

Synthesis of new 5-aryl-benzof[1,7]naphthyridines via a cascade process (Ugi-3CR / intramolecular aza Diels-Alder cycloaddition) / aromatization

Óscar Vázquez-Vera ¹, Daniel Segura-Olvera ², Mónica A. Rincón-Guevara ³, Atilano Gutiérrez-Carrillo ², Miguel A. García-Sánchez ², Ilich A. Ibarra ⁴, Leticia Lomas-Romero ^{2,*}, Alejandro Islas-Jácome ^{2,*}, and Eduardo González-Zamora ^{2,*}

¹ Unidad Profesional Interdisciplinaria de Biotecnología, Instituto Politécnico Nacional, Av. Acueducto de Guadalupe S/N, Barr. La Laguna Ticomán, C.P. 07340, Gustavo A Madero, Ciudad de México; vaveos@yahoo.com.mx (O.V.-V.)

² Departamento de Química, Universidad Autónoma Metropolitana-Iztapalapa, San Rafael Atlixco 186, Col. Vicentina, C.P. 09340, Iztapalapa, Ciudad de México; mudo-2@hotmail.com (D.S.-O.); agrmn@xanum.uam.mx (A.G.-C.); mags@xanum.uam.mx (M.A.G.-S.)

³ Departamento de Biotecnología, Universidad Autónoma Metropolitana-Iztapalapa, San Rafael Atlixco 186, Col. Vicentina, C.P. 09340, Iztapalapa, Ciudad de México; monicarinconguevara@gmail.com (M.A.R.-G.)

⁴ Laboratorio de Fisicoquímica y Reactividad de Superficies, Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Circuito Exterior S/N, Ciudad Universitaria, C.P. 04510, Coyoacán, Ciudad de México; argel@unam.mx (I.A.I.)

* Correspondence: llr@xanum.uam.mx (L.L.-R.); aij@xanum.uam.mx (A.I.-J.); egz@xanum.uam.mx (E.G.-Z.); Tel.: +52-55-5804-4913 (L.L.-R.; A.I.-J.; E.G.-Z.)

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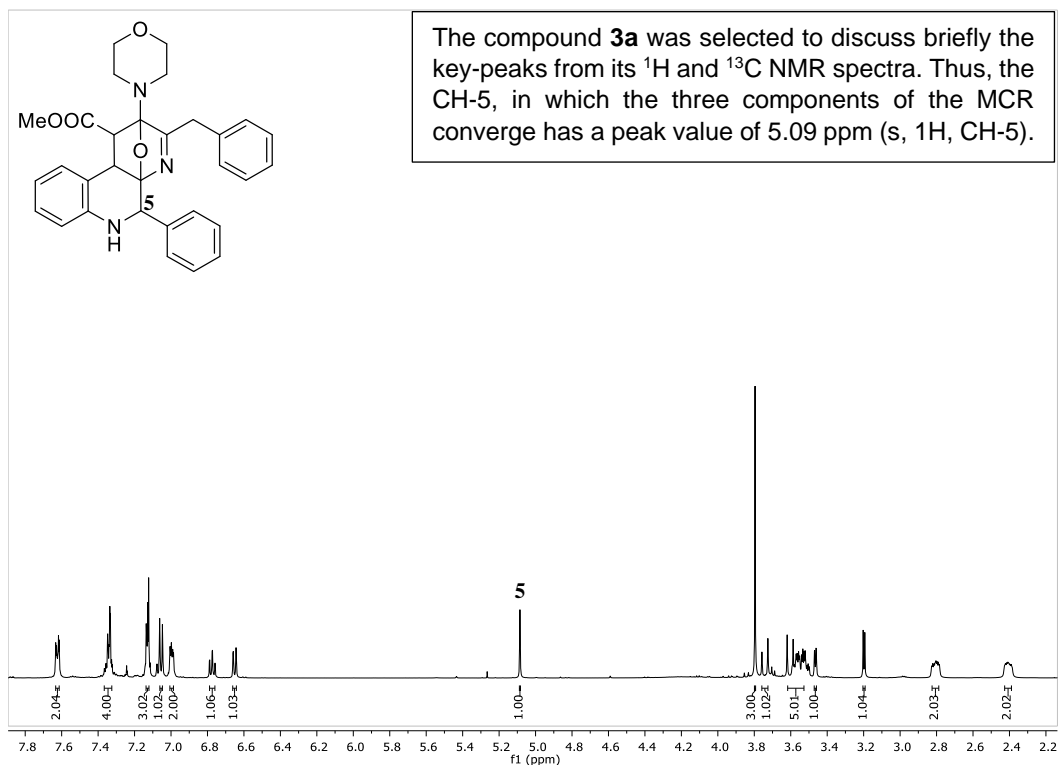


Figure S1. ^1H NMR spectrum of the product **3a**

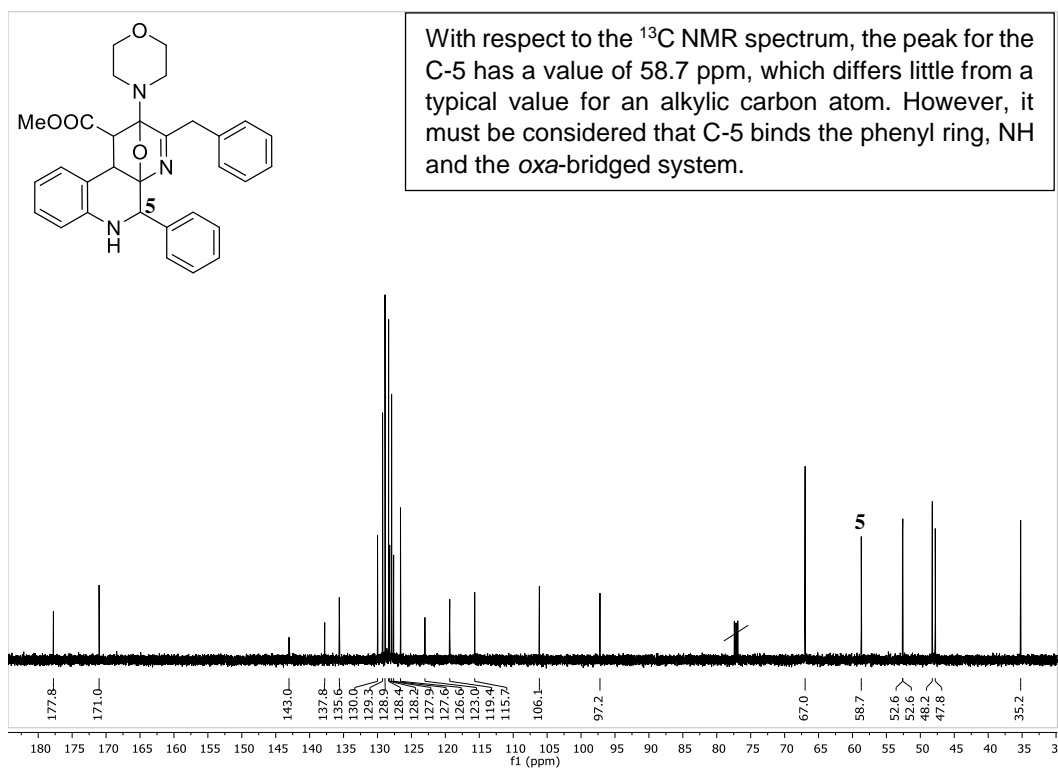


Figure S2. ^{13}C NMR spectrum of the product **3a**

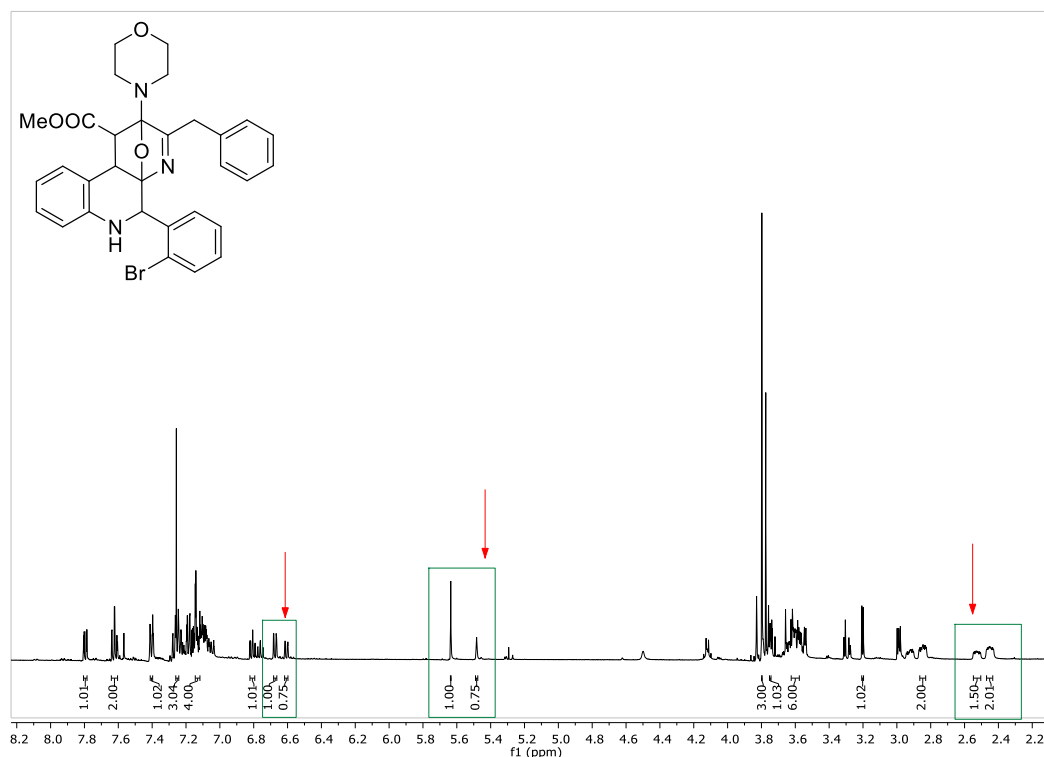


Figure S3. ^1H NMR spectrum of the product **3b** (mixture of inseparable diastereoisomers $r = 4:3$)

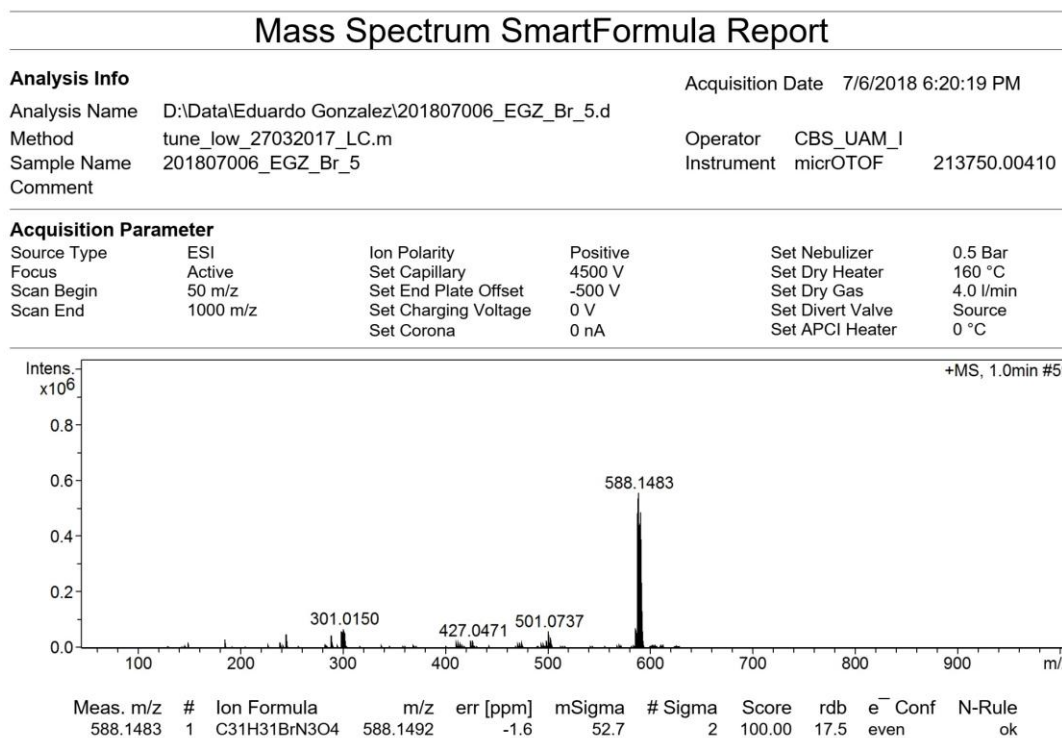


Figure S4. HRMS spectrum of the product **3b**

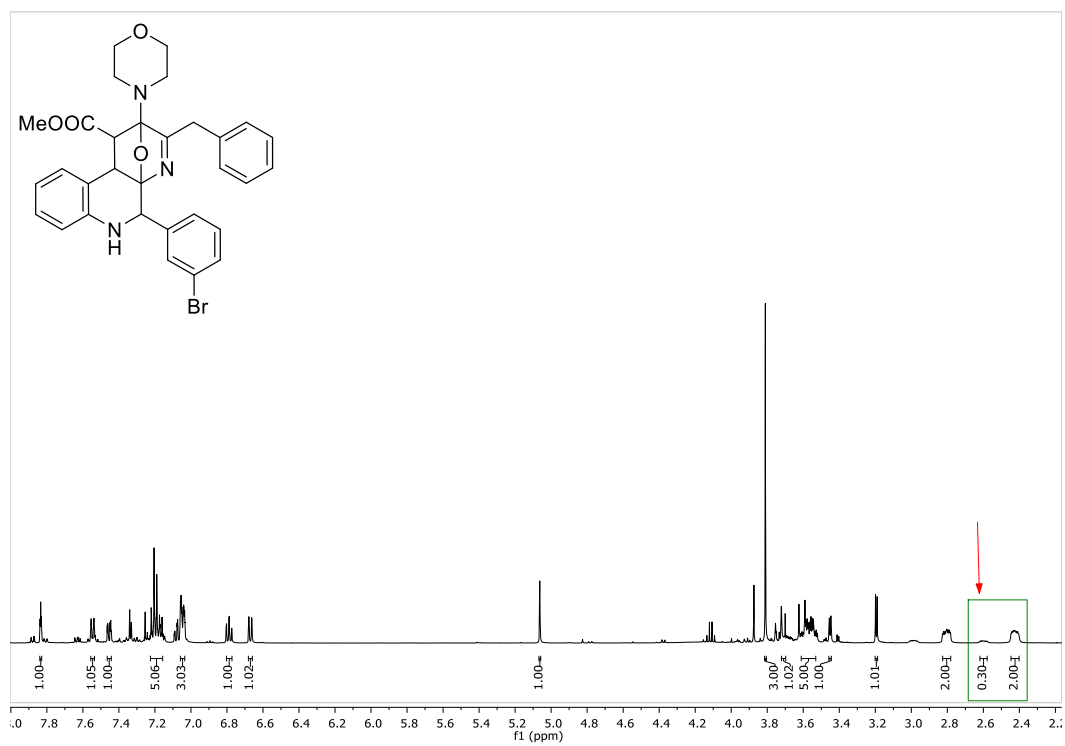


Figure S5. ^1H NMR spectrum of the product **3c** (mixture of inseparable diastereoisomers $r = 20:3$)

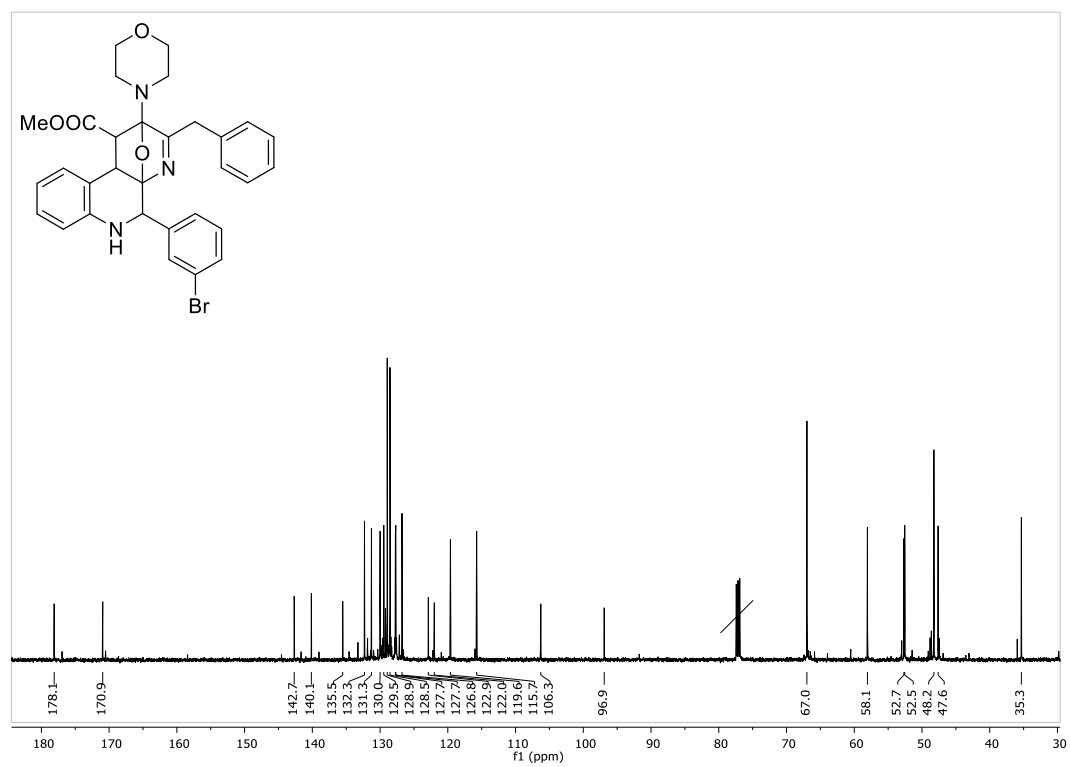


Figure S6. ^{13}C NMR spectrum of the product **3c**

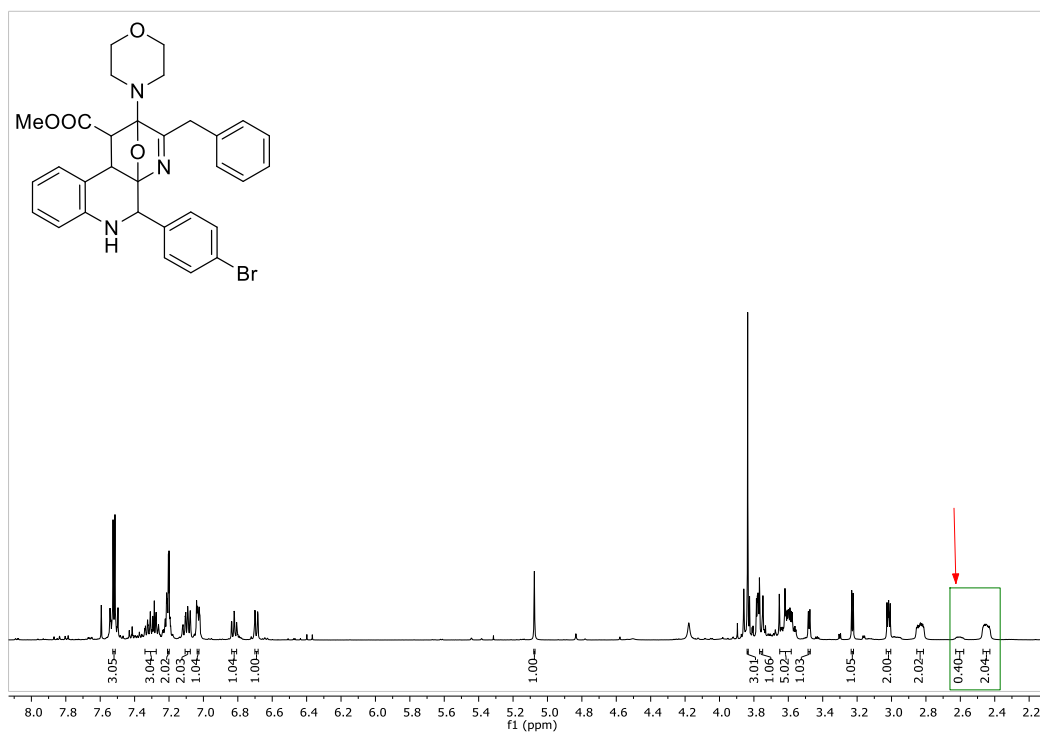


Figure S7. ^1H NMR spectrum of the product **3d** (mixture of inseparable diastereoisomers $r = 5:1$)

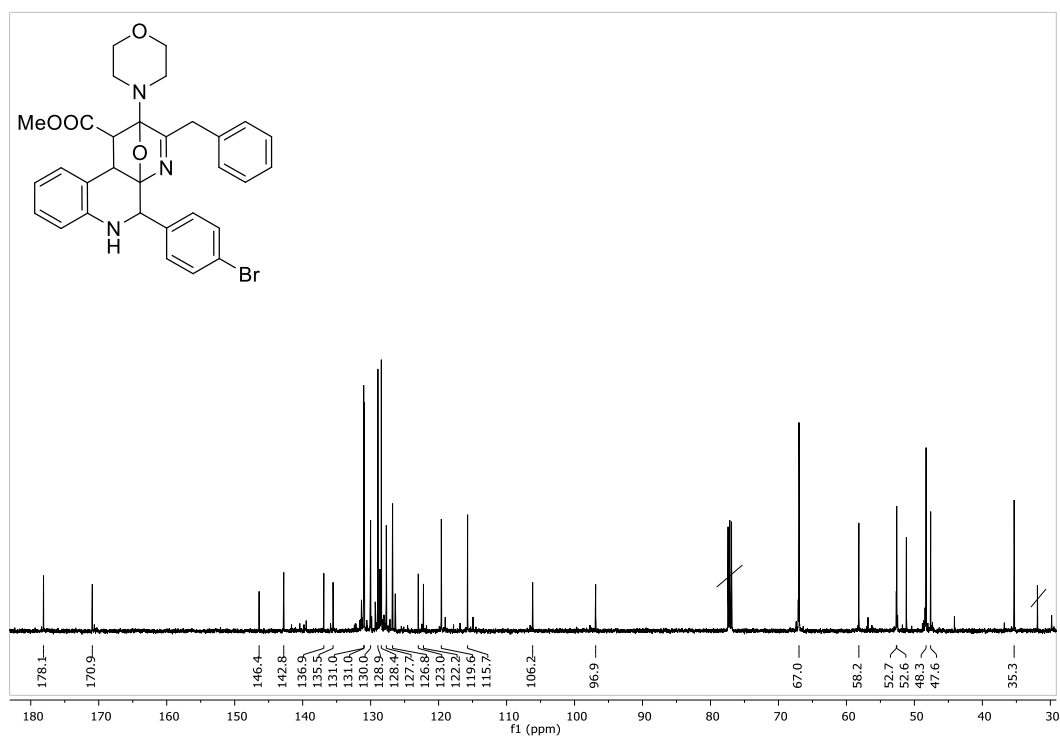


Figure S8. ^{13}C NMR spectrum of the product **3d**

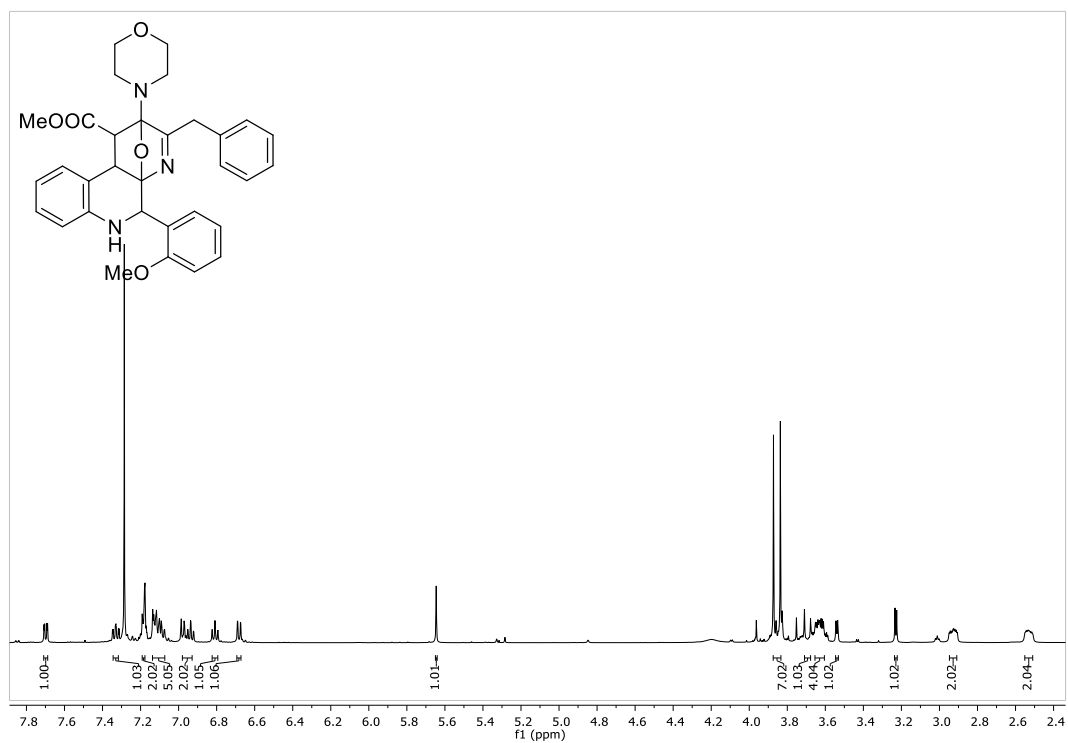


Figure S9. ^1H NMR spectrum of the product **3e**

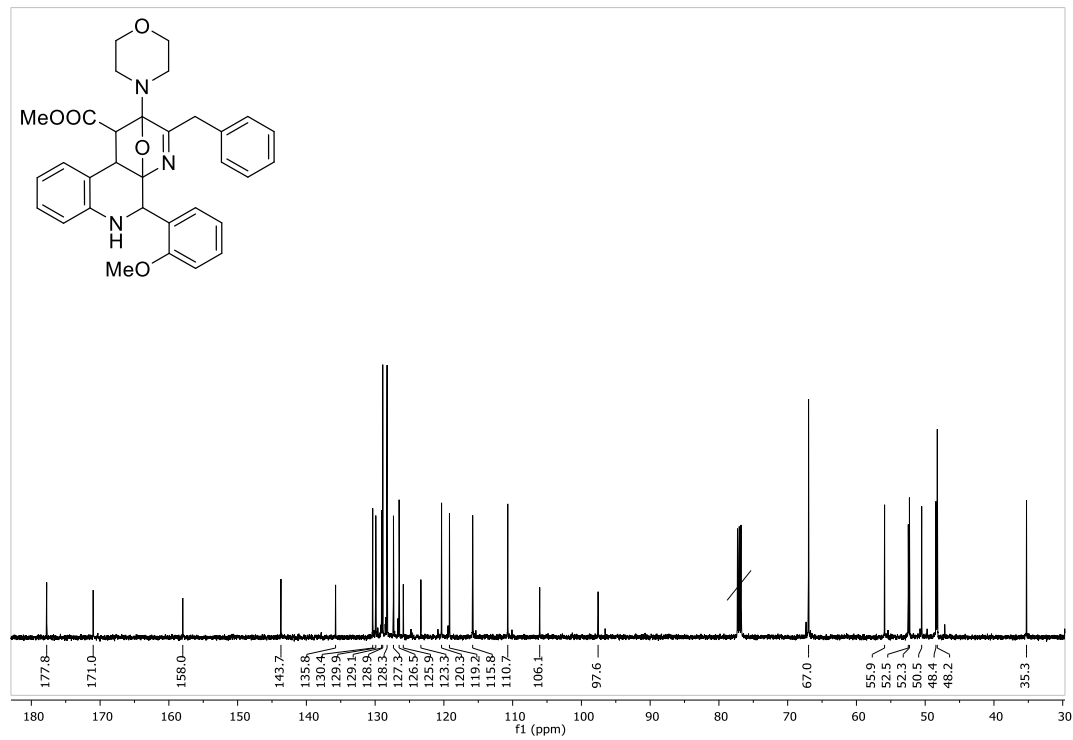


Figure S10. ^{13}C NMR spectrum of the product **3e**

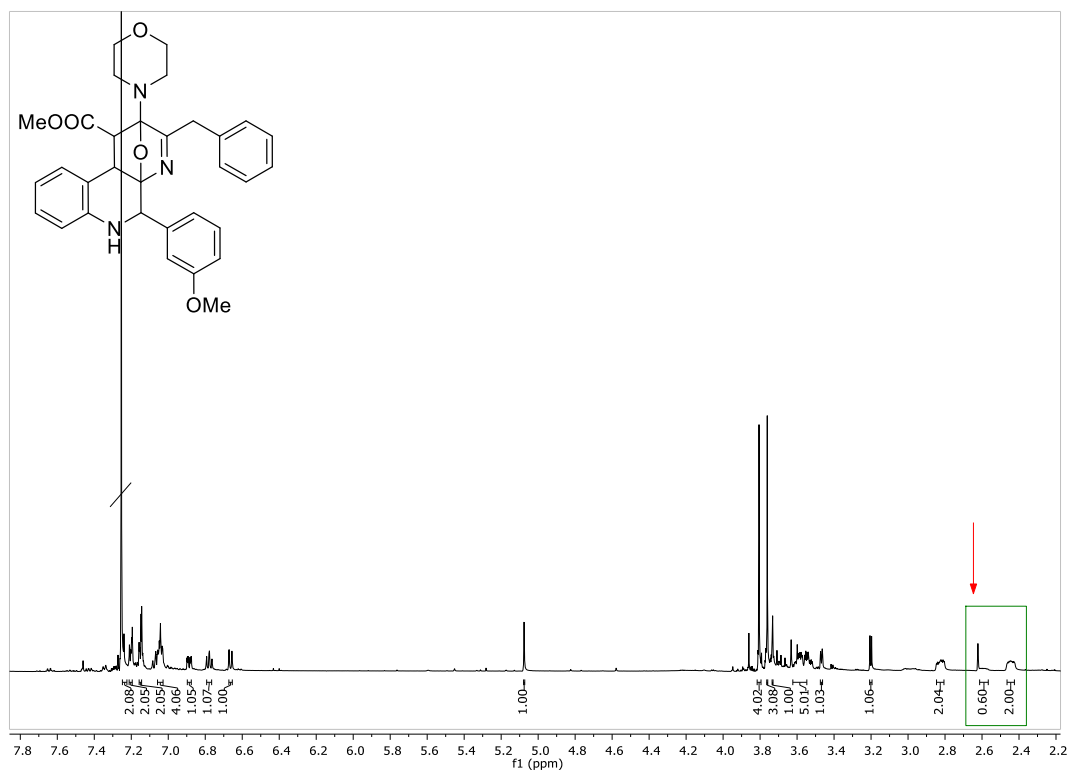


Figure S11. ^1H NMR spectrum of the product **3f** (mixture of inseparable diastereoisomers $r = 10:3$)

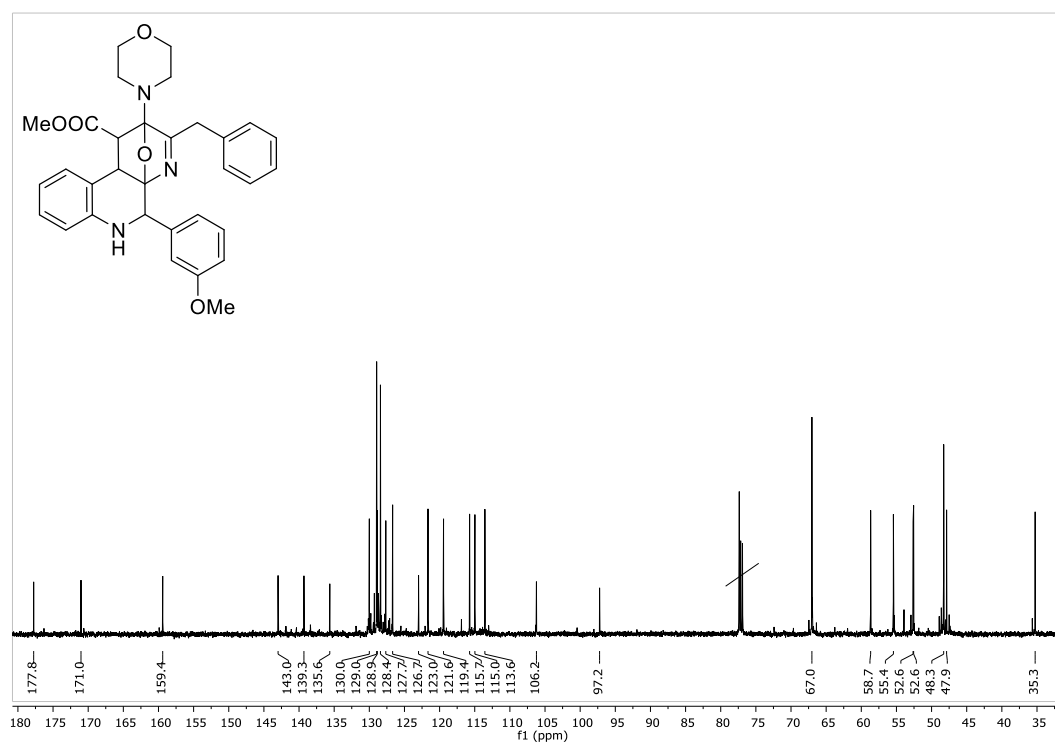


Figure S12. ^{13}C NMR spectrum of the product **3f**

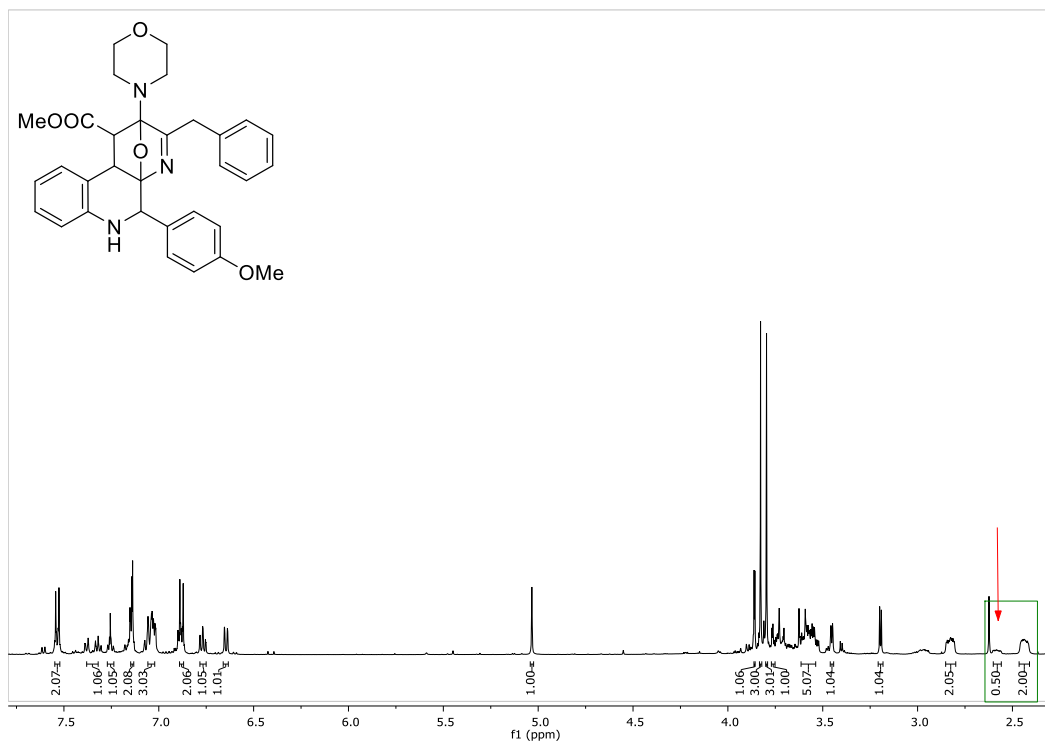


Figure S13. ^1H NMR spectrum of the product **3g** (mixture of inseparable diastereoisomers $r = 4:1$)

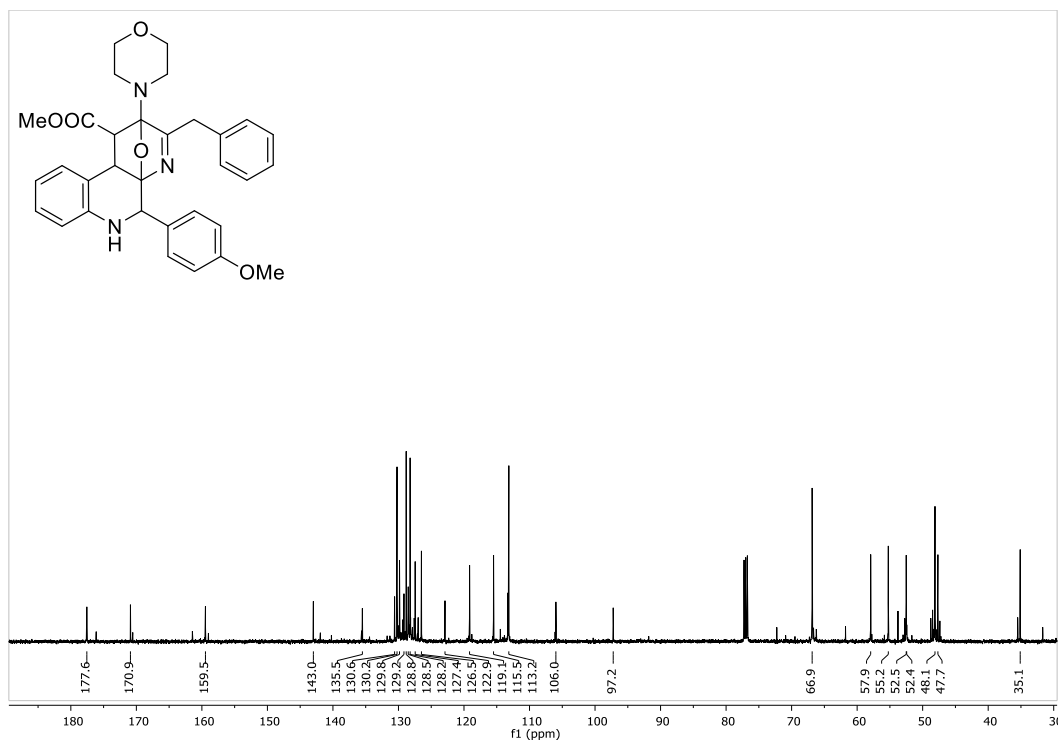


Figure S14. ^{13}C NMR spectrum of the product **3g**

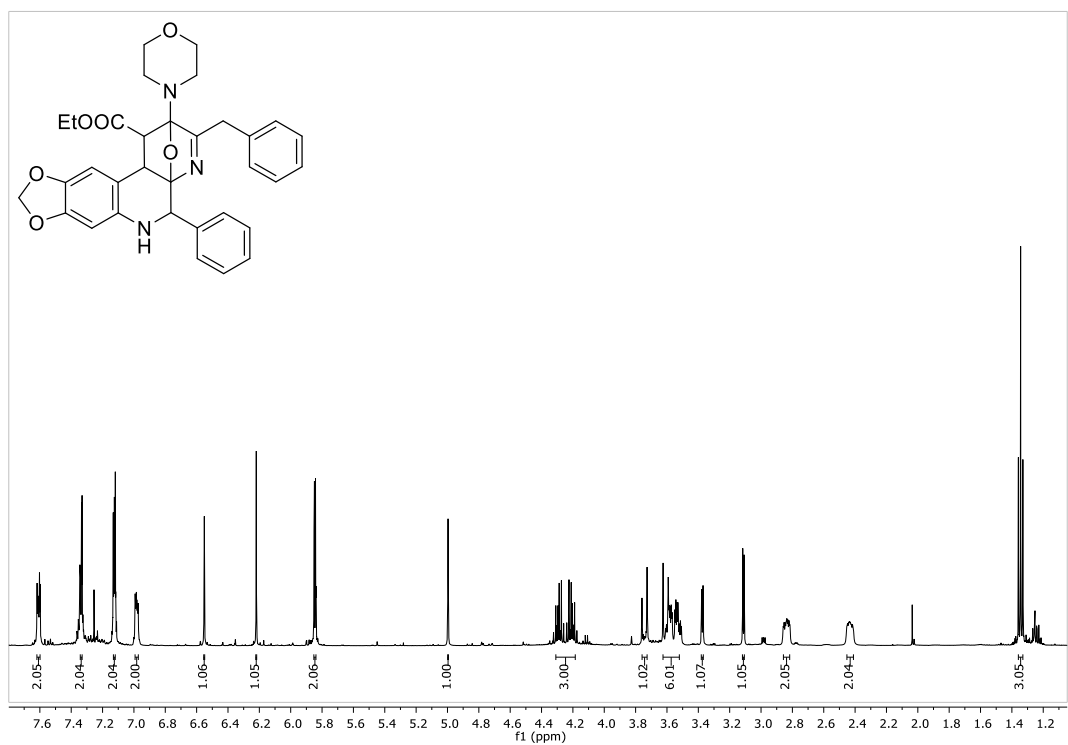


Figure S15. ^1H NMR spectrum of the product **3h**

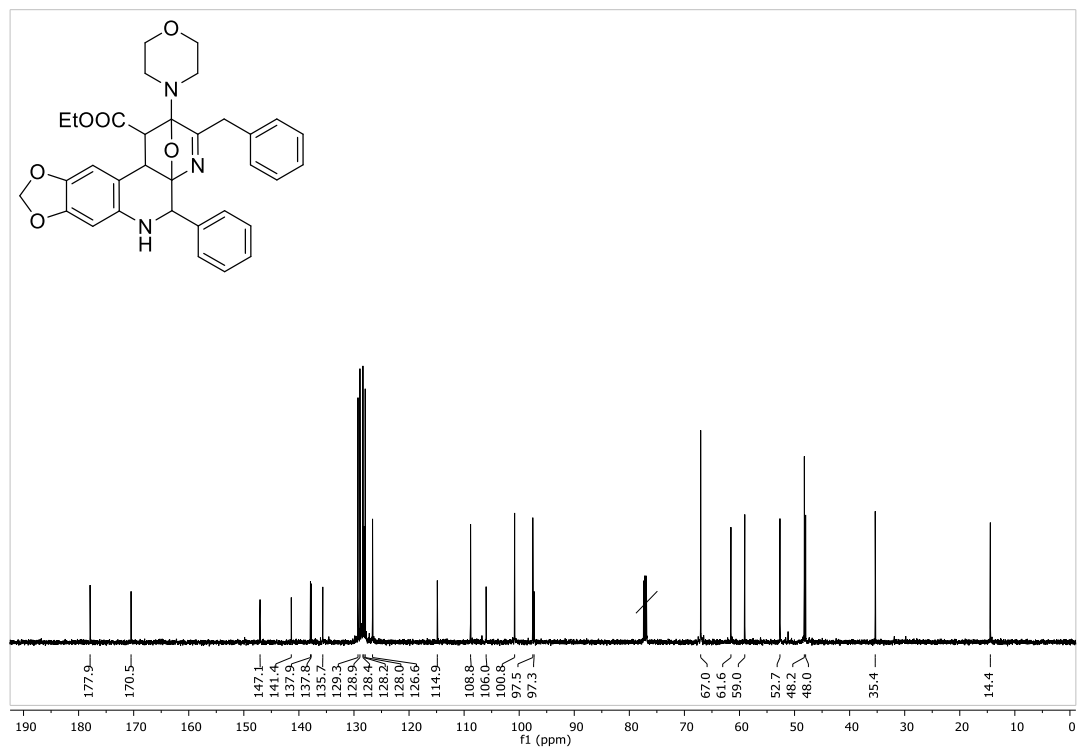


Figure S16. ^{13}C NMR spectrum of the product **3h**

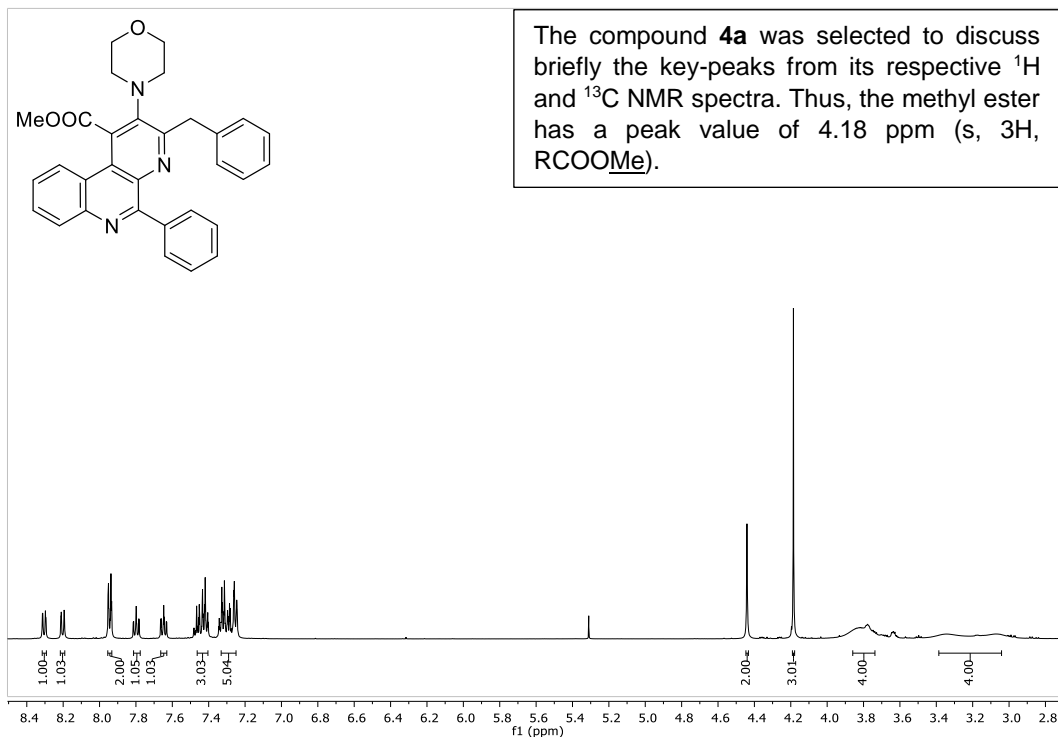


Figure S17. ^1H NMR spectrum of the product **4a**

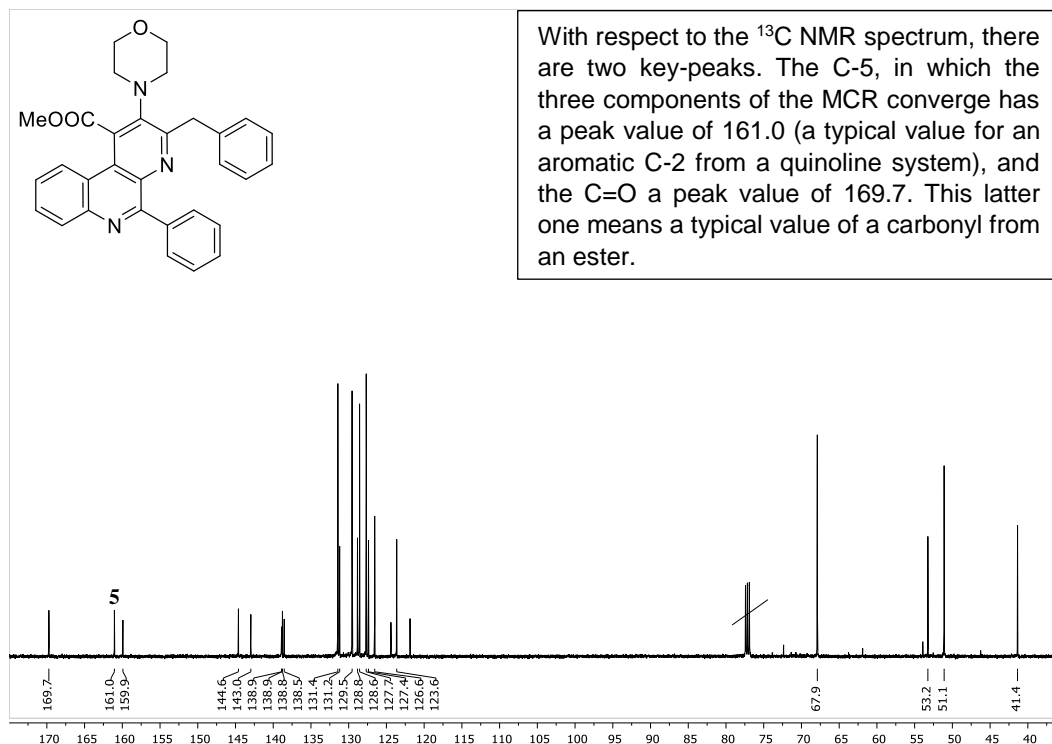


Figure S18. ^{13}C NMR spectrum of the product **4a**

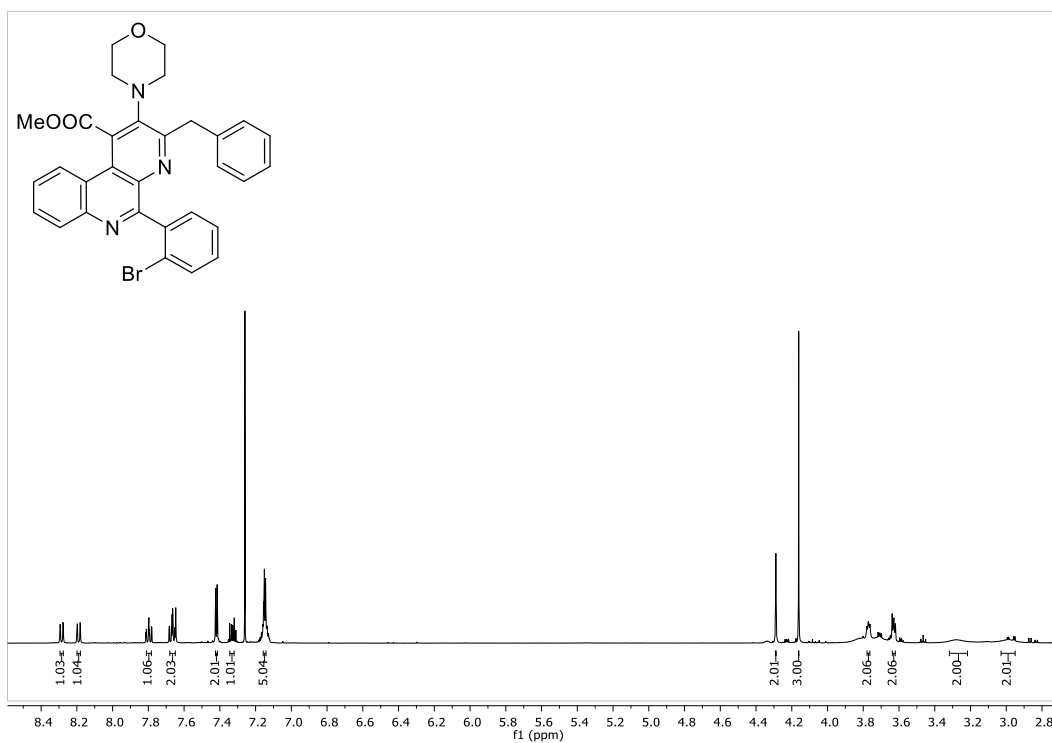


Figure S19. ^1H NMR spectrum of the product **4b**

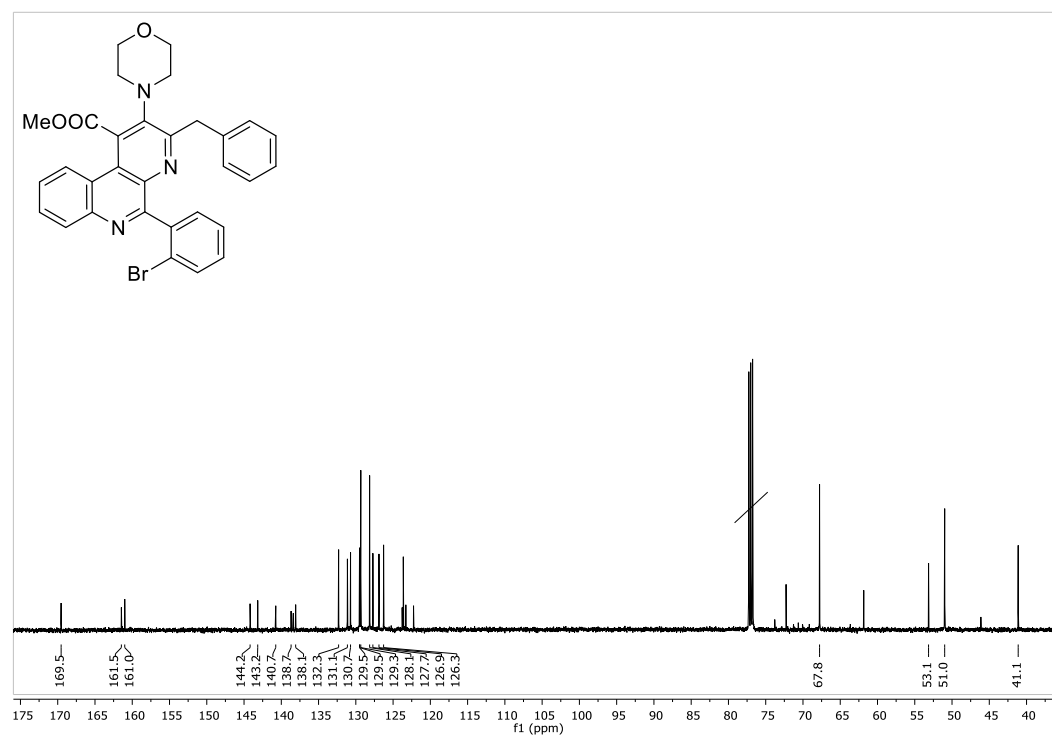


Figure S20. ^{13}C NMR spectrum of the product **4b**

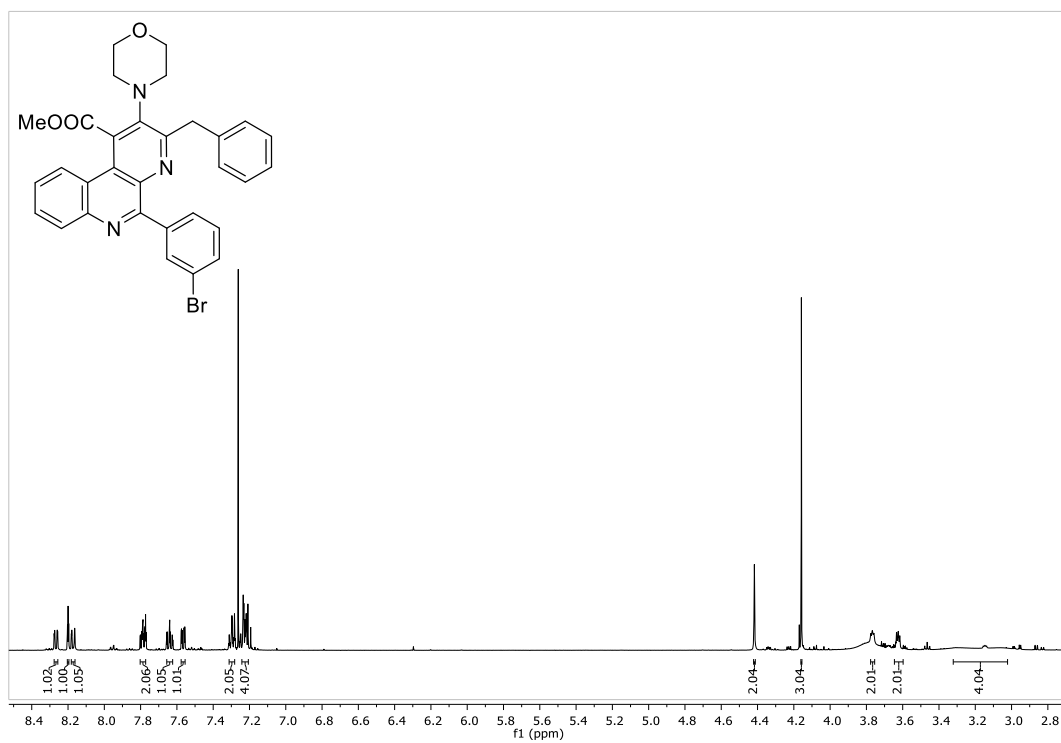


Figure S21. ^1H NMR spectrum of the product **4c**

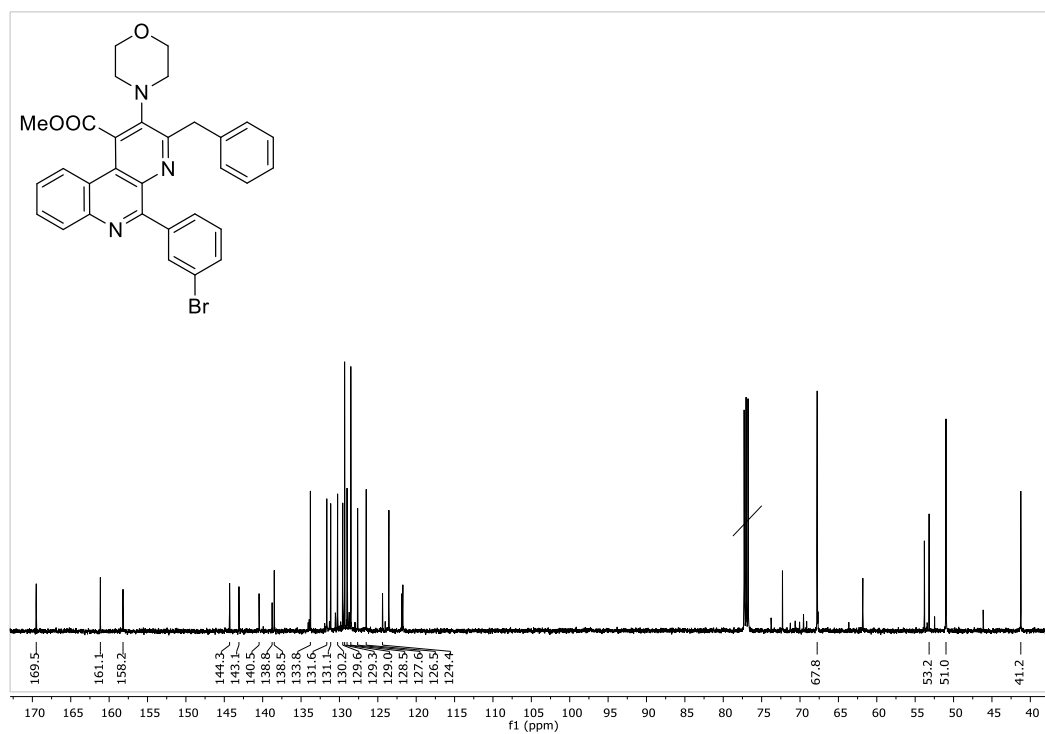


Figure S22. ^{13}C NMR spectrum of the product **4c**

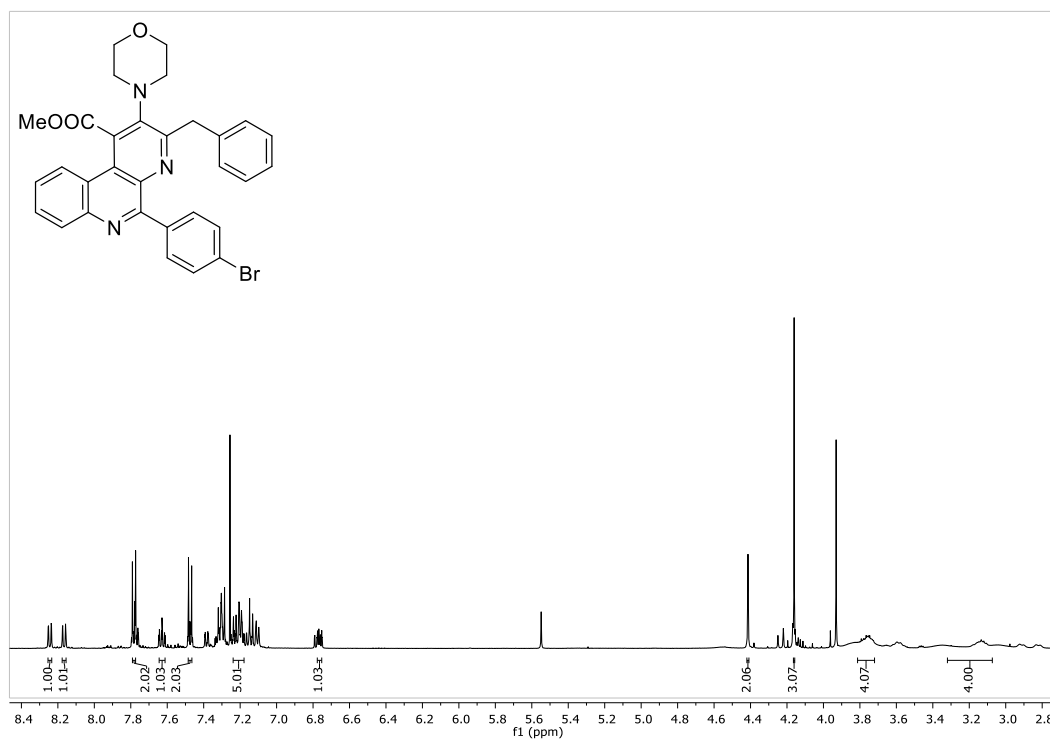


Figure S23. ^1H NMR spectrum of the product **4d**

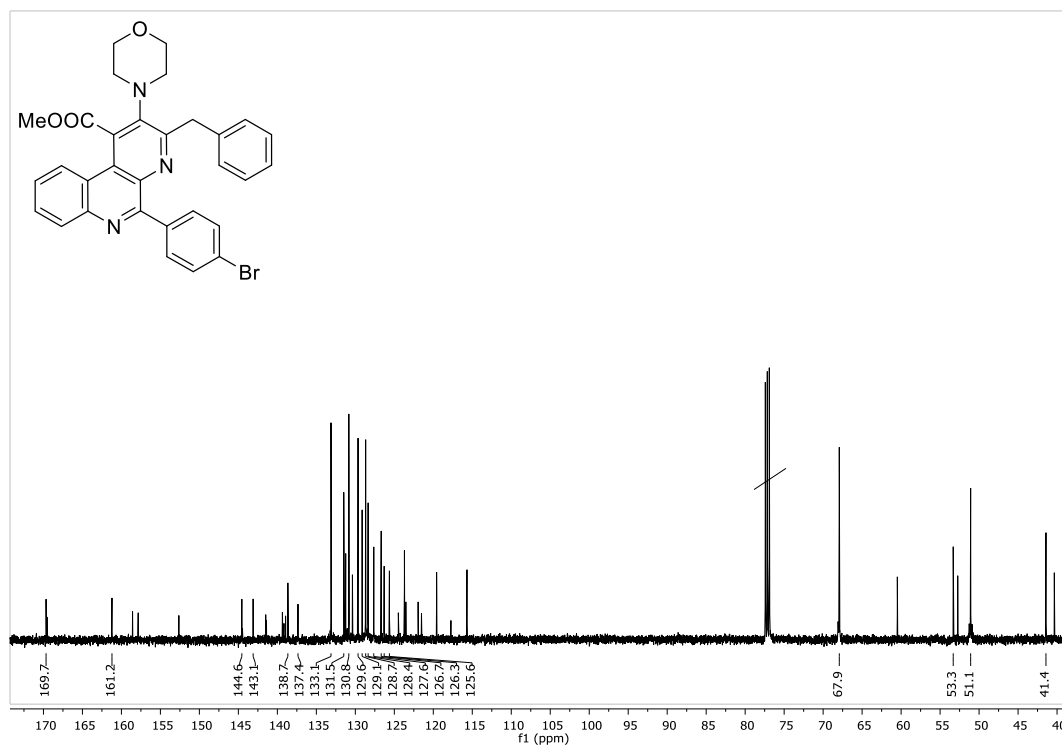


Figure S24. ^{13}C NMR spectrum of the product **4d**

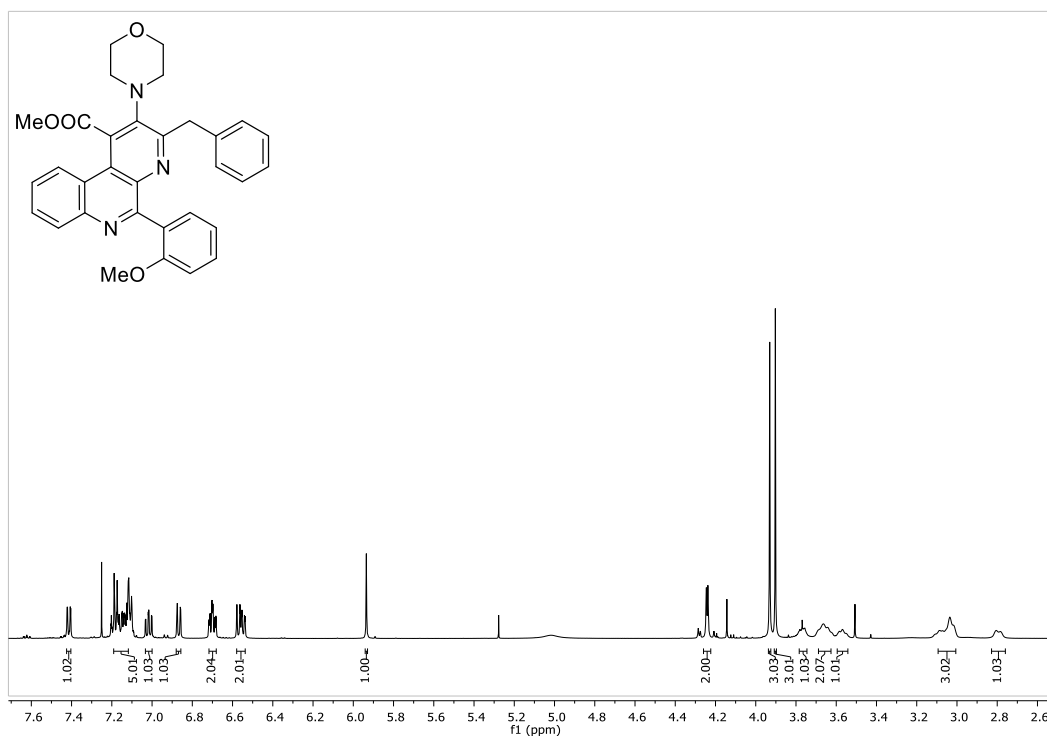


Figure S25. ^1H NMR spectrum of the product **4e**

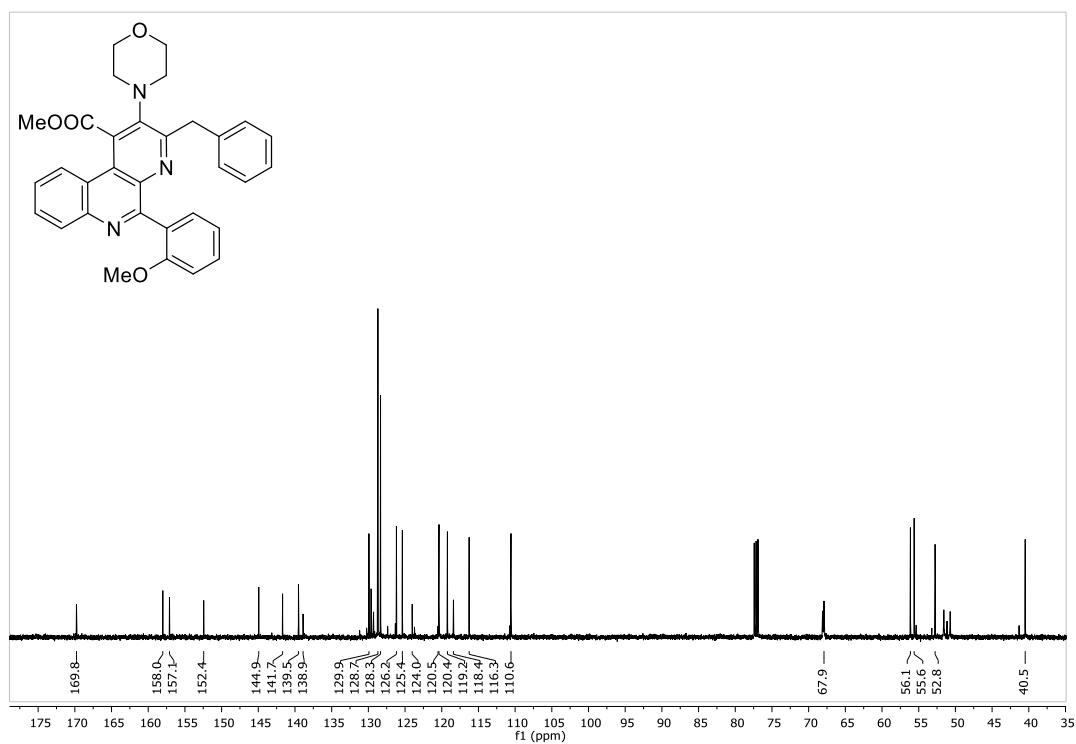


Figure S26. ^{13}C NMR spectrum of the product **4e**

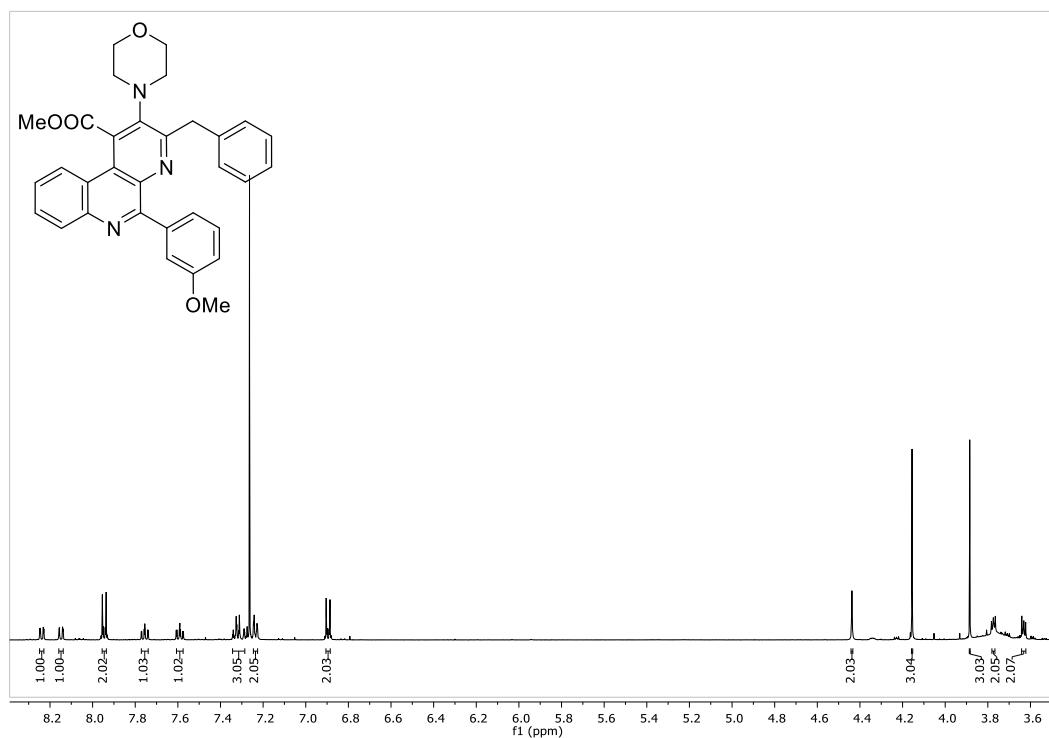


Figure S27. ^1H NMR spectrum of the product **4f**

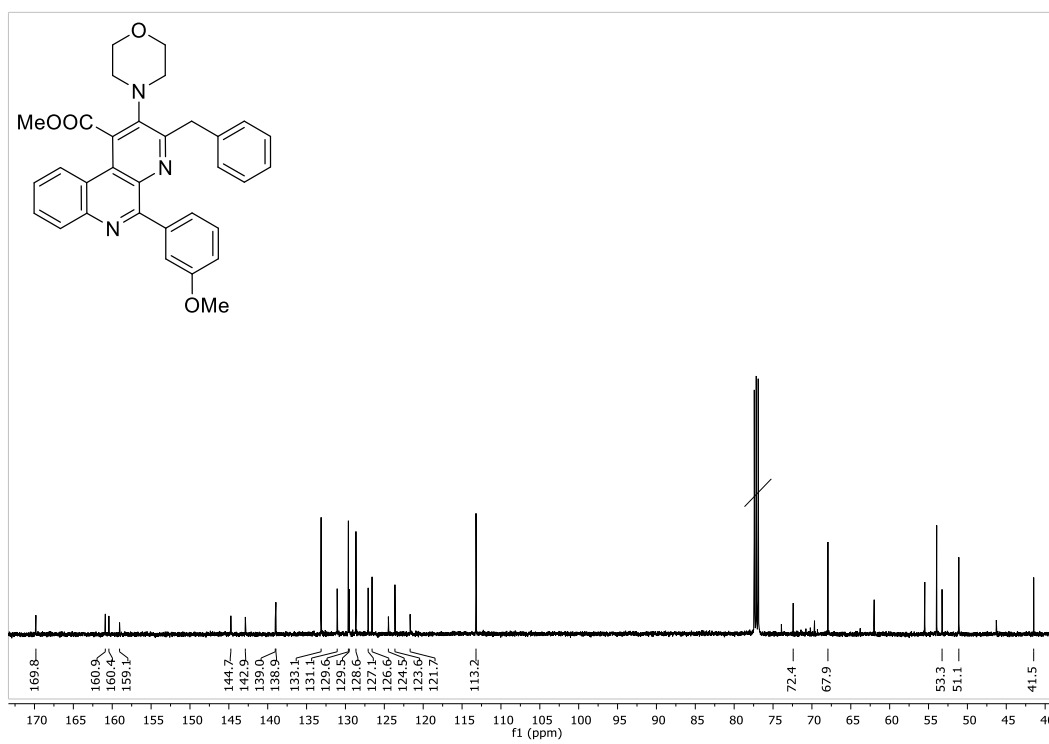


Figure S28. ^{13}C NMR spectrum of the product **4f**

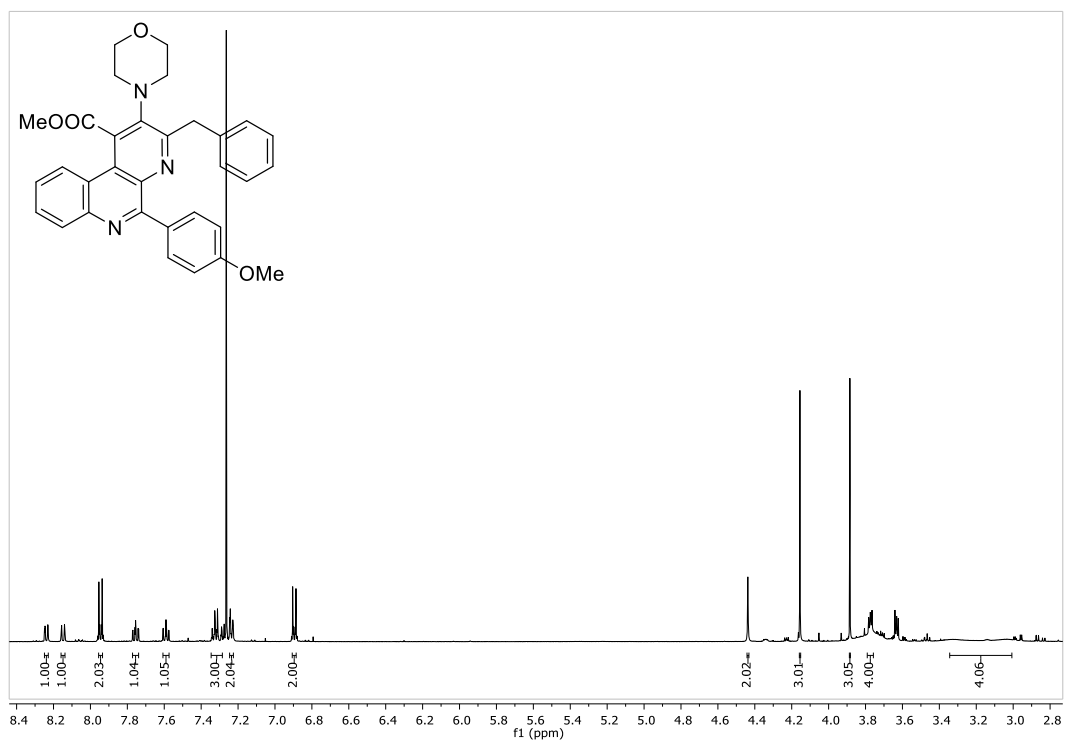


Figure S29. ^1H NMR spectrum of the product **4g**

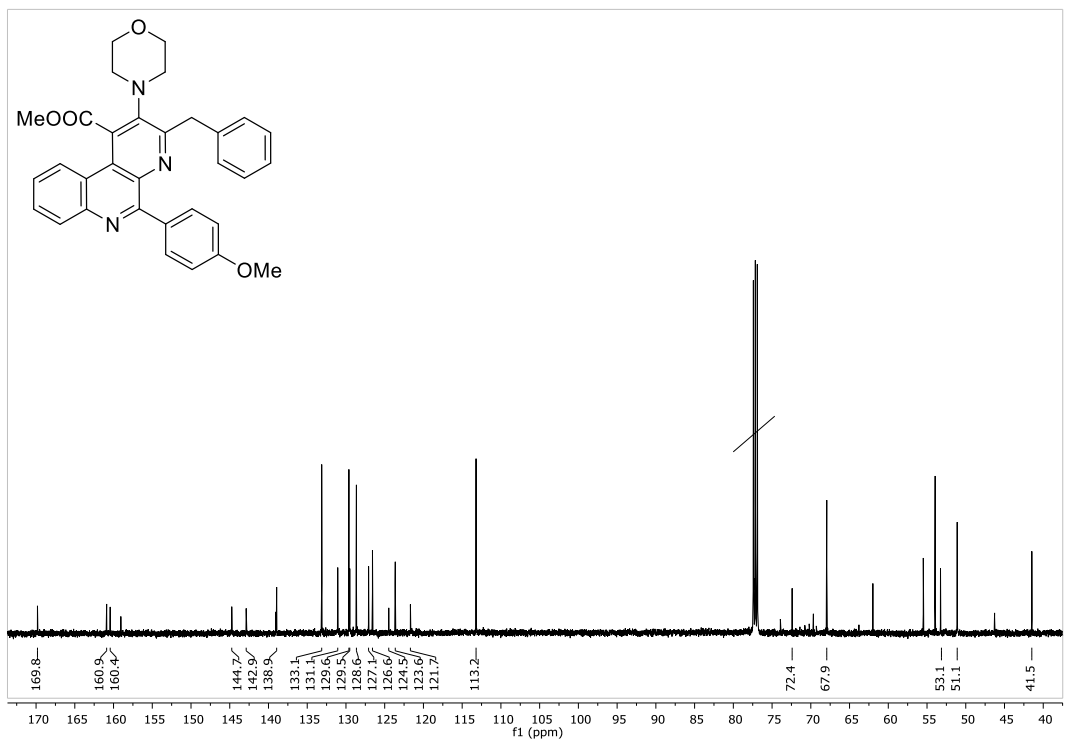


Figure S30. ^{13}C NMR spectrum of the product **4g**

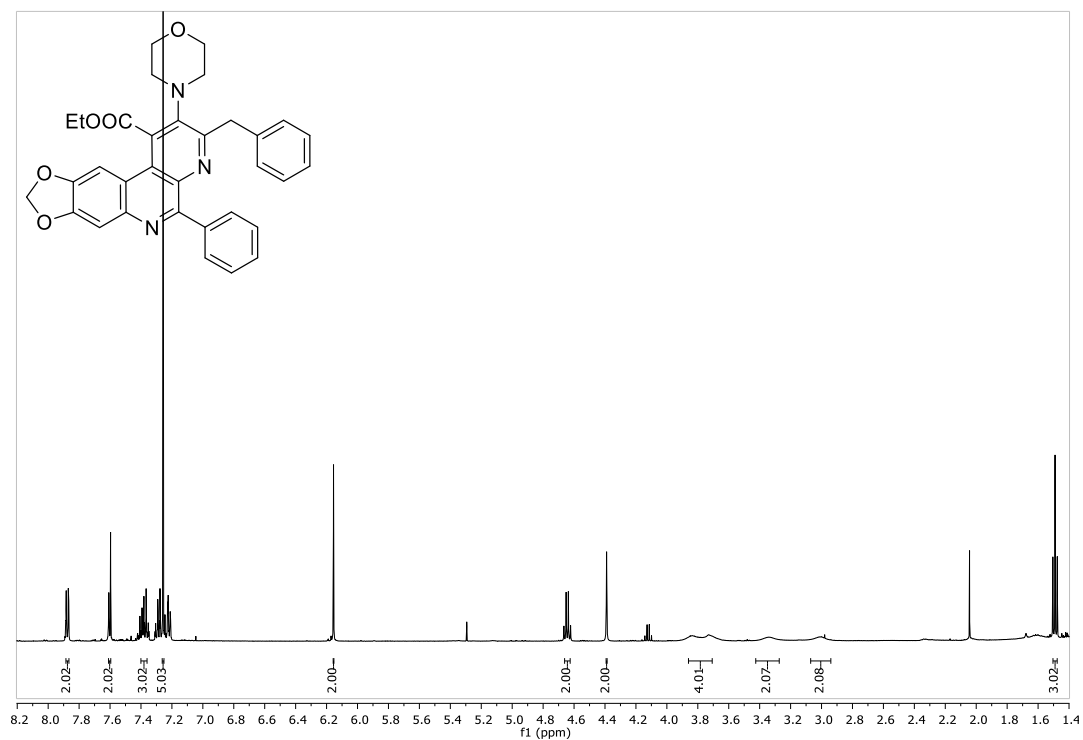


Figure S31. ^1H NMR spectrum of the product **4h**

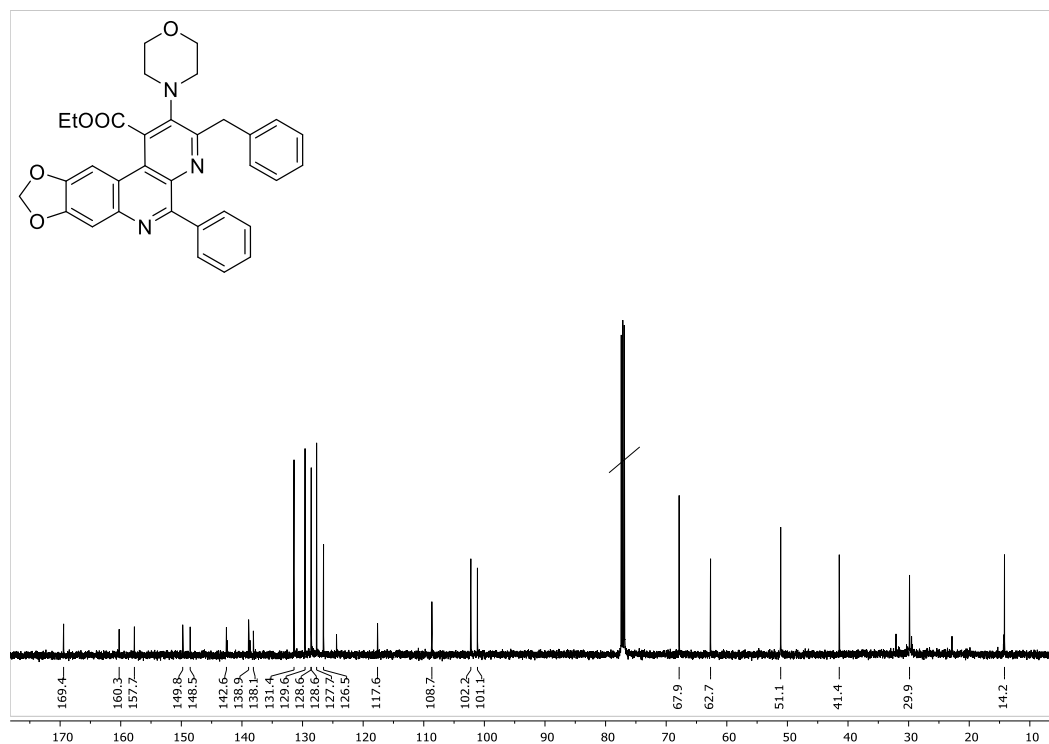


Figure S32. ^{13}C NMR spectrum of the product **4h**

2D-NMR spectra for the products **3a**, **3c–h**

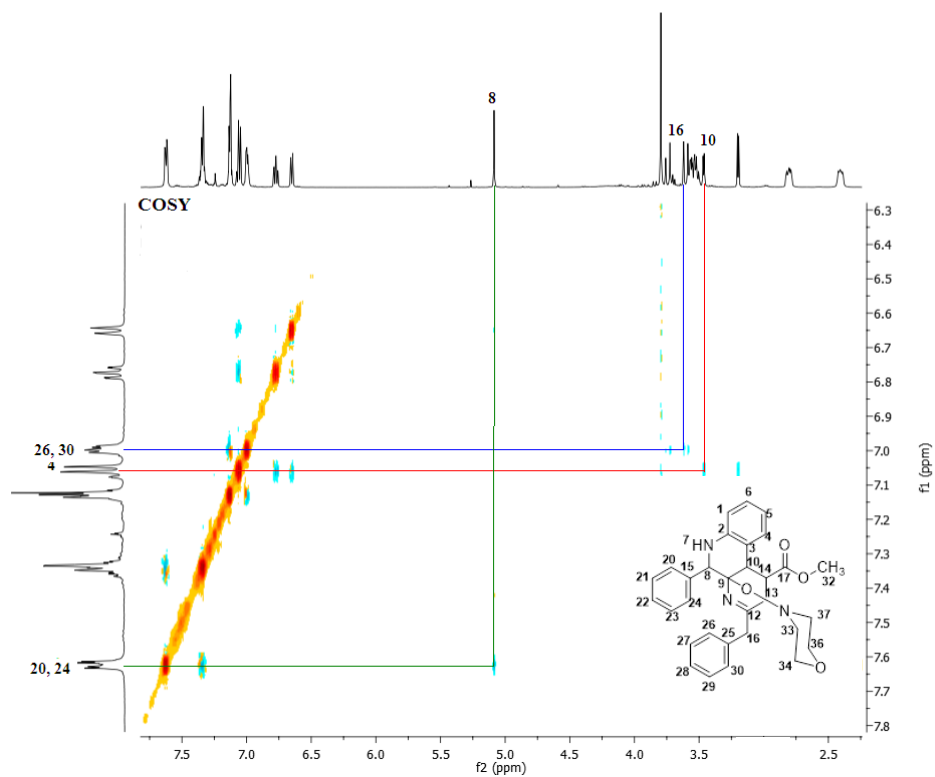


Figure S33. COSY spectrum of the product **3a**

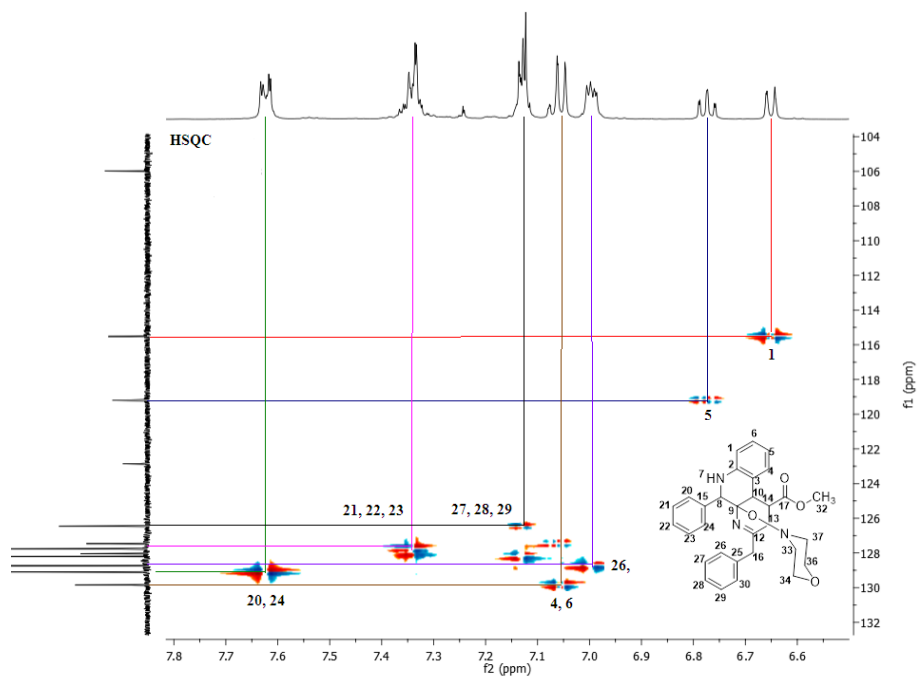


Figure S34. HSQC spectrum of the product **3a**

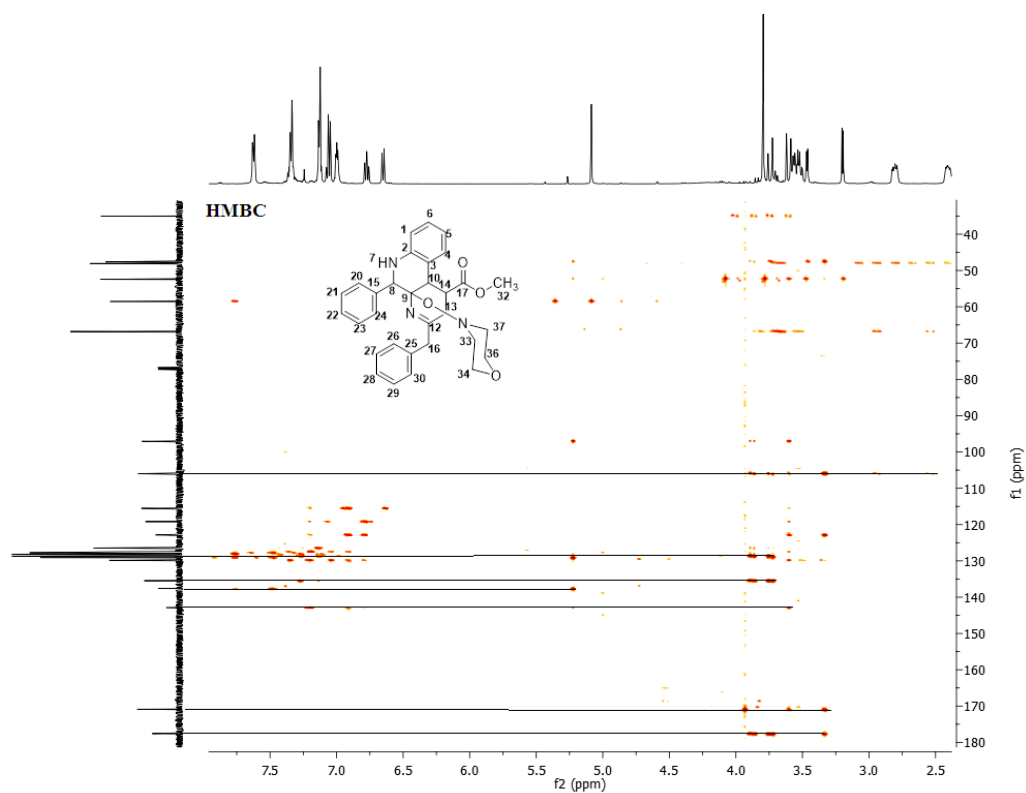


Figure S35. HMBC spectrum of the product **3a**

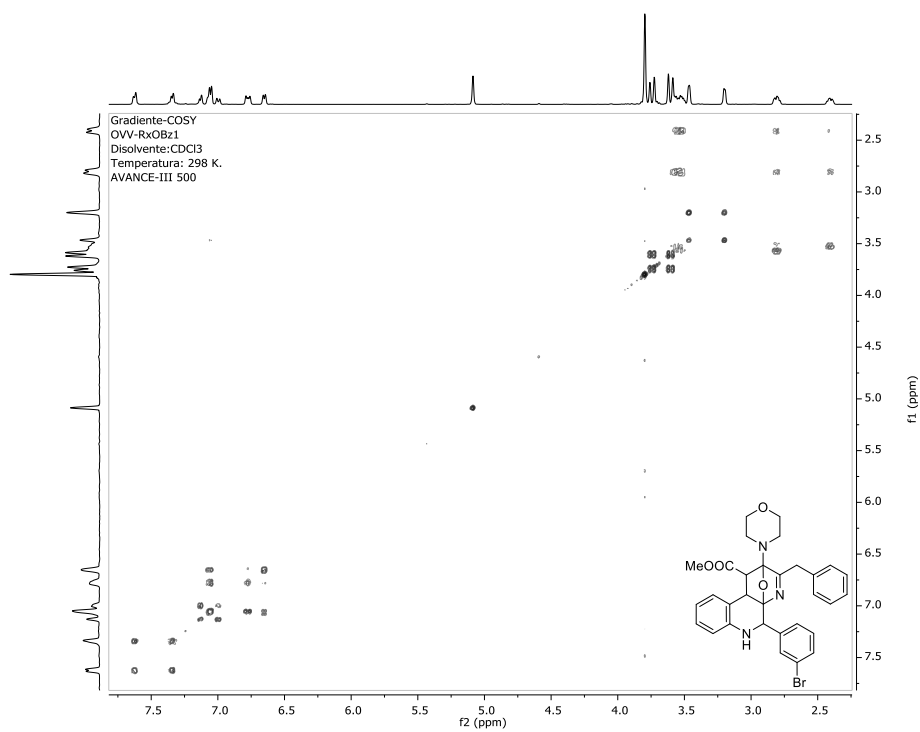


Figure S36. COSY spectrum of the product **3c**

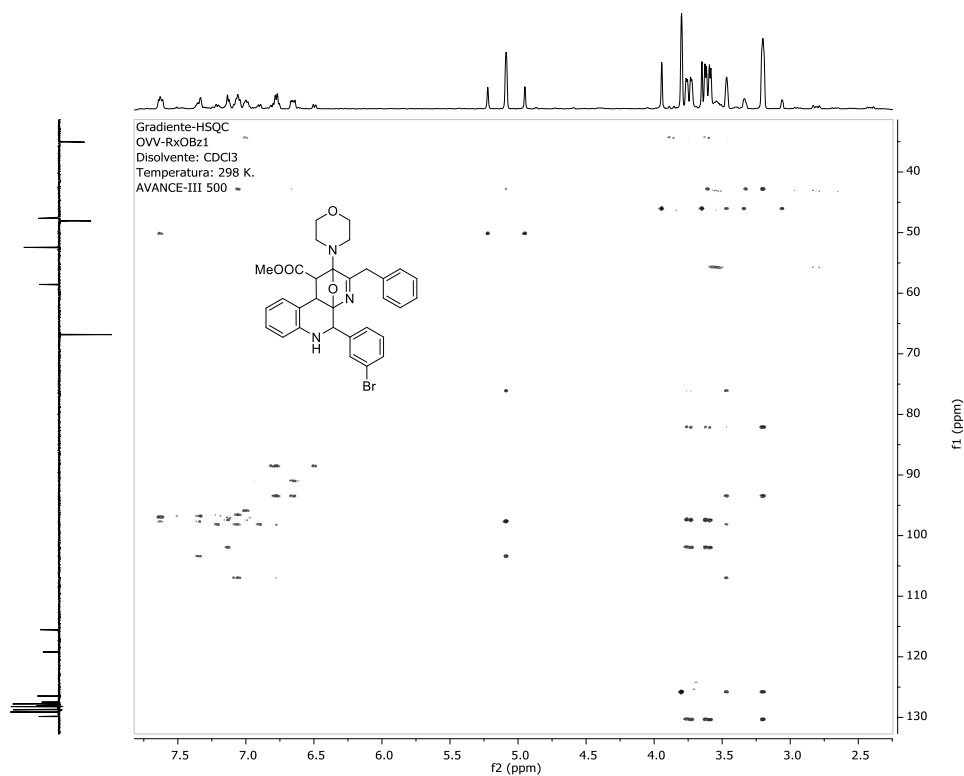


Figure S37. HSQC spectrum of the product **3c**

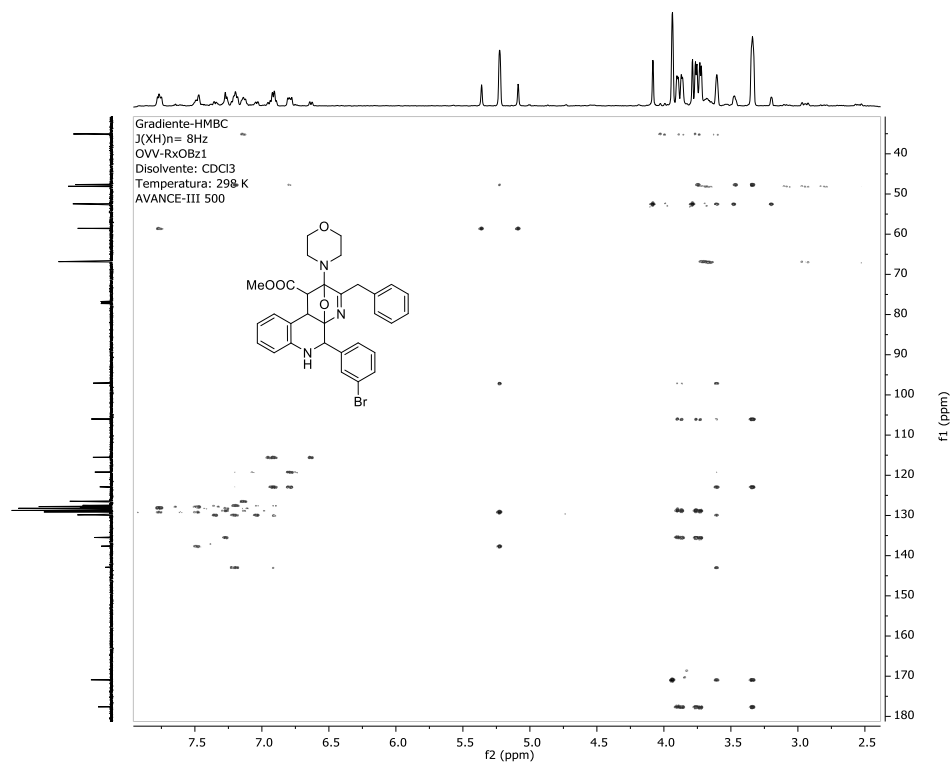


Figure S38. HMBC spectrum of the product **3c**

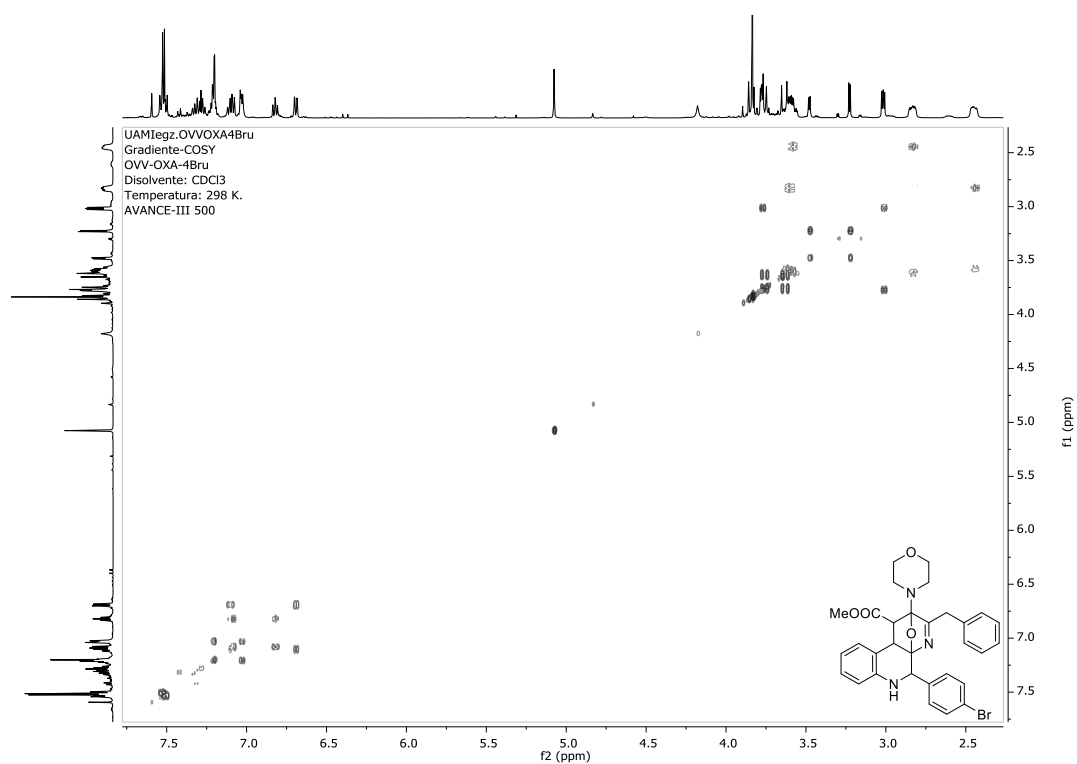


Figure S39. COSY spectrum of the product **3d**

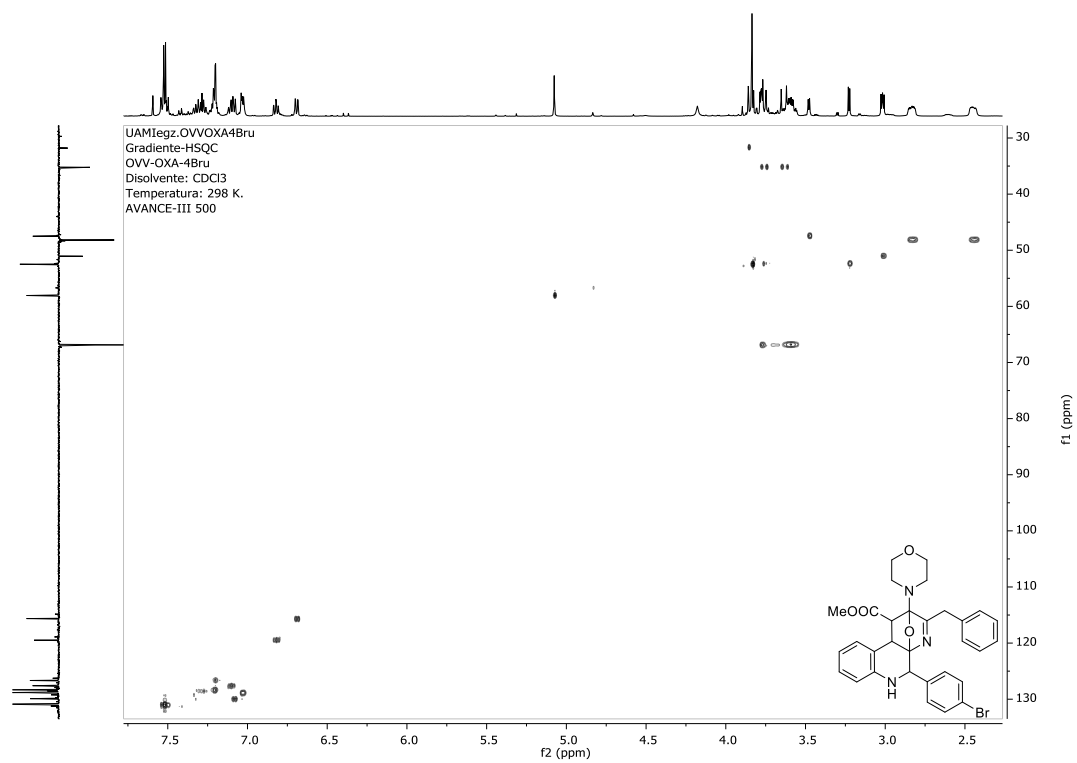


Figure S40. HSQC spectrum of the product **3d**

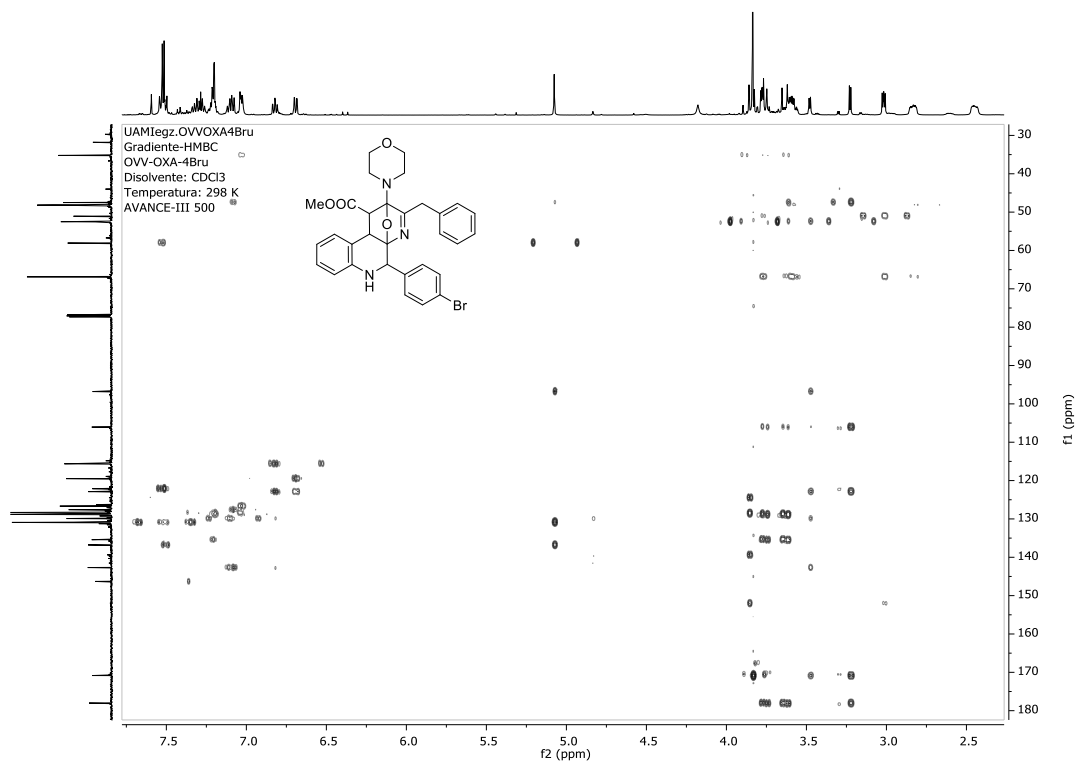


Figure S41. HMBC spectrum of the product **3d**

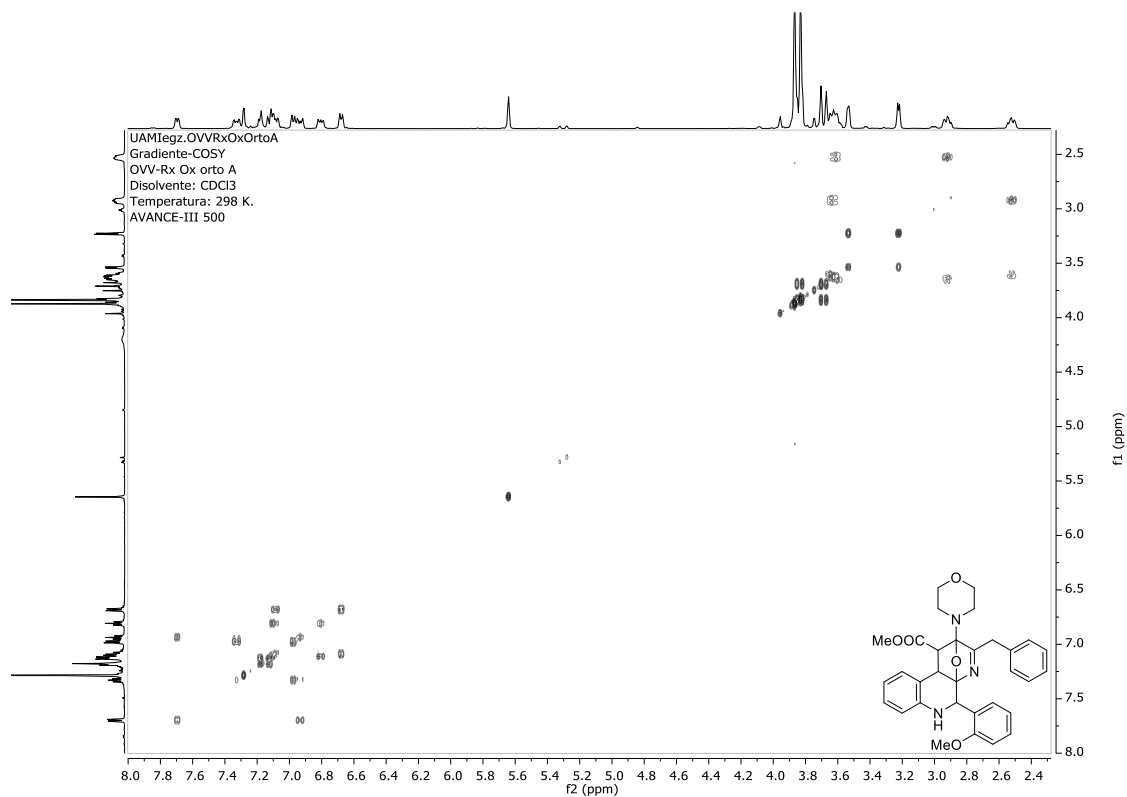


Figure S42. COSY spectrum of the product **3e**

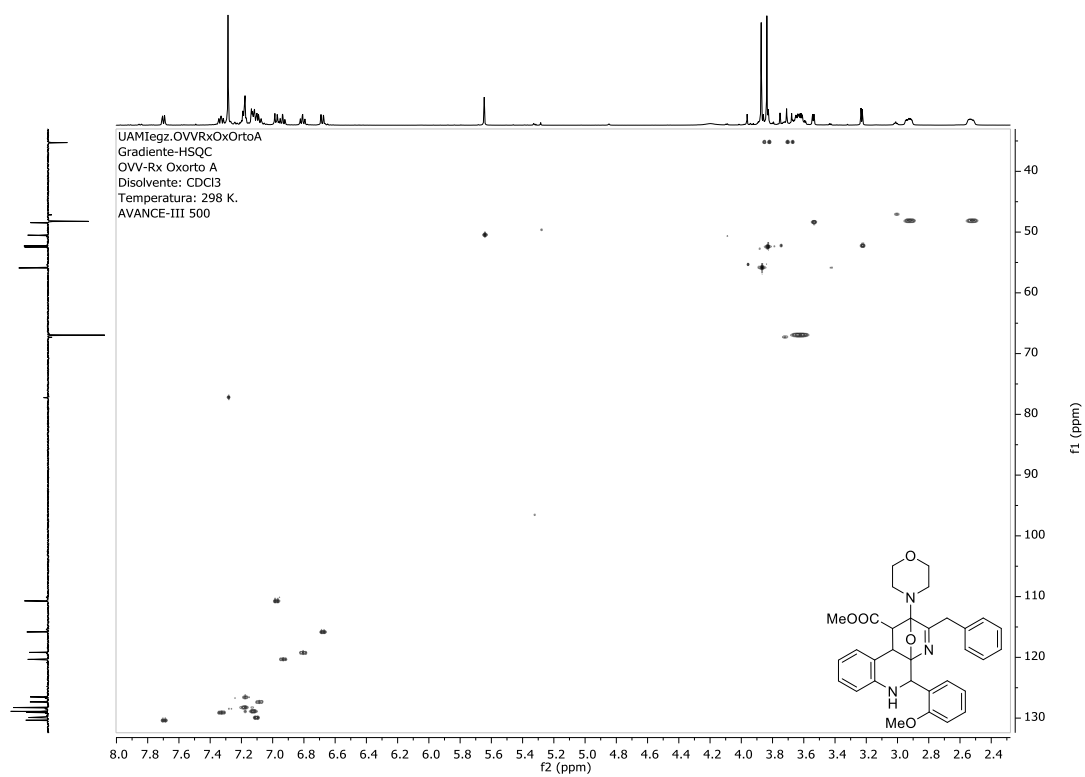


Figure S43. HSQC spectrum of the product **3e**

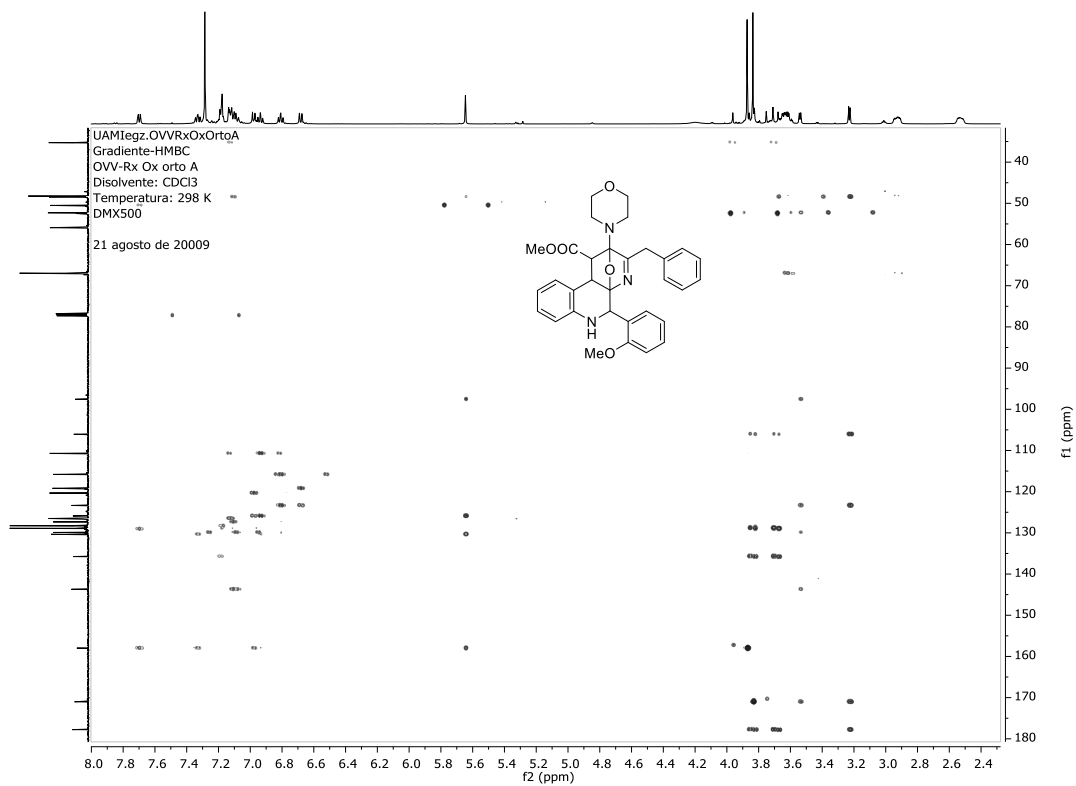


Figure S44. HMBC spectrum of the product **3e**

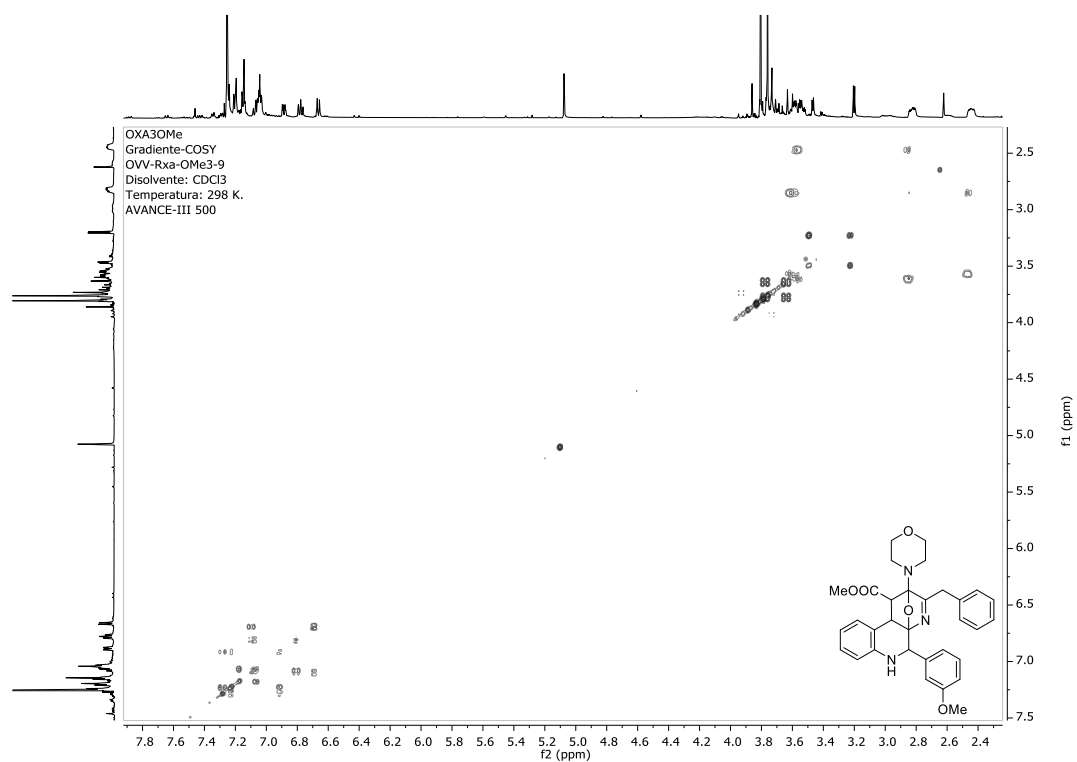


Figure S45. COSY spectrum of the product **3f**

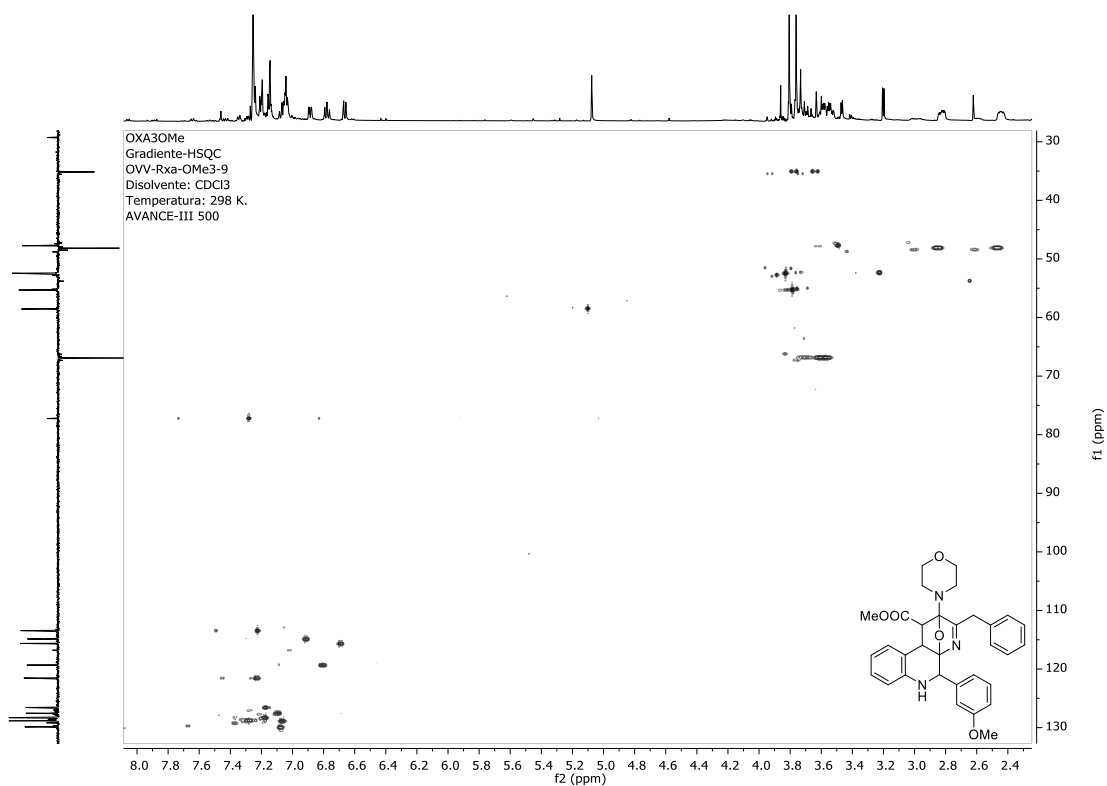


Figure S46. HSQC spectrum of the product **3f**

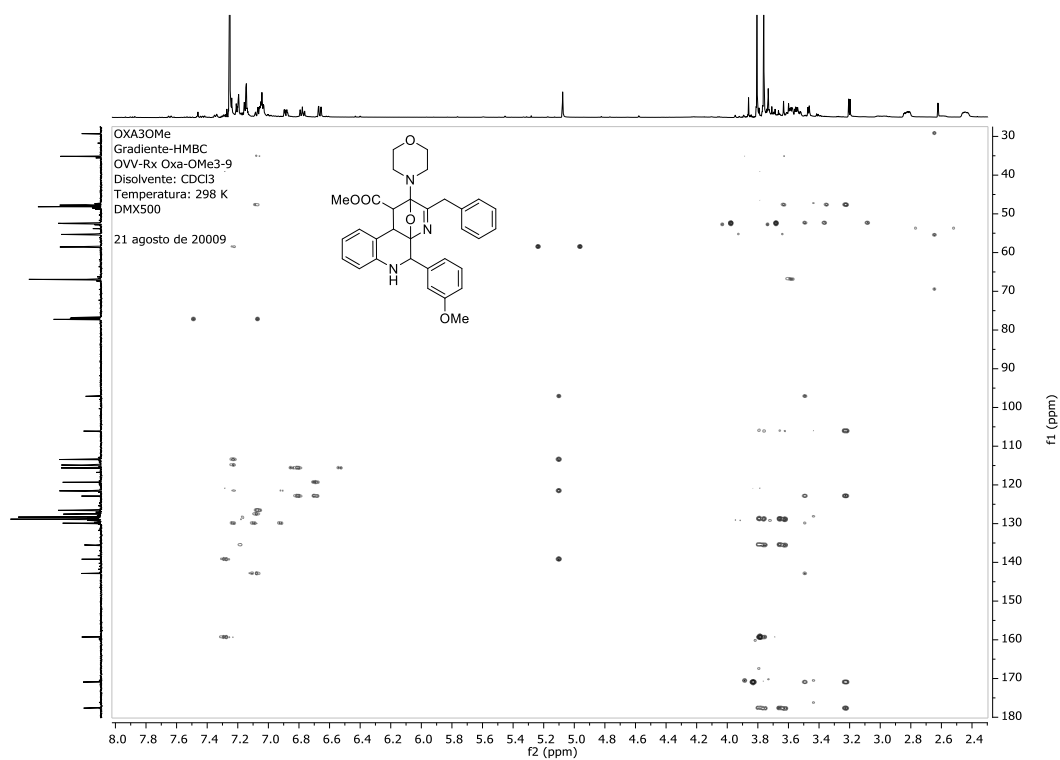


Figure S47. HMBC spectrum of the product **3f**

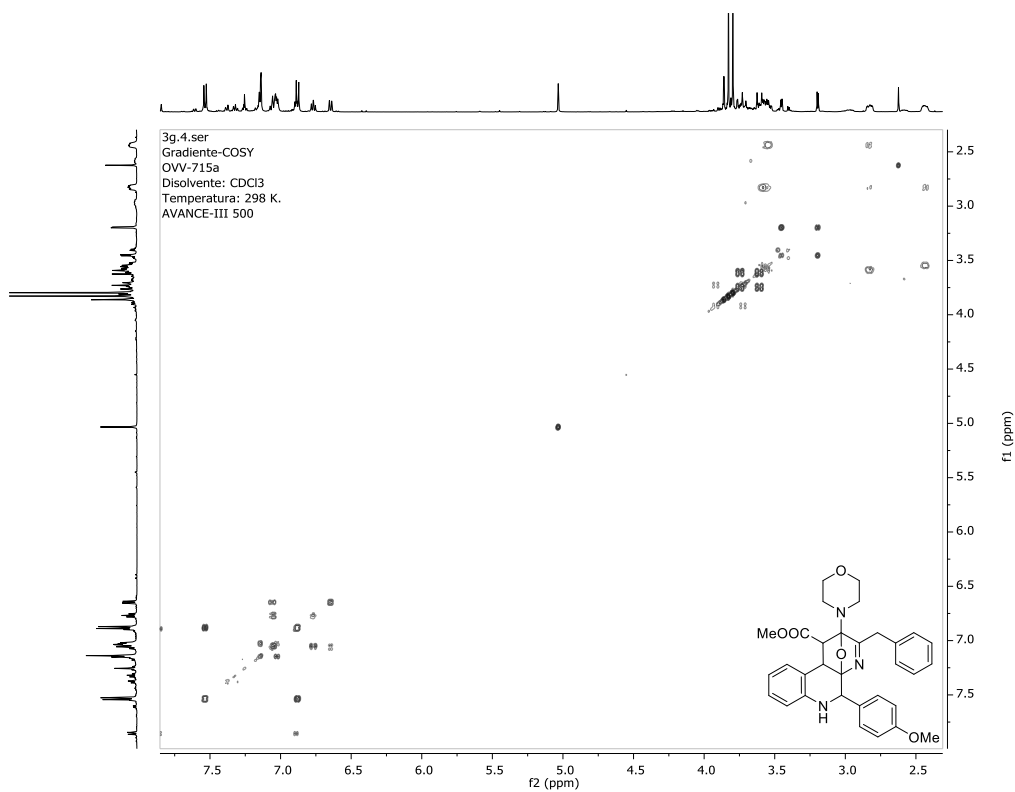


Figure S48. COSY spectrum of the product **3g**

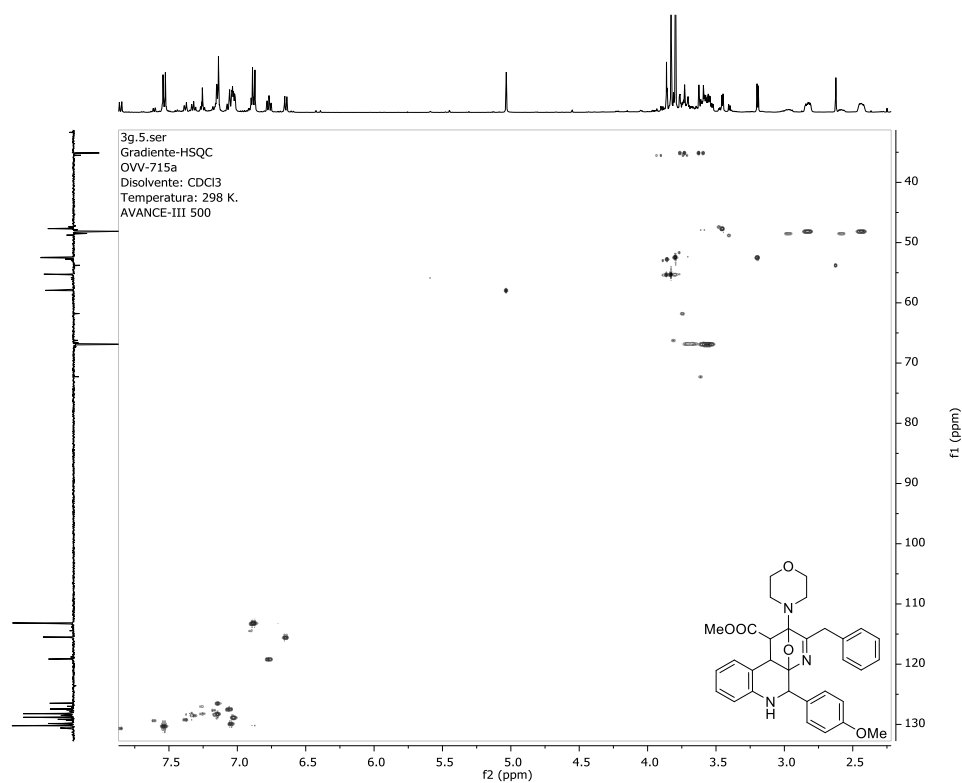


Figure S49. HSQC spectrum of the product **3g**

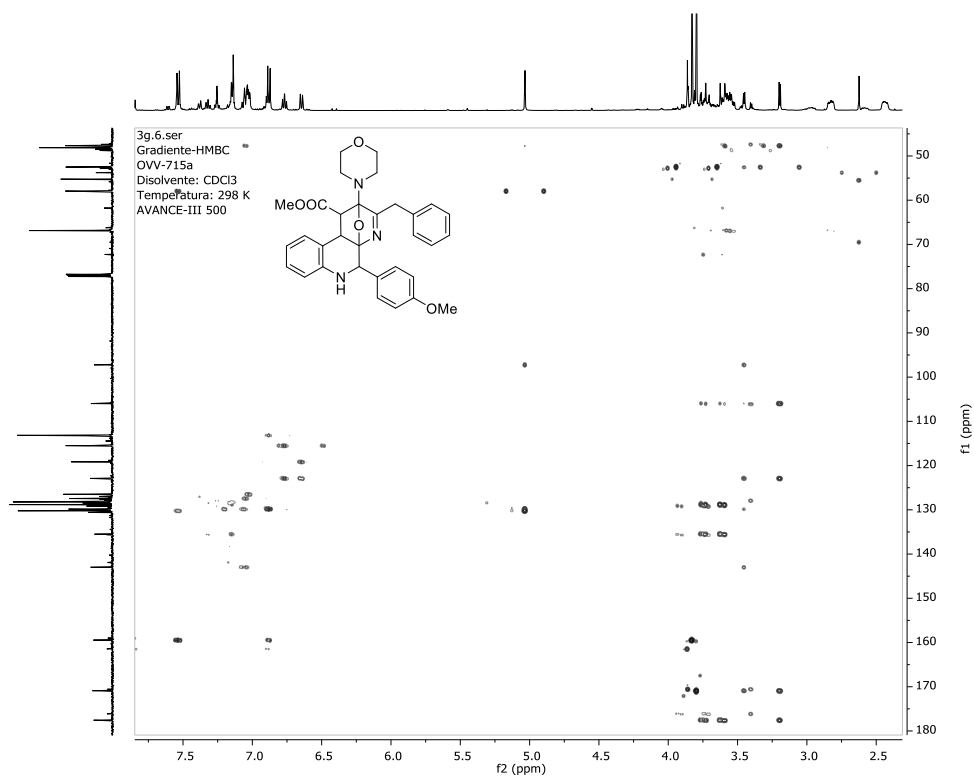


Figure S50. HMBC spectrum of the product **3g**

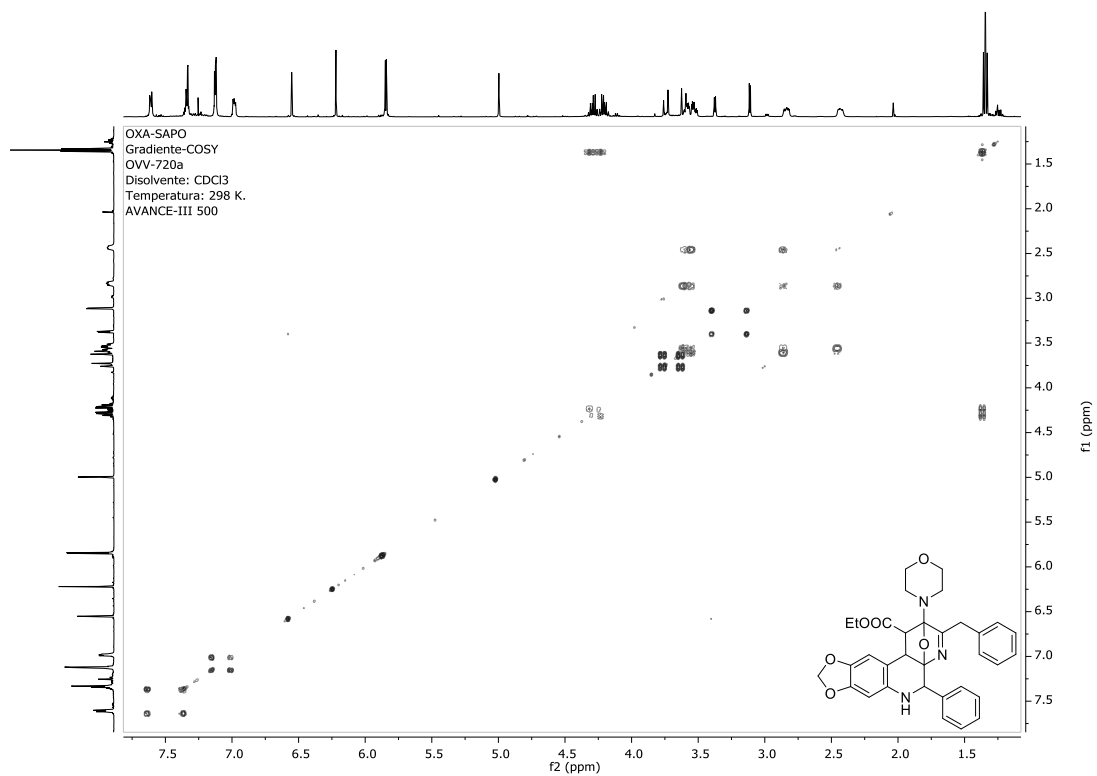


Figure S51. COSY spectrum of the product **3h**

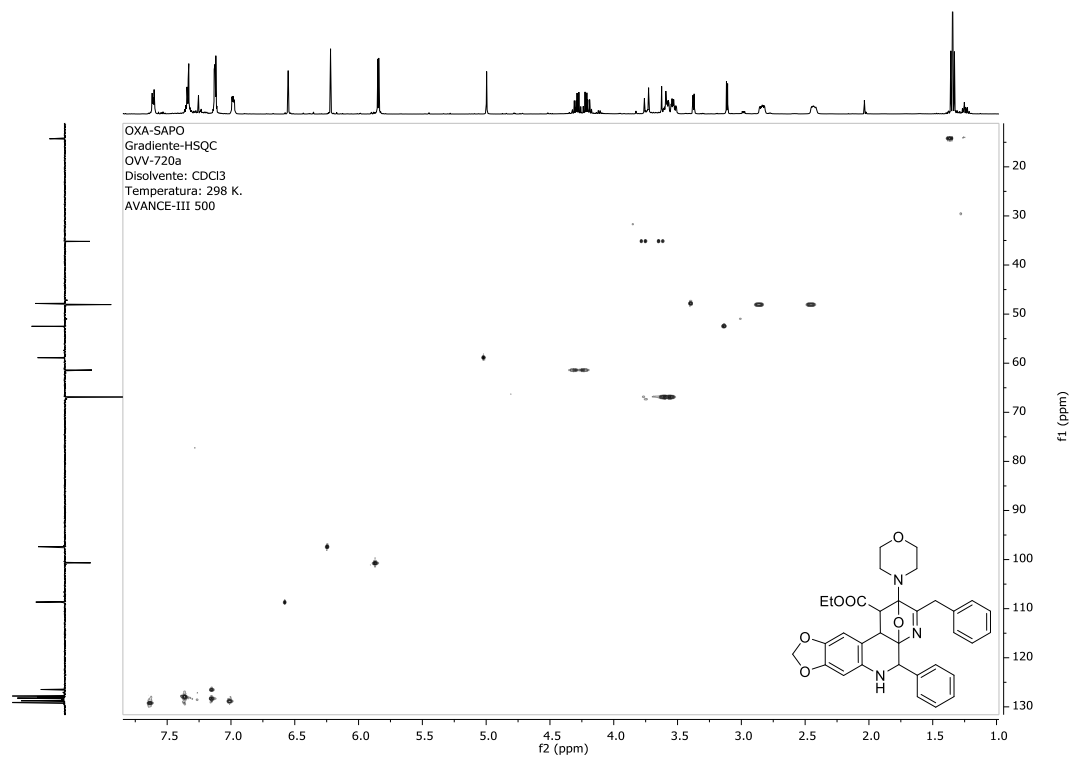


Figure S52. HSQC spectrum of the product **3h**

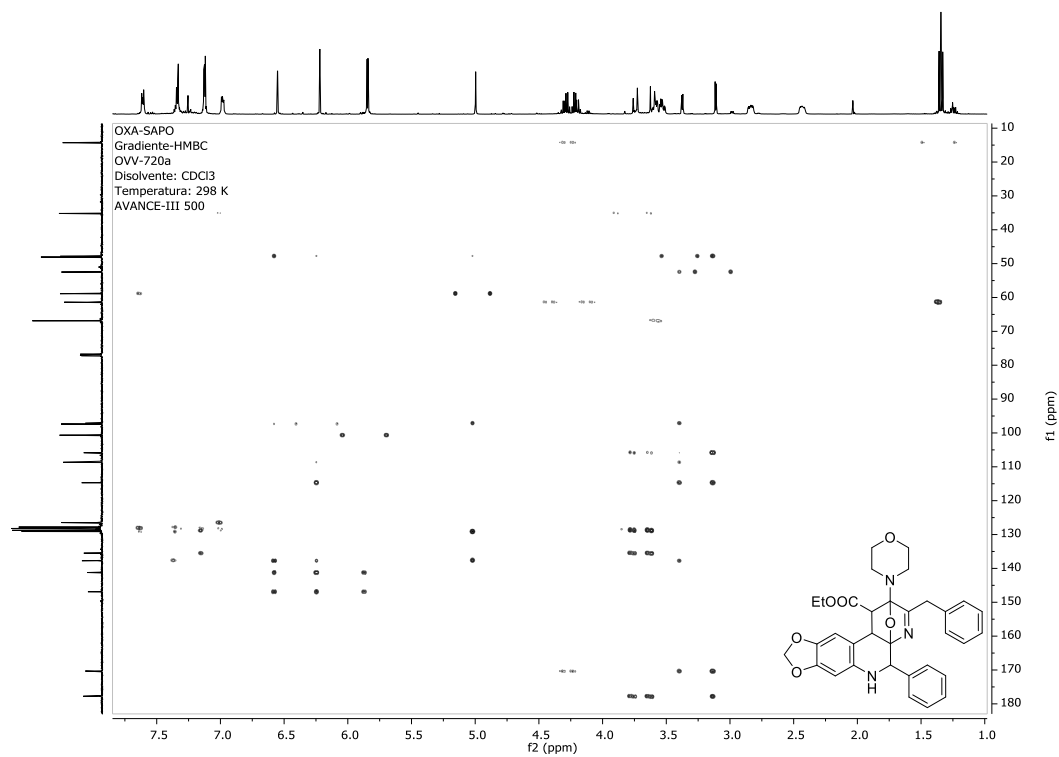


Figure S53. HMBC spectrum of the product **3h**

2D-NMR spectra for the products **4a–h**

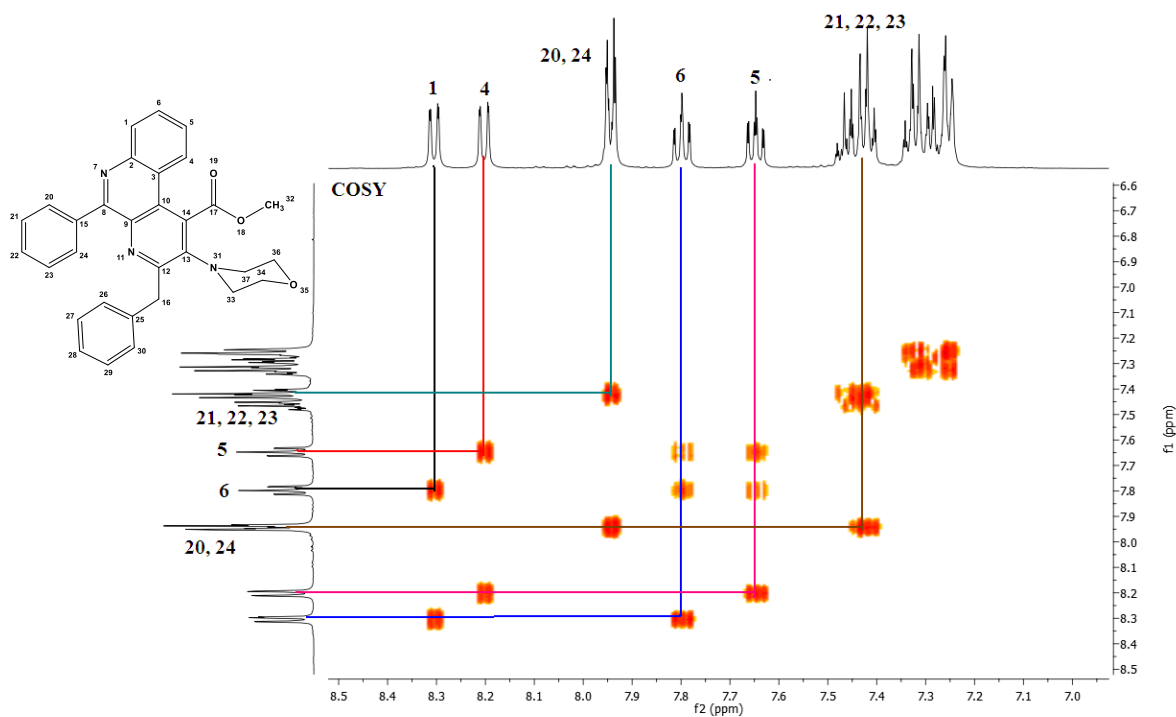


Figure S54. COSY spectrum of the product **4a**

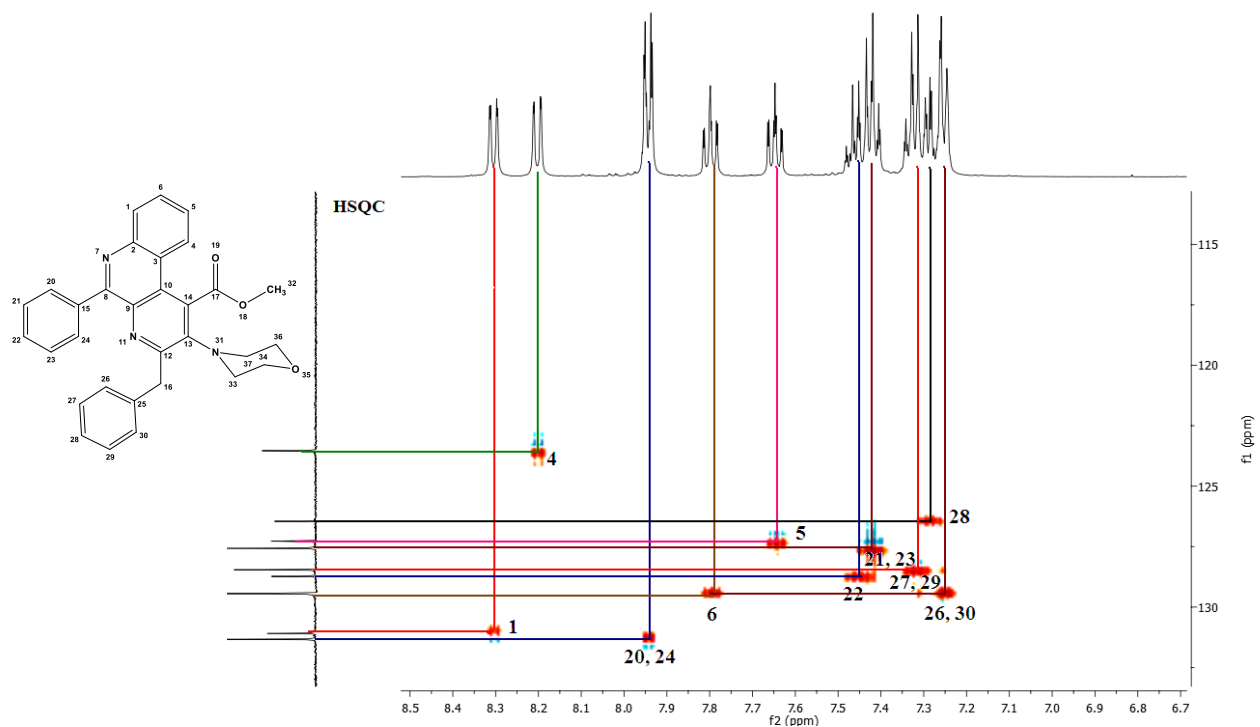


Figure S55. HSQC spectrum of the product **4a**

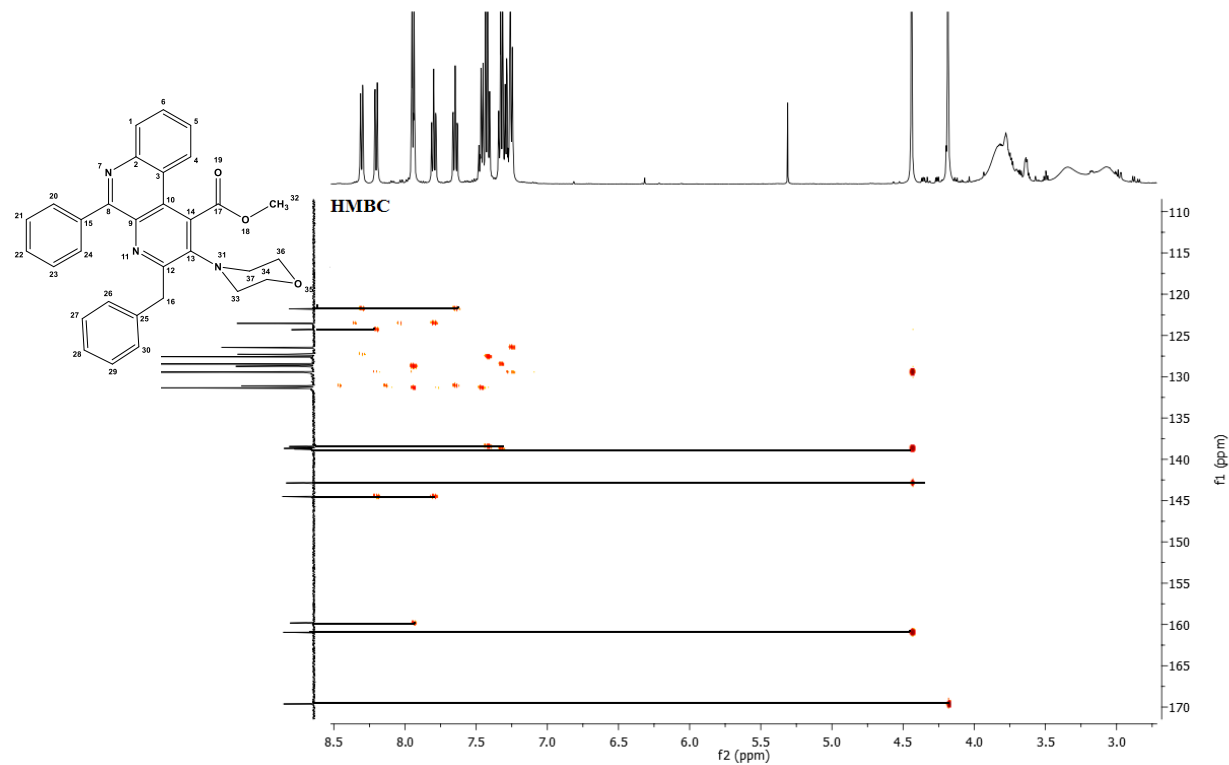


Figure S56. HMBC spectrum of the product **4a**

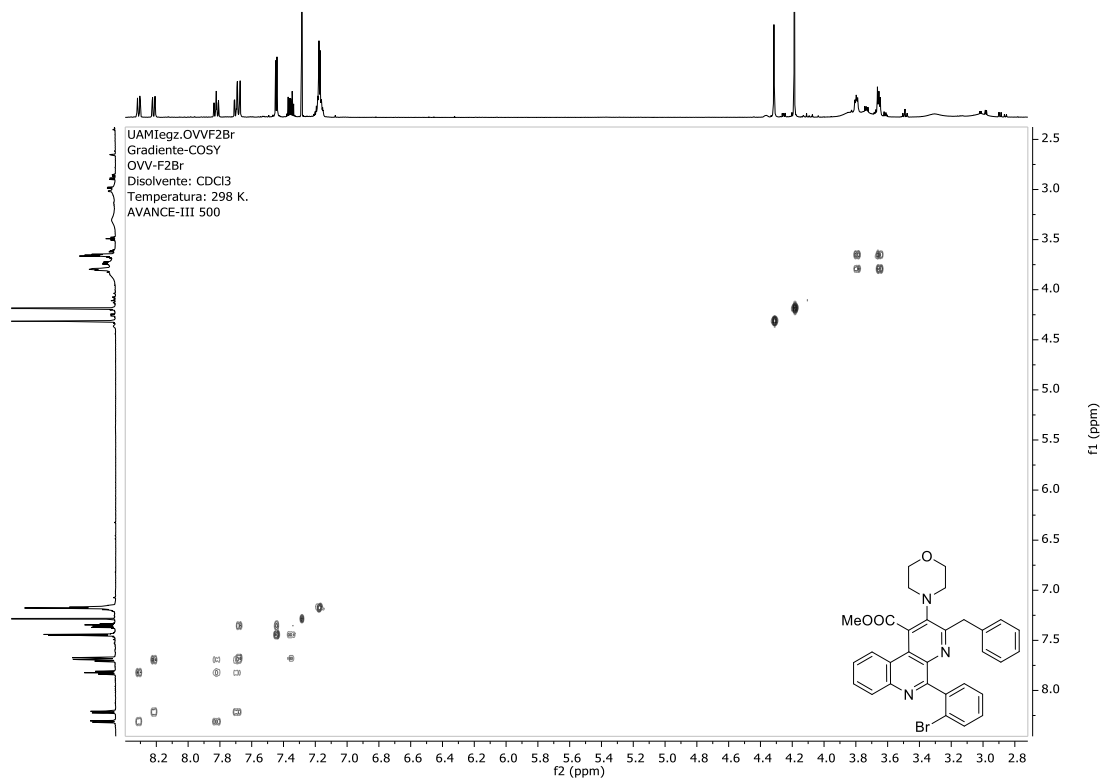


Figure S57. COSY spectrum of the product **4b**

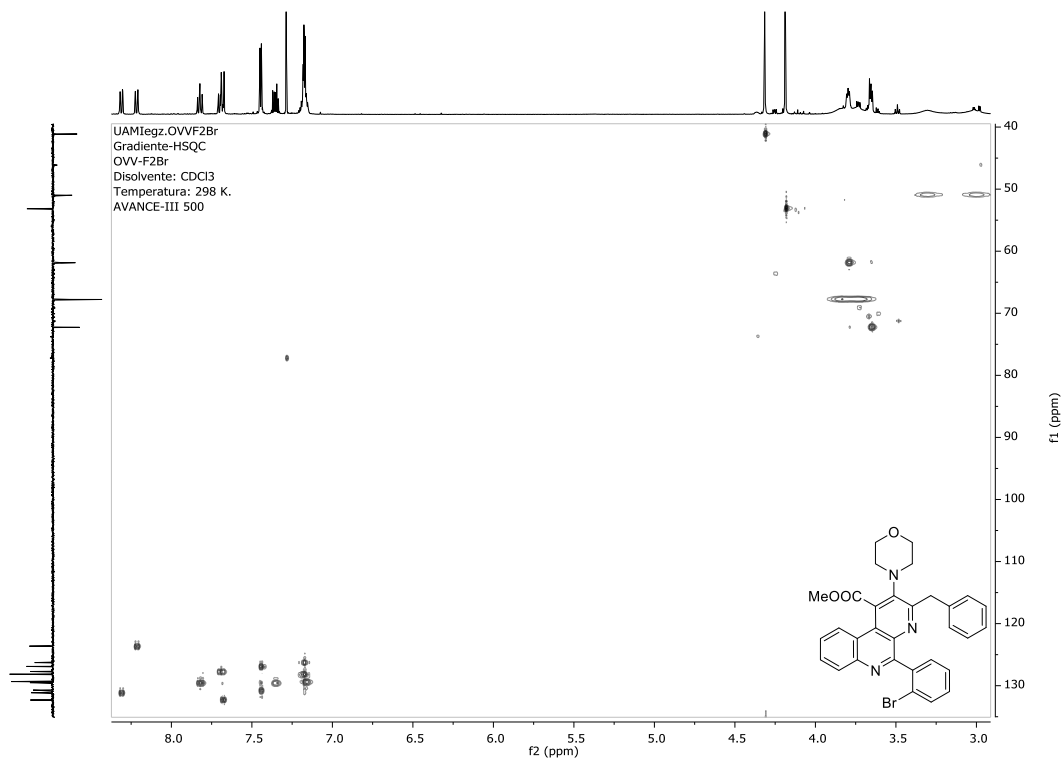


Figure S58. HSQC spectrum of the product **4b**

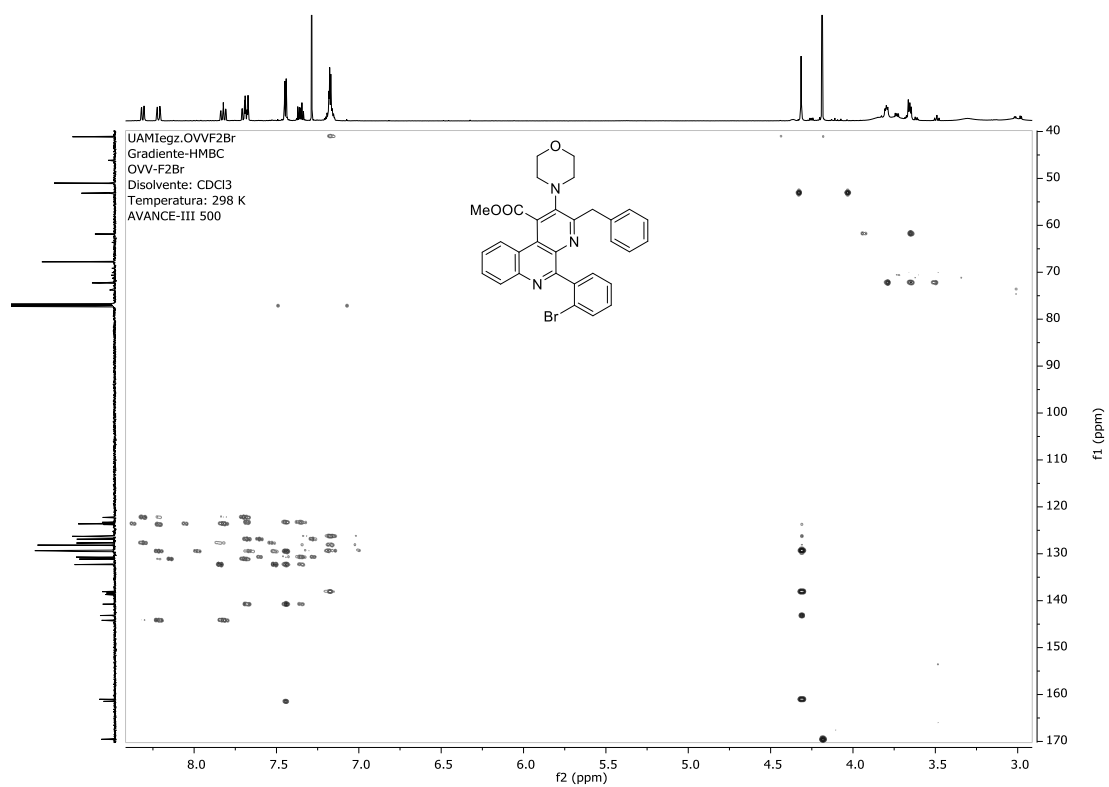


Figure S59. HMBC spectrum of the product **4b**

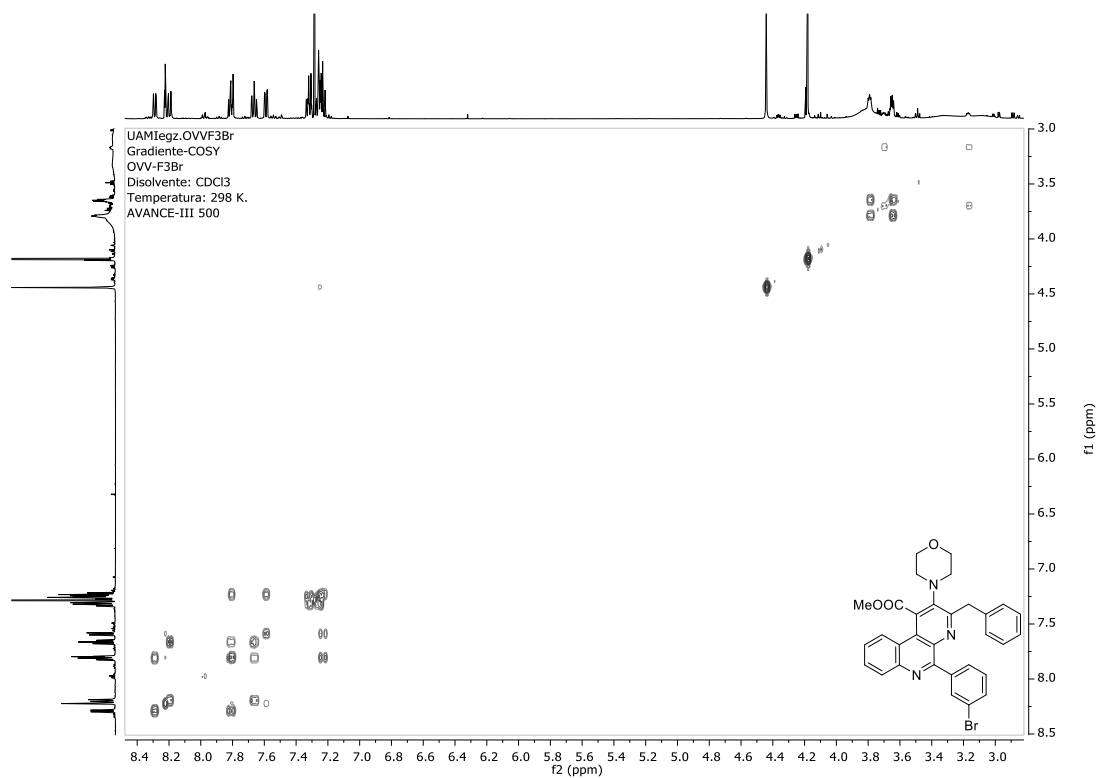


Figure S60. COSY spectrum of the product **4c**

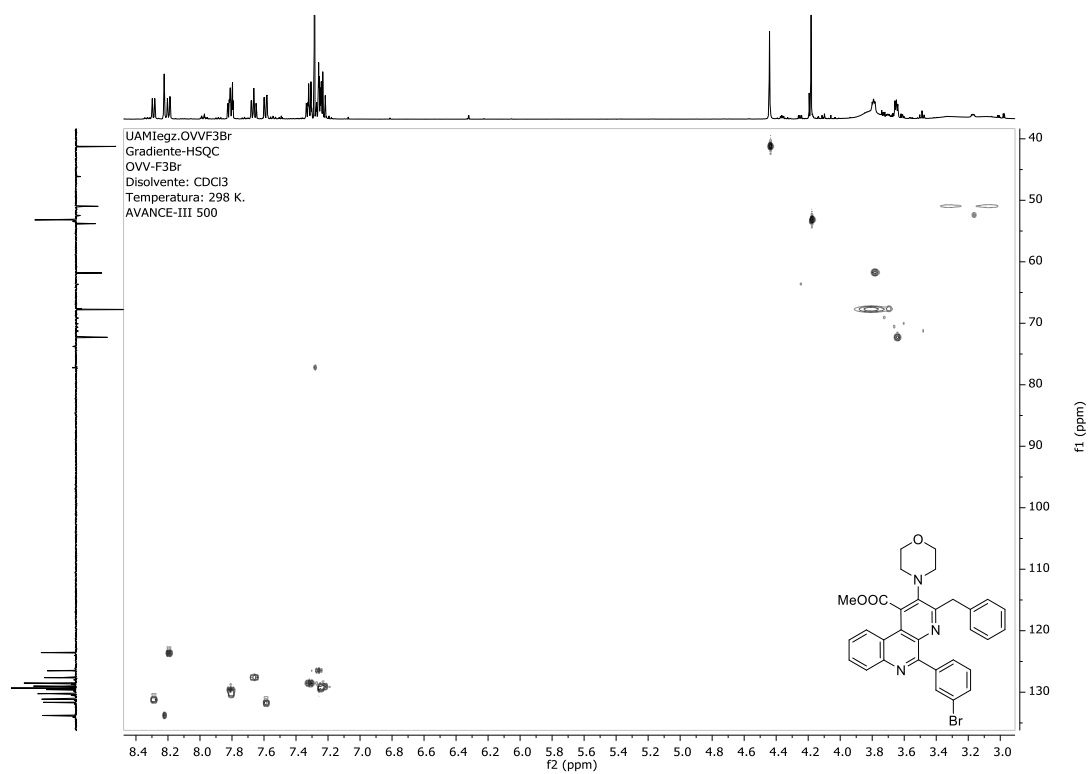


Figure S61. HSQC spectrum of the product **4c**

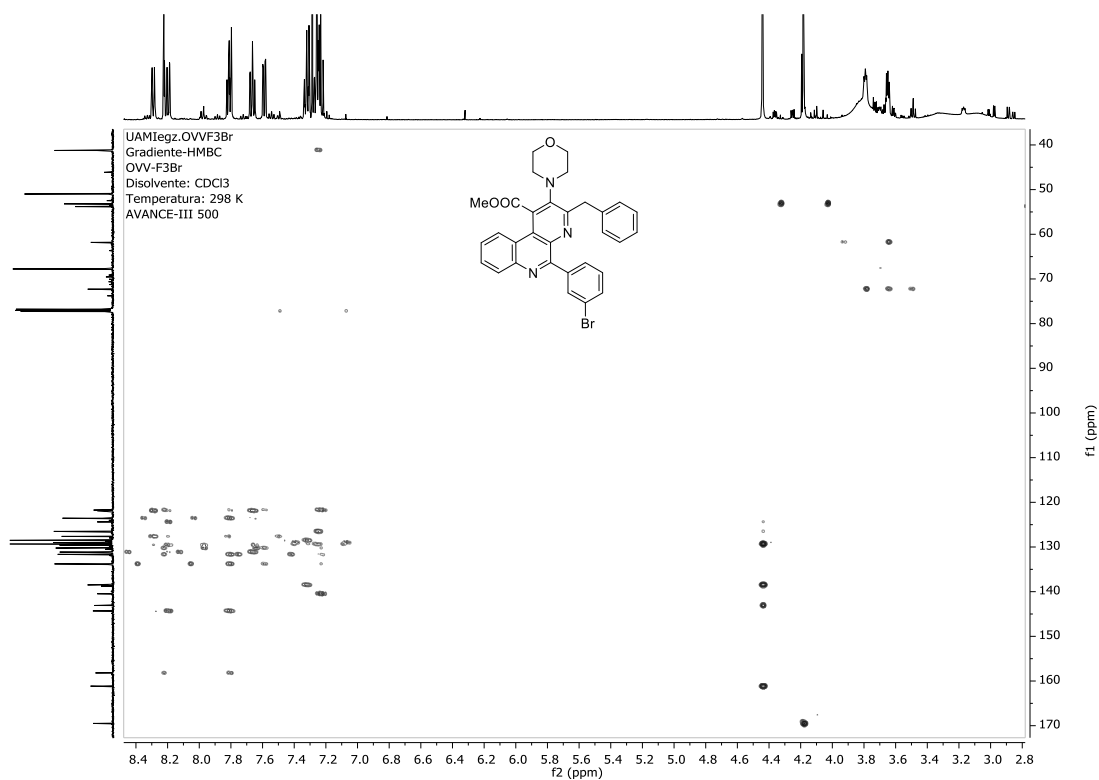


Figure S62. HMBC spectrum of the product **4c**

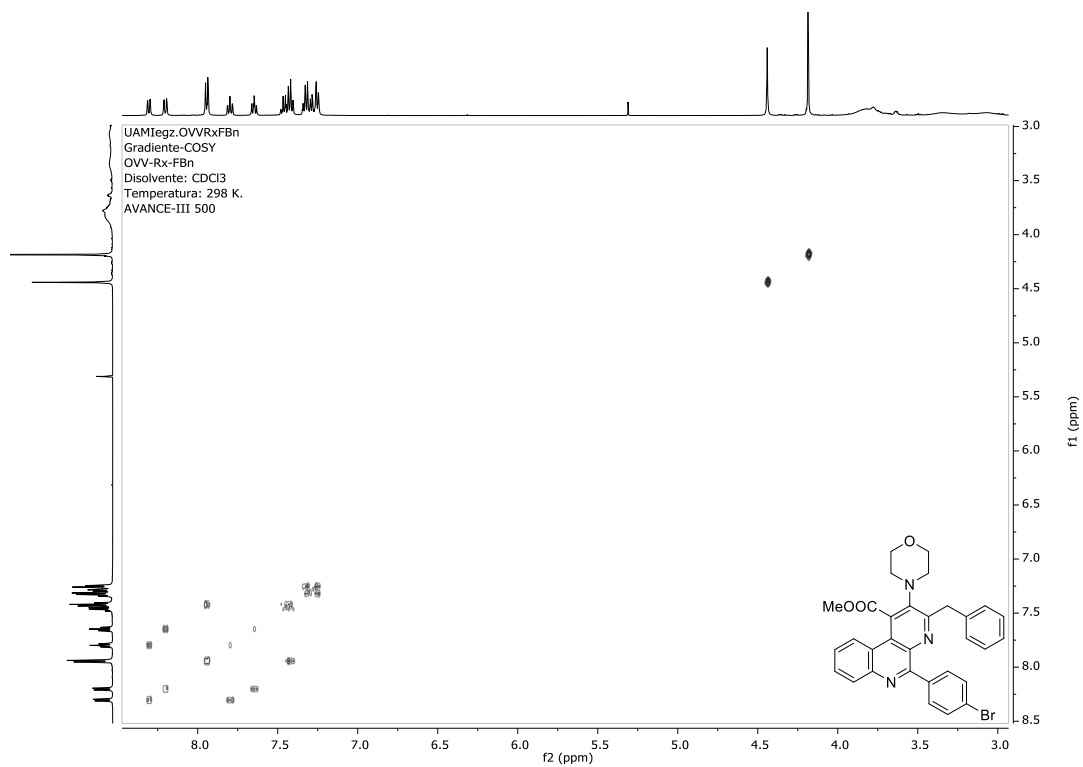


Figure S63. COSY spectrum of the product **4d**

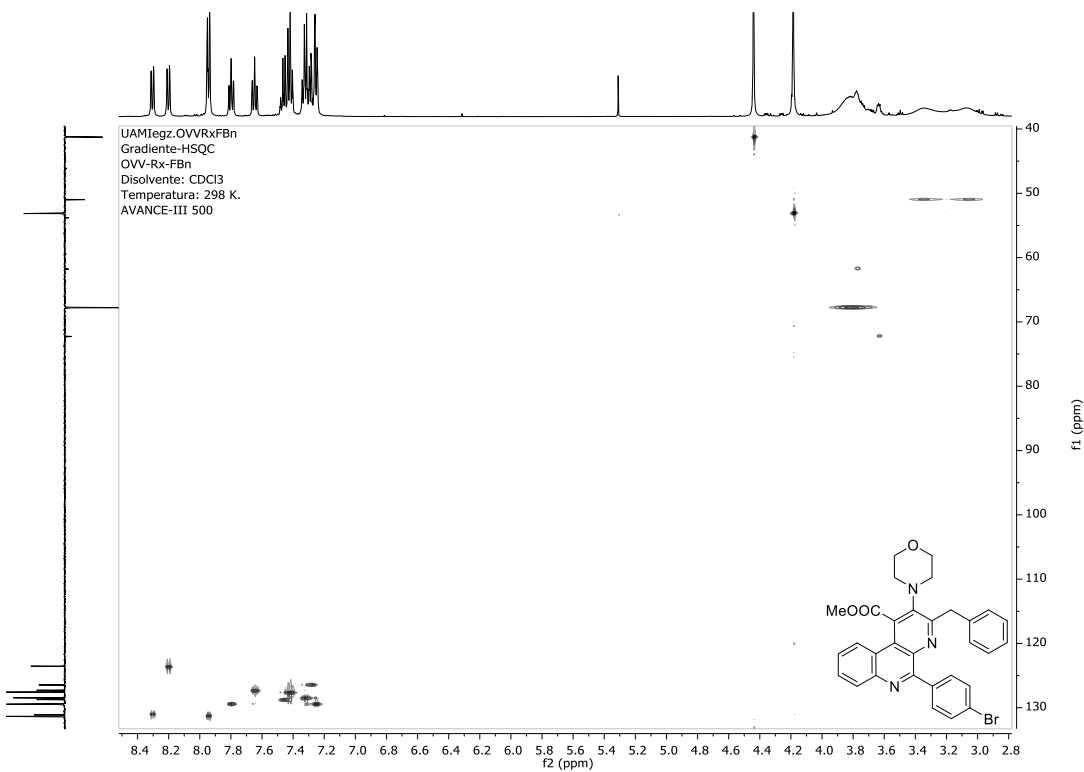


Figure S64. HSQC spectrum of the product **4d**

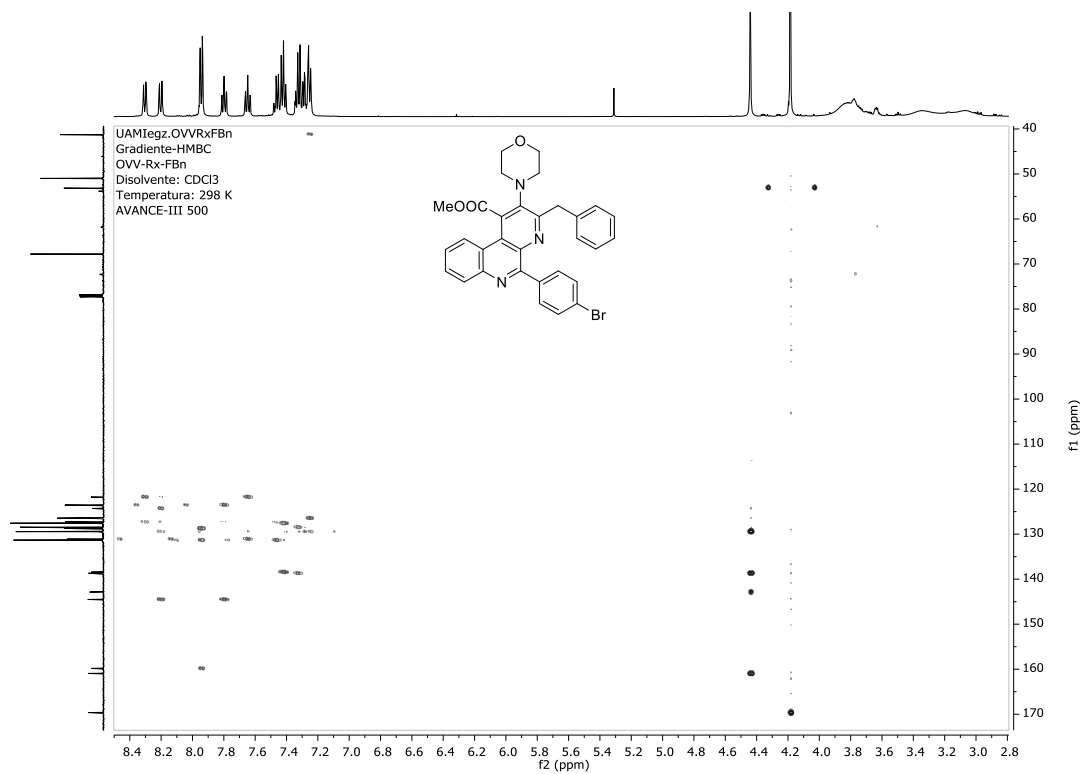


Figure S65. HMBC spectrum of the product **4d**

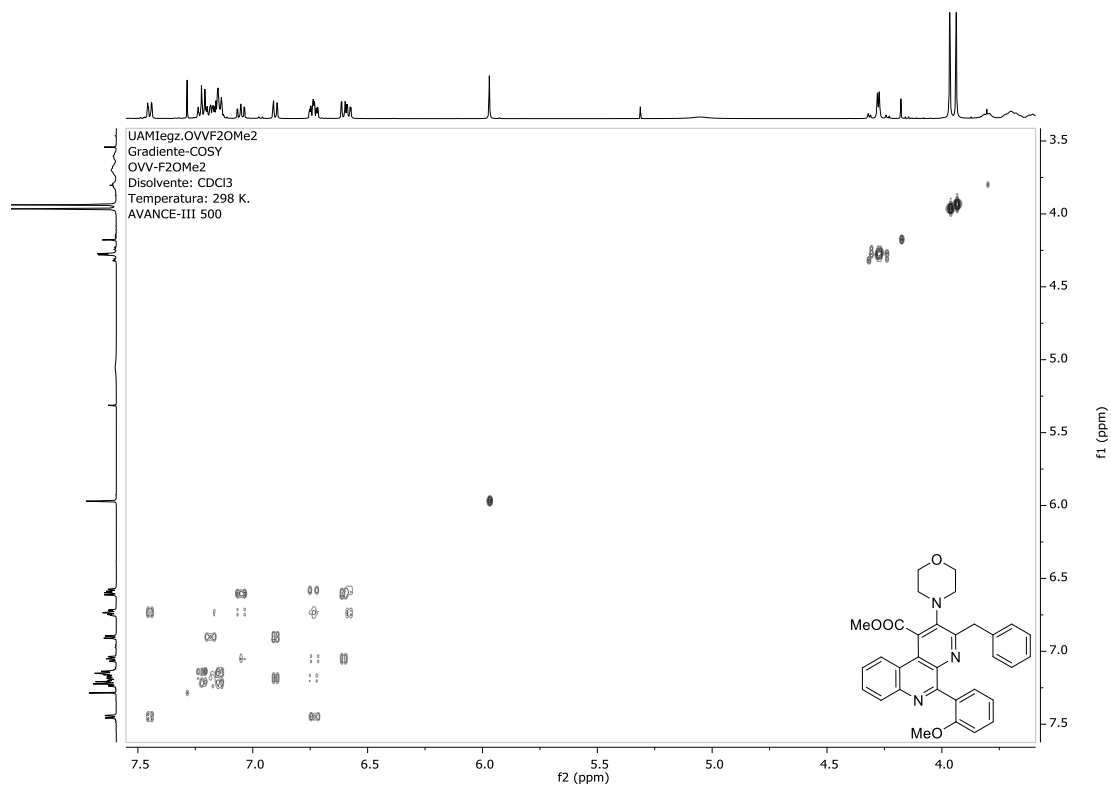


Figure S66. COSY spectrum of the product **4e**

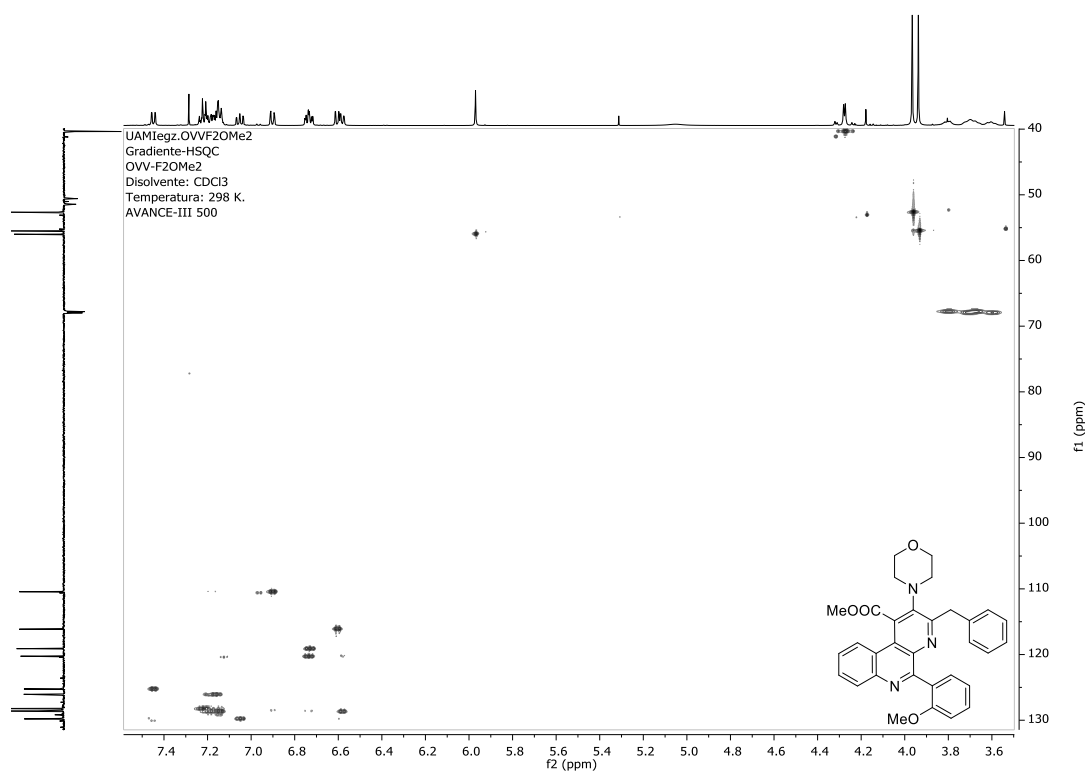


Figure S67. HSQC spectrum of the product **4e**

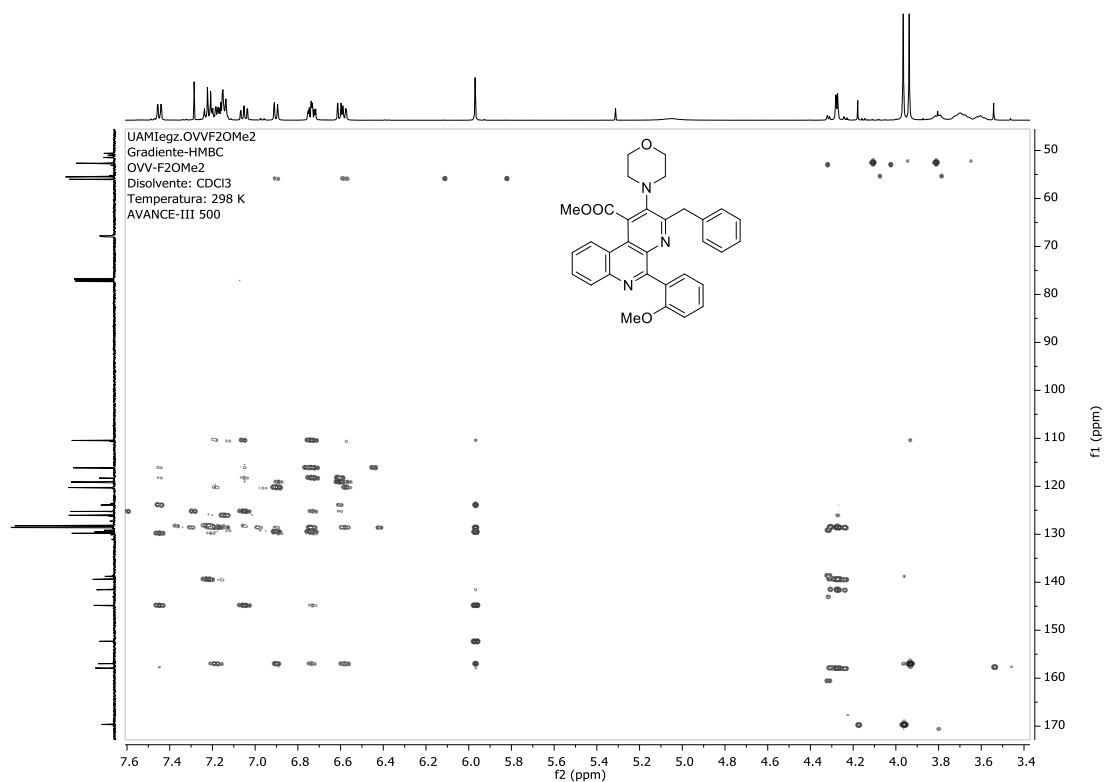


Figure S68. HMBC spectrum of the product **4e**

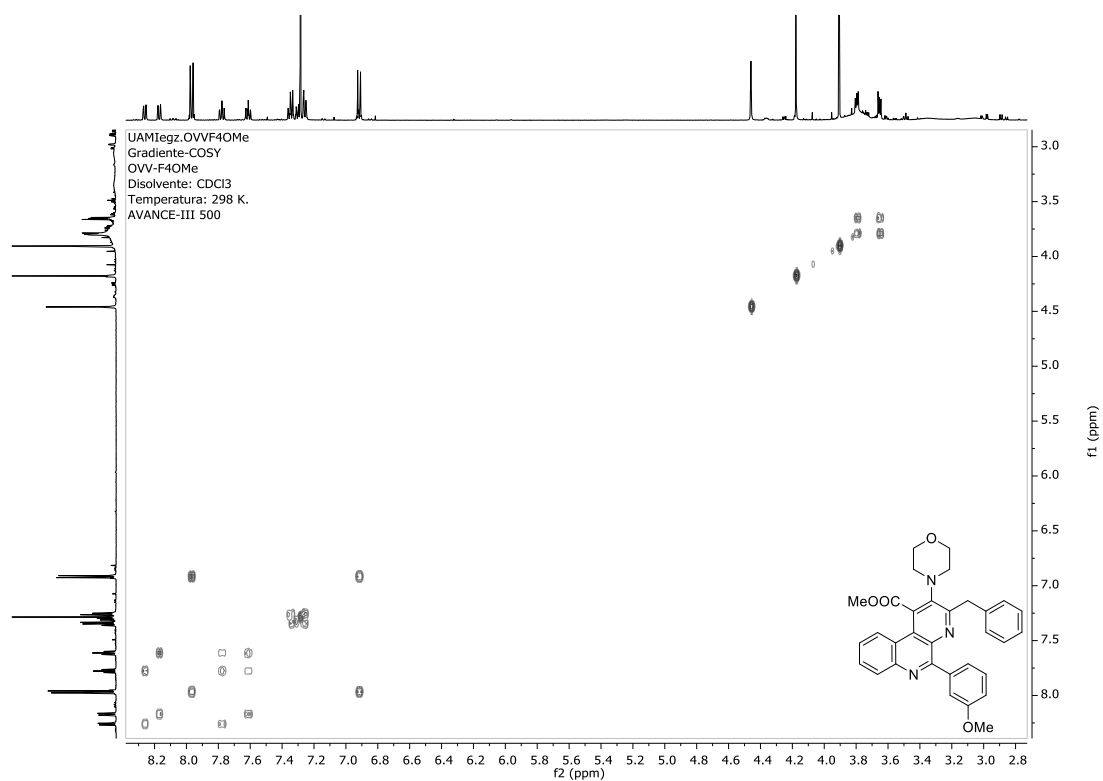


Figure S69. COSY spectrum of the product **4f**

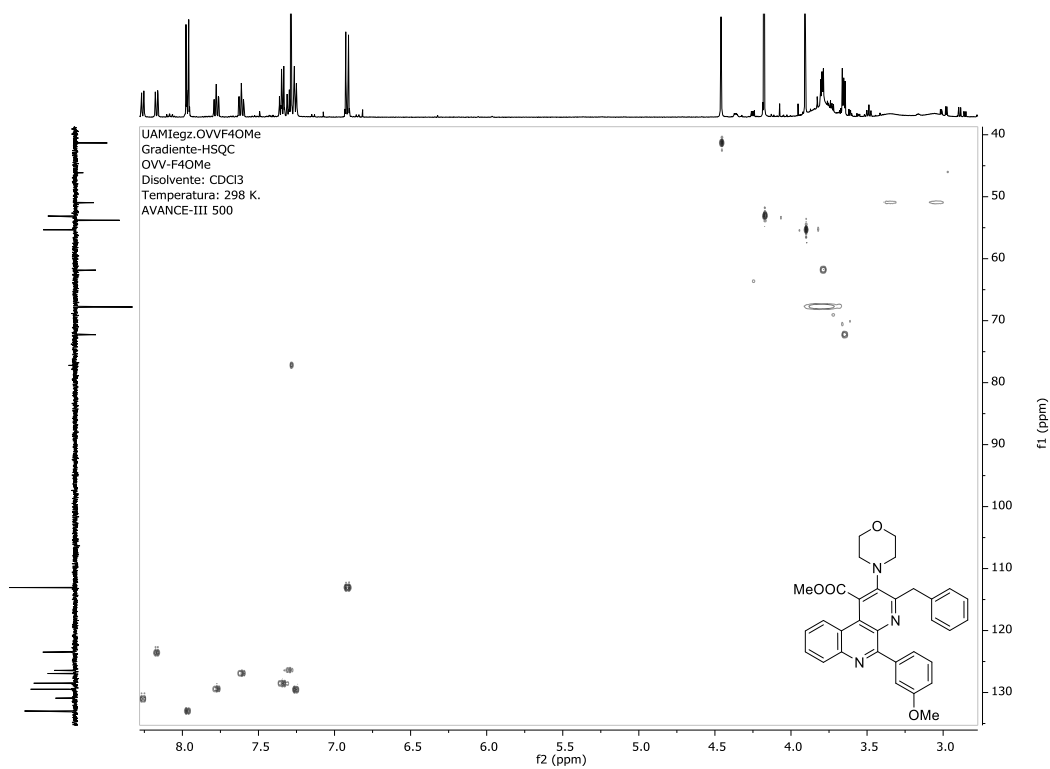


Figure S70. HSQC spectrum of the product **4f**

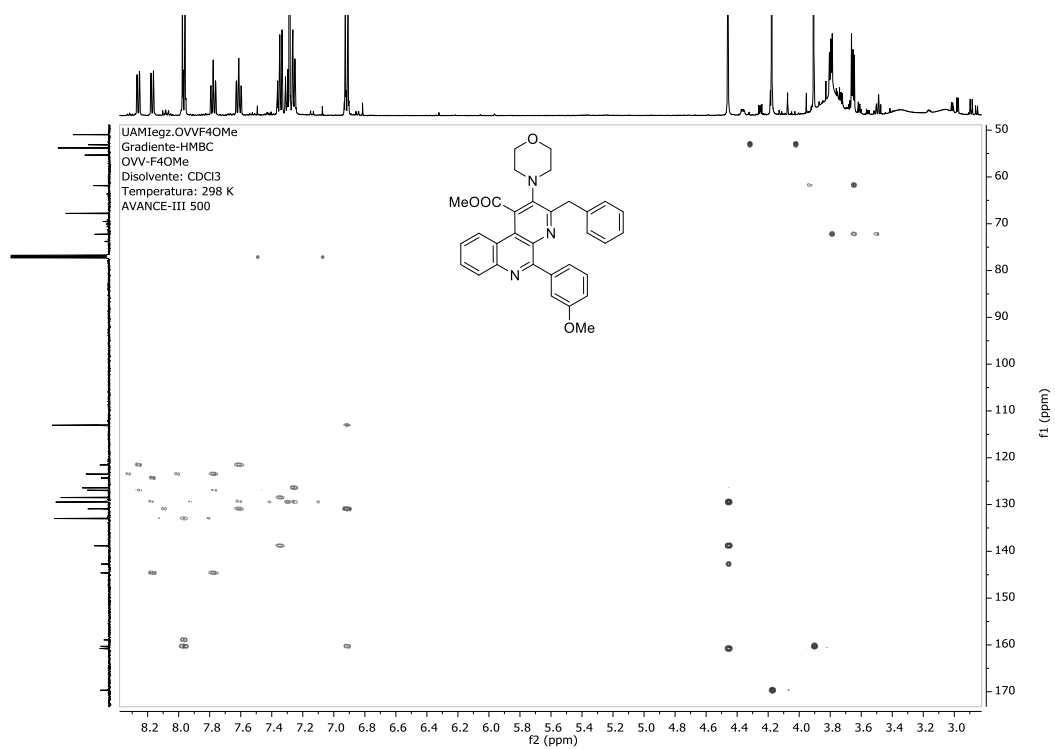


Figure S71. HMBC spectrum of the product **4f**

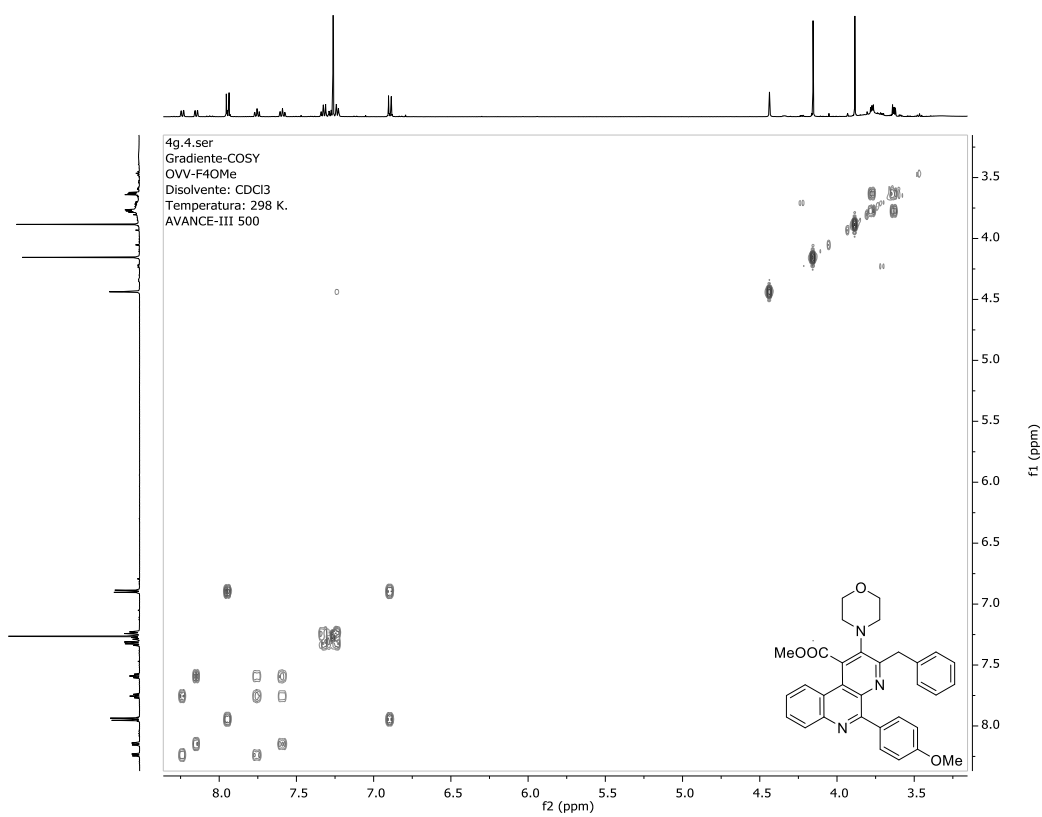


Figure S72. COSY spectrum of the product **4g**

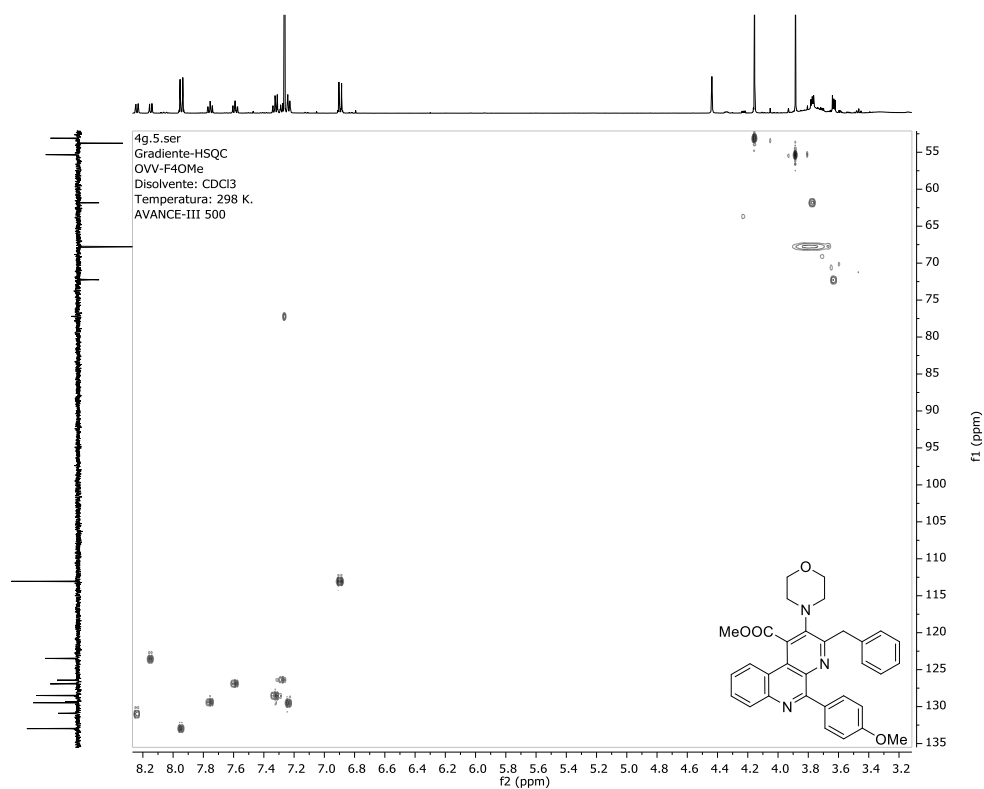


Figure S73. HSQC spectrum of the product **4g**

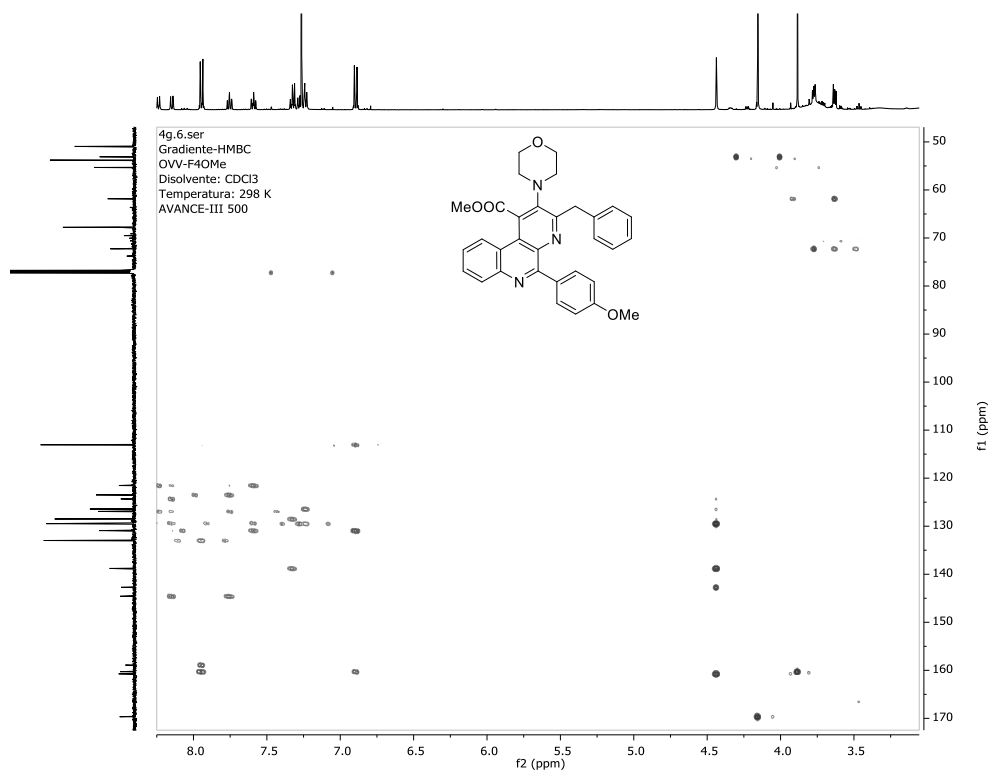


Figure S74. HMBC spectrum of the product **4g**

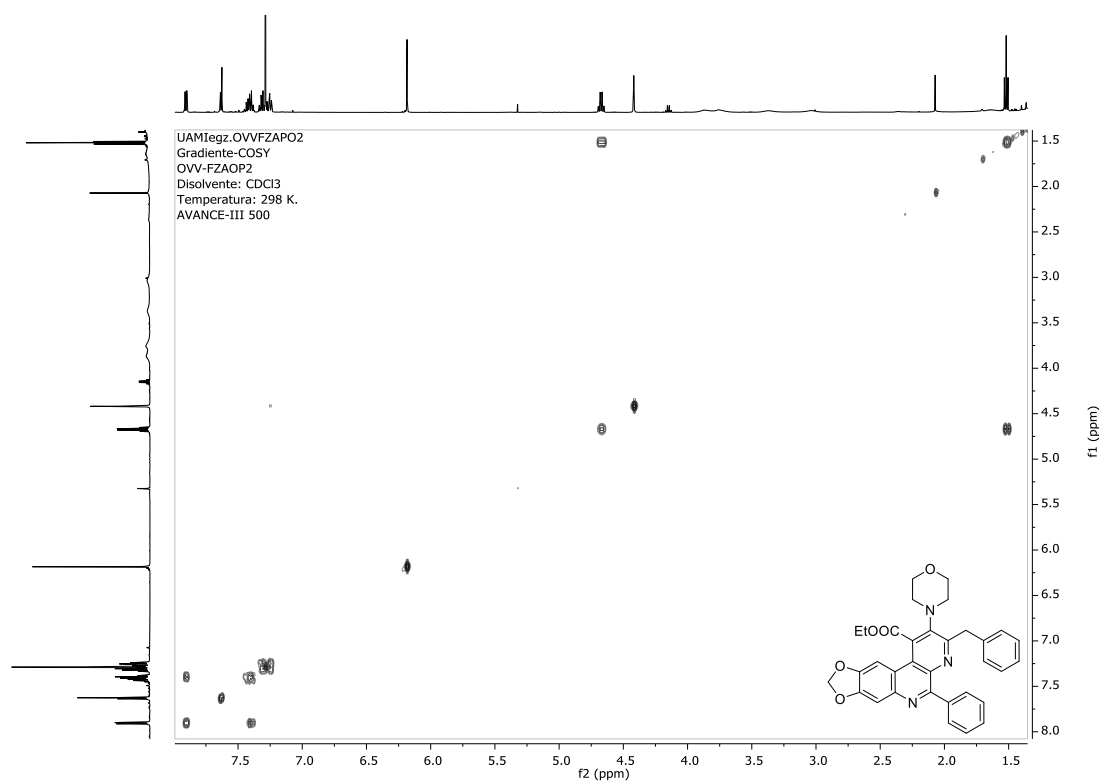


Figure S75. COSY spectrum of the product **4h**

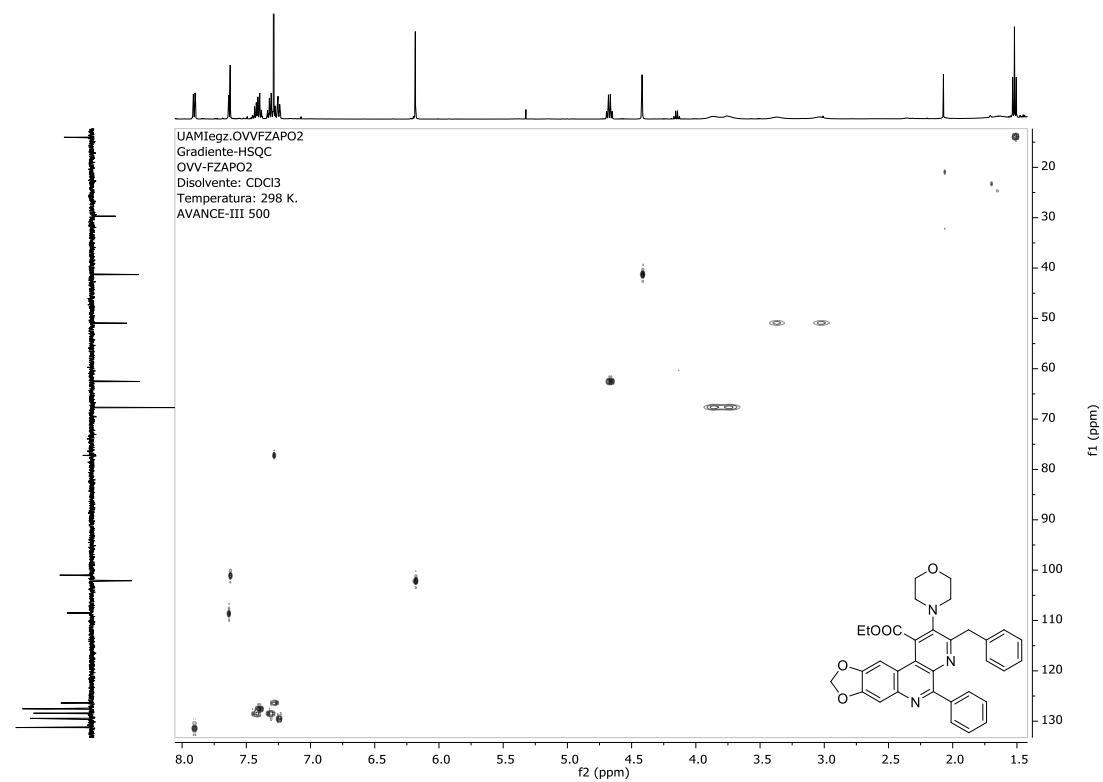


Figure S76. HSQC spectrum of the product **4h**

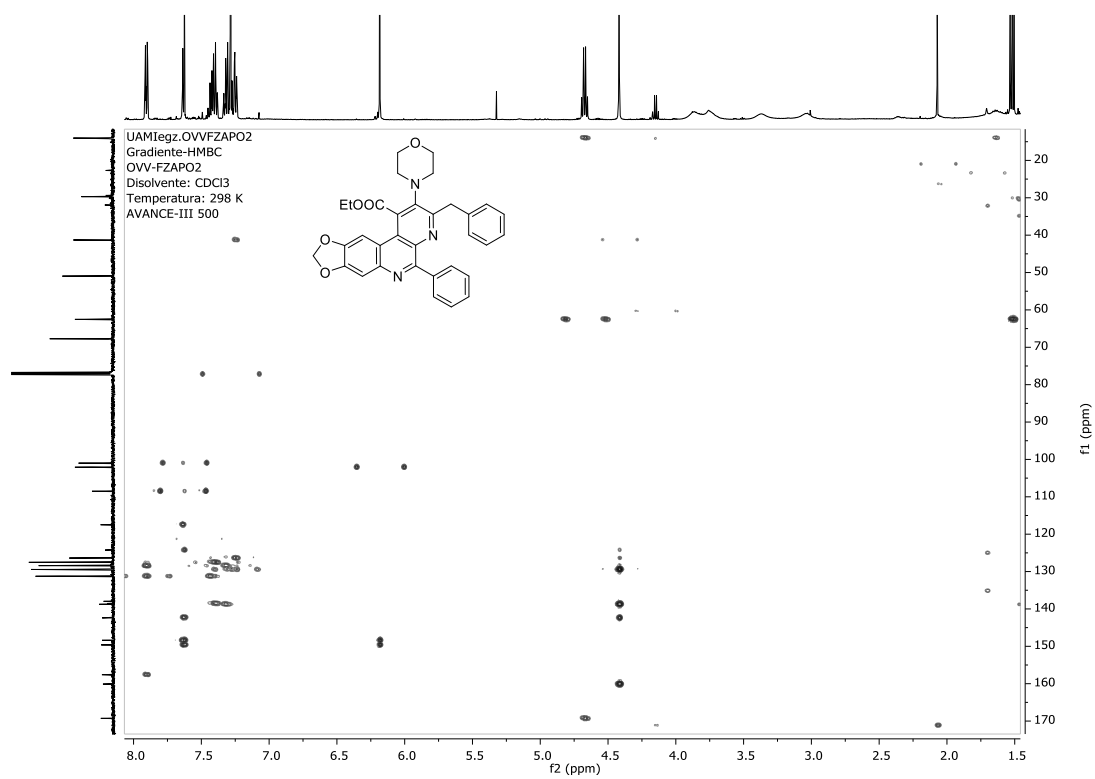


Figure S77. HMBC spectrum of the product **4h**