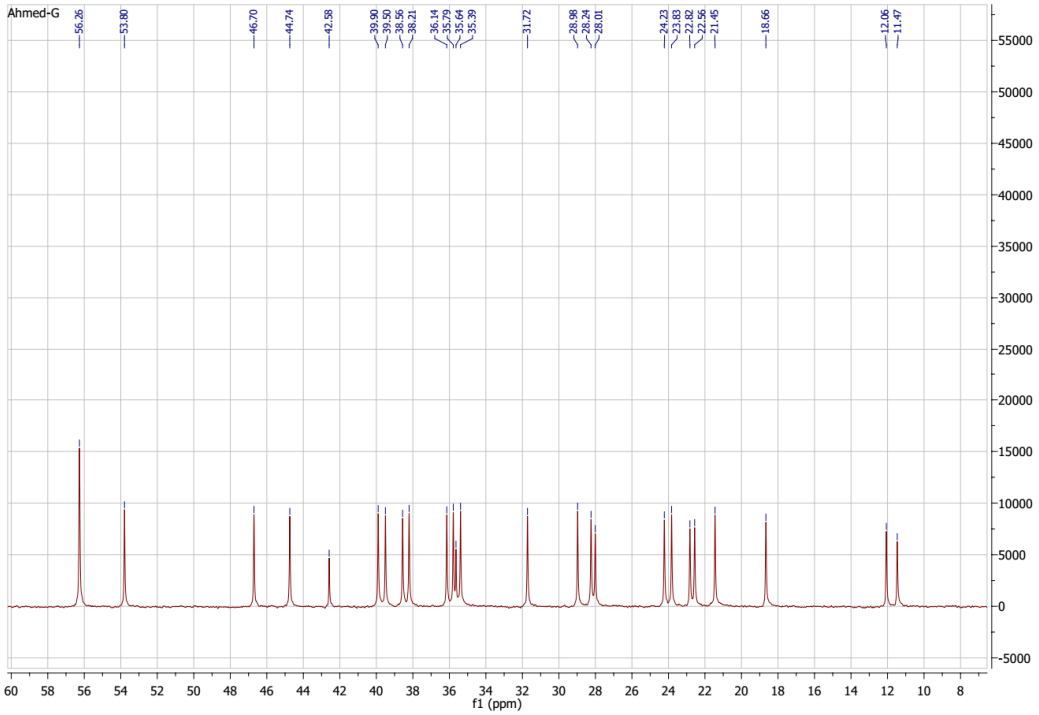


Fig.S36. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **7.**

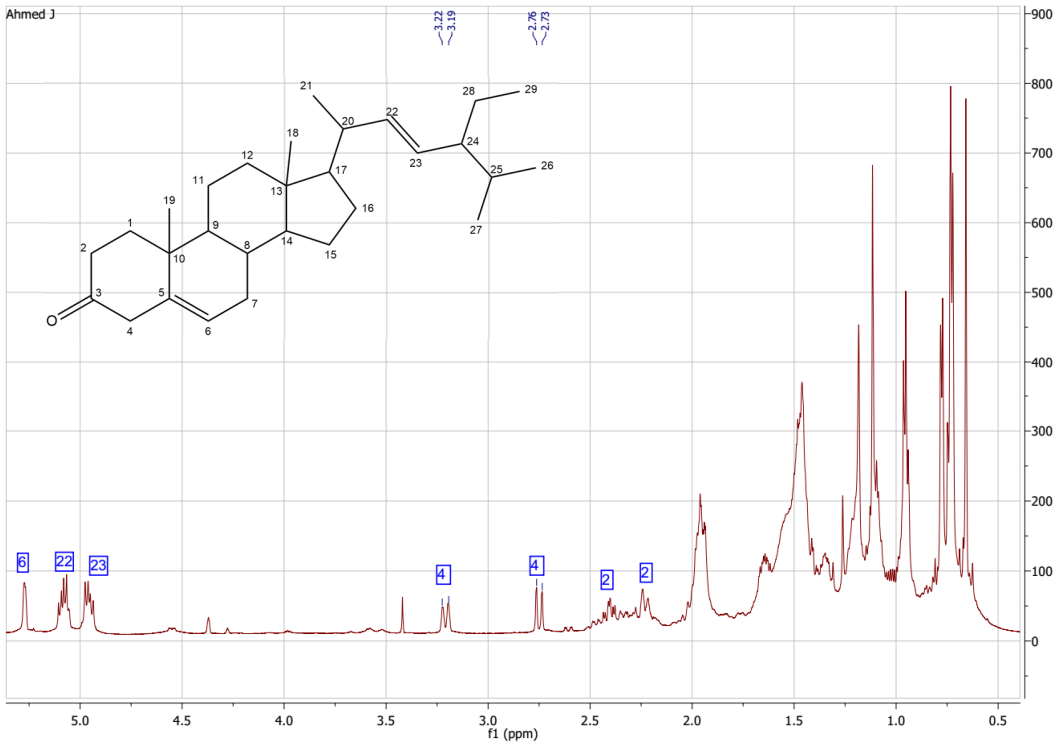


Fig.S37. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of compound **8.**

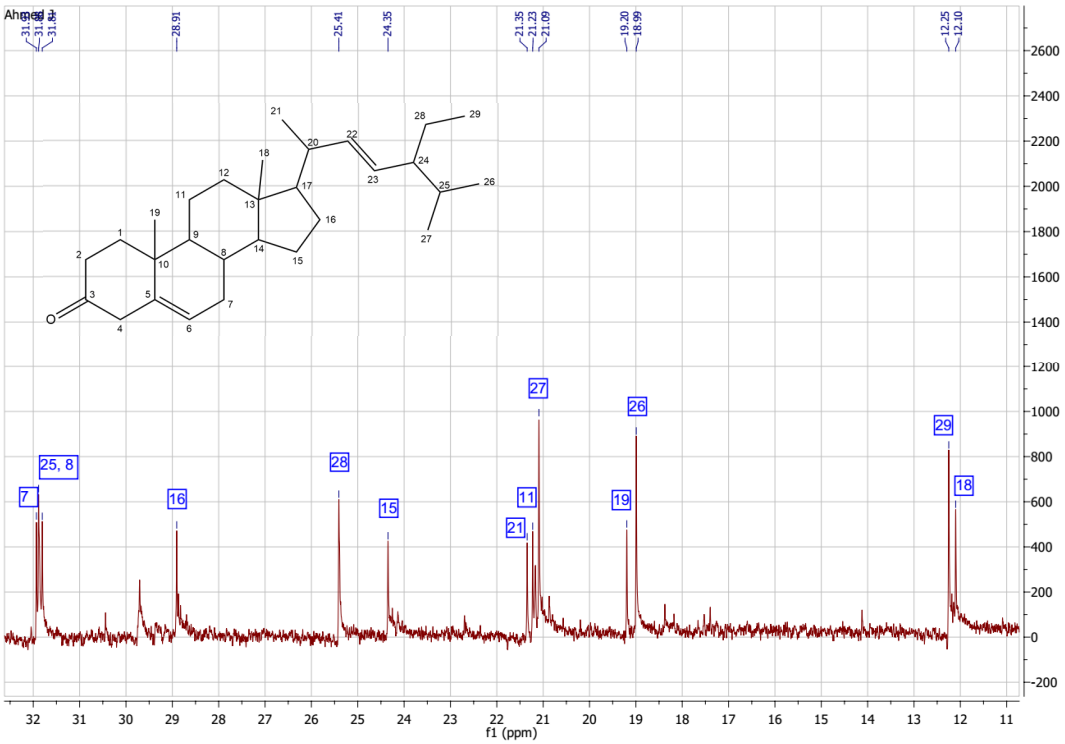


Fig.S38. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **8.**

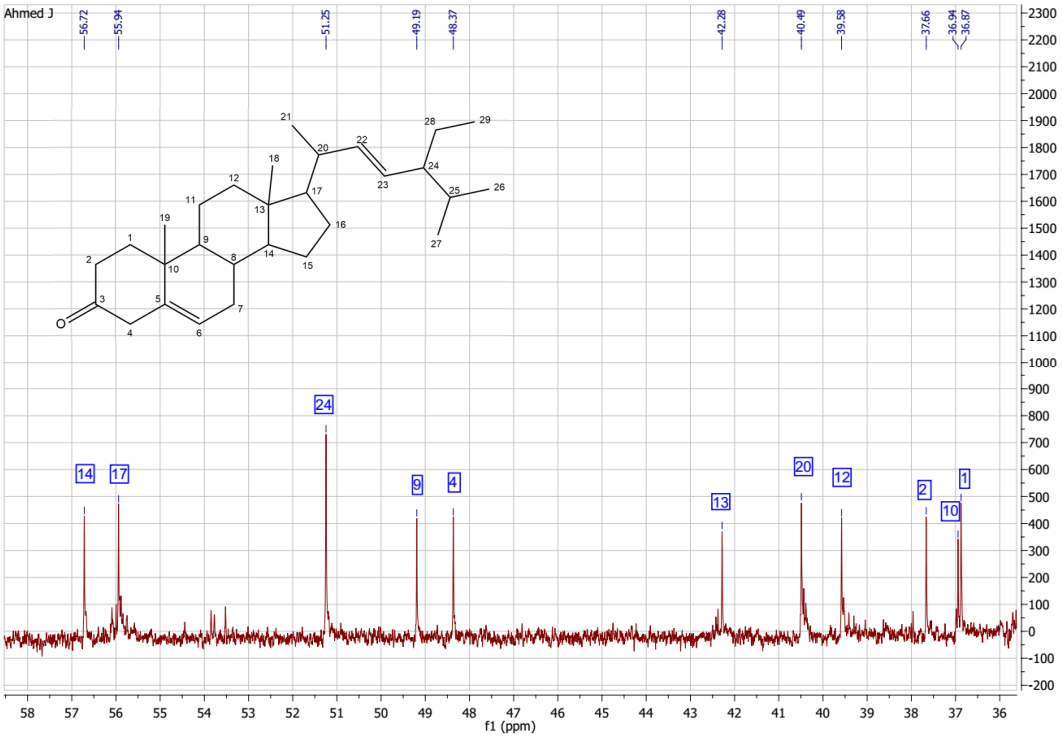


Fig.S39. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **8.**

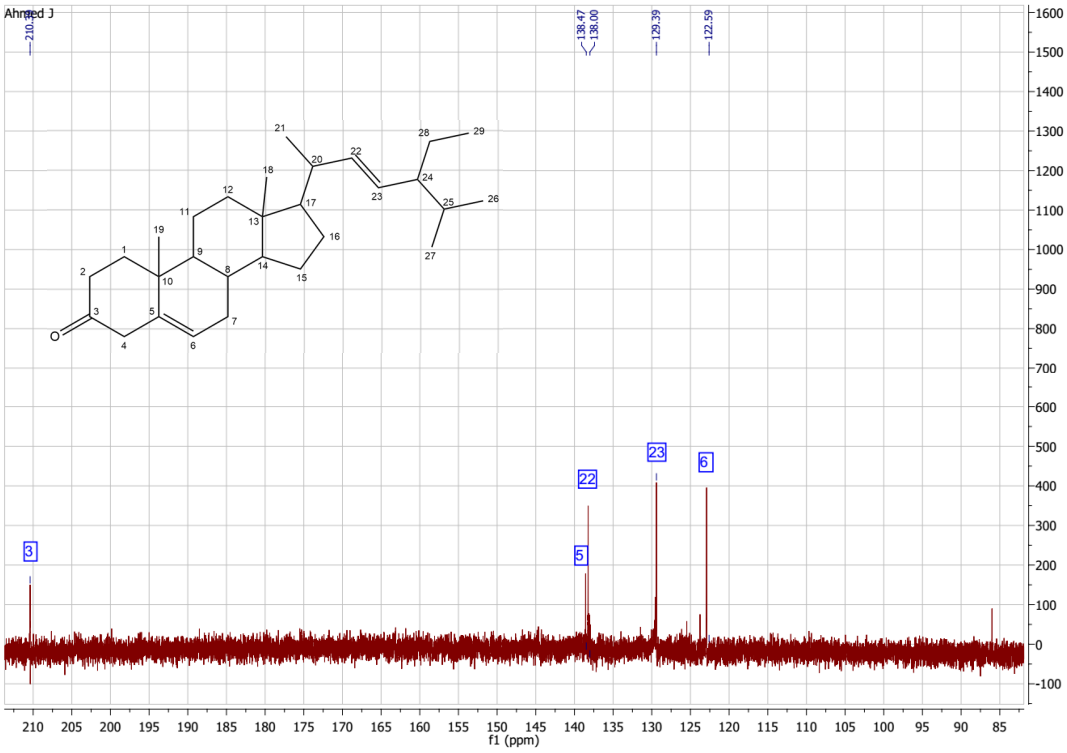


Fig.S40. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **8.**

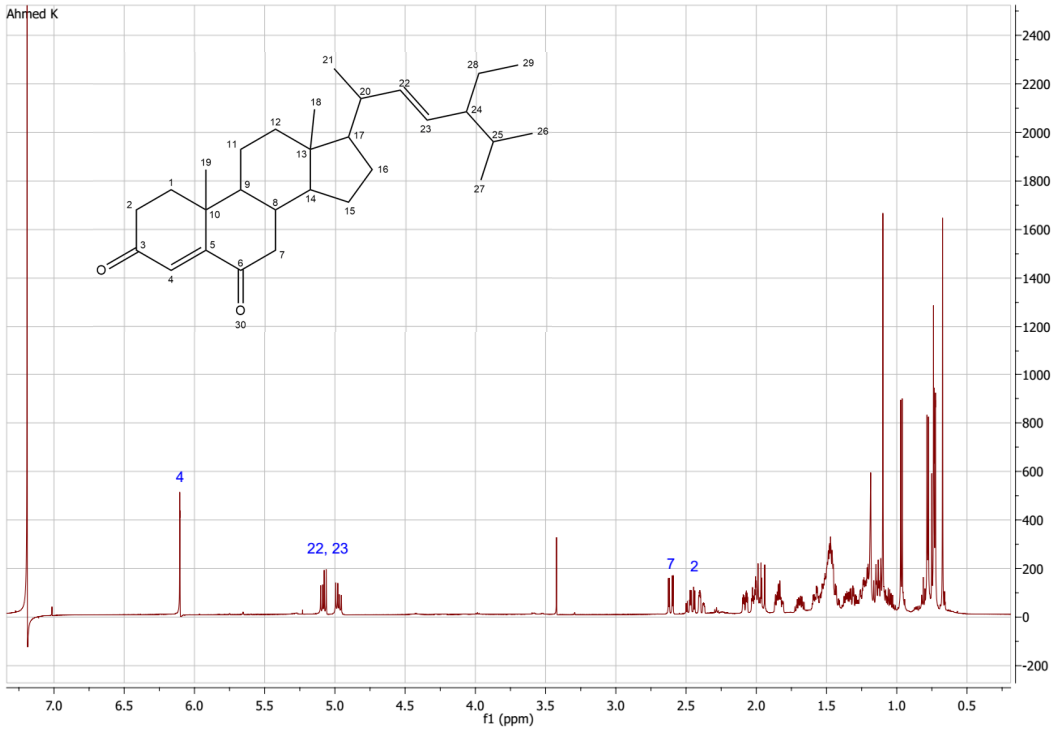


Fig.S41. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of compound **9.**

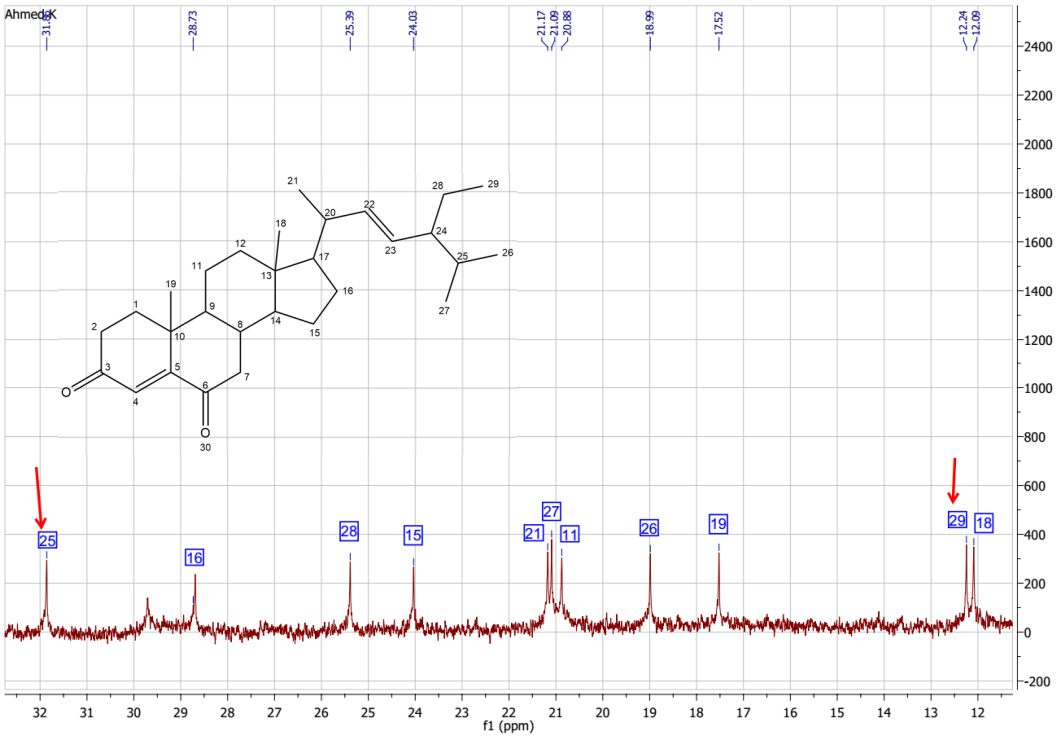


Fig.S42. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **9.**

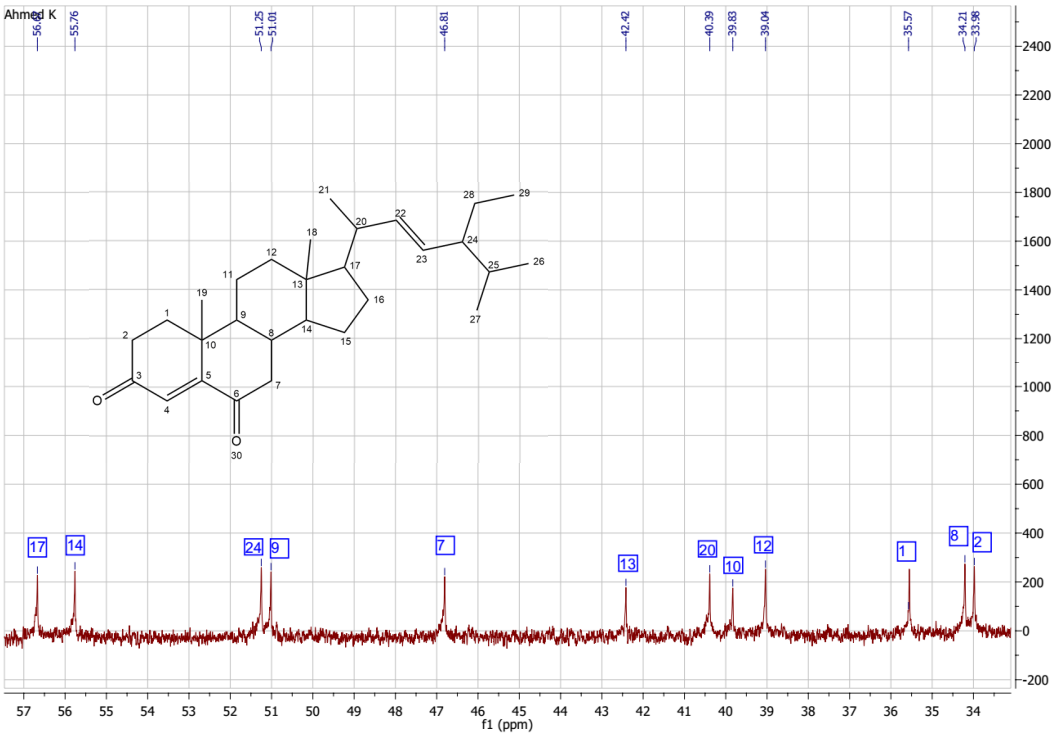


Fig.S43. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **9.**

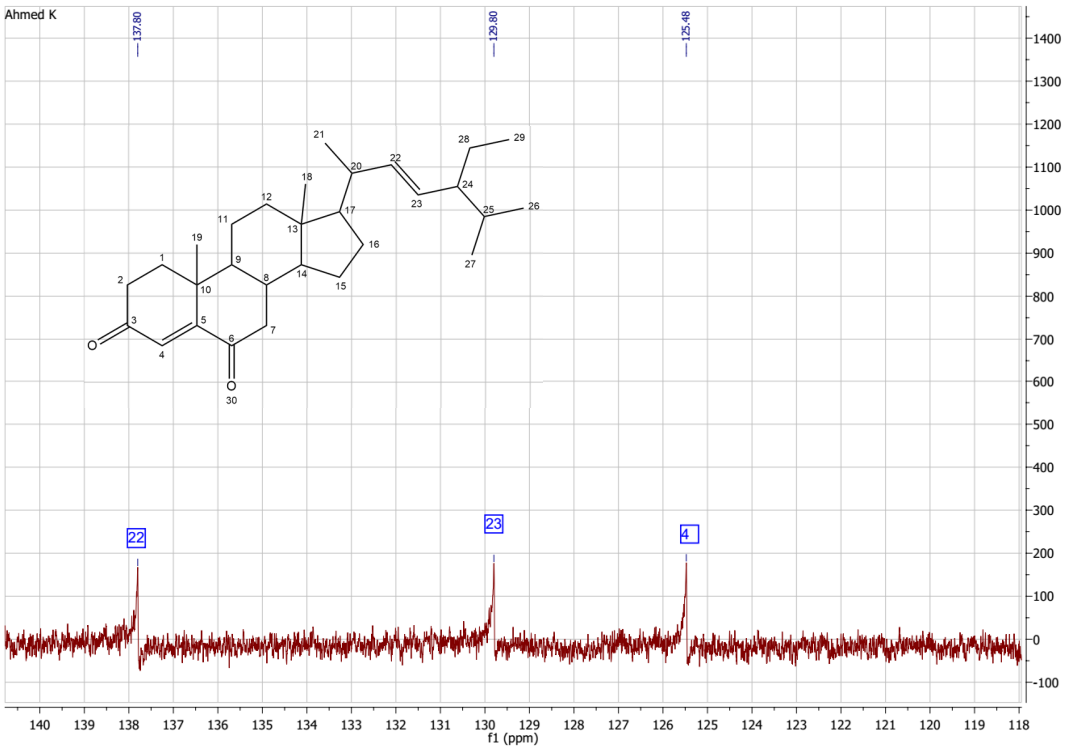


Fig.S44. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **9.**

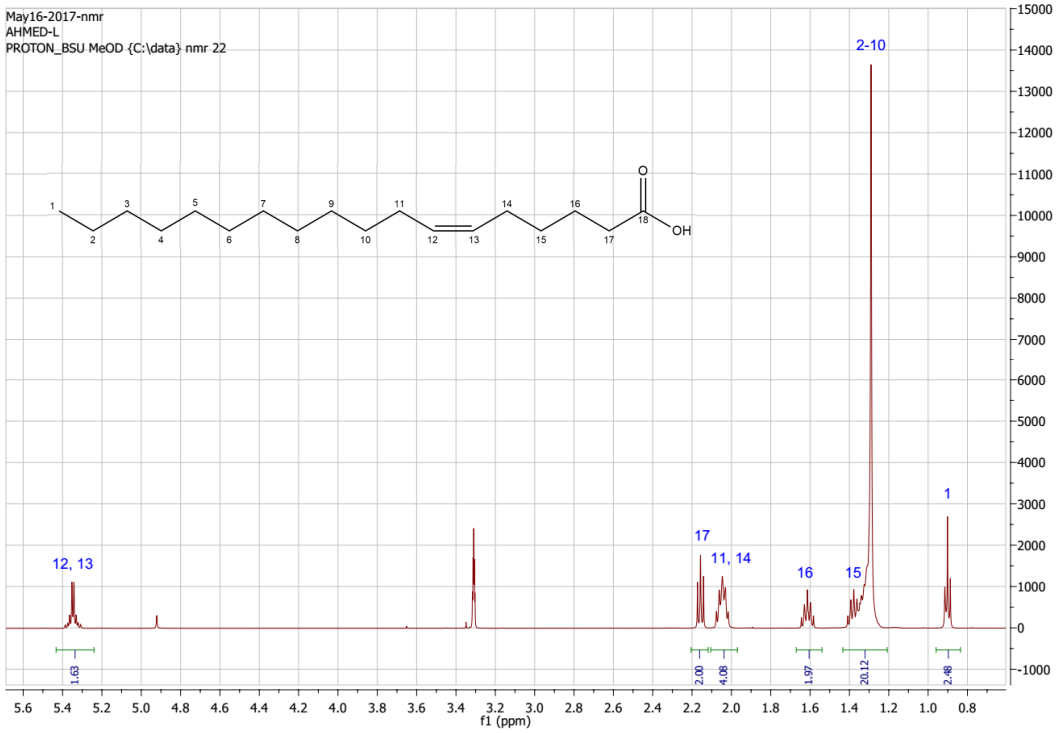


Fig.S45. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of compound **10.**

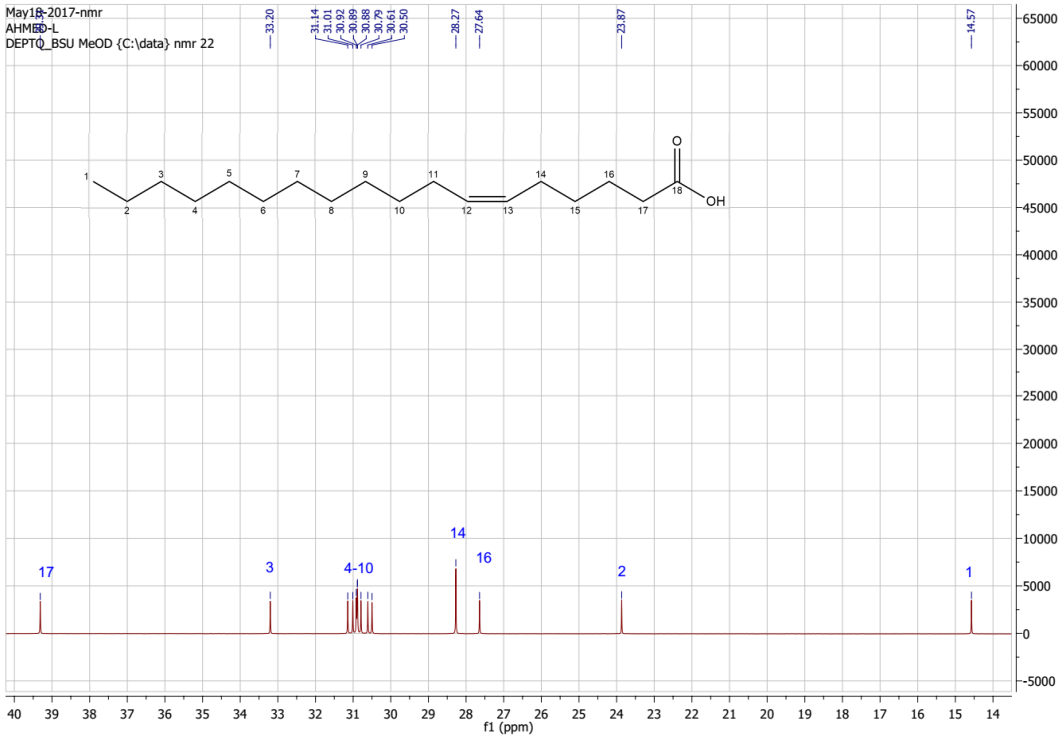


Fig.S46. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **10.**

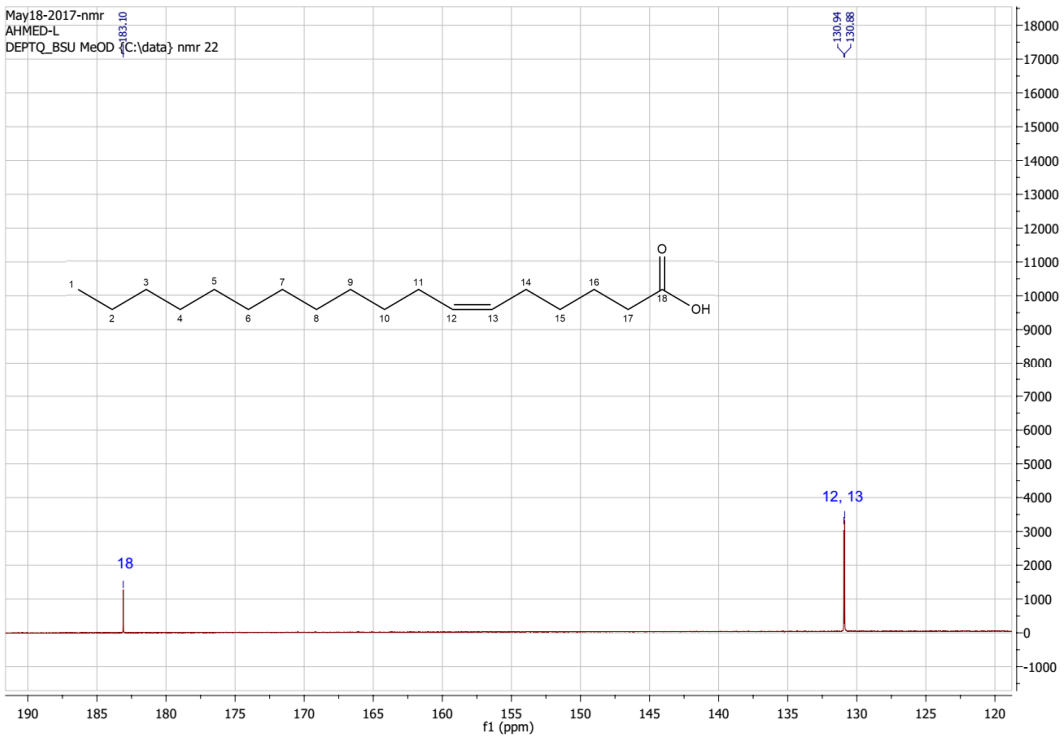


Fig.S47. ^{13}C NMR (100 MHz, $CDCl_3$) spectrum expansion of compound **10.**