

Supporting Information

# Structure-Activity Relationships of the Antimalarial Agent Artemisinin 10. Synthesis and Antimalarial Activity of Enantiomers of *rac*-5 $\beta$ -Hydroxy-D-Secoartemisinin and Analogs: Implications Regarding the Mechanism of Action.

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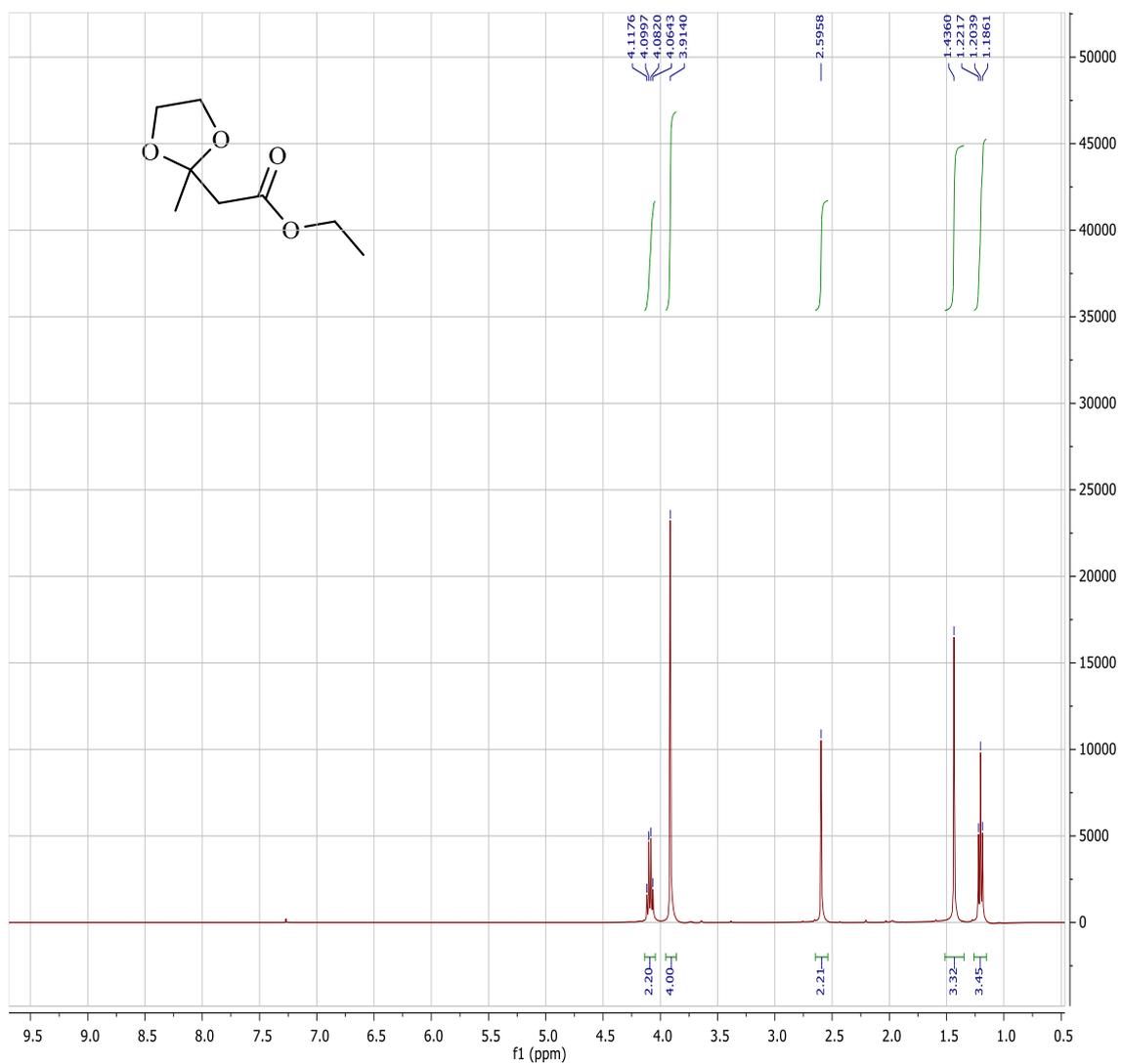


Figure S1. <sup>1</sup>H-spectrum of the compound 3 (CDCl<sub>3</sub>, 400 MHz).

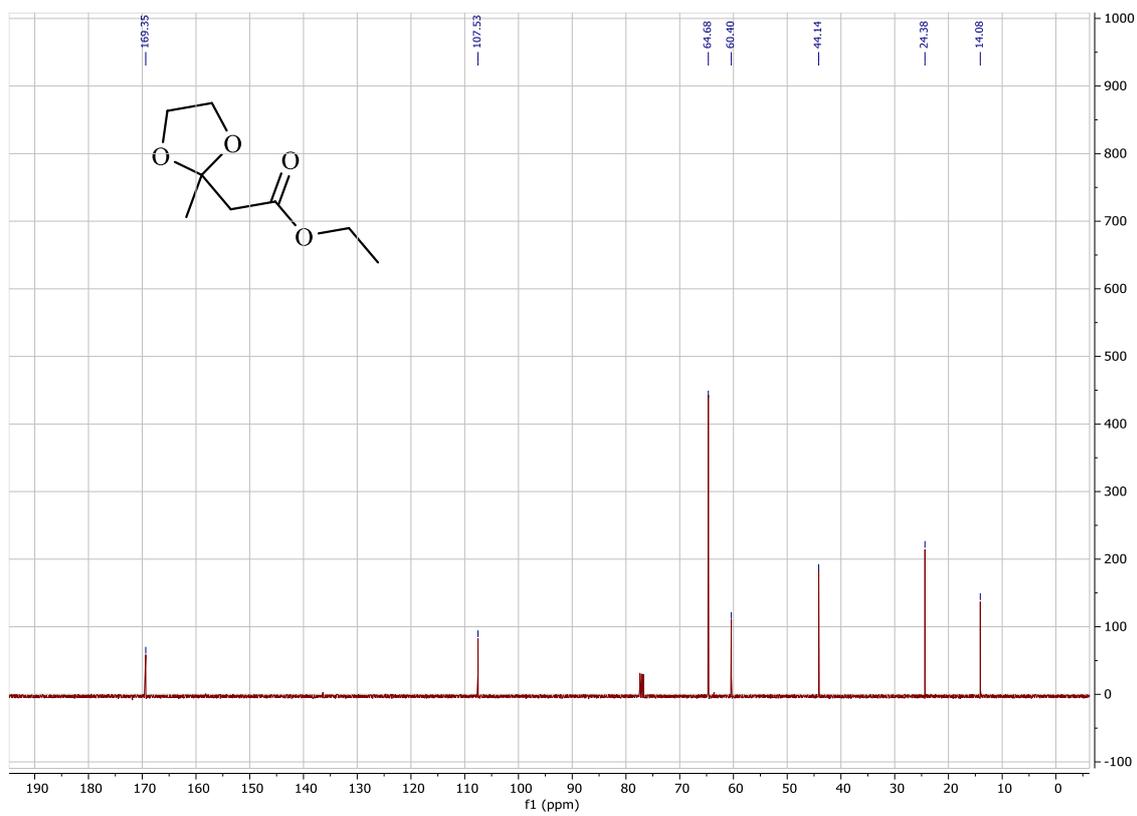


Figure S2. <sup>13</sup>C-NMR spectrum of the compound 3 (CDCl<sub>3</sub>, 100 MHz).

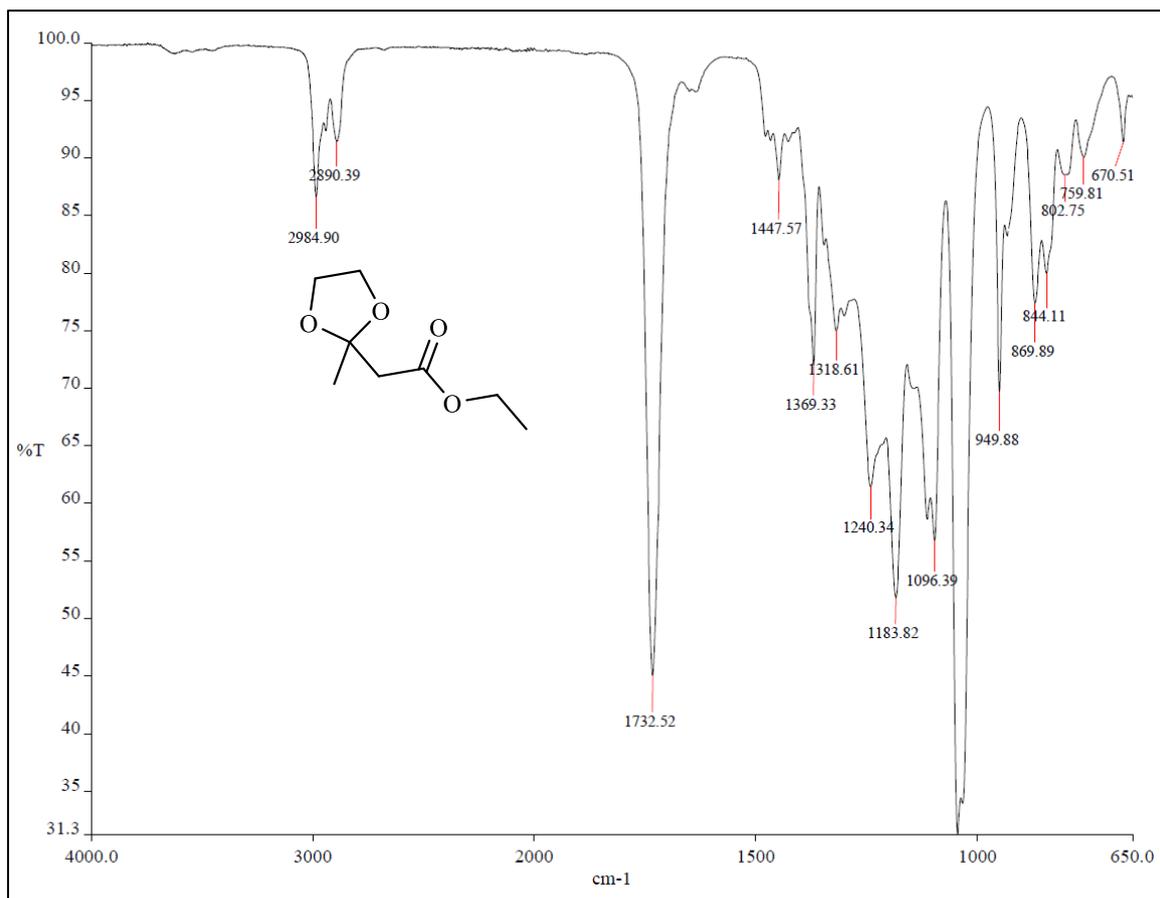


Figure S3. IR-spectrum of the compound 3.

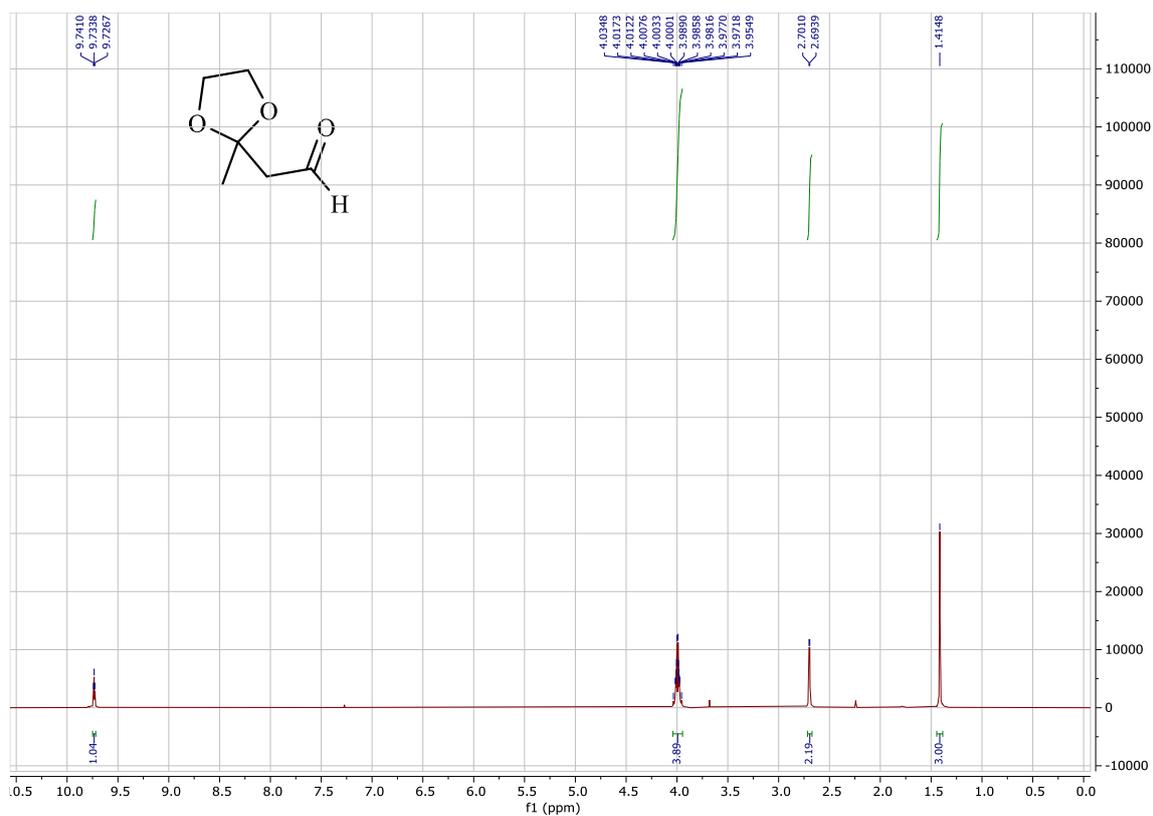


Figure S4. <sup>1</sup>H-spectrum of the compound 4 (CDCl<sub>3</sub>, 400 MHz).

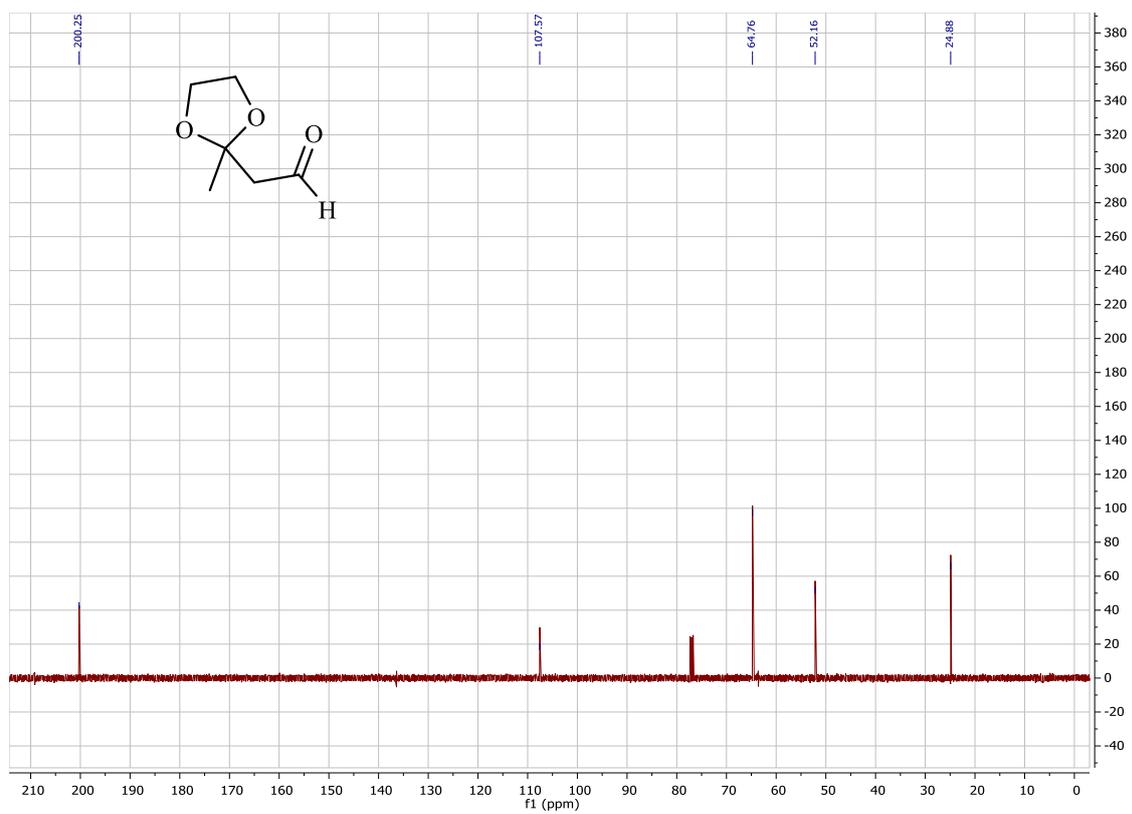


Figure S5. <sup>13</sup>C-NMR spectrum of the compound 4 (CDCl<sub>3</sub>, 100 MHz).

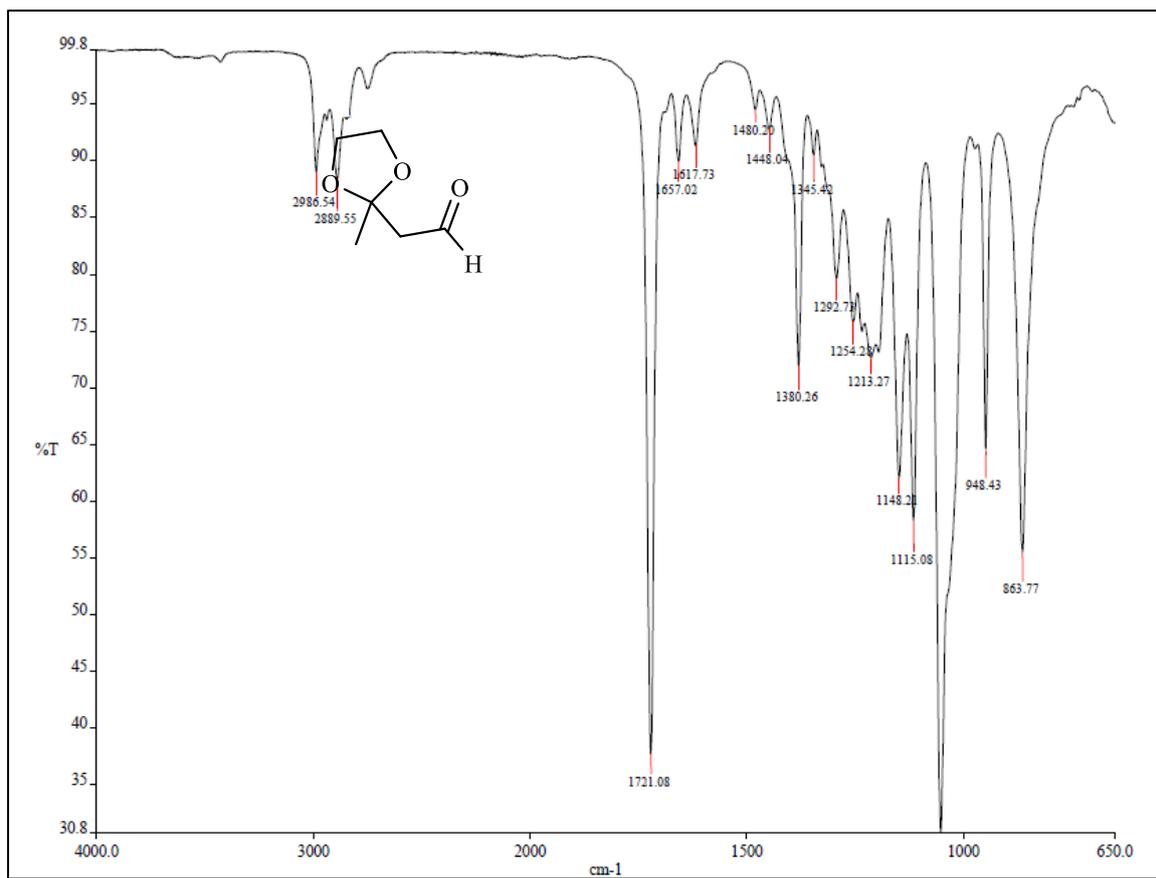


Figure S6. IR-spectrum of the compound 4.

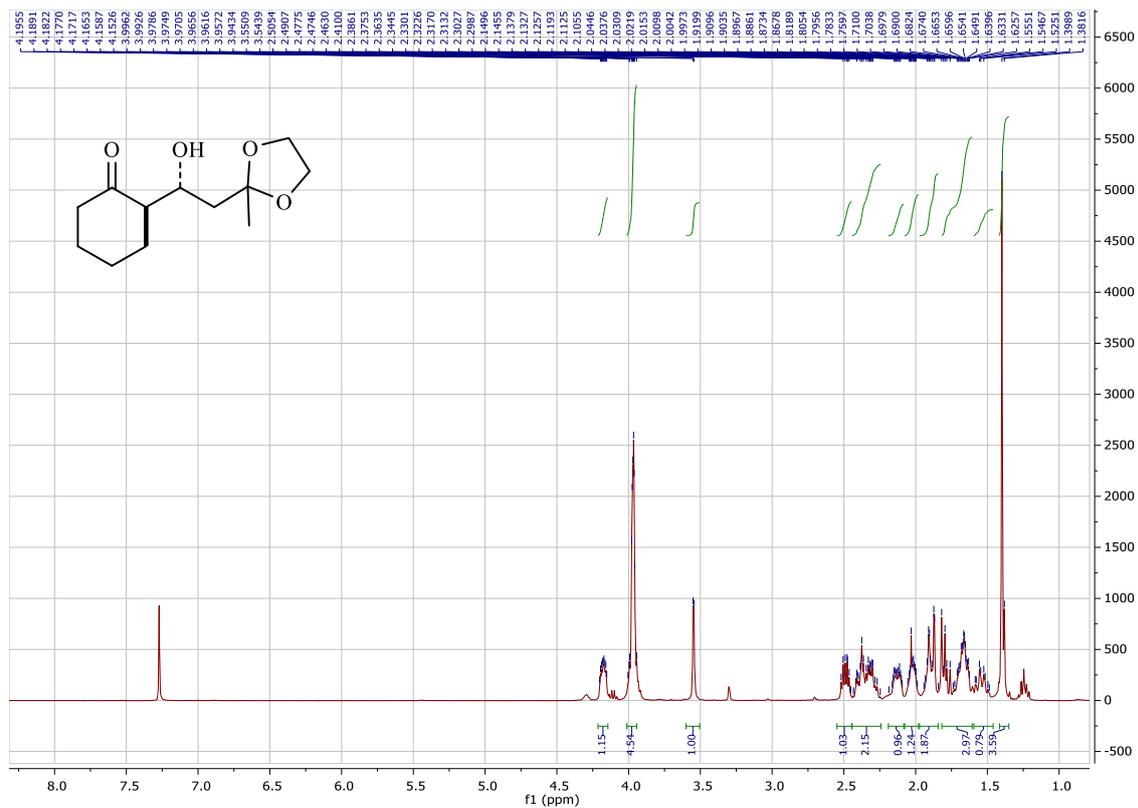


Figure S7. <sup>1</sup>H-spectrum of the compound **5** (CDCl<sub>3</sub>, 400 MHz).

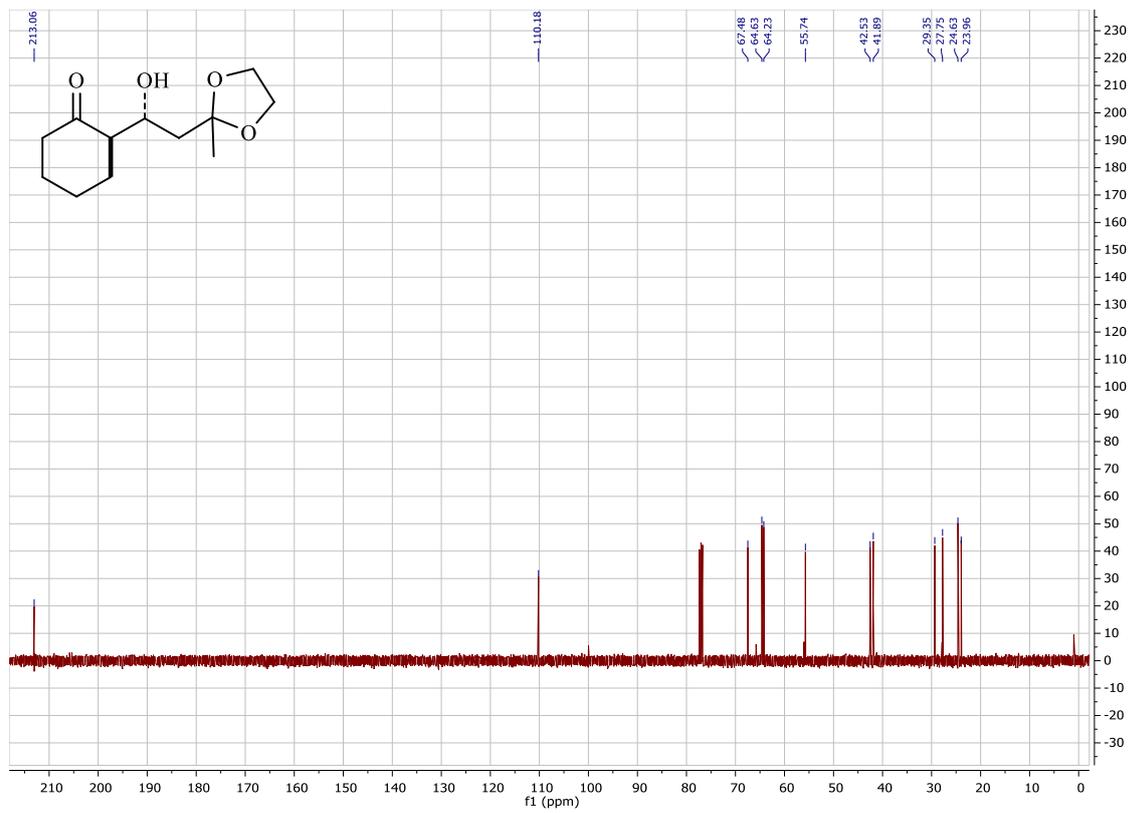


Figure S8.  $^{13}\text{C-NMR}$  spectrum of the compound 5 (CDCl<sub>3</sub>, 100 MHz).

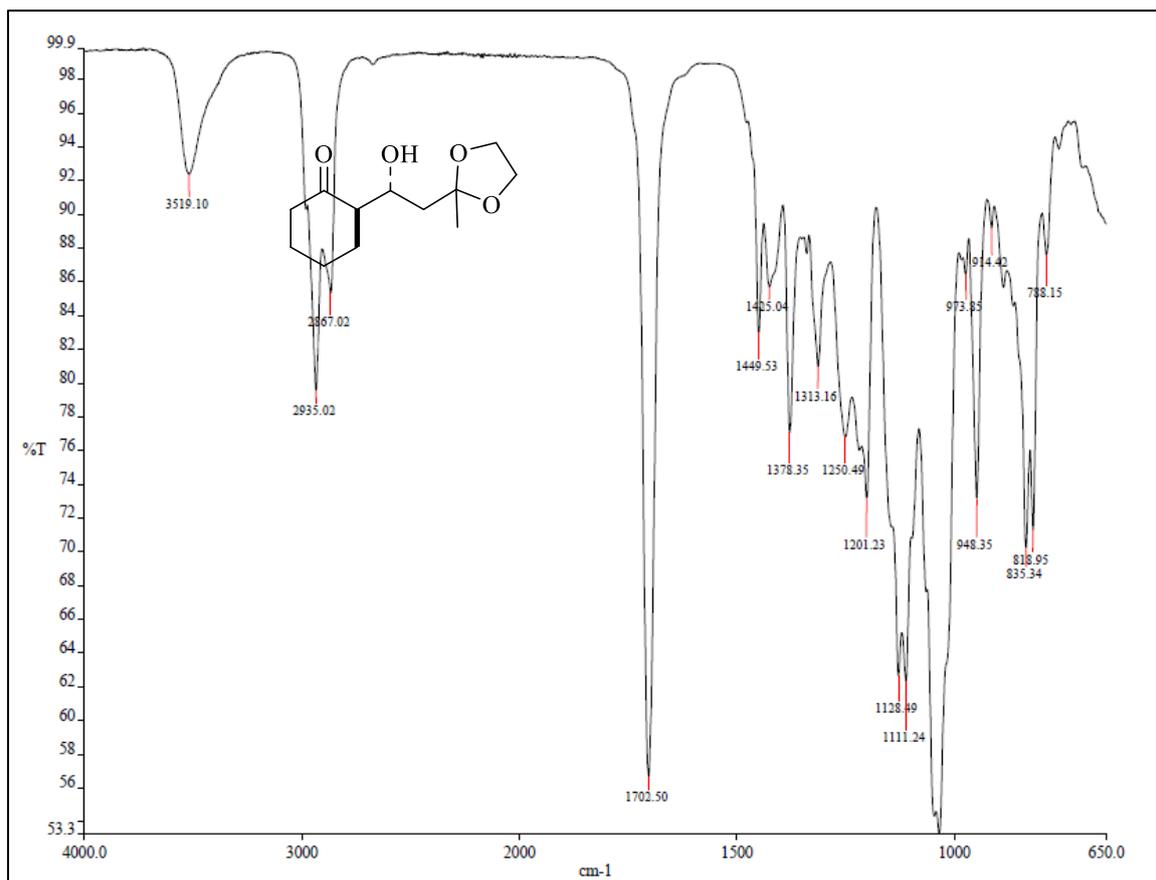


Figure S9. IR-spectrum of the compound 5.

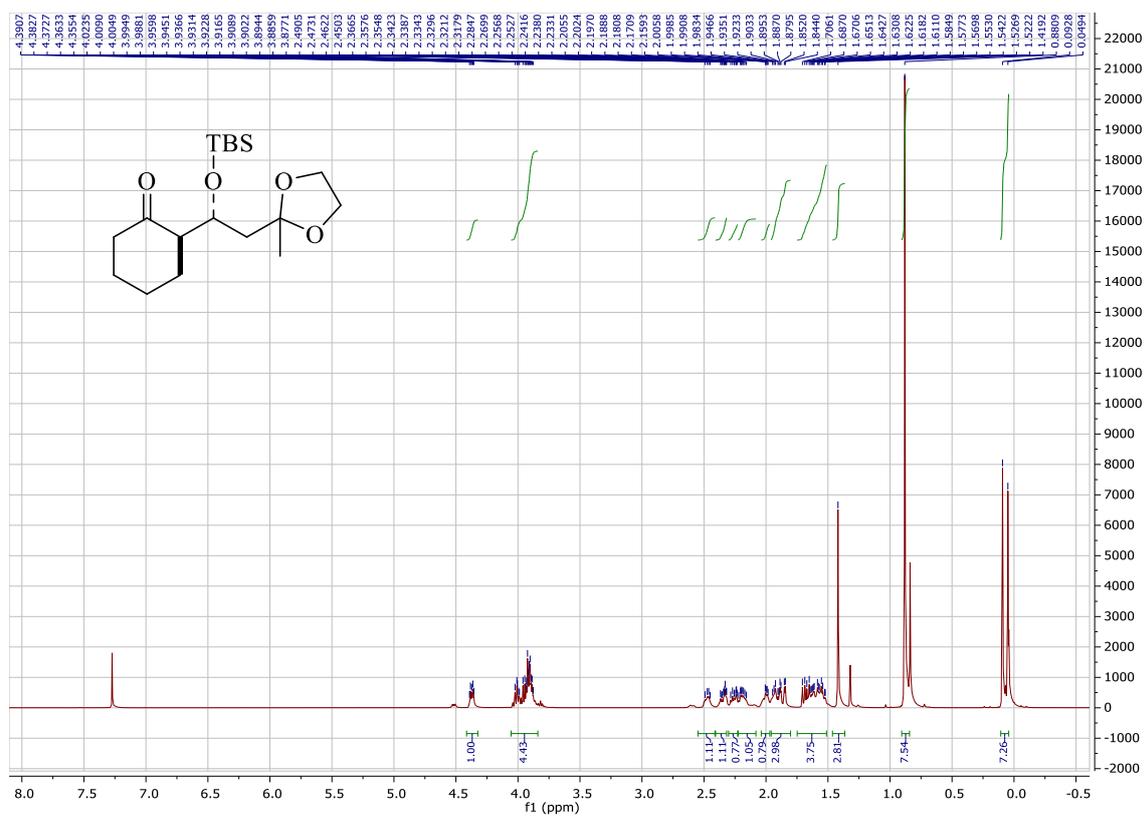


Figure S10. <sup>1</sup>H-spectrum of the compound 6 (CDCl<sub>3</sub>, 400 MHz).

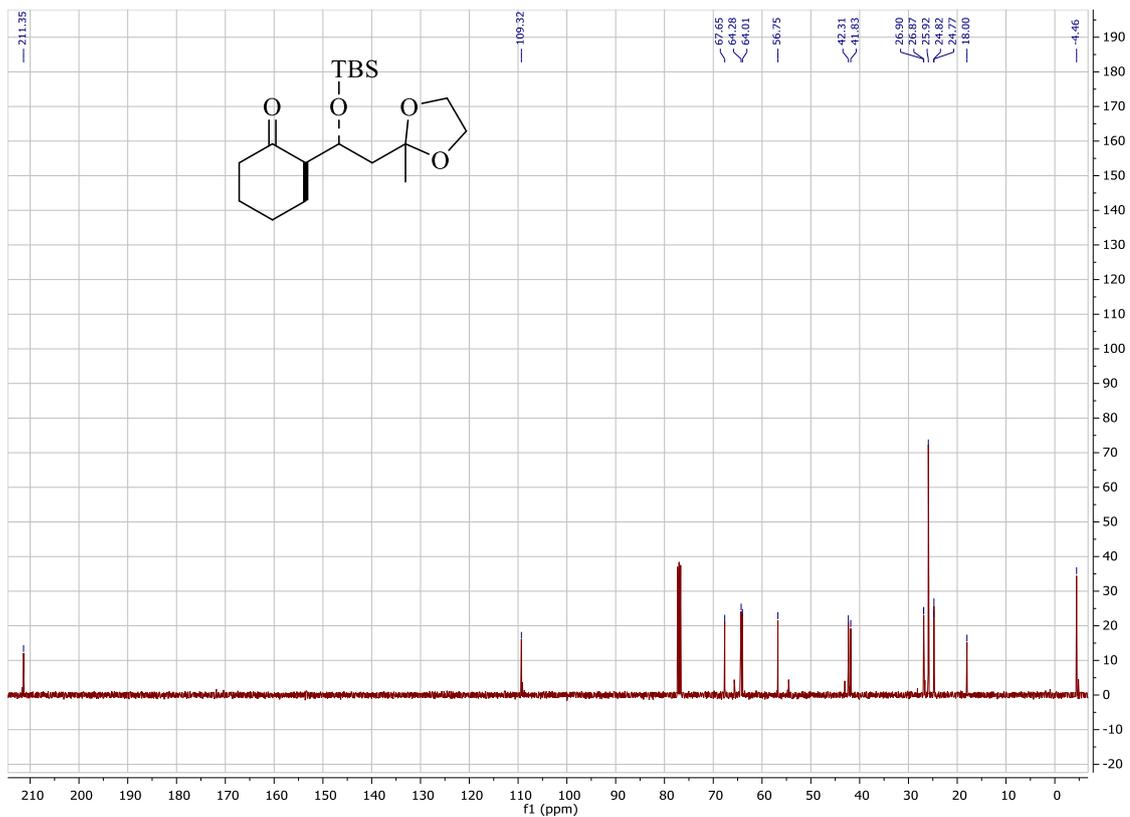


Figure S11. <sup>13</sup>C-NMR spectrum of the compound 6 (CDCl<sub>3</sub>, 100 MHz).

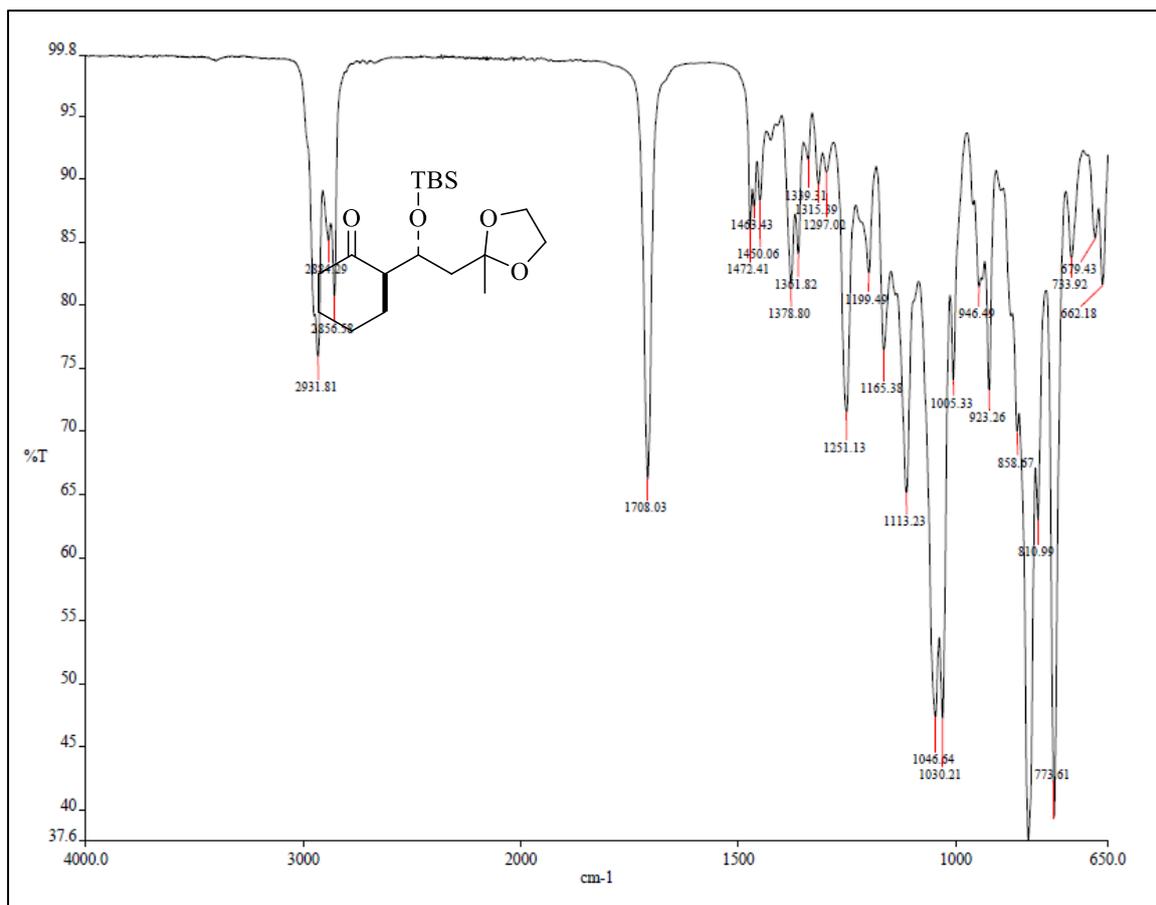


Figure S12. IR-spectrum of the compound 6.

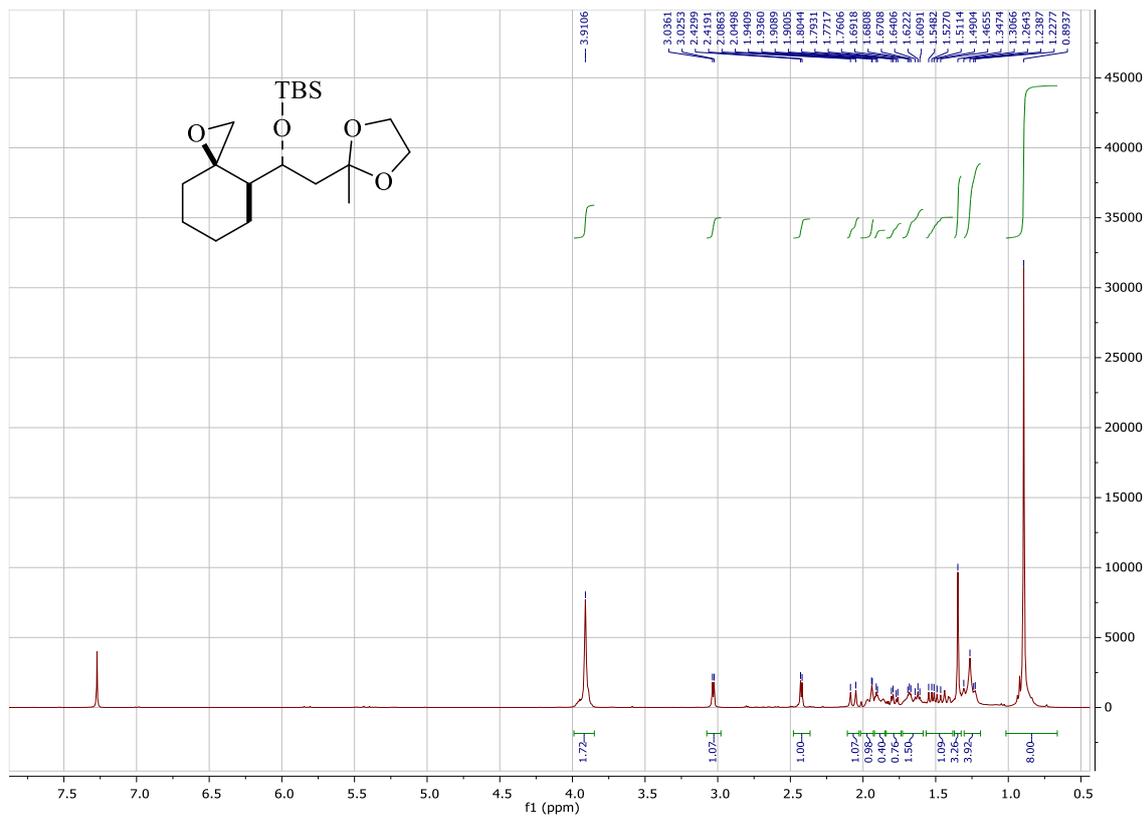


Figure S13. <sup>1</sup>H-spectrum of the compound 7 (CDCl<sub>3</sub>, 400 MHz).

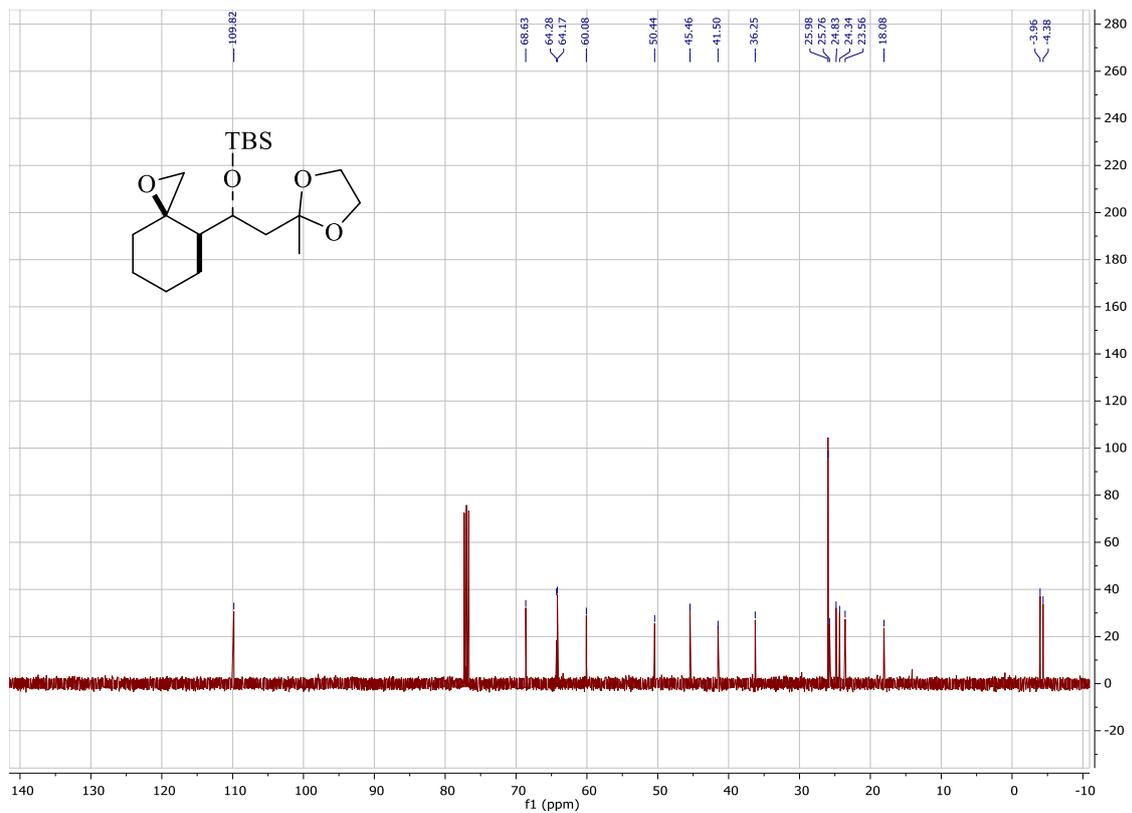


Figure S14.  $^{13}\text{C}$ -NMR spectrum of the compound 7 ( $\text{CDCl}_3$ , 100 MHz).

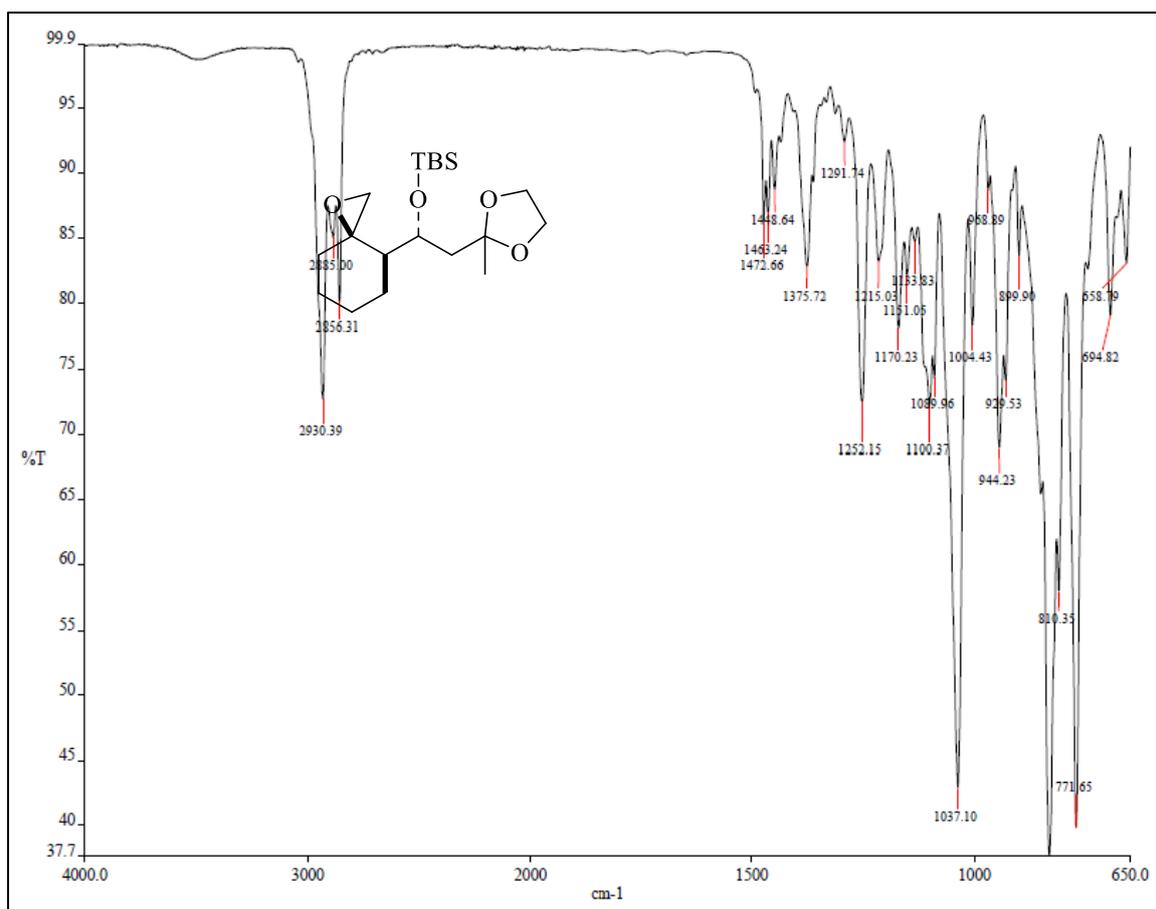


Figure S15. IR-spectrum of the compound 7.

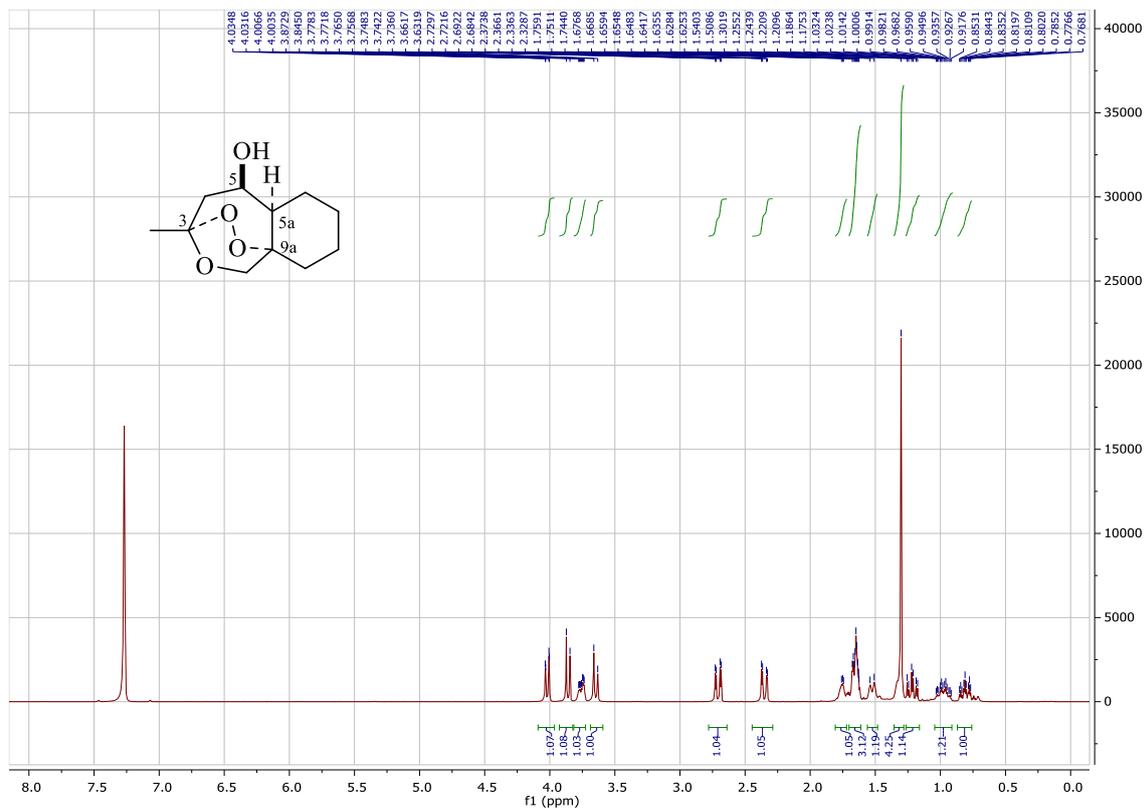


Figure S16.  $^1\text{H}$ -spectrum of the compound *rac-2* (CDCl<sub>3</sub>, 400 MHz).

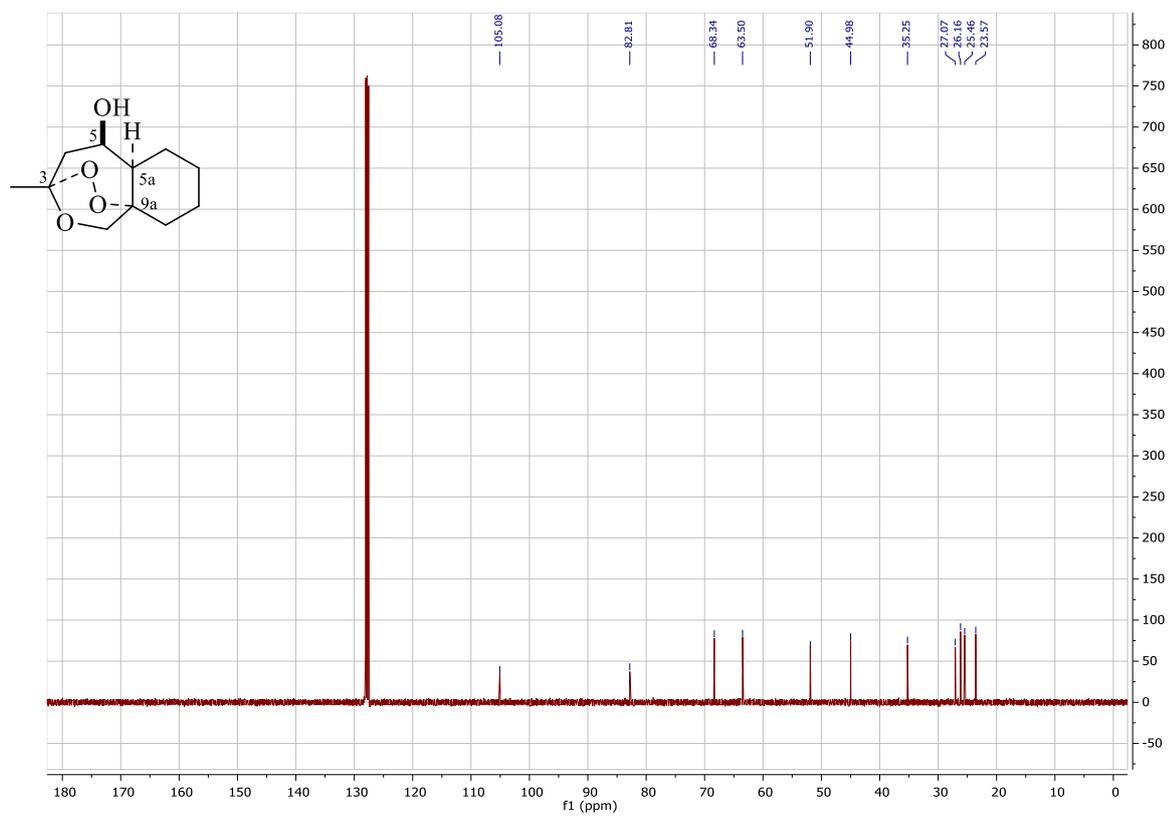


Figure S17.  $^{13}\text{C}$ -NMR spectrum of the compound *rac*-2 ( $\text{CDCl}_3$ , 100 MHz).

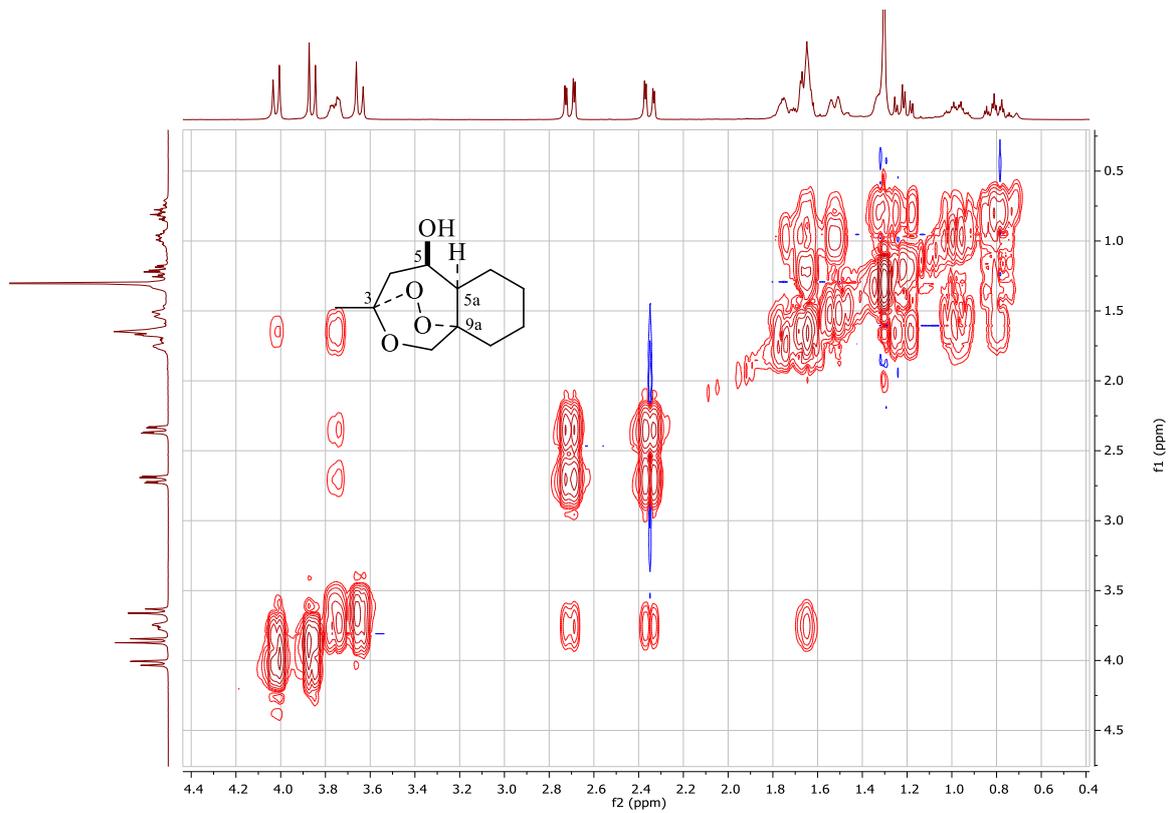
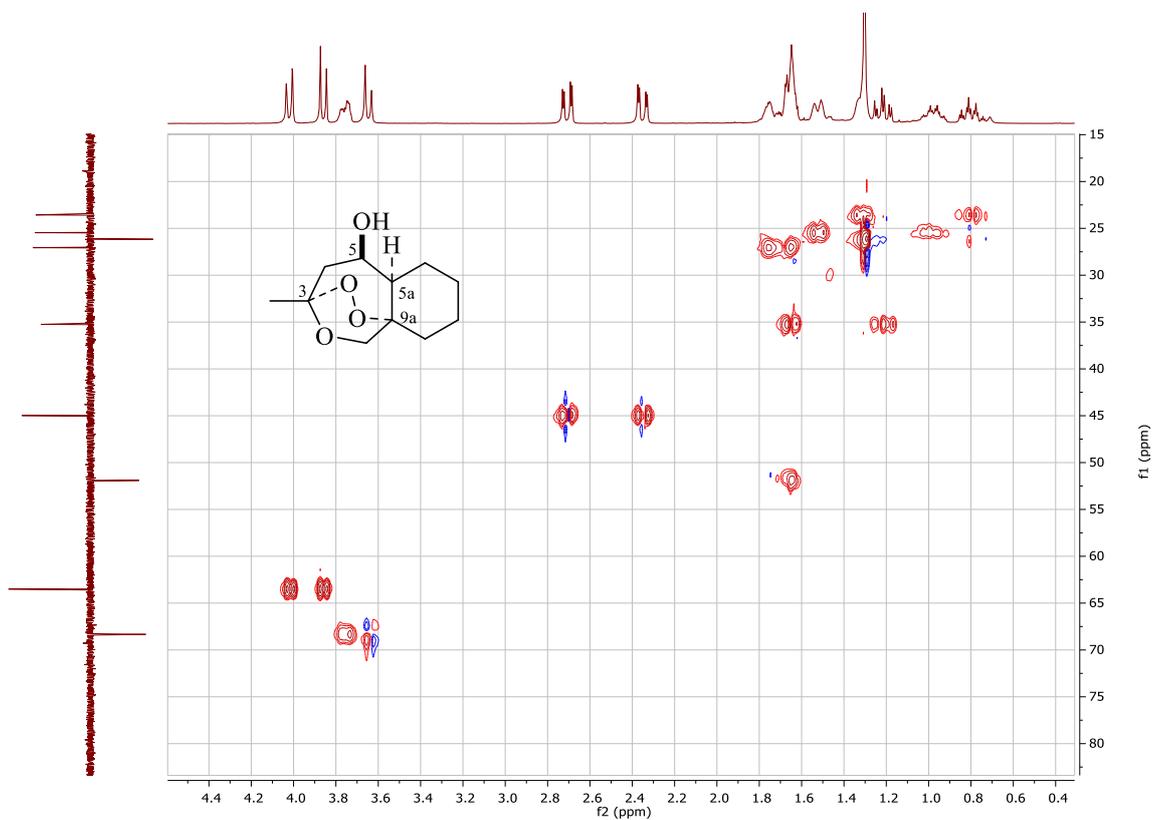


Figure S18. COSY spectrum of the compound *rac-2*



S18. HSQC spectrum of the compound *rac-2*

Figure

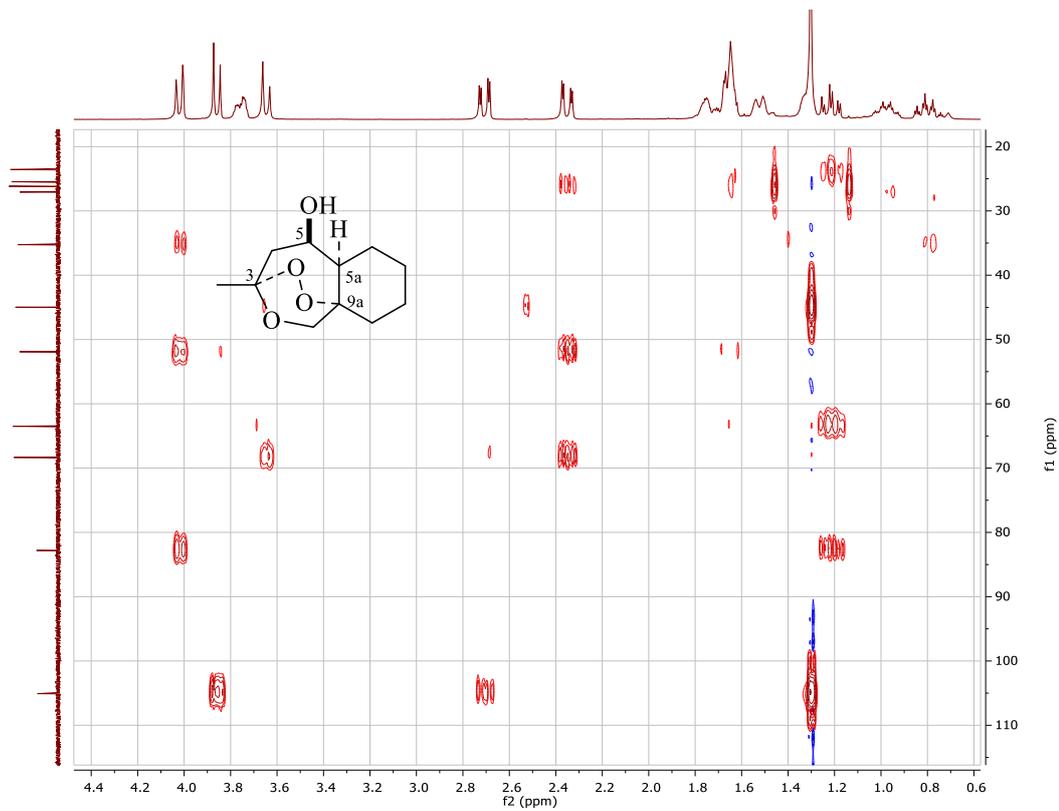


Figure S19. HMBC spectrum of the compound *rac-2*

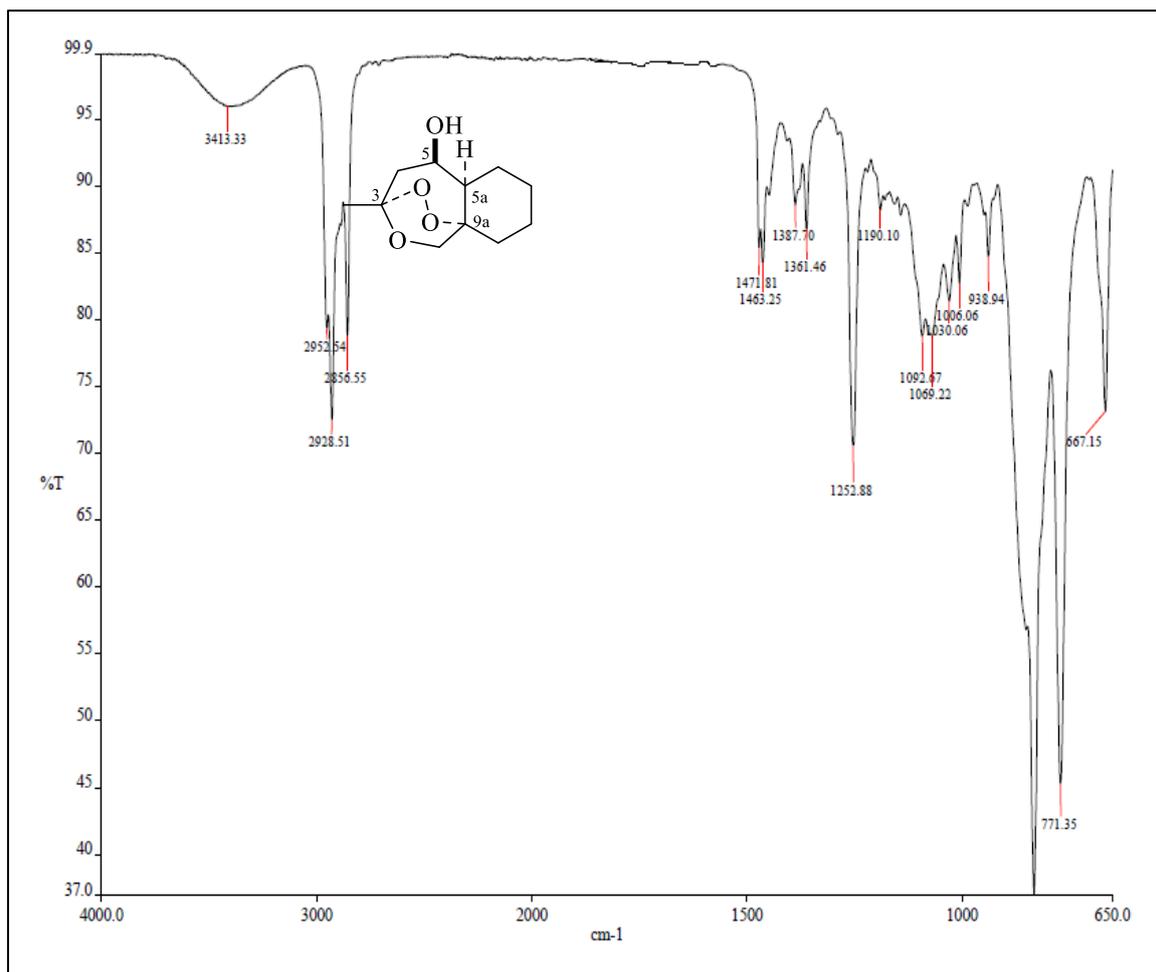


Figure S20. IR-spectrum of the compound *rac-2*

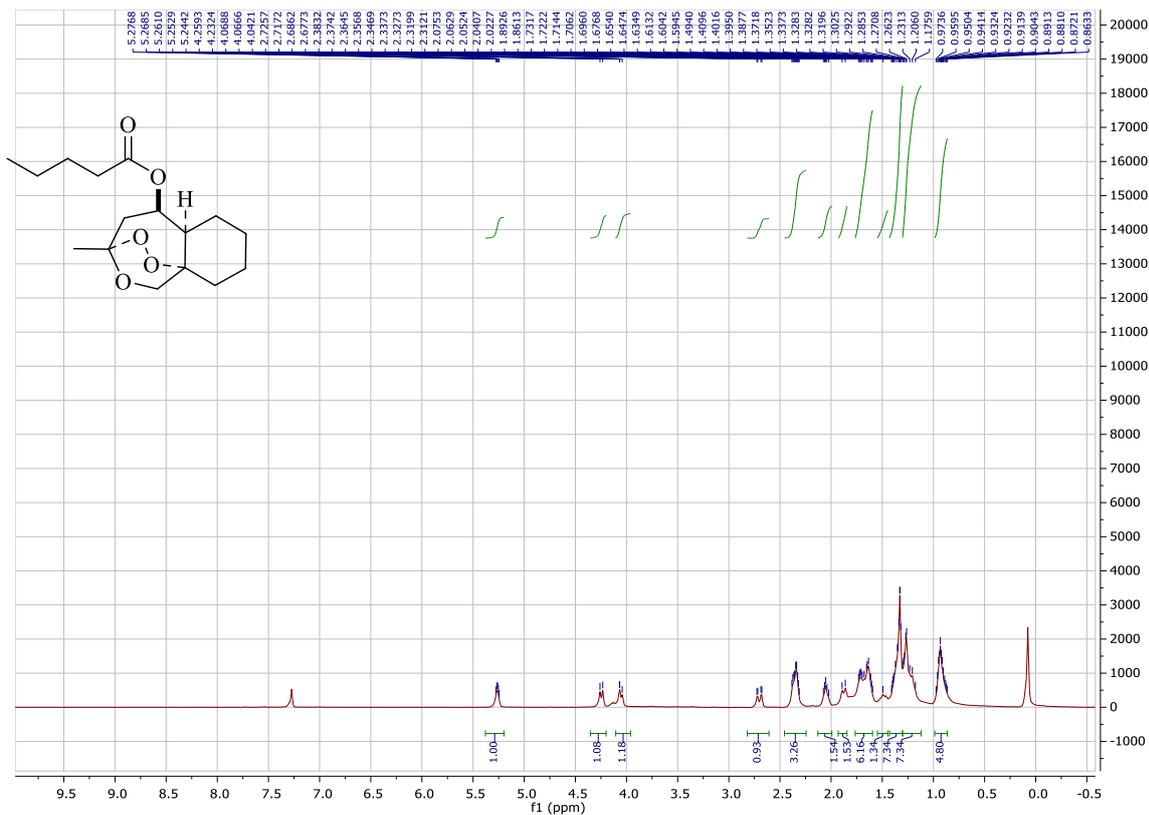


Figure S21. <sup>1</sup>H spectrum of the compound 9 (CDCl<sub>3</sub>, 400 MHz).

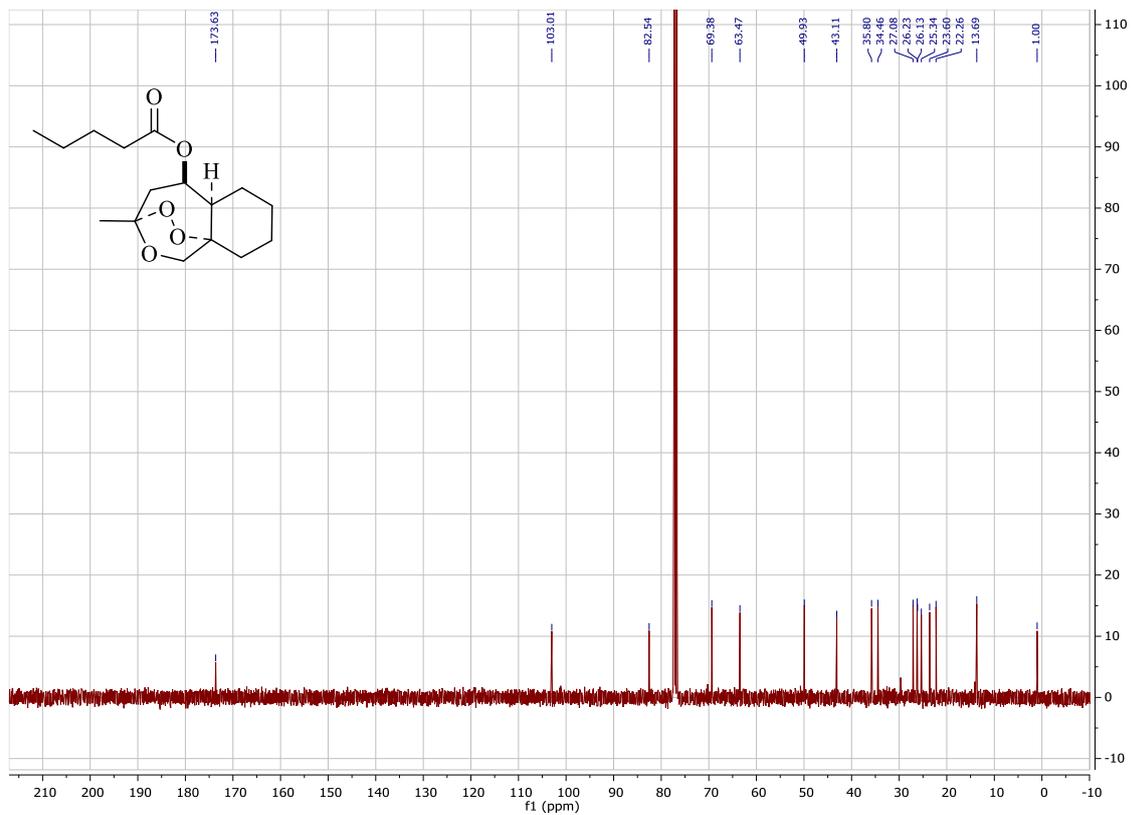


Figure S22.  $^{13}\text{C}$ -NMR spectrum of the compound 9 (CDCl<sub>3</sub>, 100 MHz).

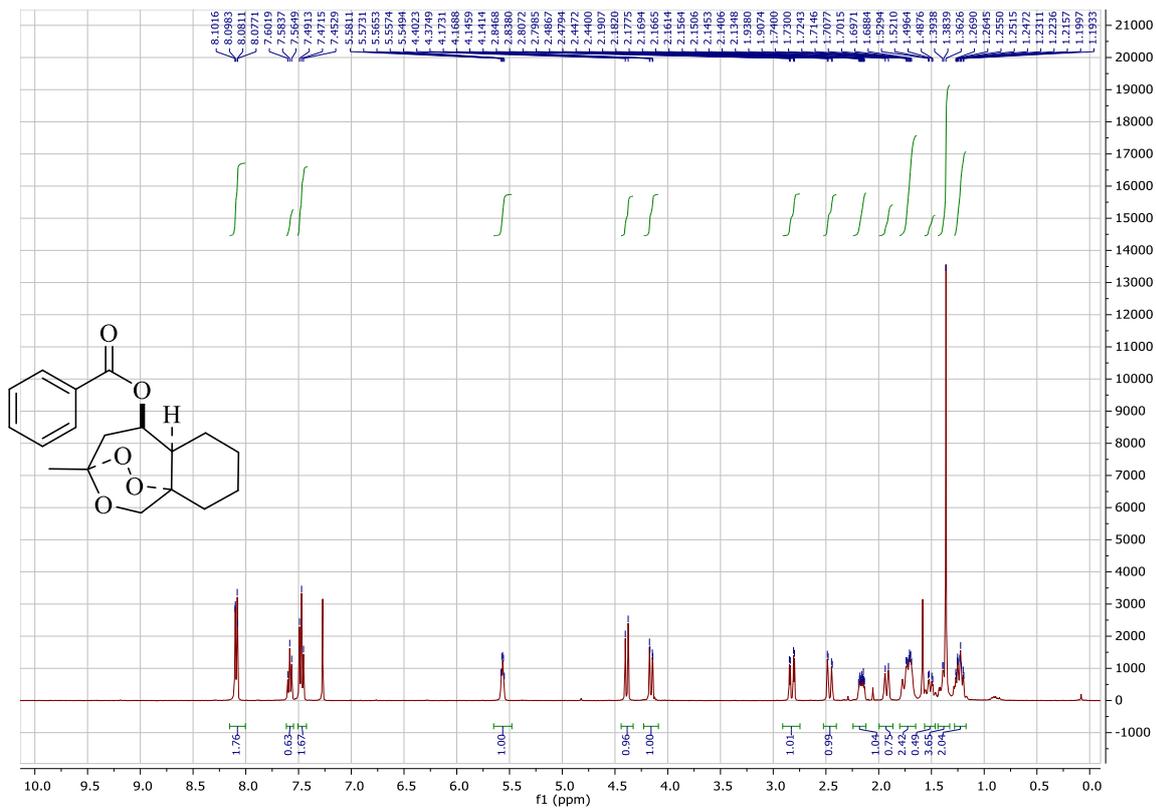


Figure S23. <sup>1</sup>H-spectrum of the compound 10 (CDCl<sub>3</sub>, 400 MHz).

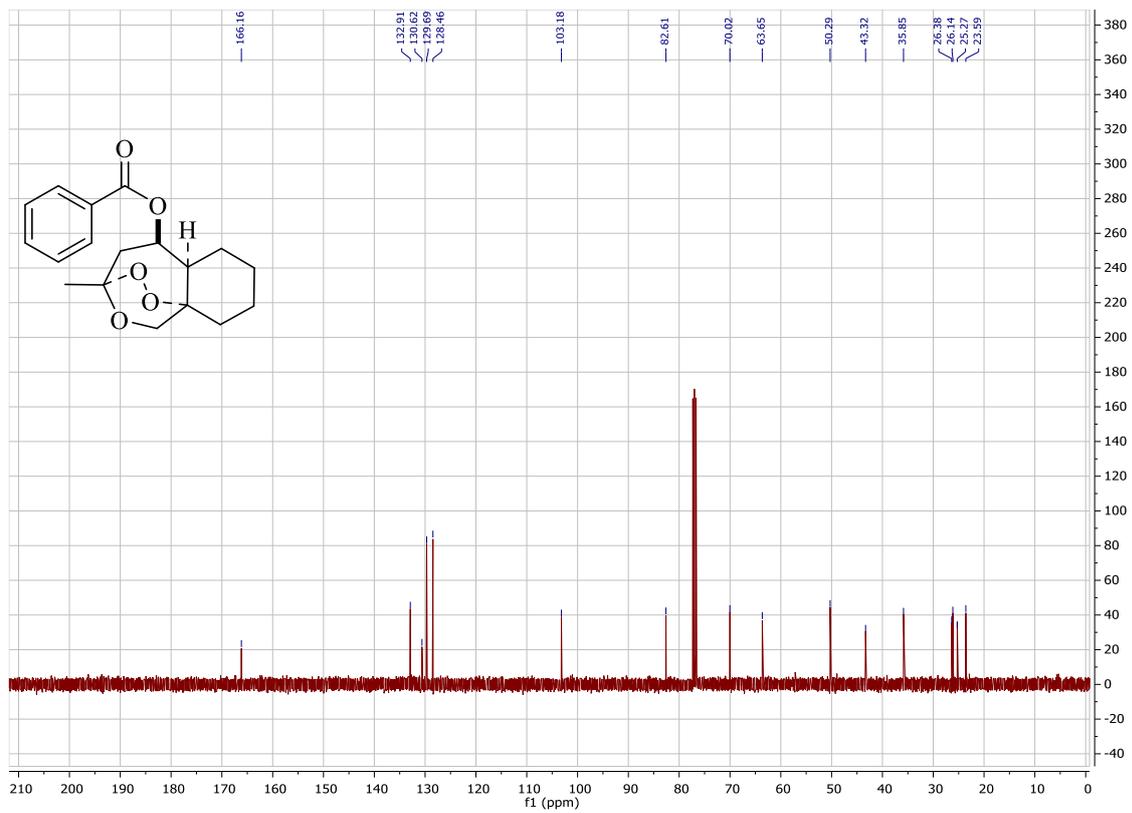


Figure S24. <sup>13</sup>C-NMR spectrum of the compound 10 (CDCl<sub>3</sub>, 100 MHz).

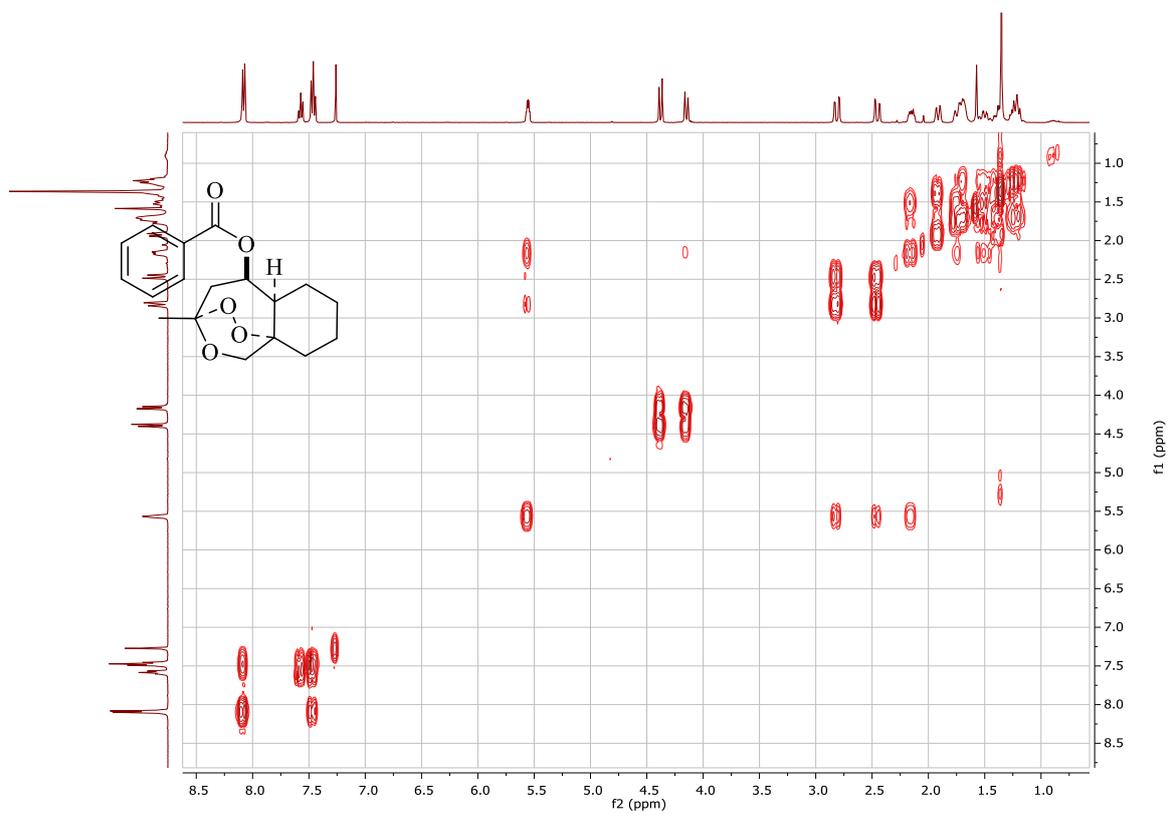
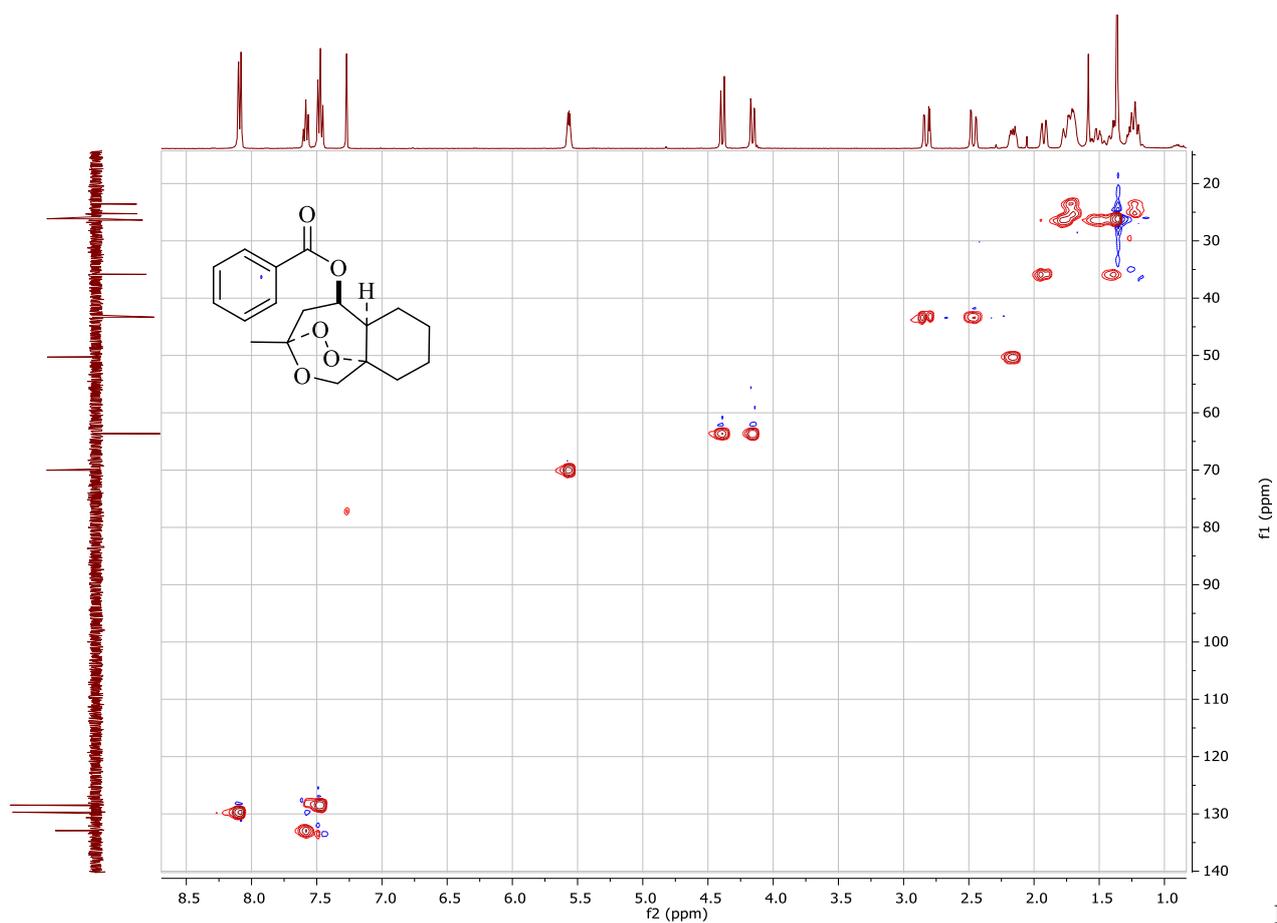


Figure S25. COSY spectrum of the compound 10.



Figure

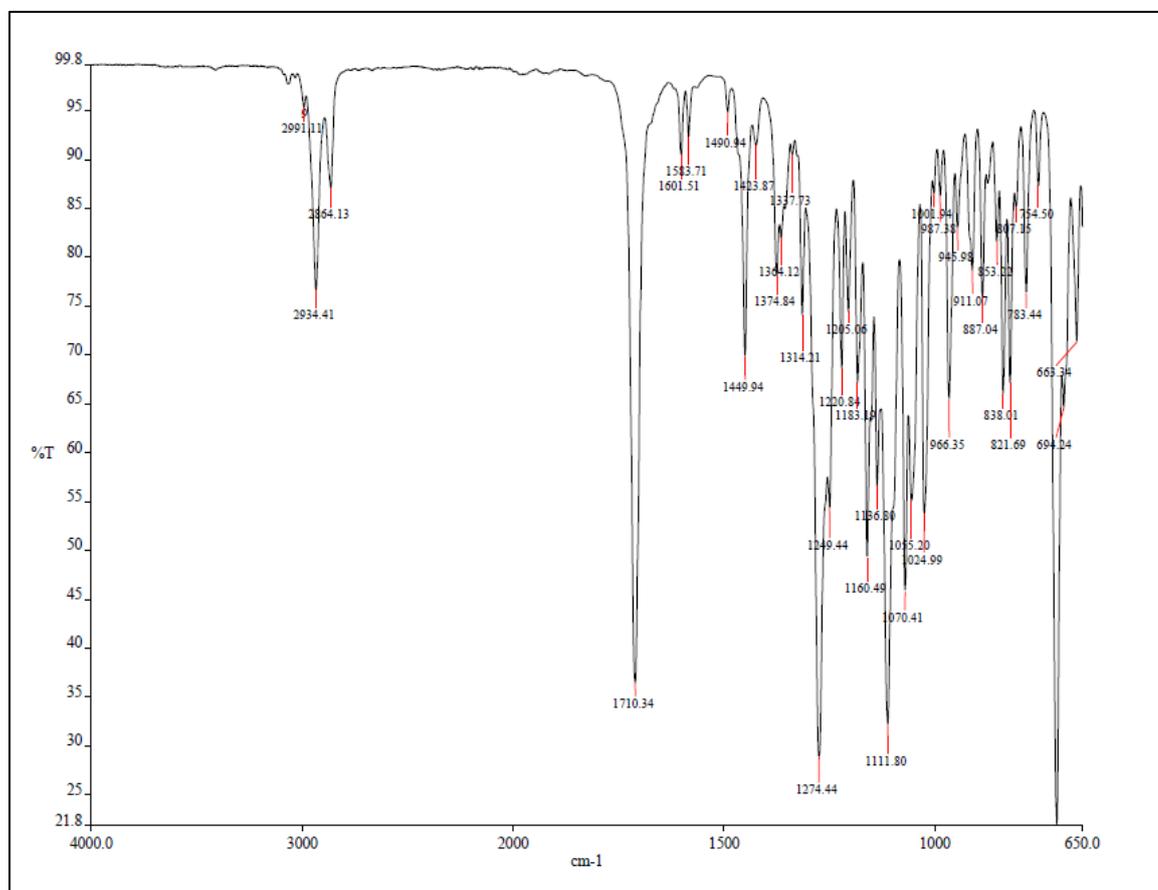
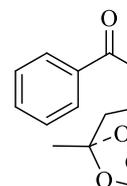


Figure S27. IR-spectrum of the compound 10.



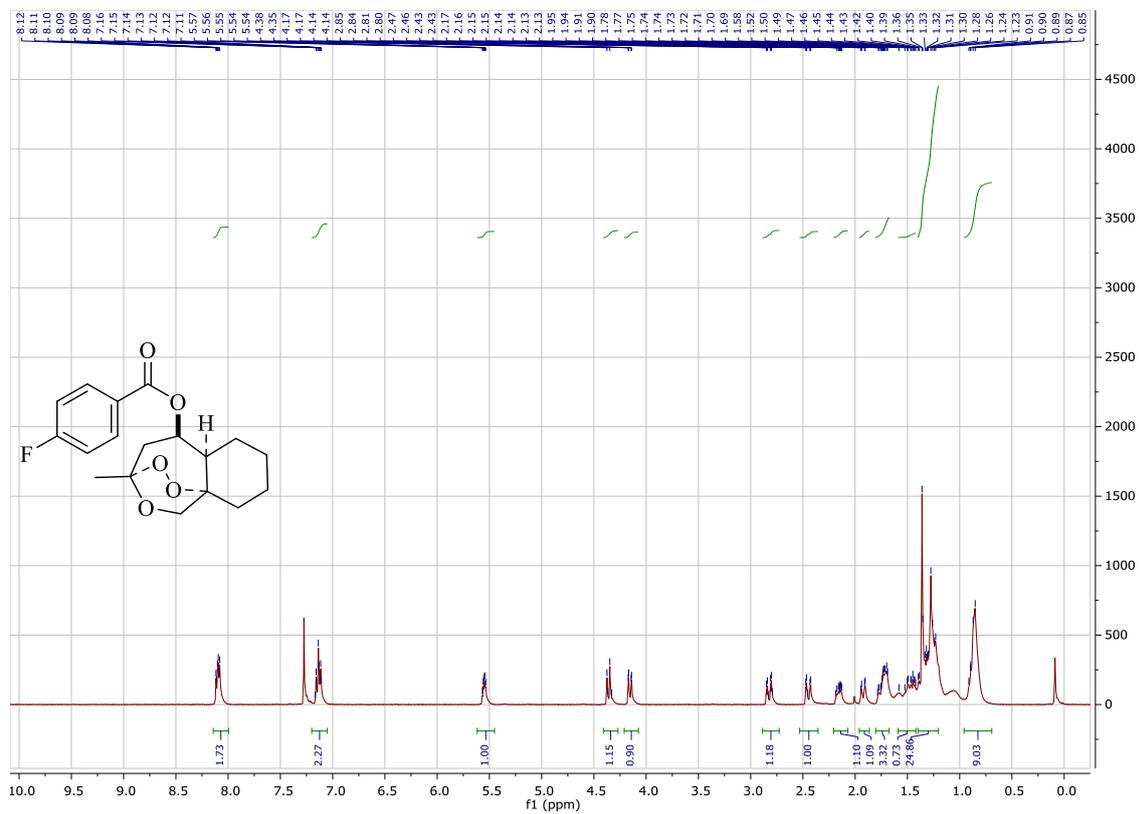


Figure S28.  $^1\text{H}$ -spectrum of the compound 11 ( $\text{CDCl}_3$ , 400 MHz).

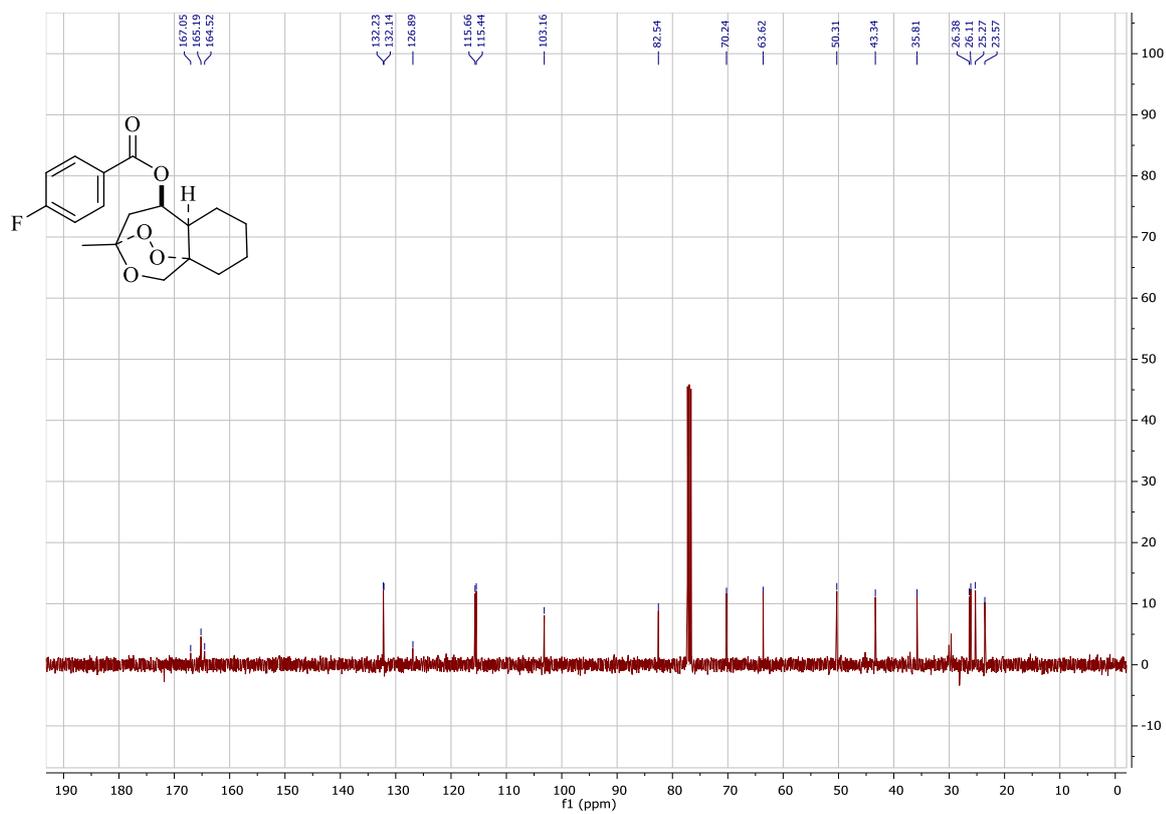
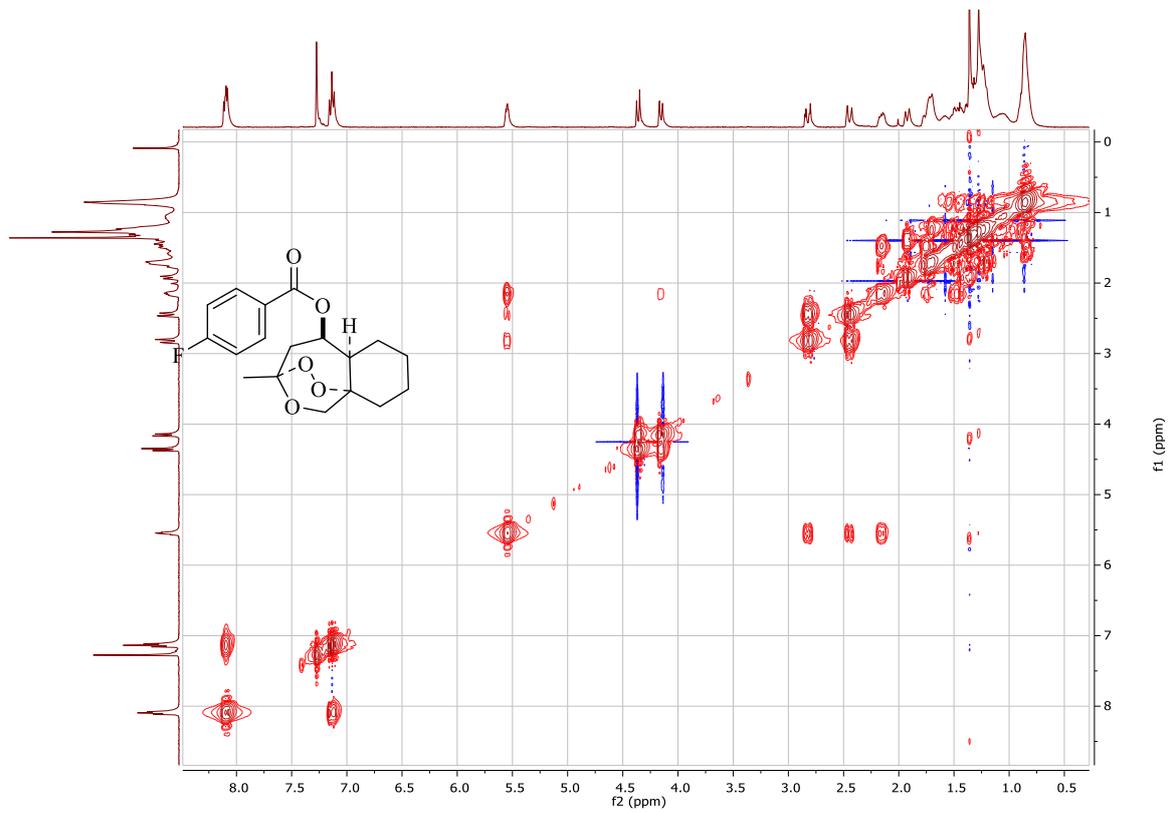


Figure S29.  $^{13}\text{C}$ -NMR spectrum of the compound **11** ( $\text{CDCl}_3$ , 100 MHz).



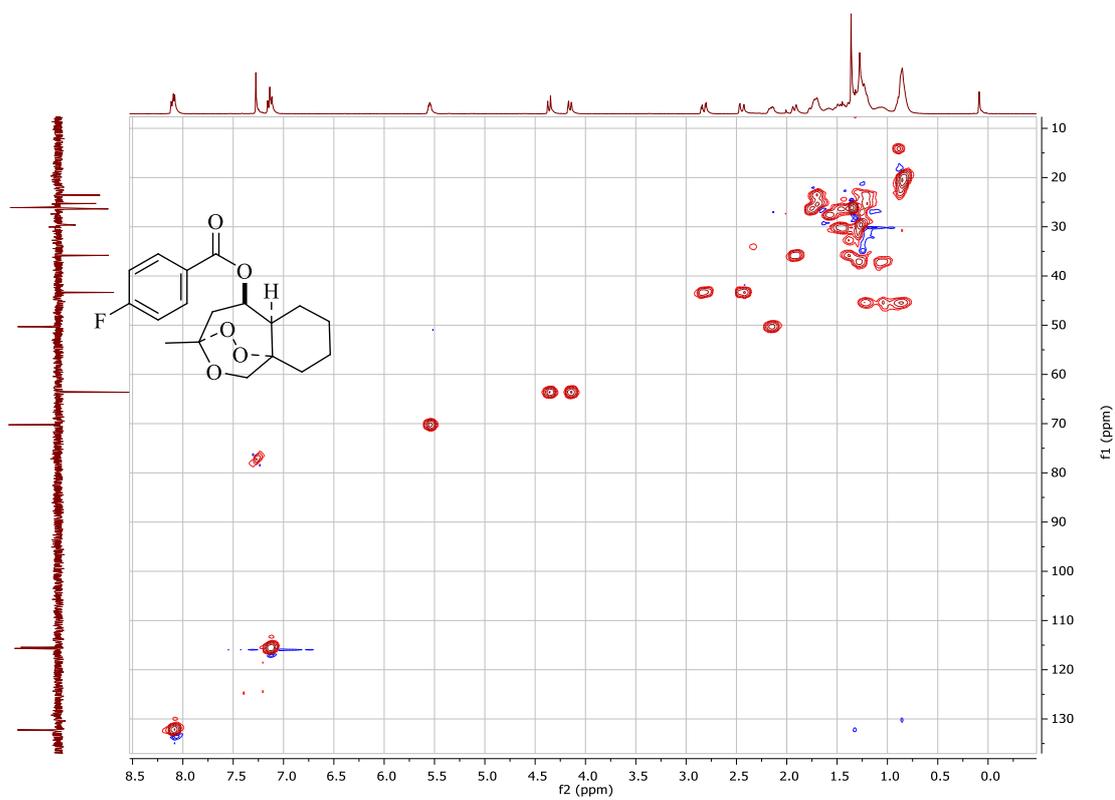


Figure S31. HSQC spectrum of the compound **11**.

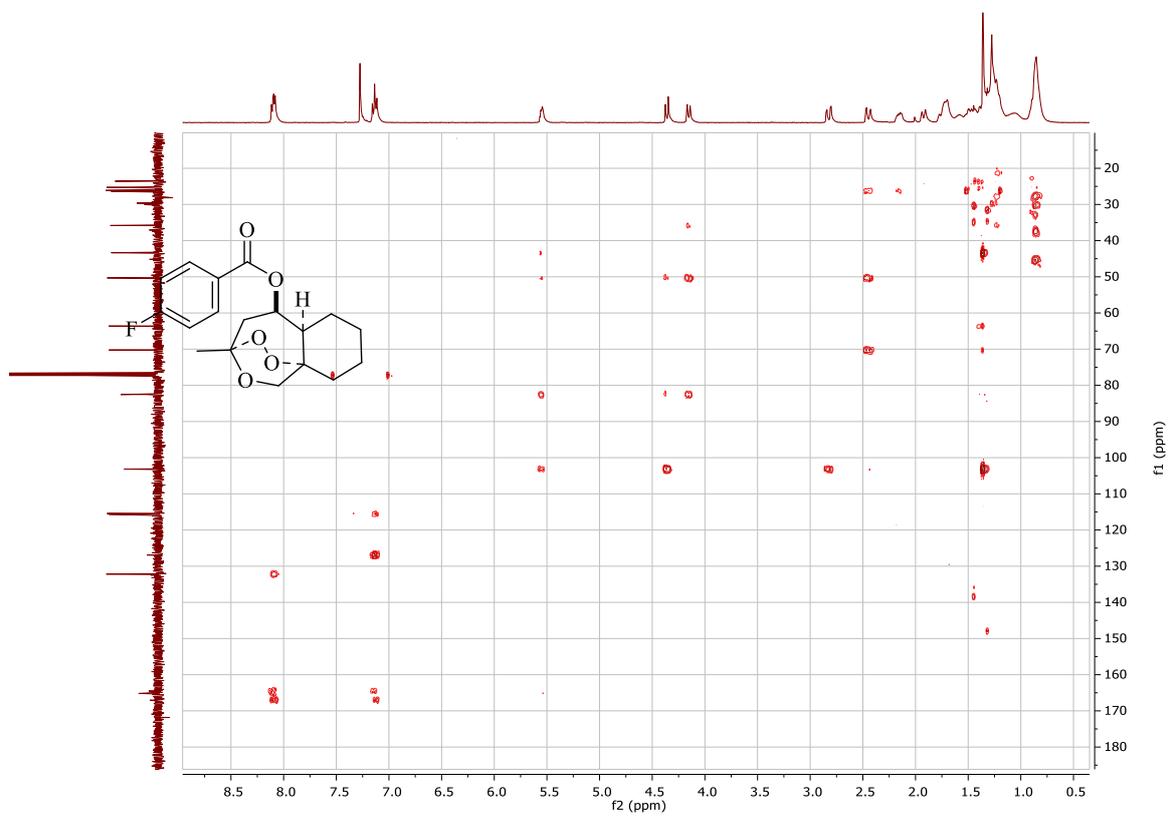


Figure S32. HMBC spectrum of the compound 11.

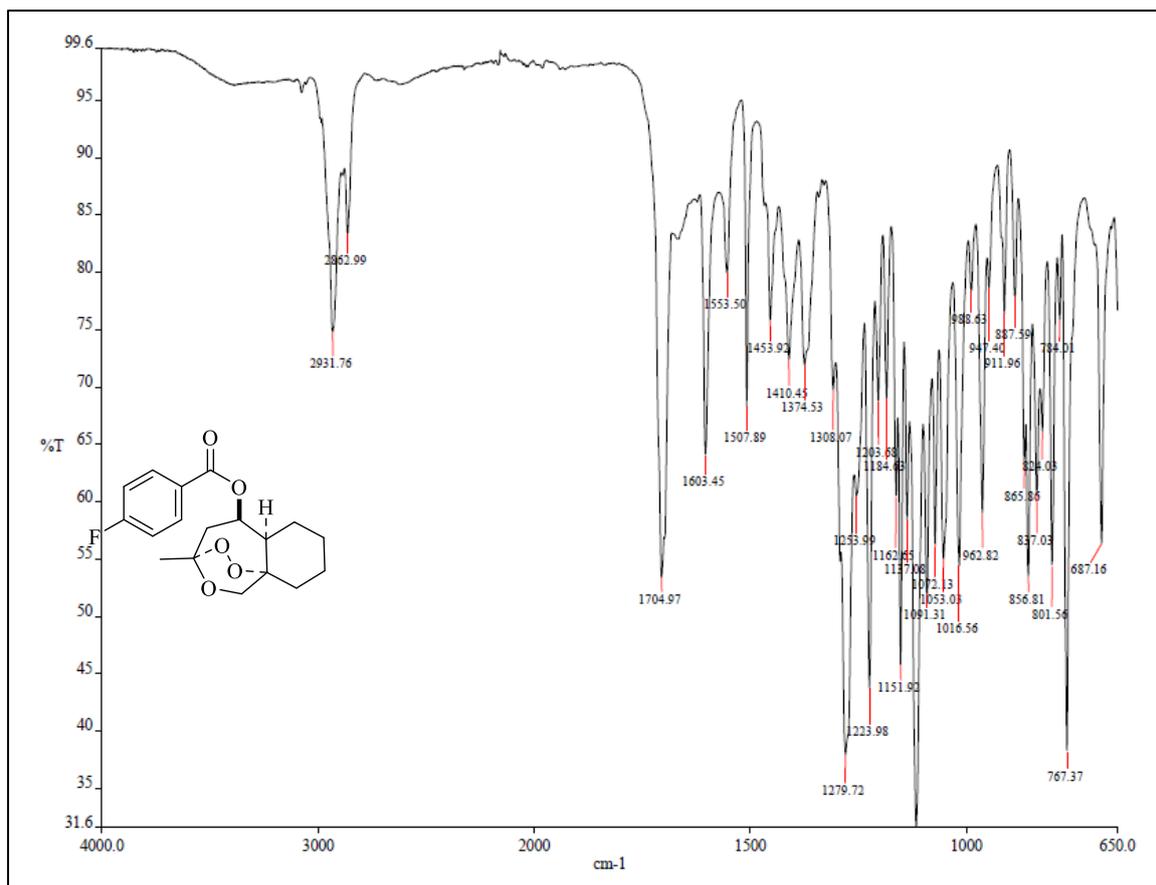


Figure S33. IR-spectrum of the compound 11.



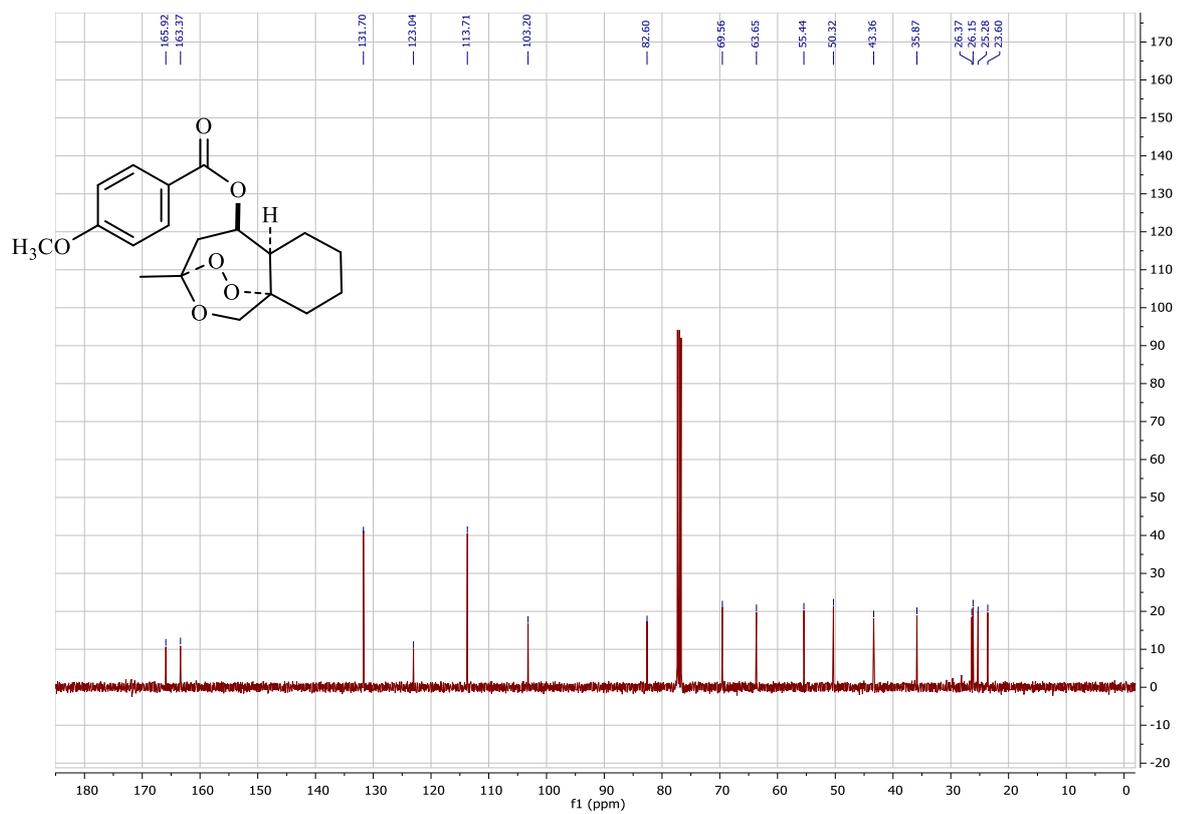
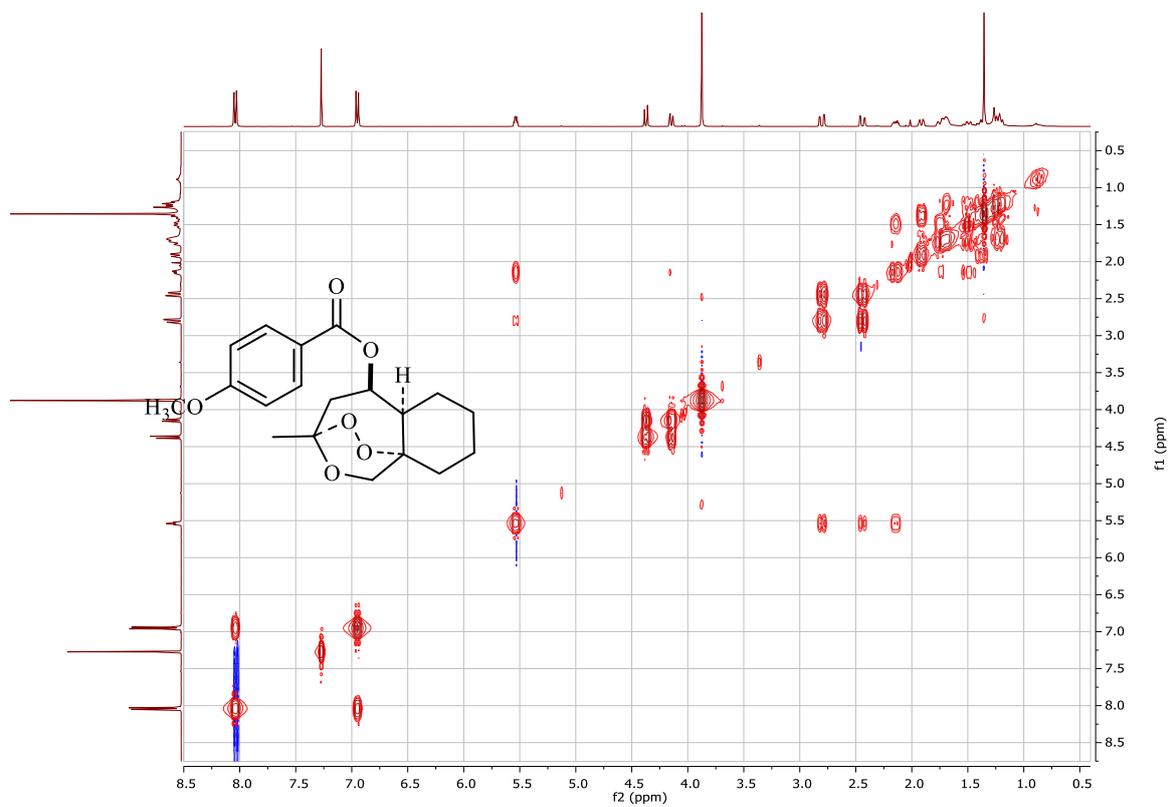
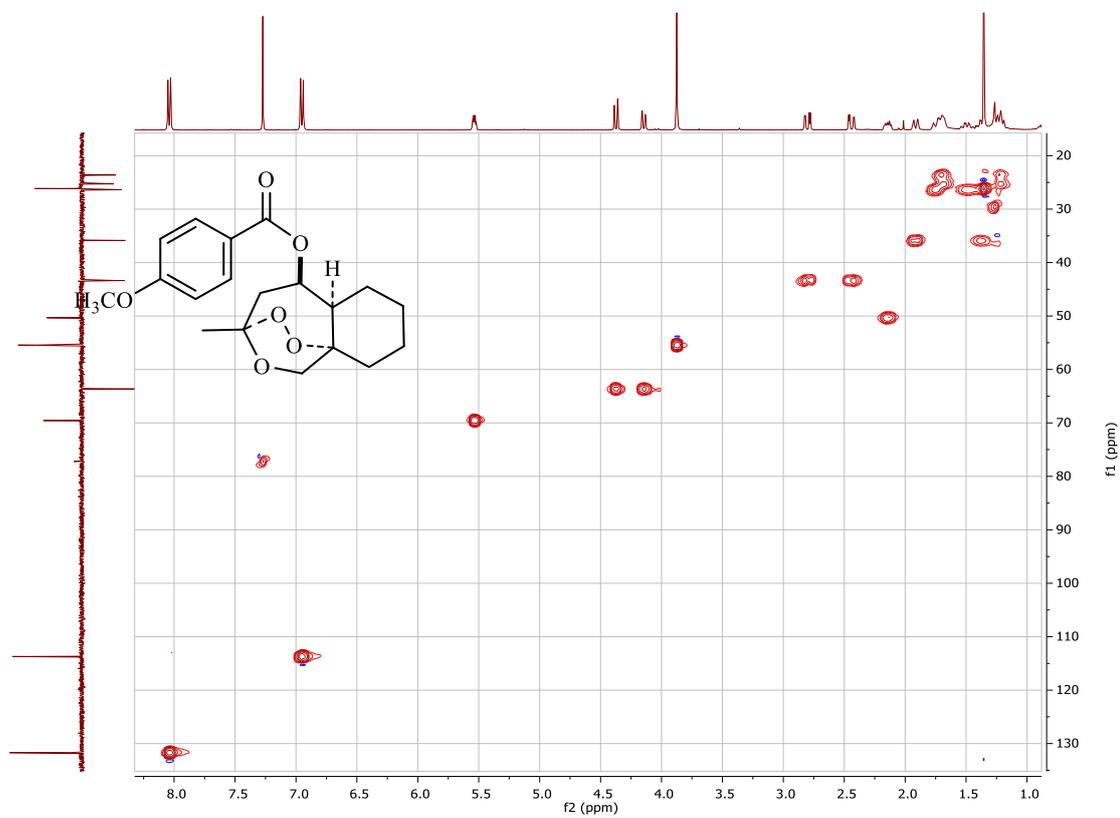


Figure S35. <sup>13</sup>C-NMR spectrum of the compound 12 (CDCl<sub>3</sub>, 100 MHz).





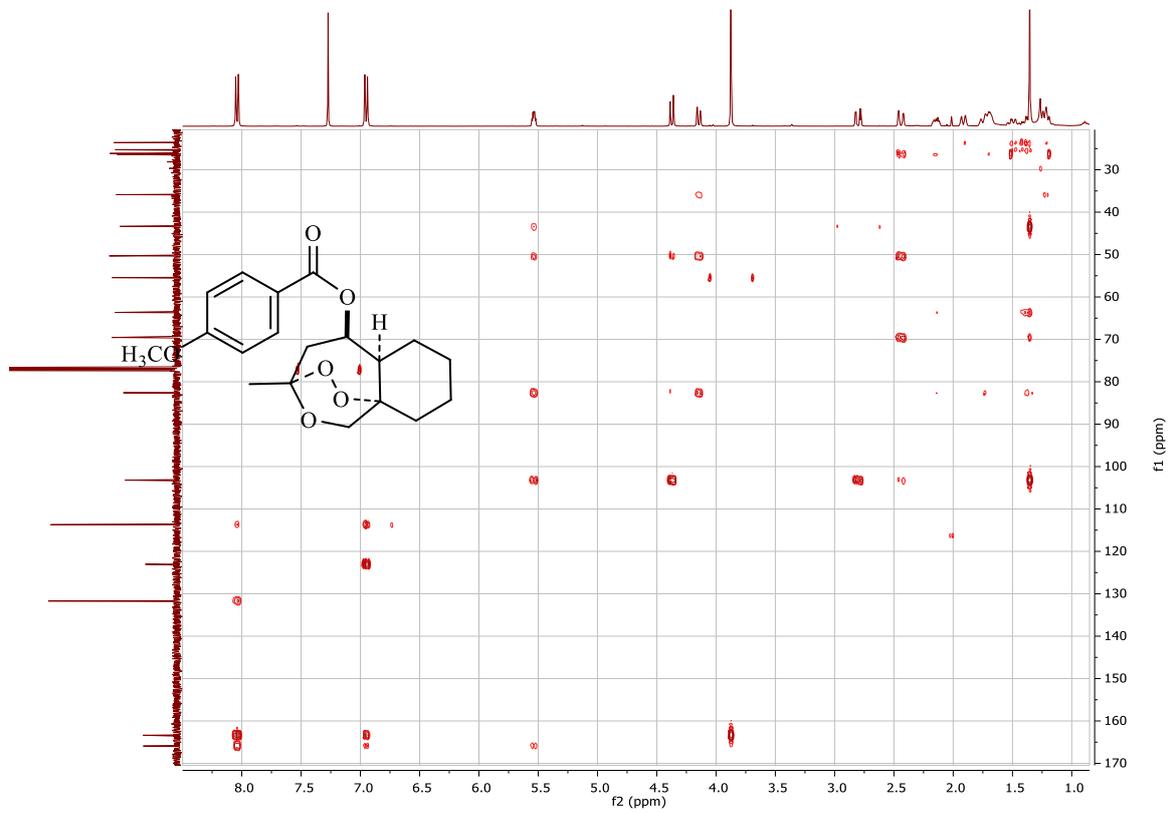


Figure S38. HMBC spectrum of the compound 12.

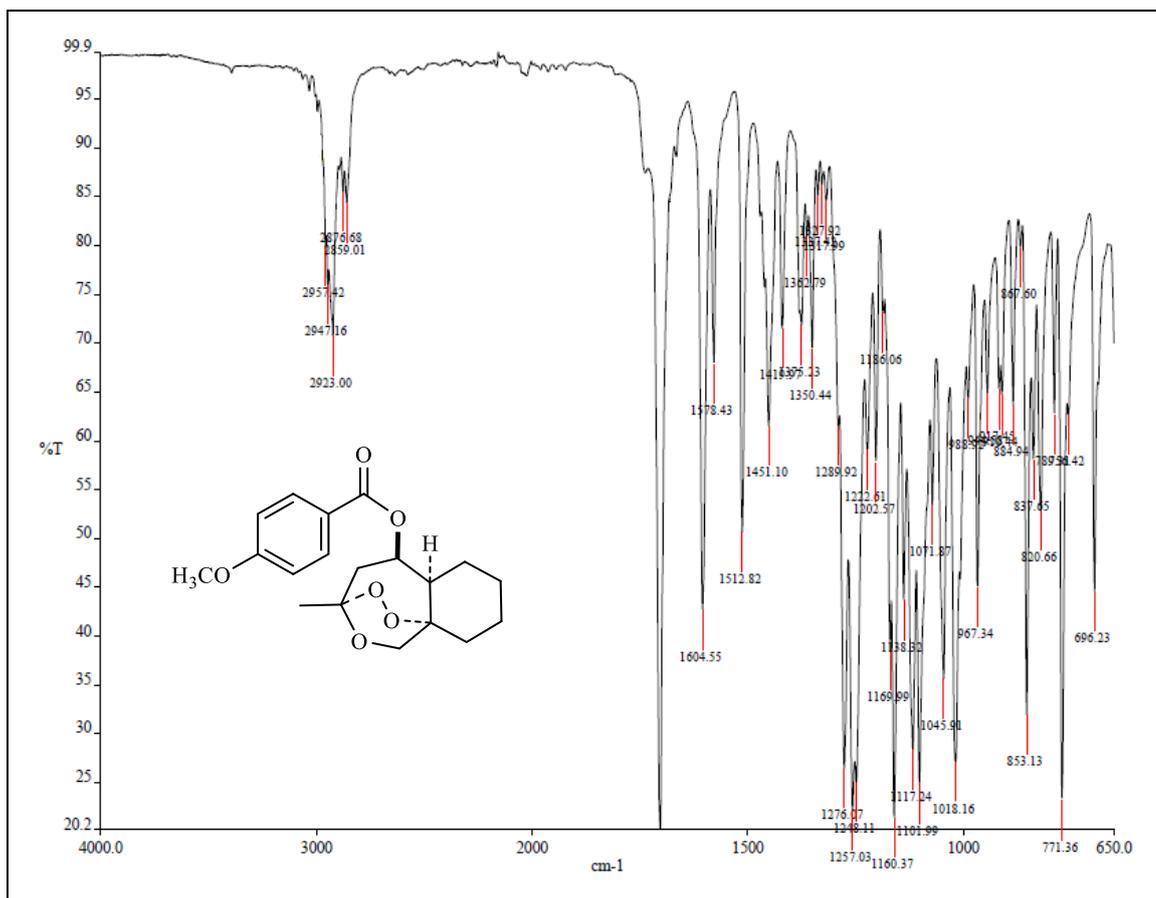


Figure S39. IR-spectrum of the compound 12.

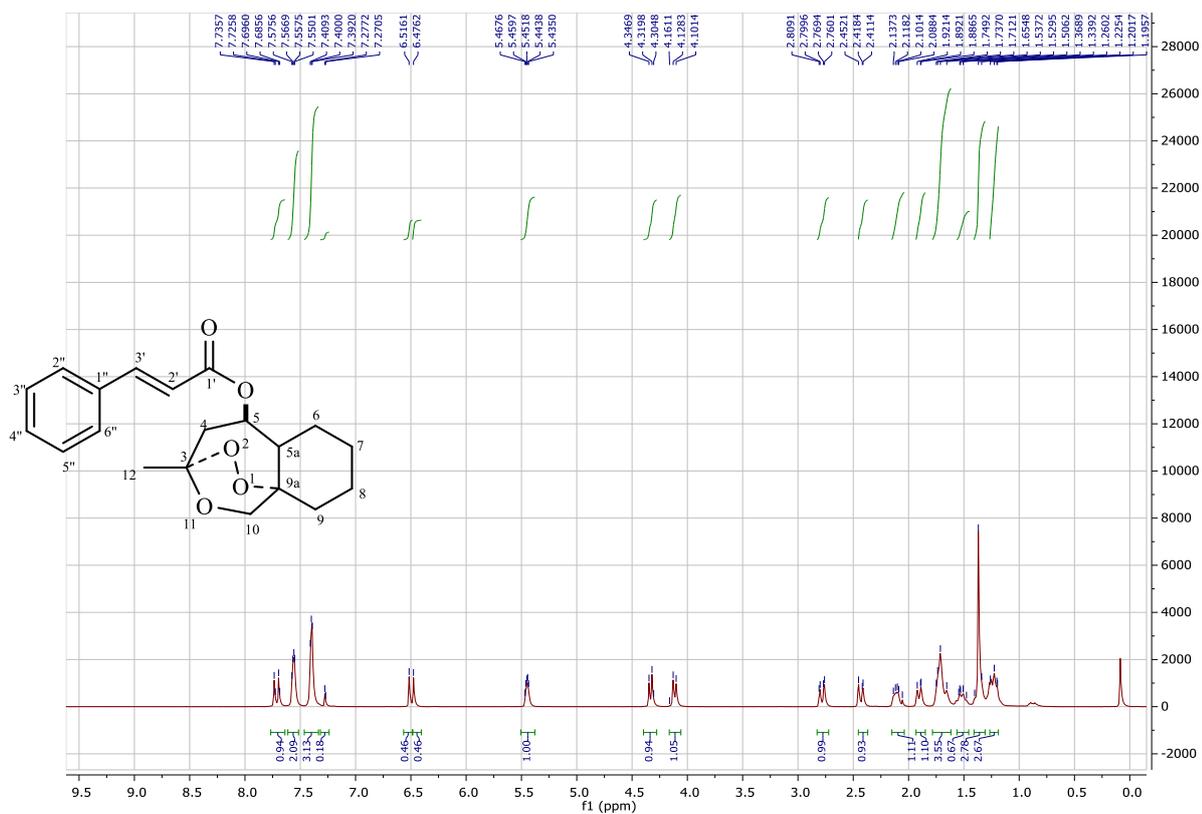


Figure S40. <sup>1</sup>H-spectrum of the compound **13** (CDCl<sub>3</sub>, 400 MHz).

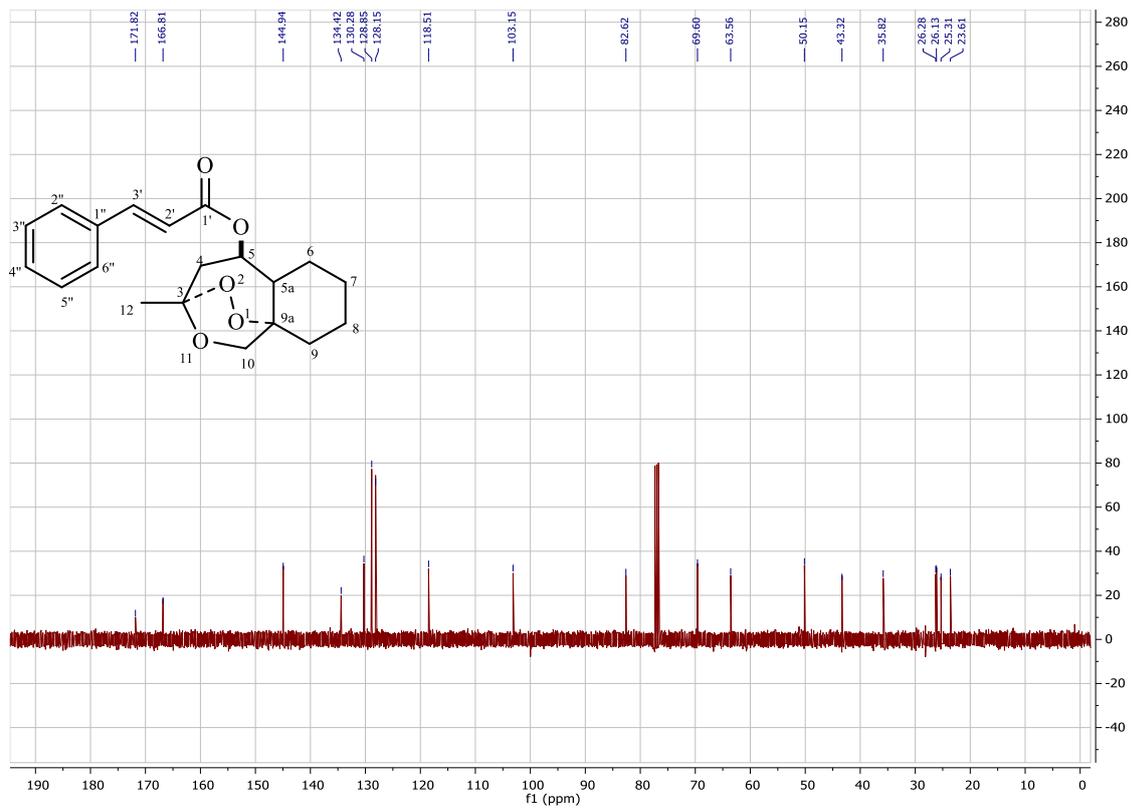


Figure S41. <sup>13</sup>C-NMR spectrum of the compound 13 (CDCl<sub>3</sub>, 100 MHz).

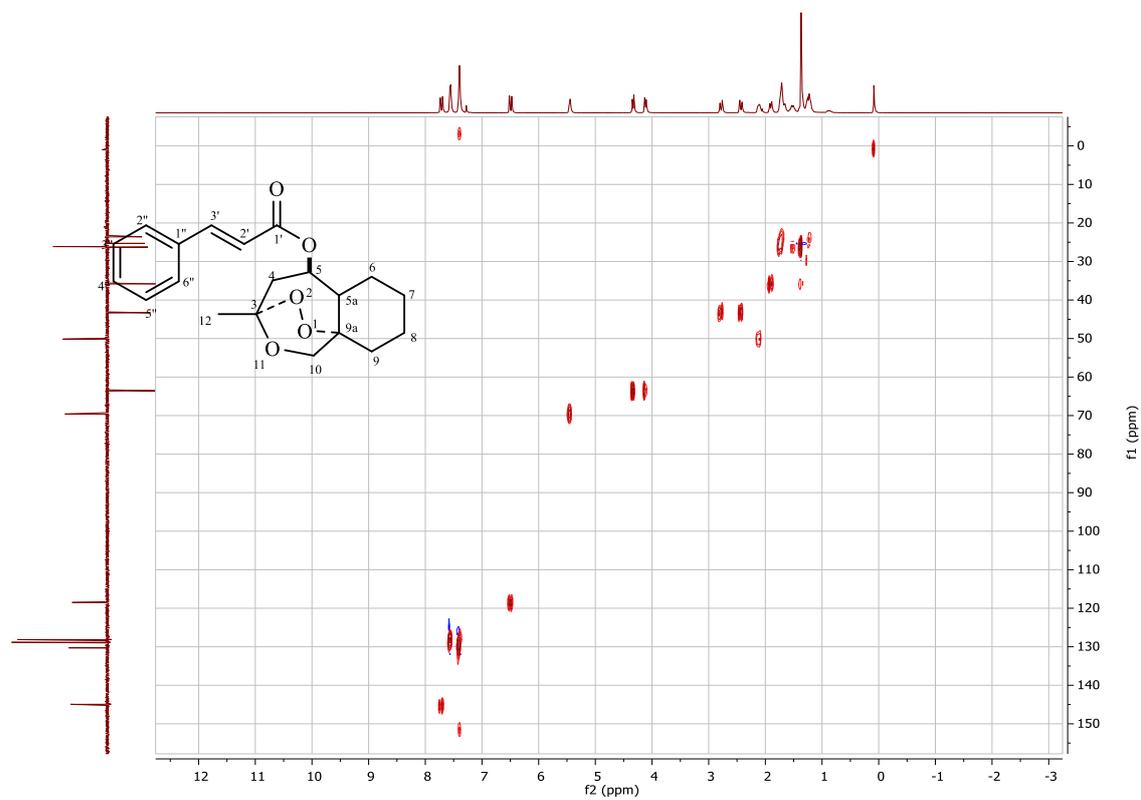


Figure S42. HSQC spectrum of the compound 13.

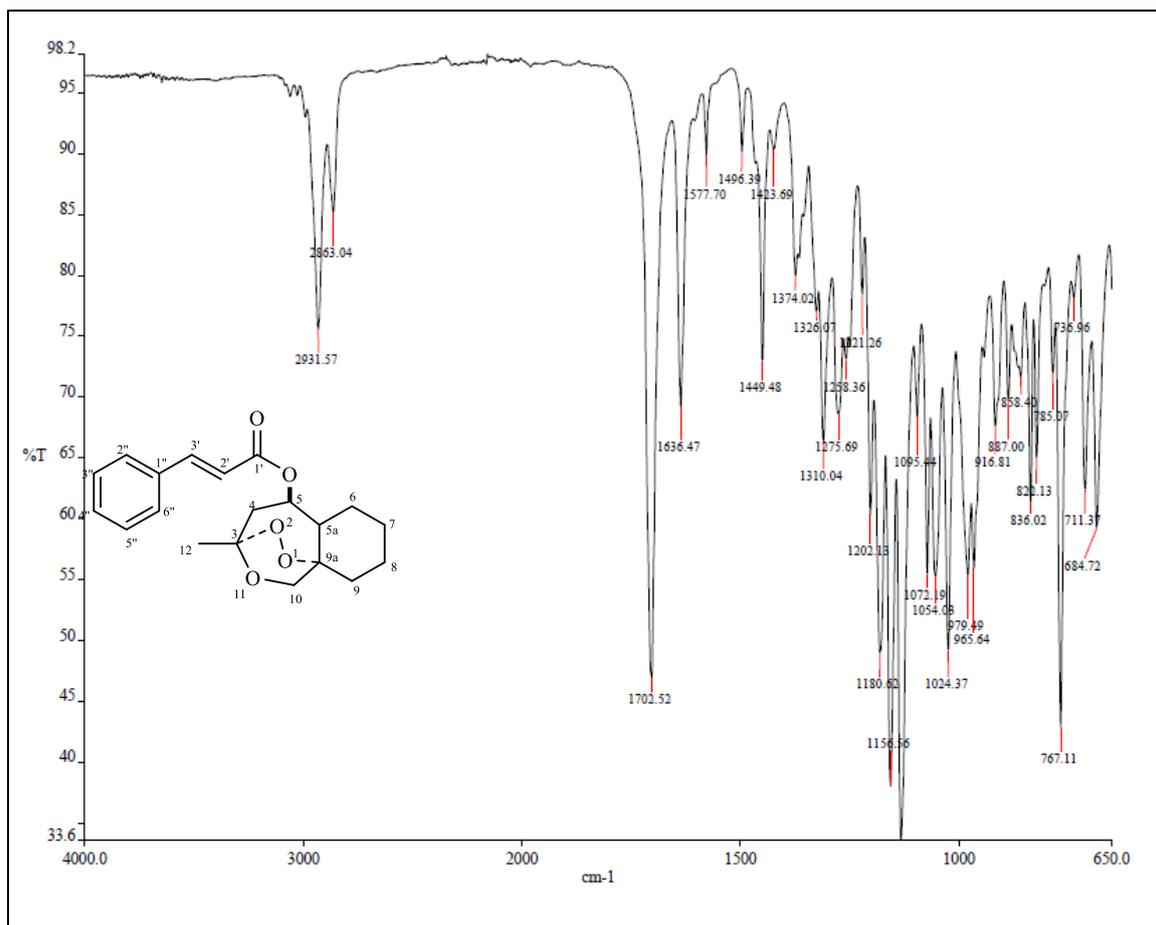


Figure S43. IR-spectrum of the compound 13.

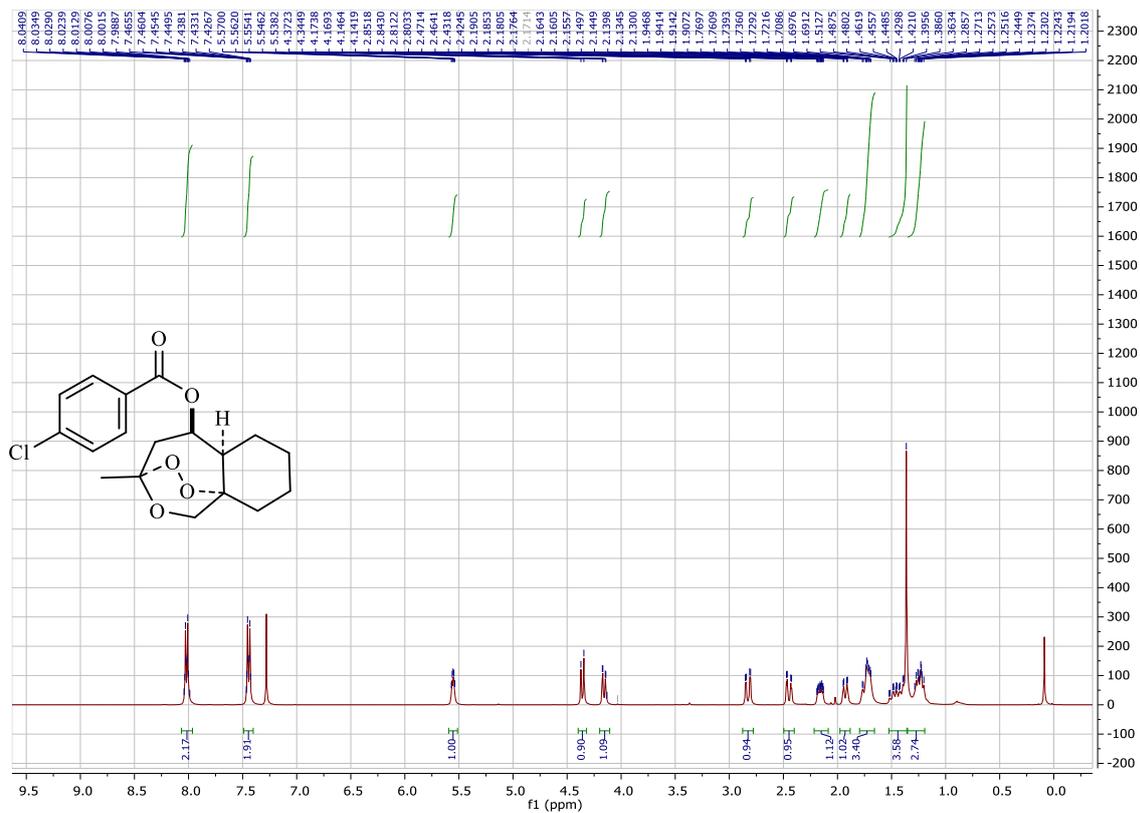


Figure S44.  $^1\text{H}$ -spectrum of the compound 14 ( $\text{CDCl}_3$ , 400 MHz).

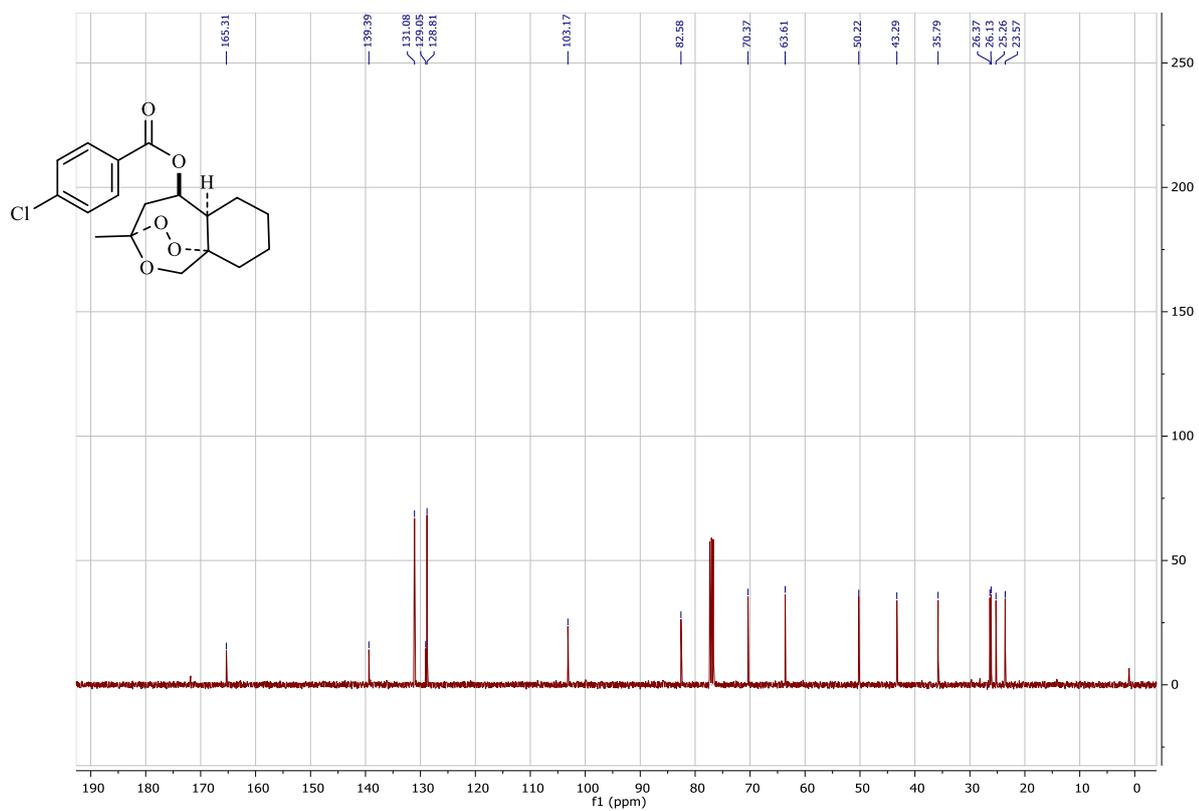
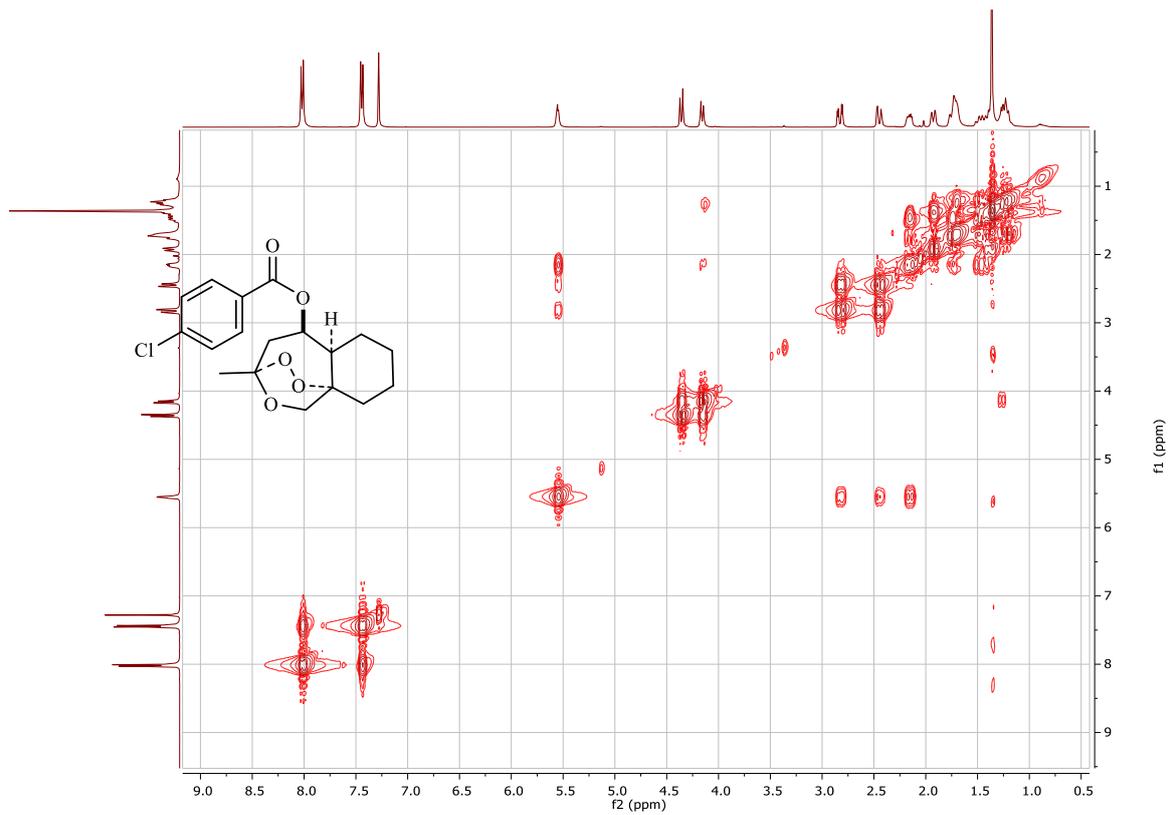
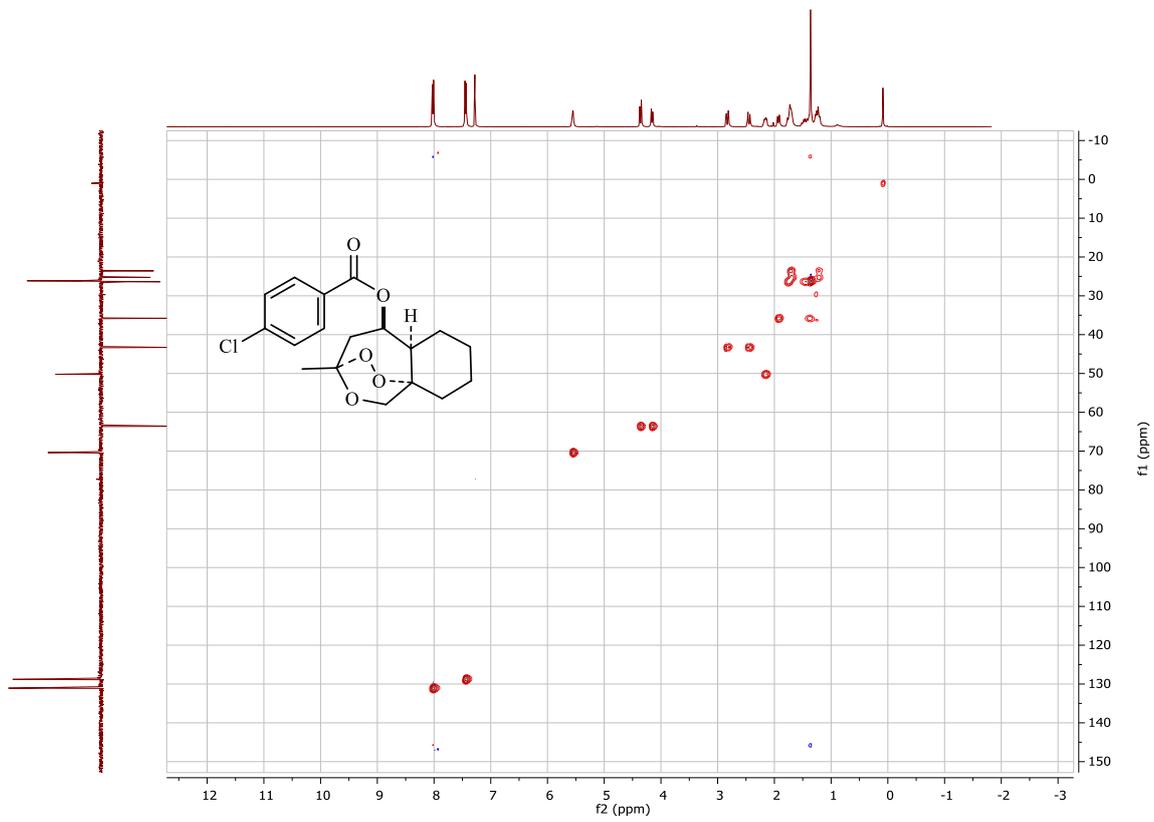


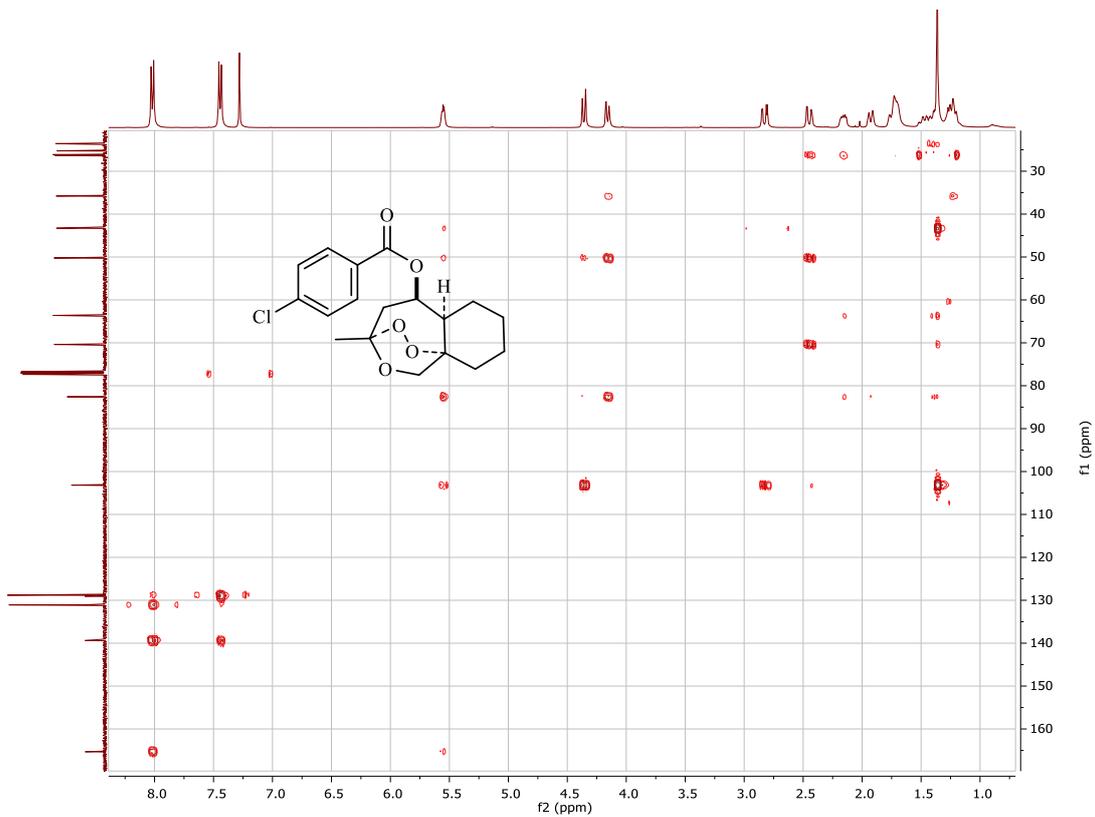
Figure S45.  $^{13}\text{C}$ -NMR spectrum of the compound **14** ( $\text{CDCl}_3$ , 100 MHz).





S47. HSQC spectrum of the compound 14.

Figure



HMBC spectrum of the compound 14.

Figure S48.

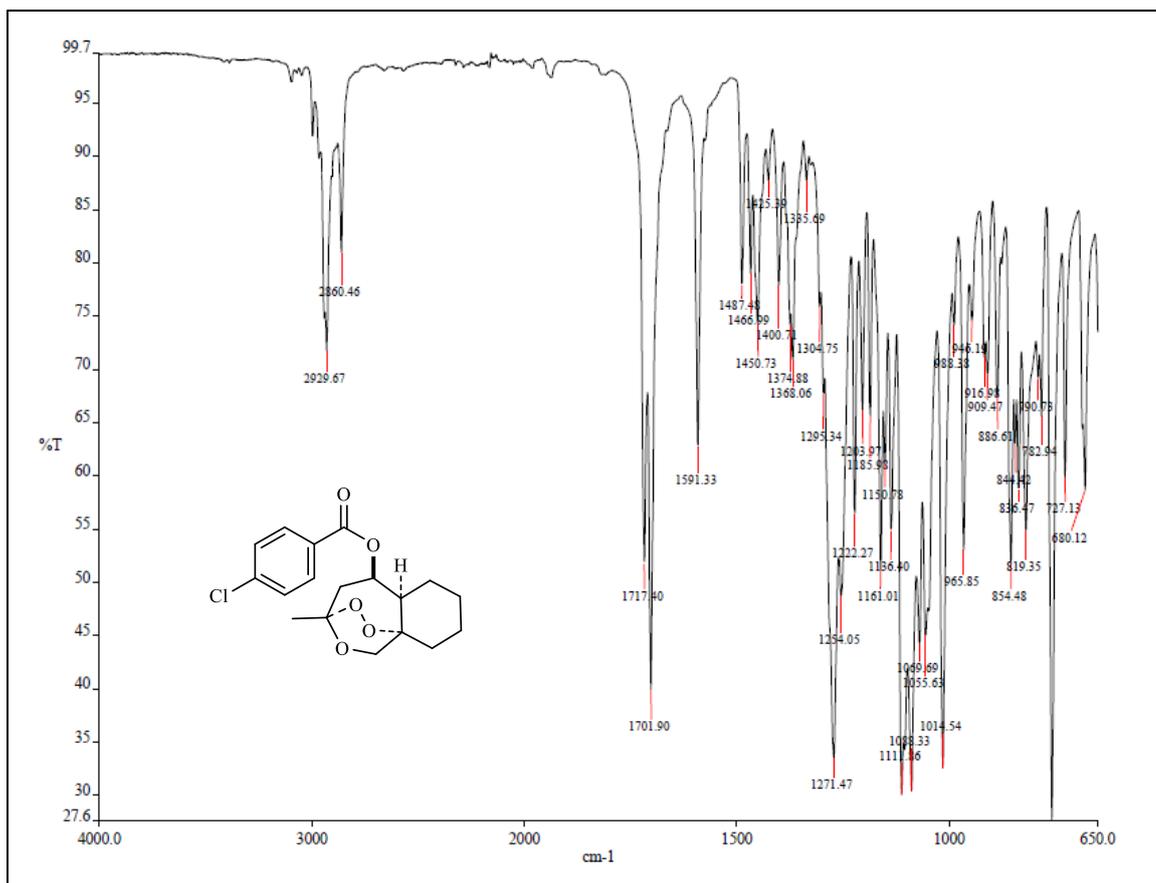


Figure S49. IR-spectrum of the compound 14.

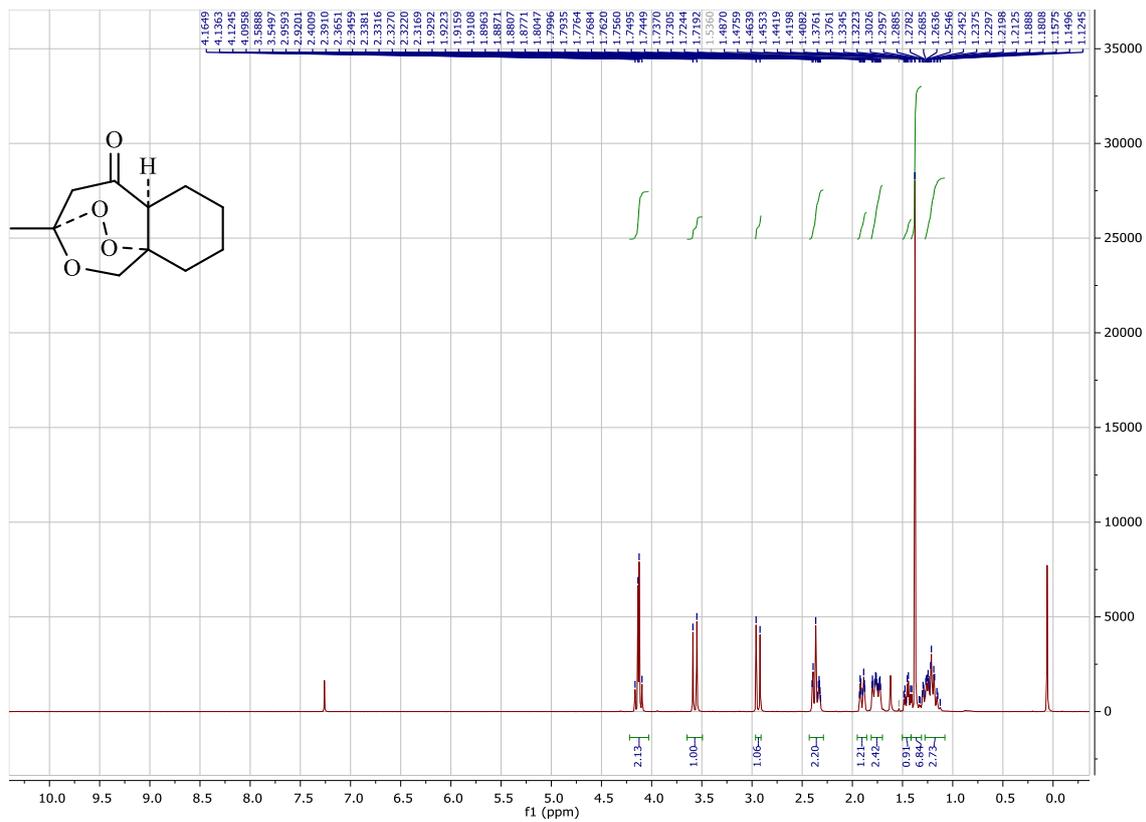


Figure S50. <sup>1</sup>H-spectrum of the compound 15 (CDCl<sub>3</sub>, 400 MHz).

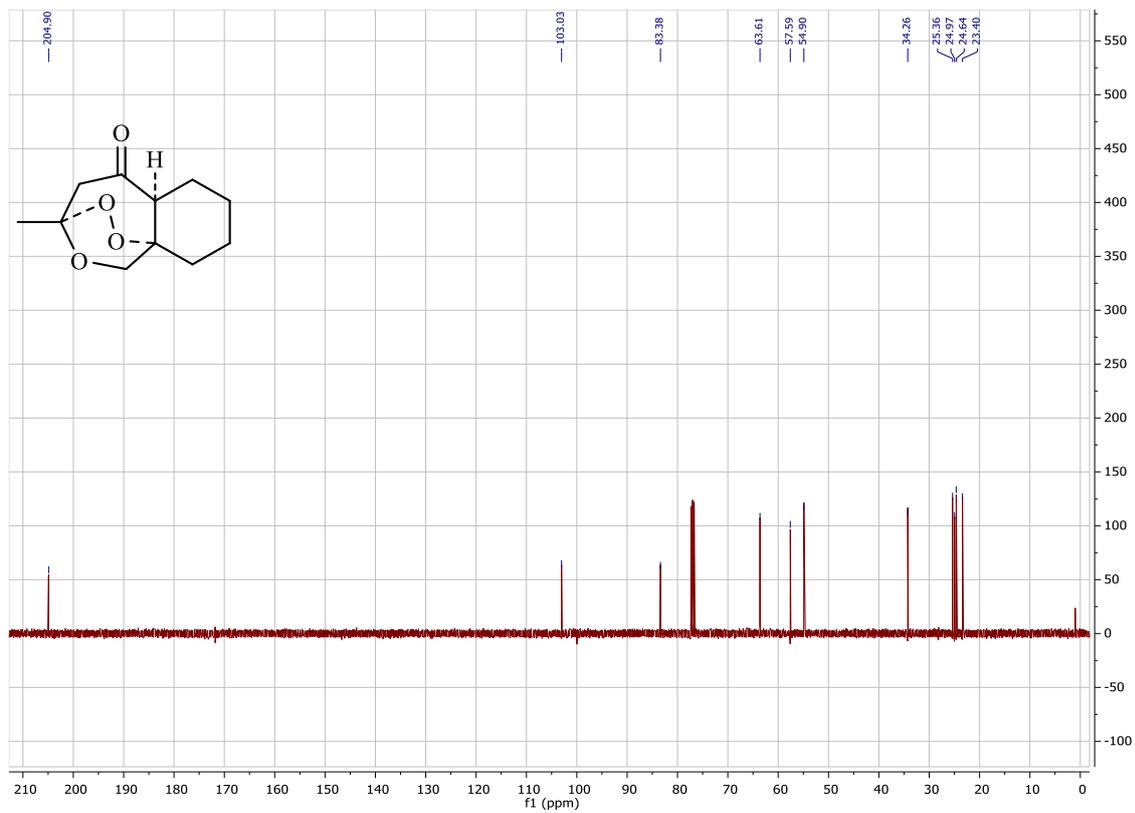


Figure S51.  $^{13}\text{C-NMR}$  spectrum of the compound 15 (CDCl<sub>3</sub>, 100 MHz).

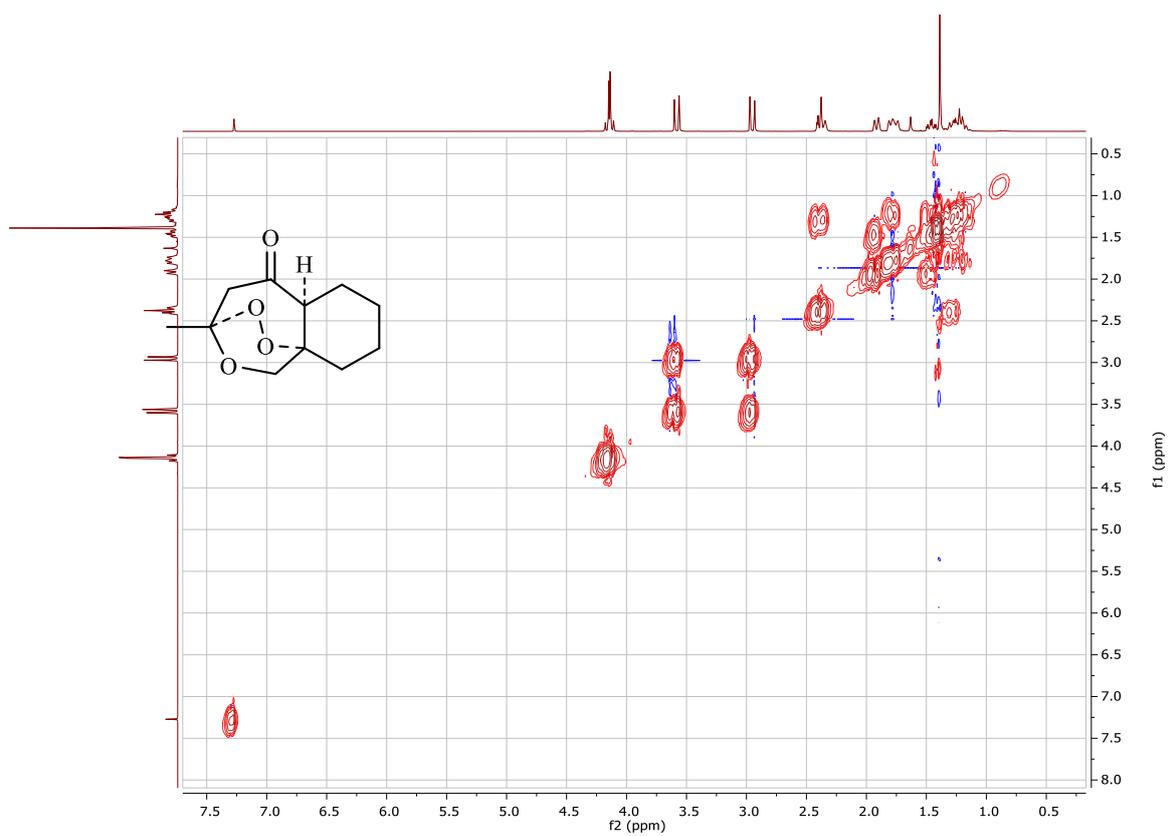


Figure S52. COSY spectrum of the compound 15.

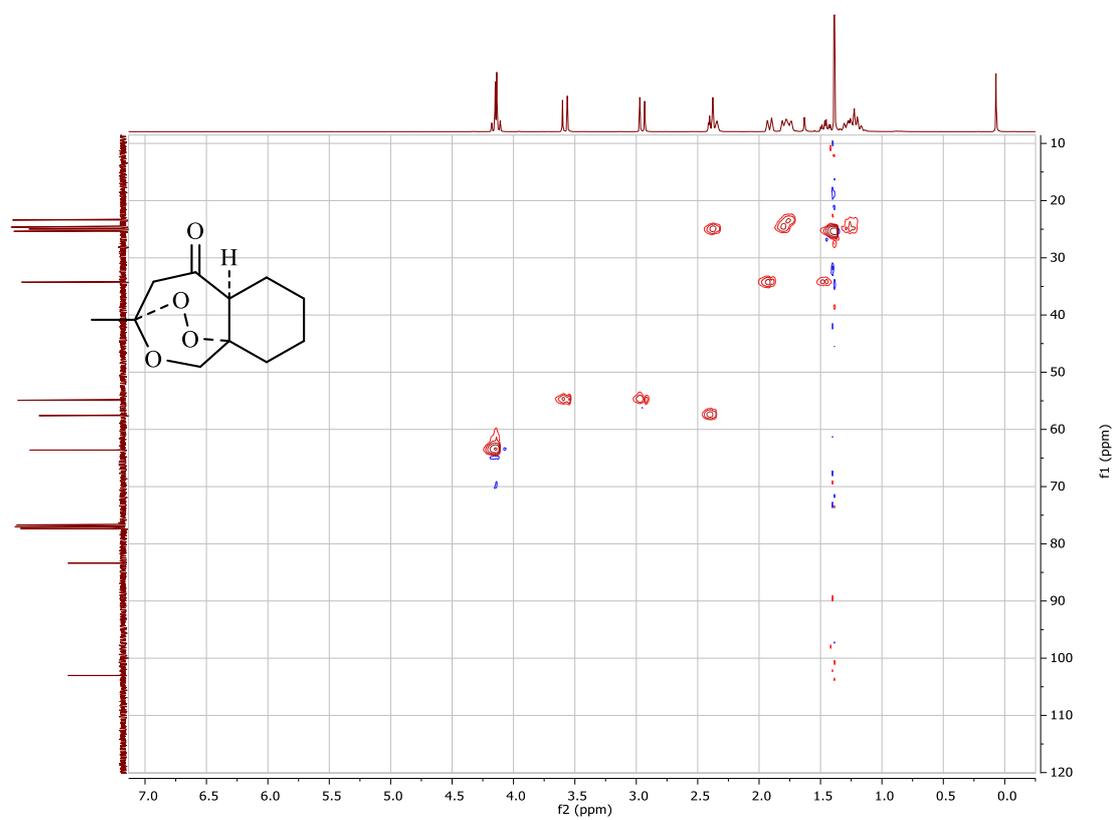


Figure S53. HSQC spectrum of the compound 15.

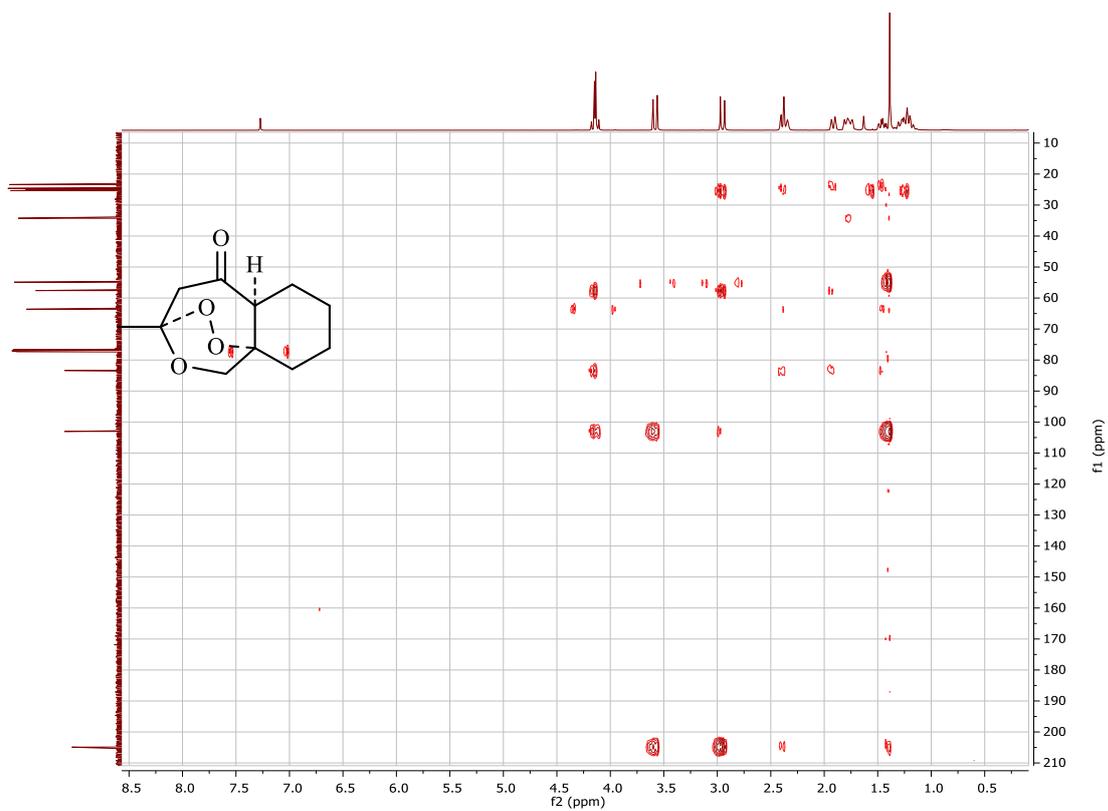
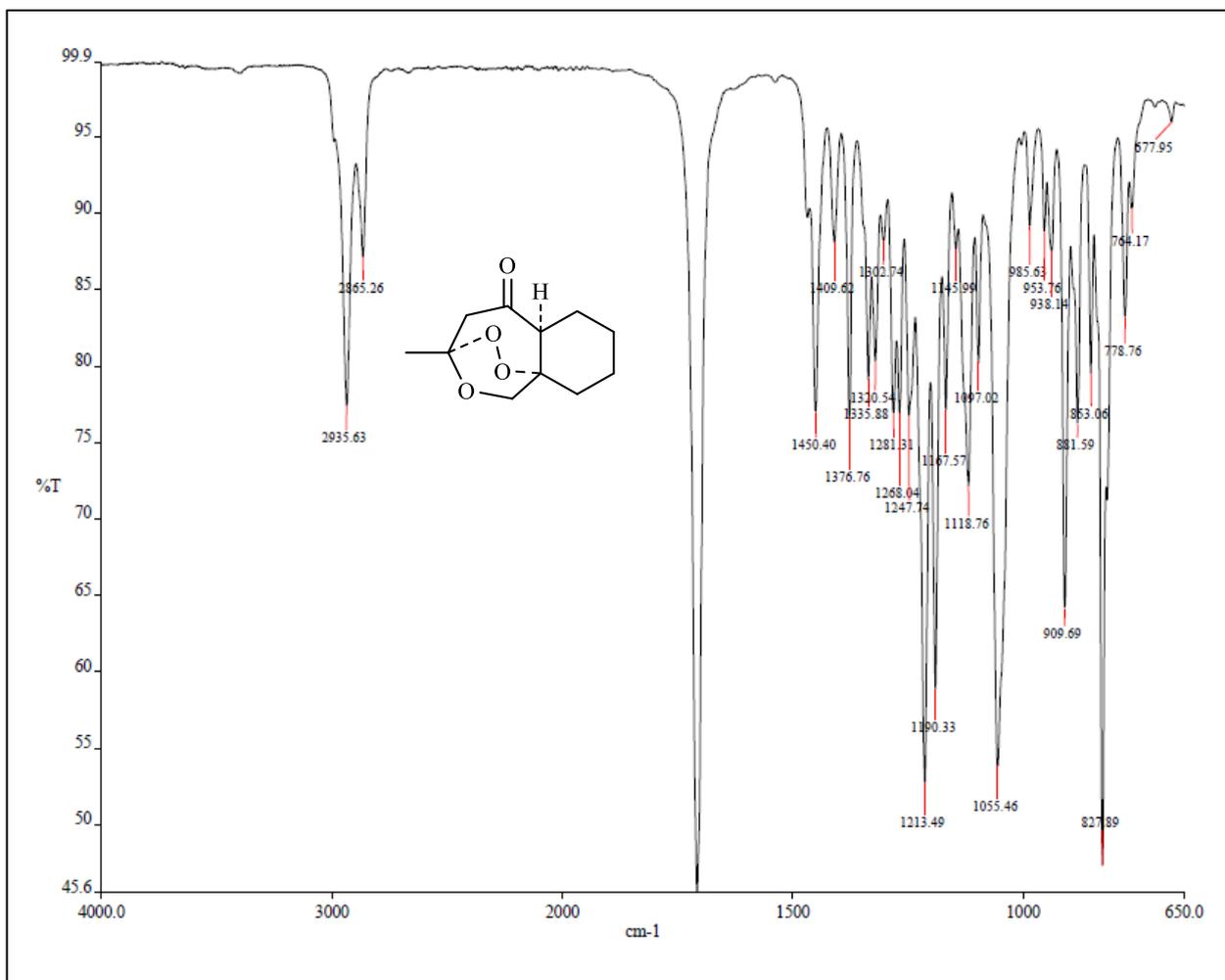


Figure S54. HMBC spectrum of the compound 15.



IR-spectrum of the compound 15.

Figure S55.

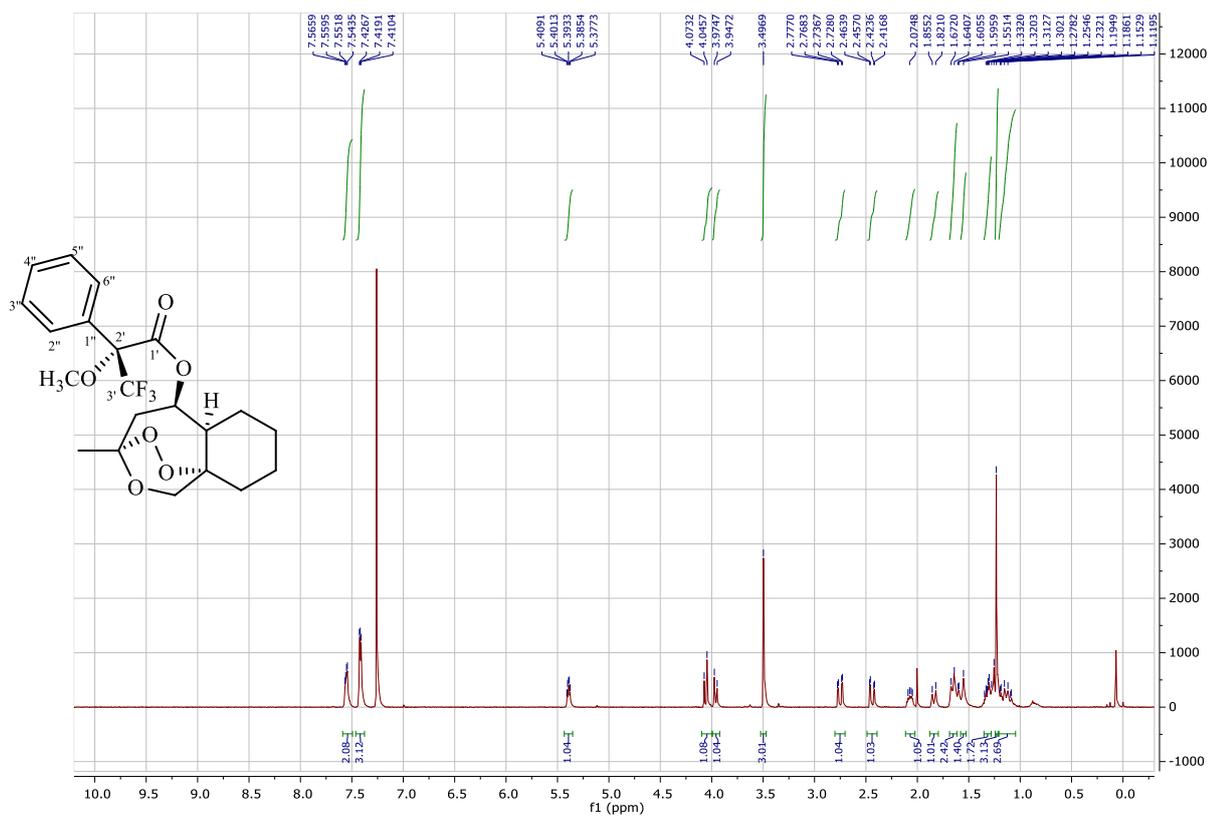


Figure S56.  $^1\text{H}$ -spectrum of the compound **19a** (CDCl<sub>3</sub>, 400 MHz).

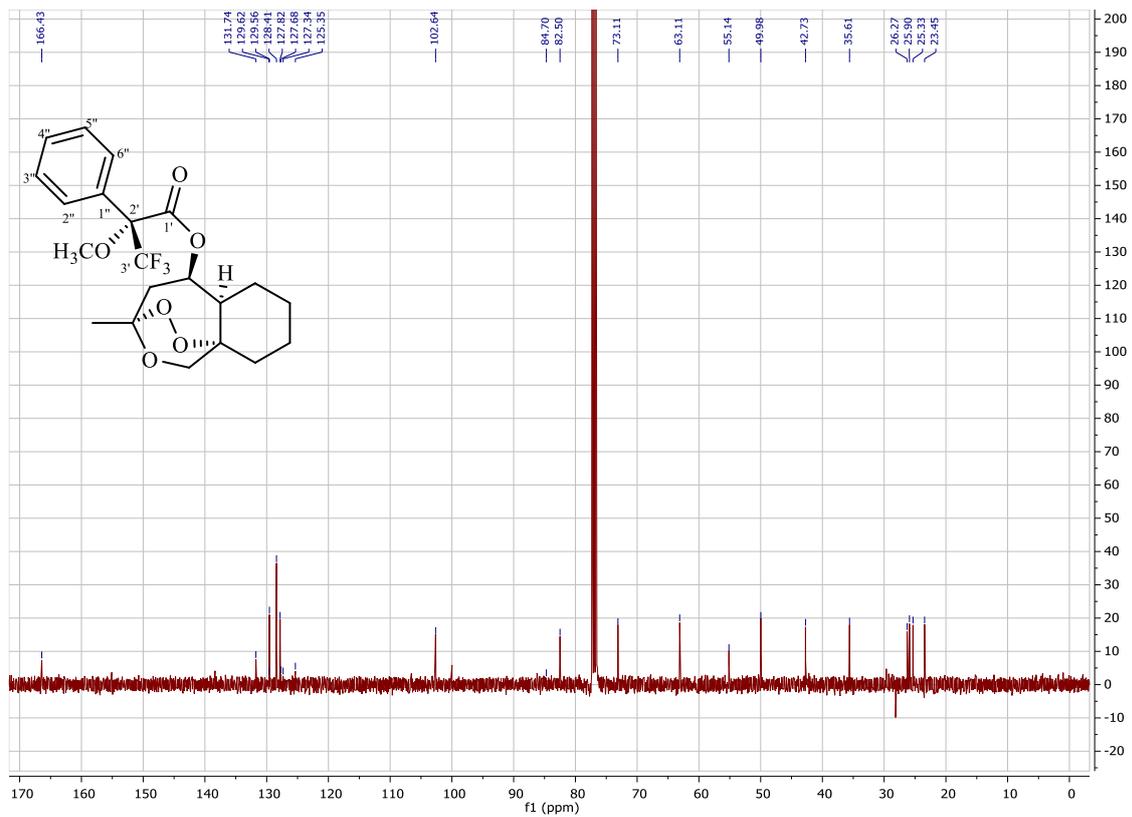


Figure S57. <sup>13</sup>C-NMR spectrum of the compound **19a** (CDCl<sub>3</sub>, 100 MHz).

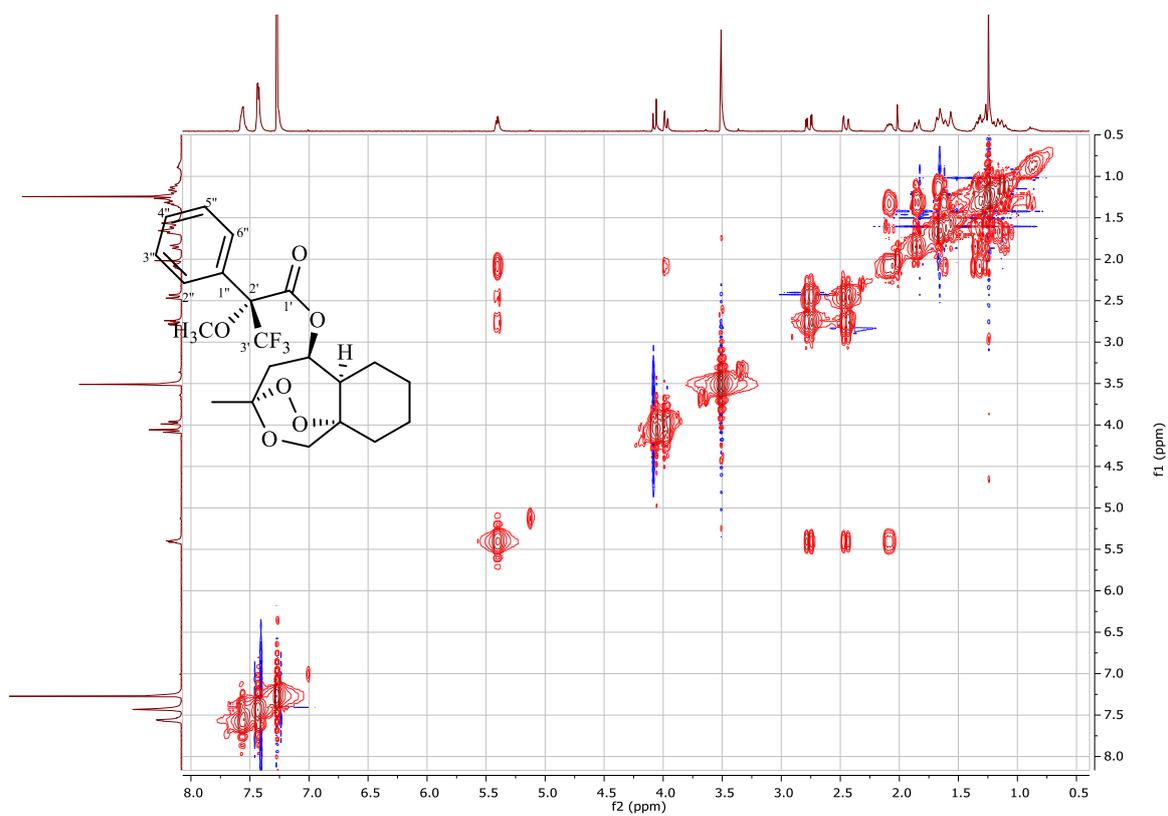


Figure S58. COSY spectrum of the compound 19a.

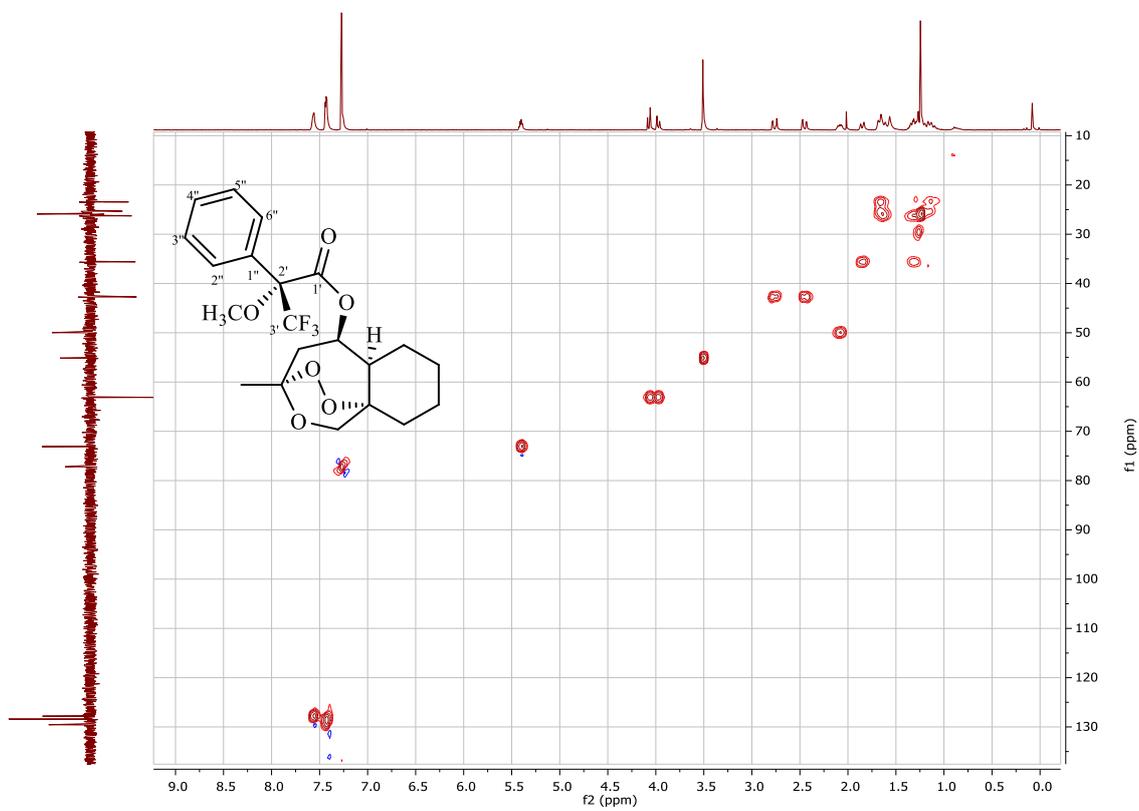


Figure S59. HSQC spectrum of the compound **19a**.

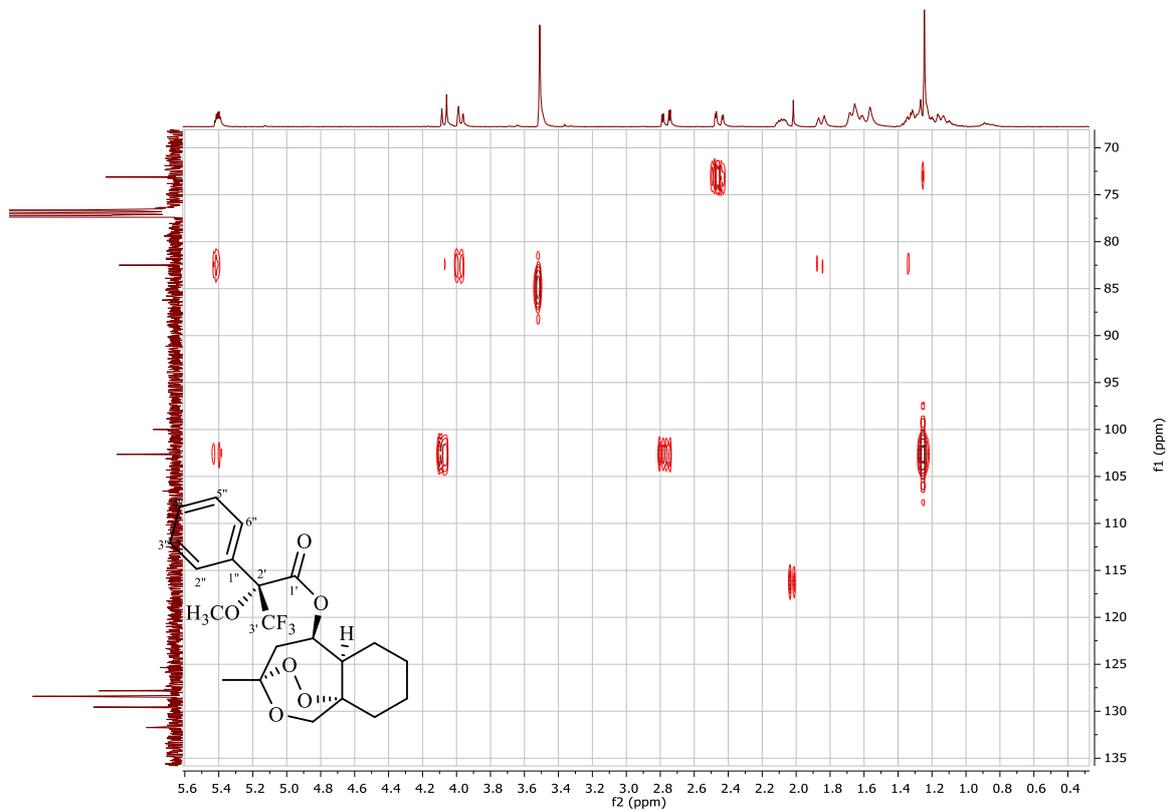
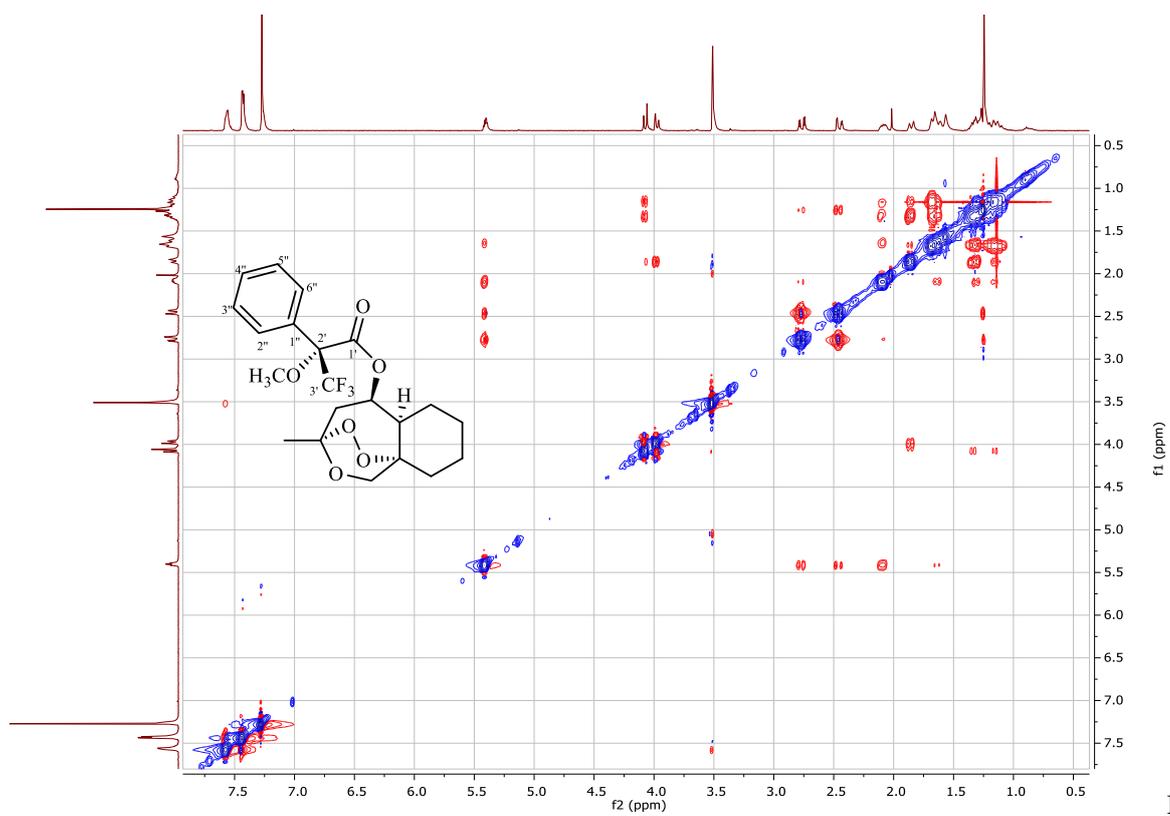


Figure S60. HMBC spectrum of the compound **19a**.



ESY spectrum of the compound **19a**.

Figure S61. NO-

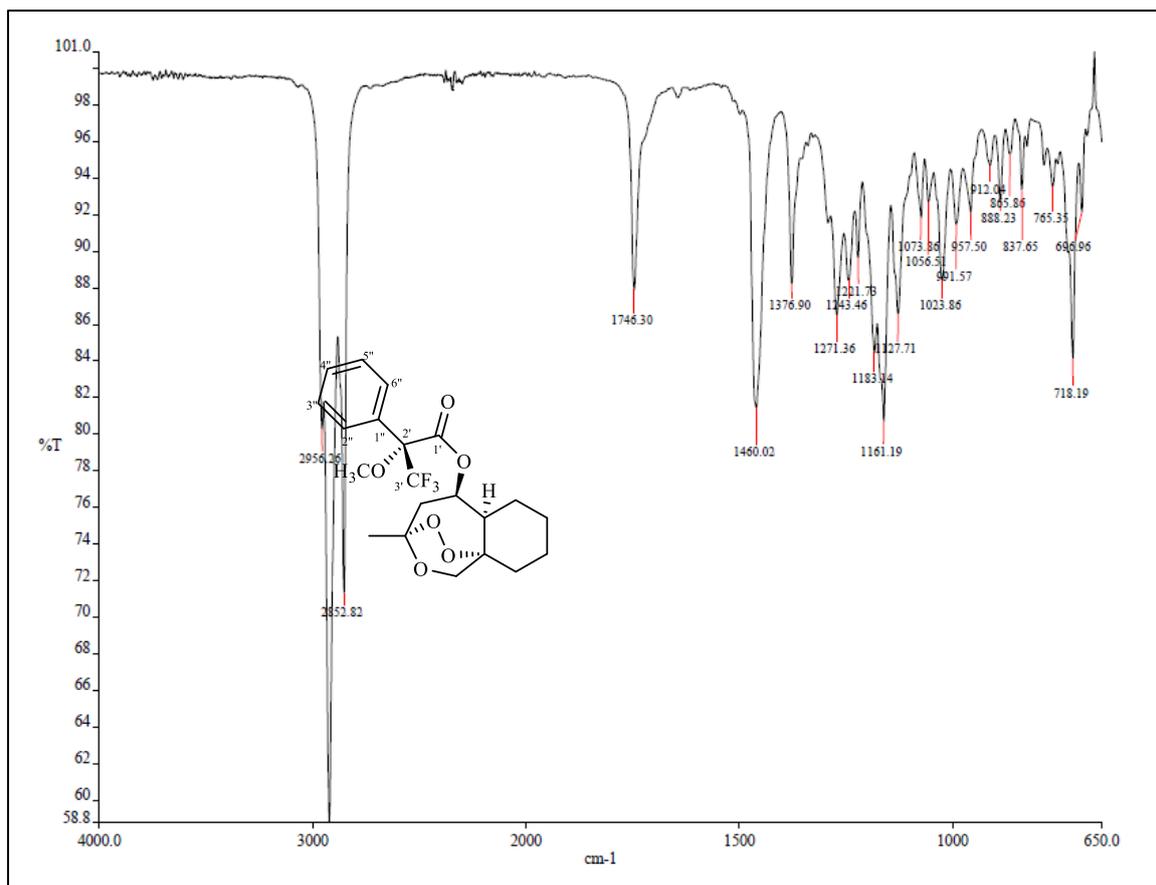


Figure S62. IR-spectrum of the compound **19a**.

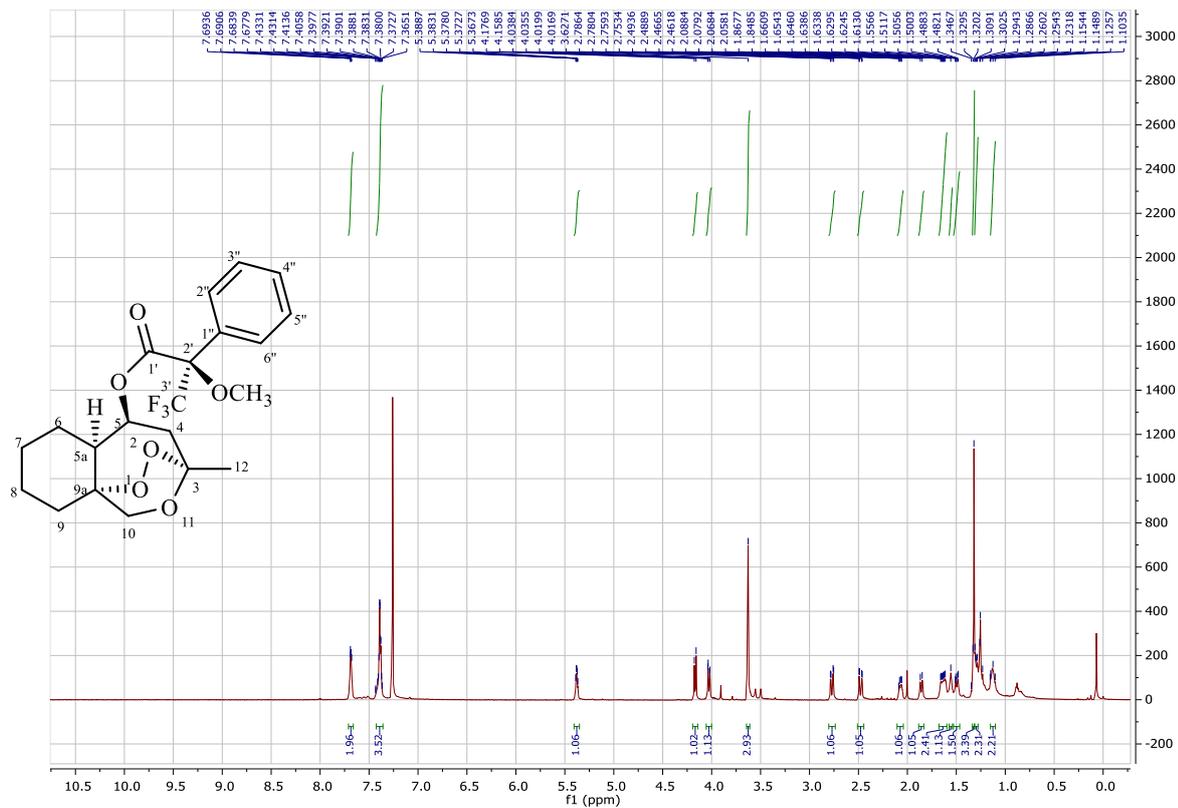


Figure S63. <sup>1</sup>H-spectrum of the compound **19b** (CDCl<sub>3</sub>, 400 MHz).

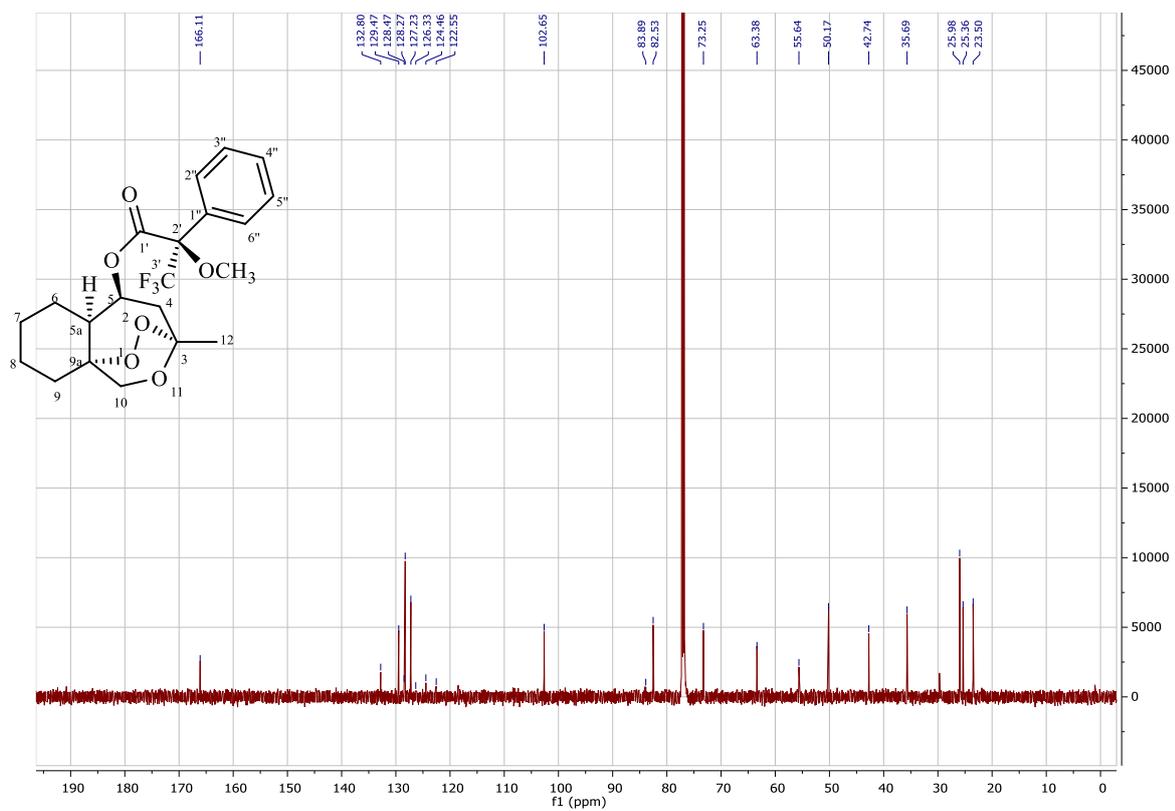
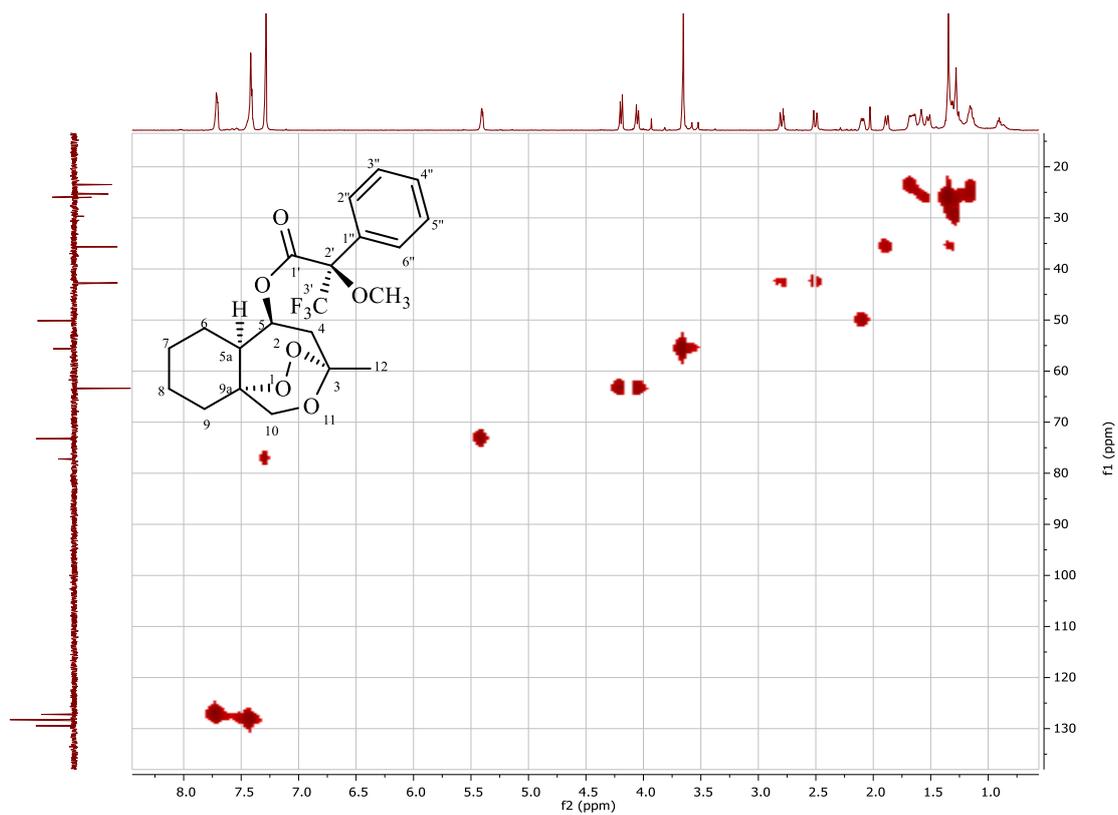
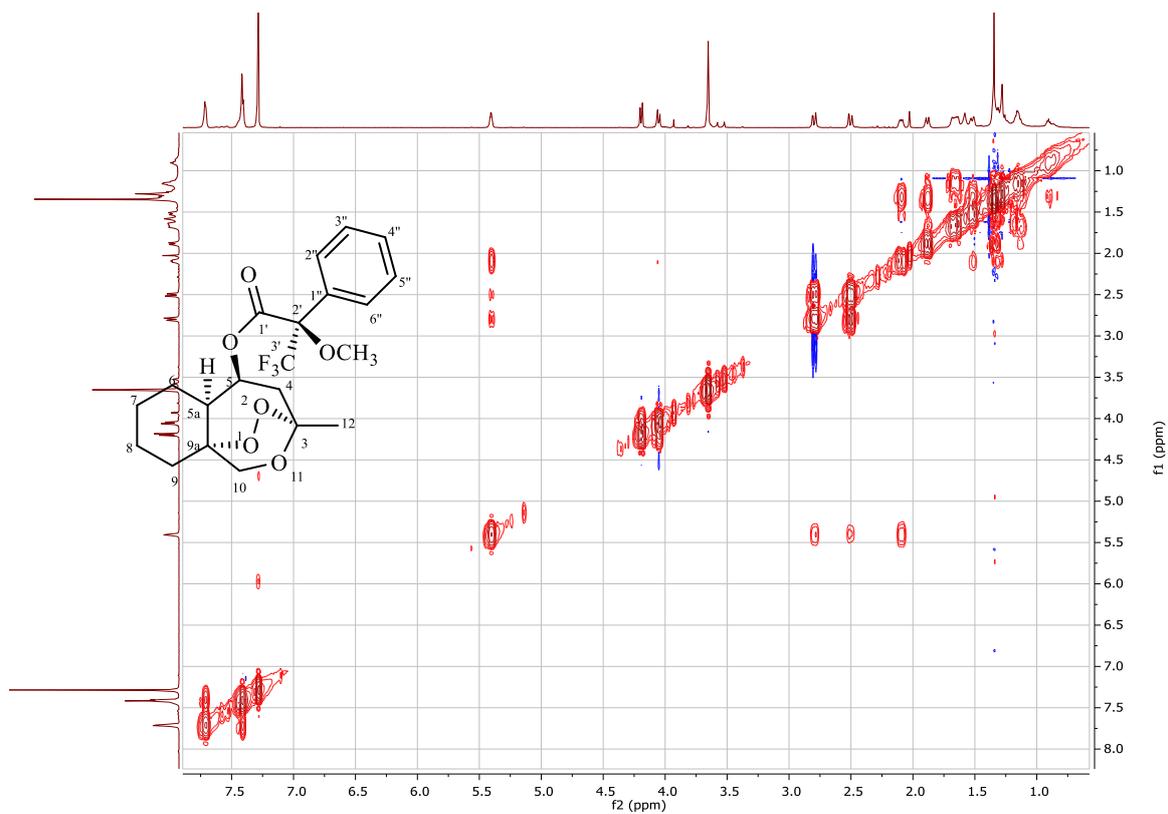


Figure S64.  $^{13}\text{C}$ -NMR spectrum of the compound **19b** ( $\text{CDCl}_3$ , 100 MHz).



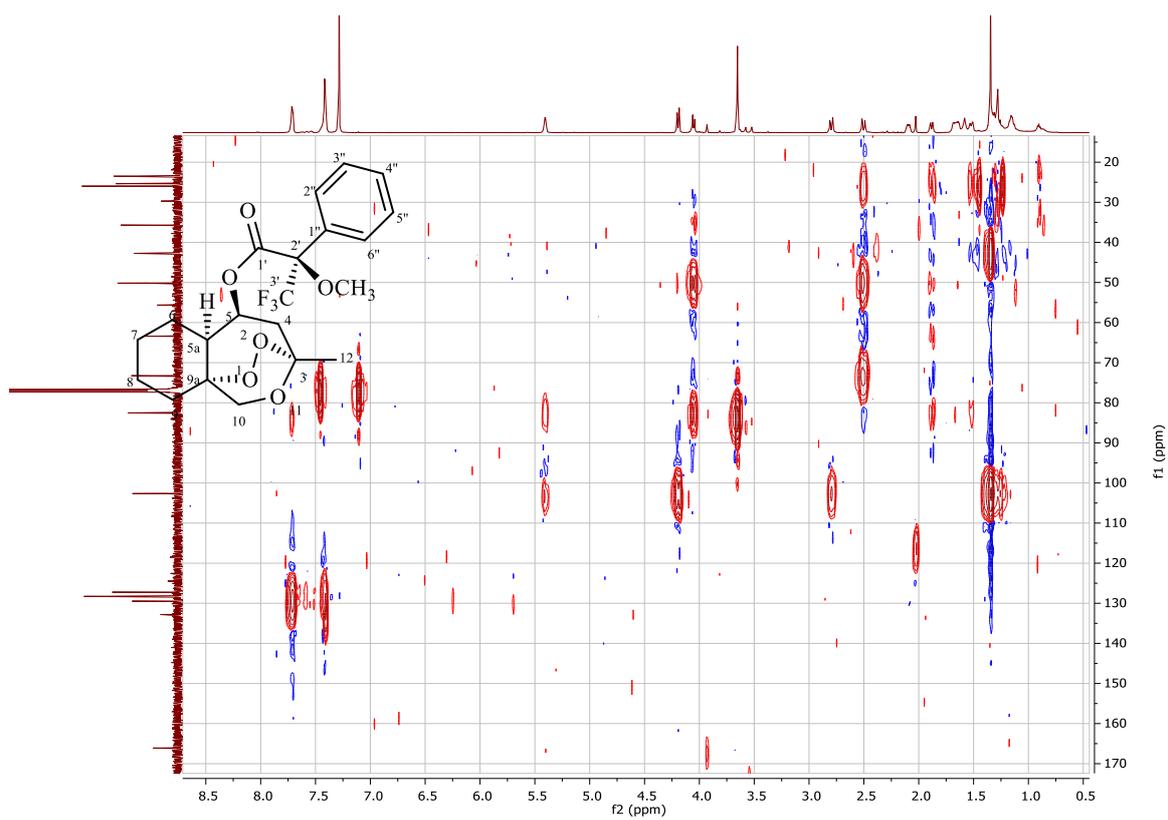


Figure S67. HMBC spectrum of the compound **19b**.

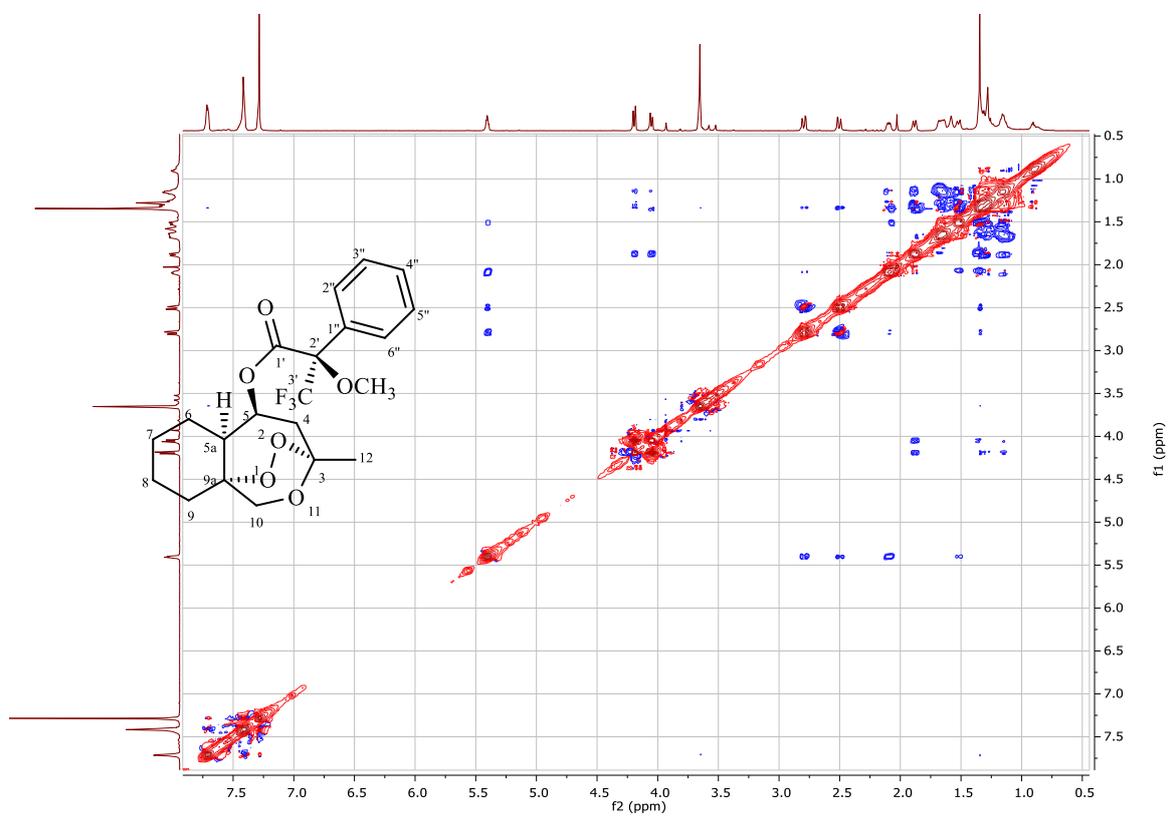


Figure S68. NOESY spectrum of the compound **19b**.

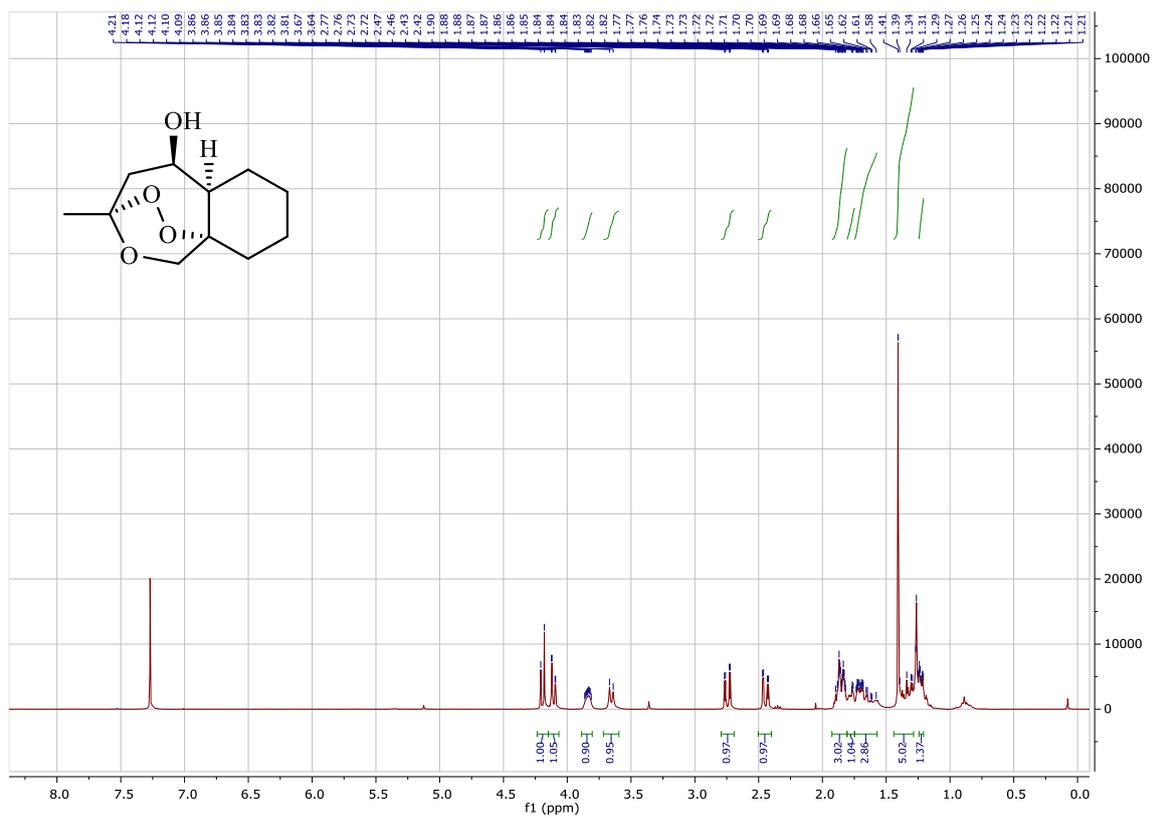


Figure S69. <sup>1</sup>H-spectrum of the compound 2a (CDCl<sub>3</sub>, 400 MHz).

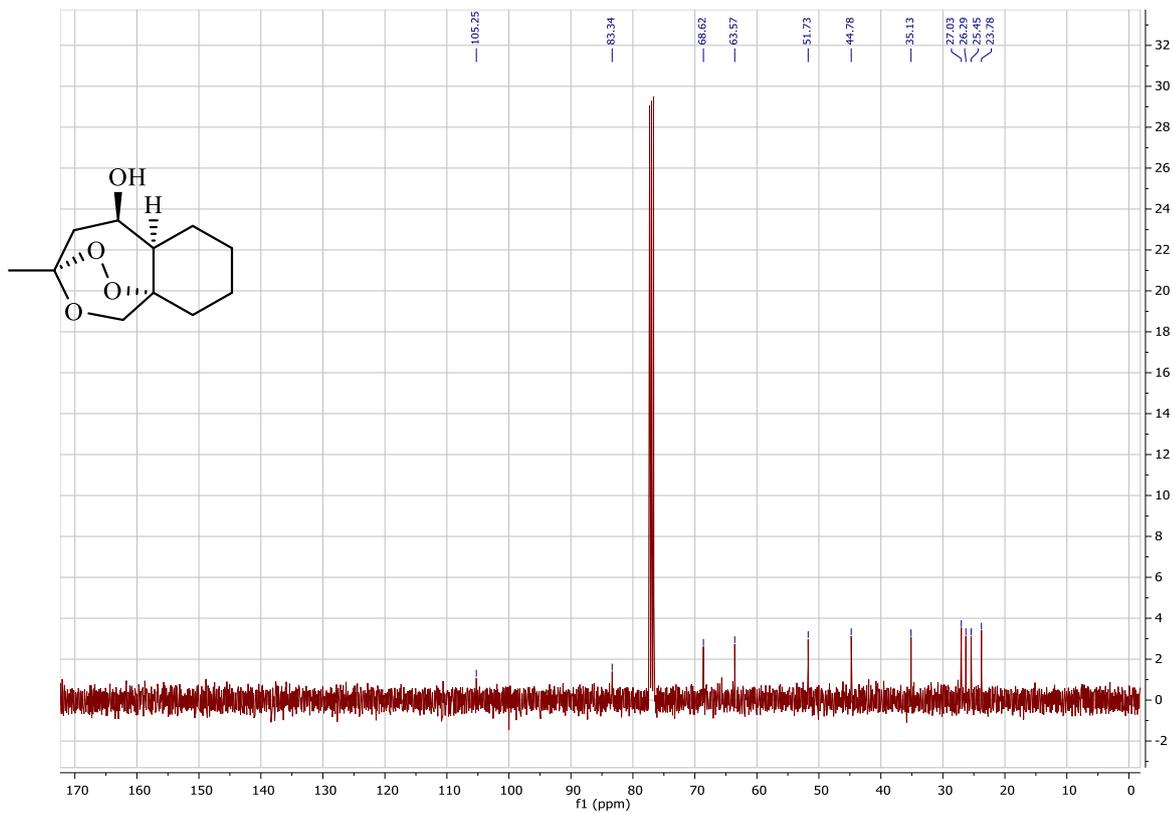


Figure S70.  $^{13}\text{C}$ -NMR spectrum of the compound **2a** (CDCl<sub>3</sub>, 100 MHz).

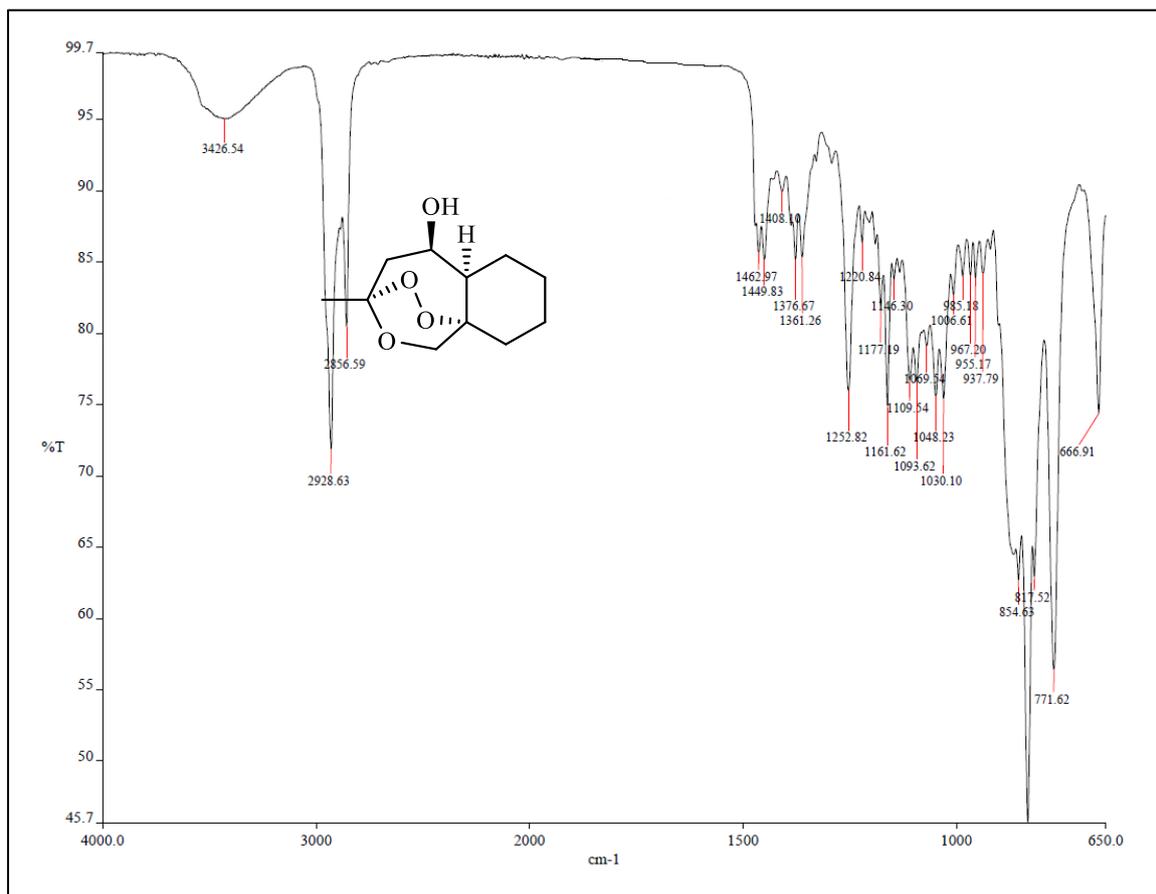


Figure S71. IR-spectrum of the compound 2a.

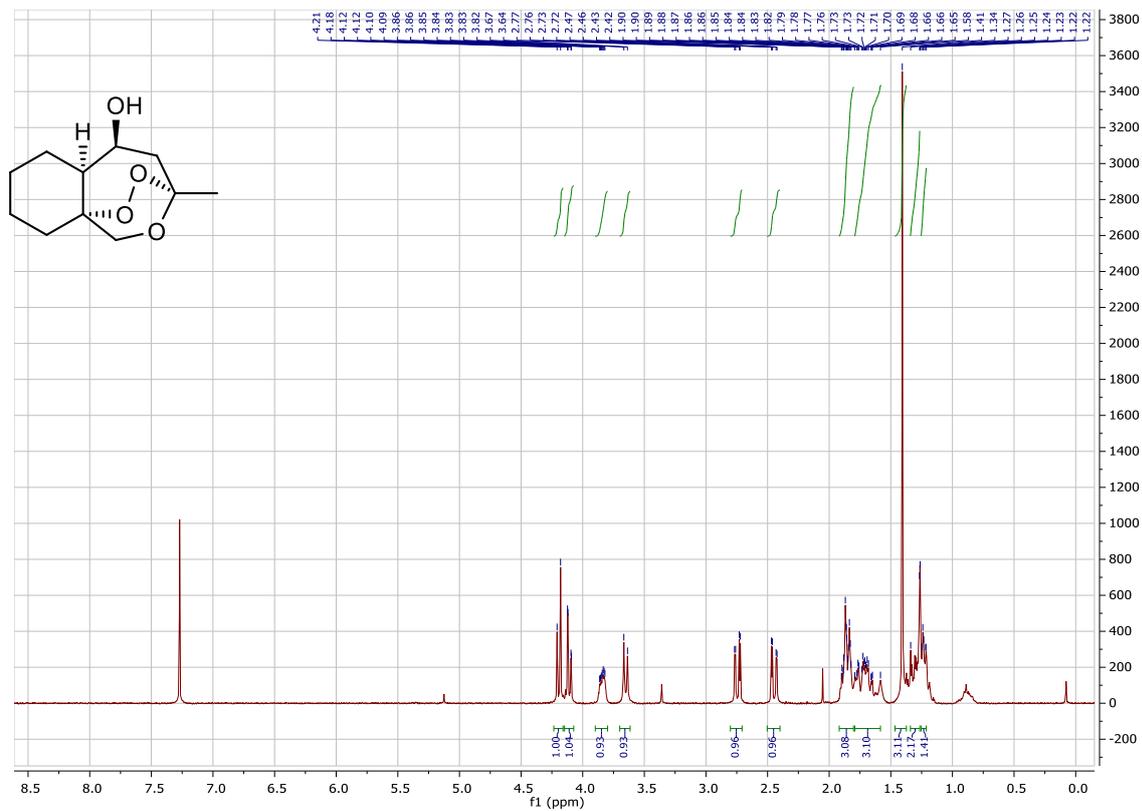


Figure S72.  $^1\text{H-NMR}$  spectrum of the compound **2b** (CDCl<sub>3</sub>, 400 MHz).

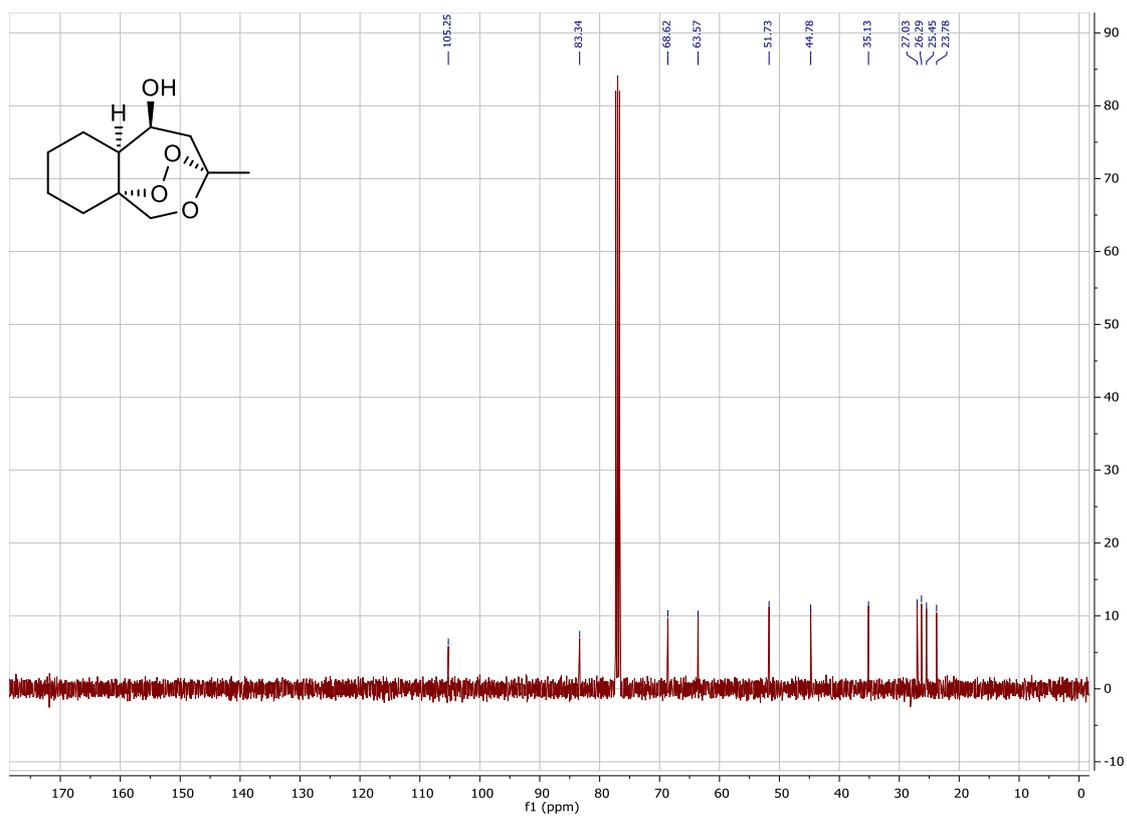


Figure S73. <sup>13</sup>C-NMR spectrum of the compound **2b** (CDCl<sub>3</sub>, 100 MHz).

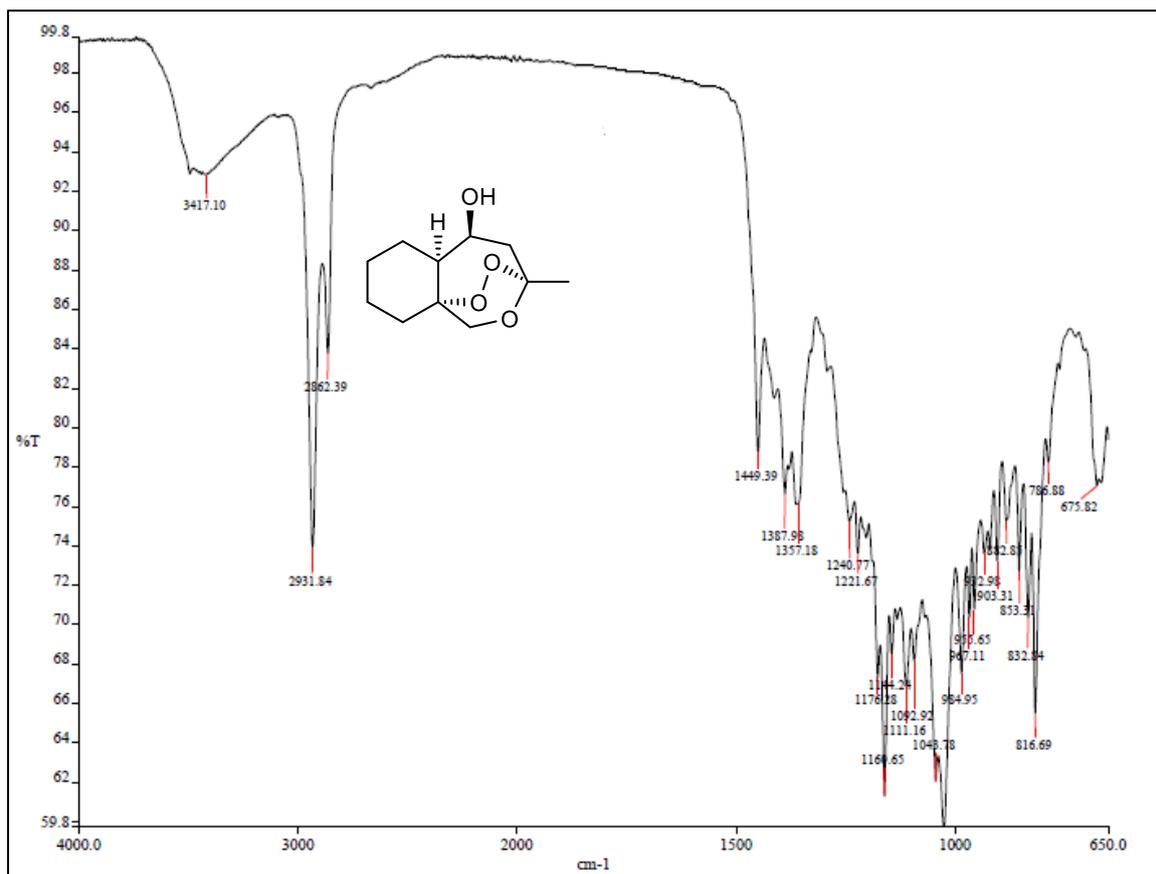


Figure S74. IR-spectrum of the compound 2b.

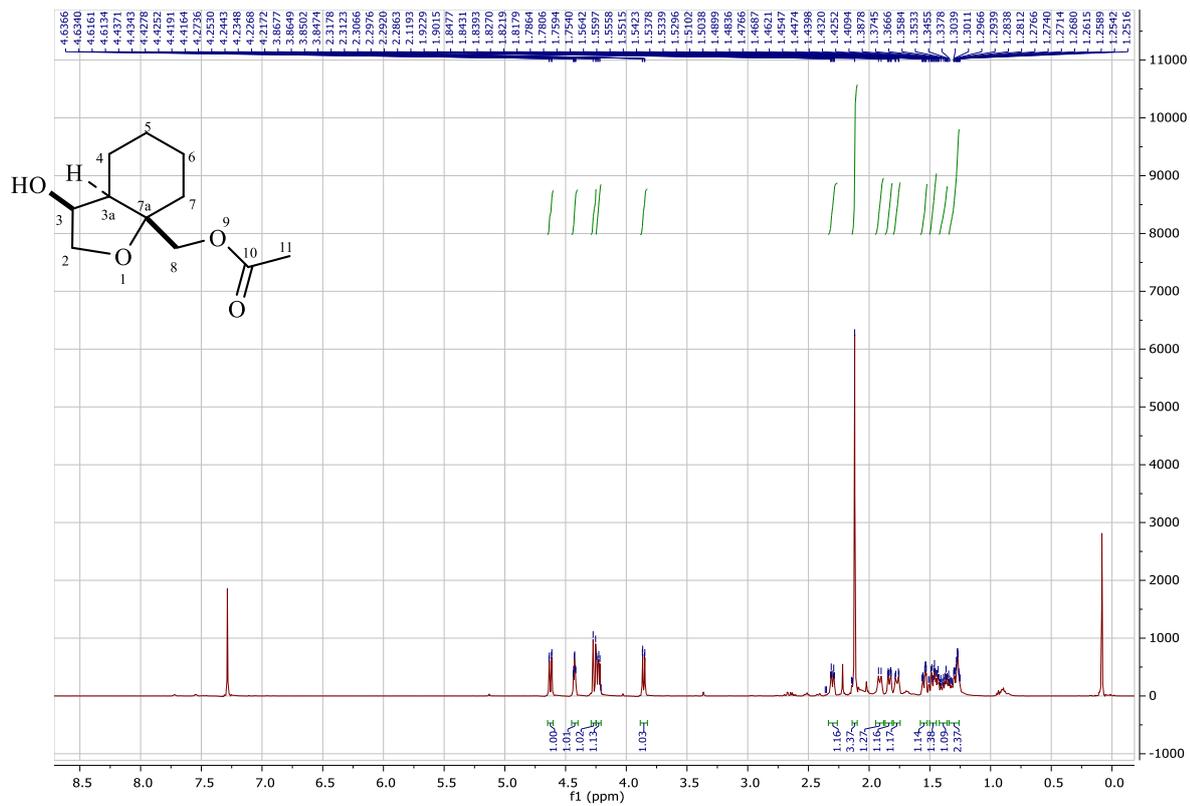


Figure S75. <sup>1</sup>H-spectrum of the compound 22 (CDCl<sub>3</sub>, 400 MHz).

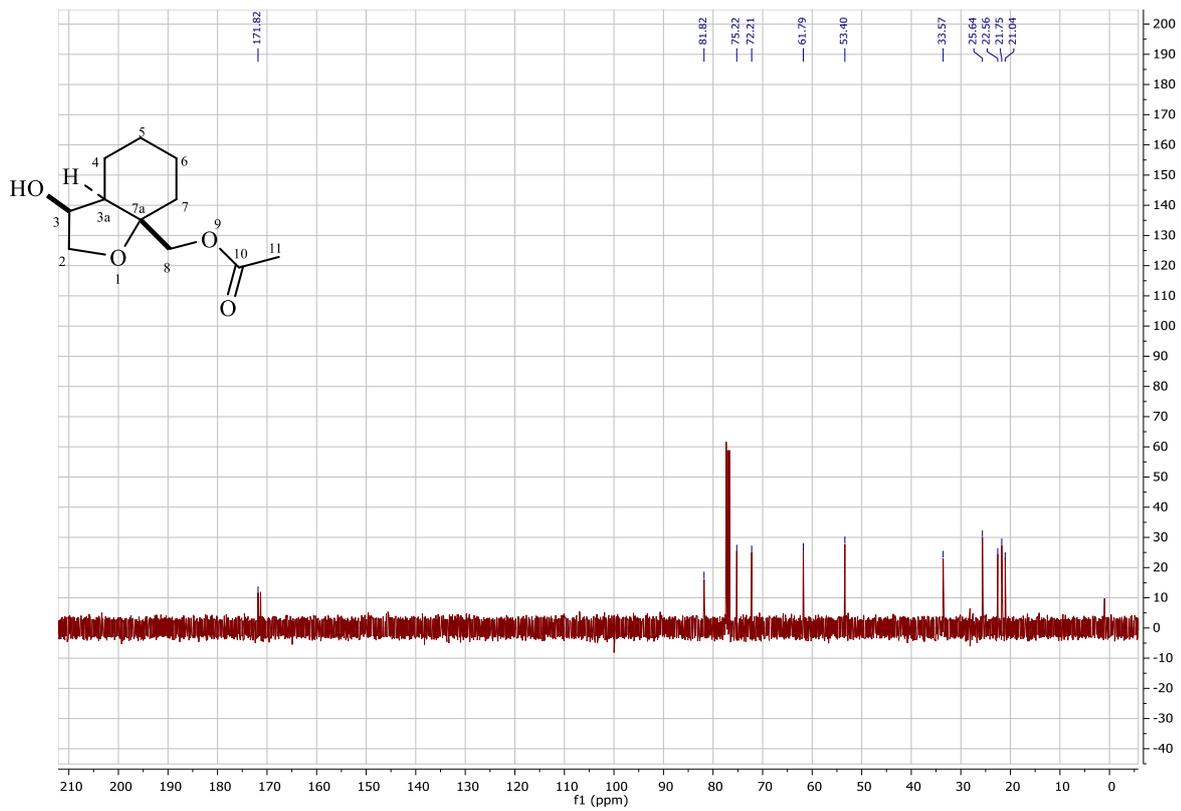


Figure S76. <sup>13</sup>C-NMR spectrum of the compound 22 (CDCl<sub>3</sub>, 100 MHz).

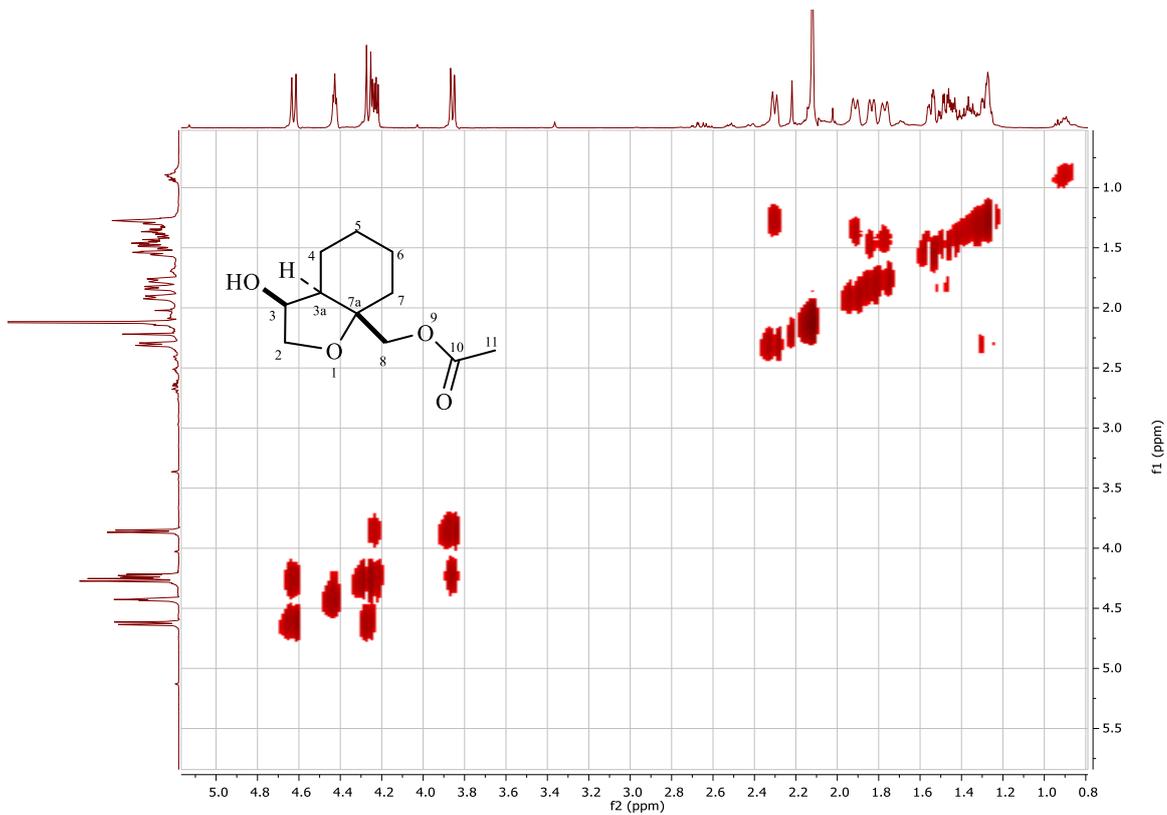


Figure S77. COSY spectrum of the compound 22.

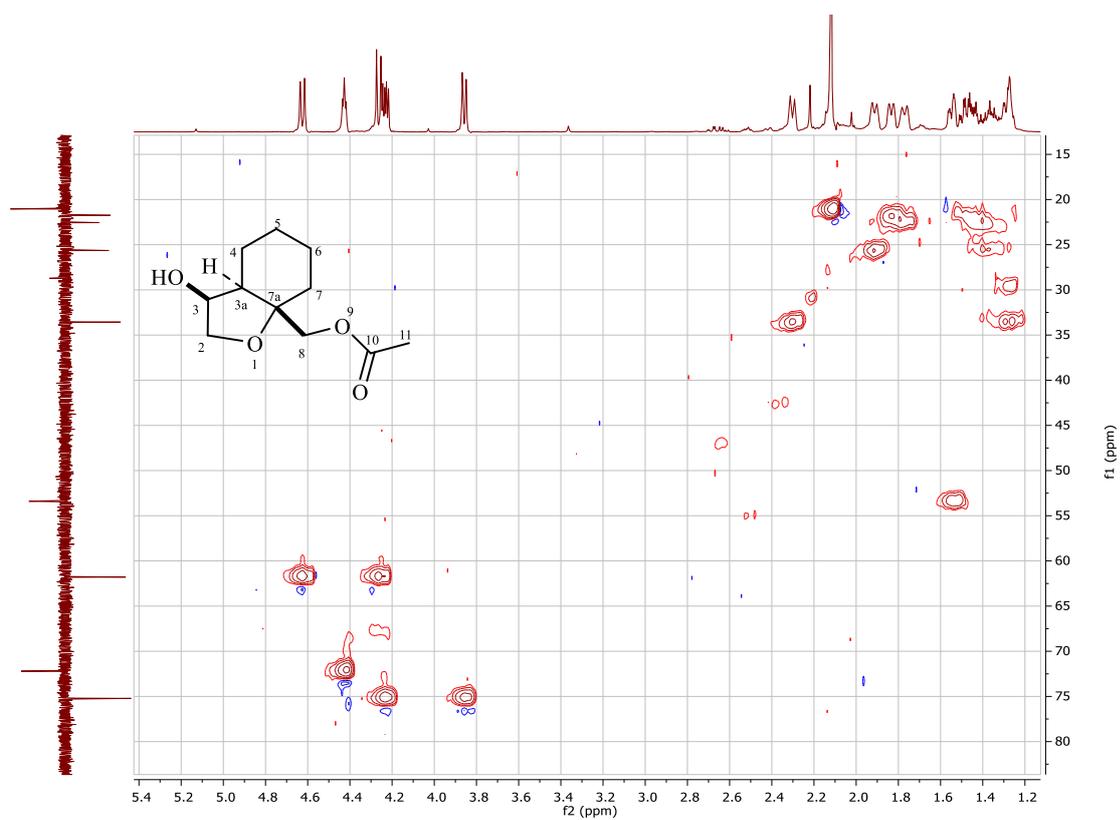


Figure S78. HSQC spectrum of the compound 22.

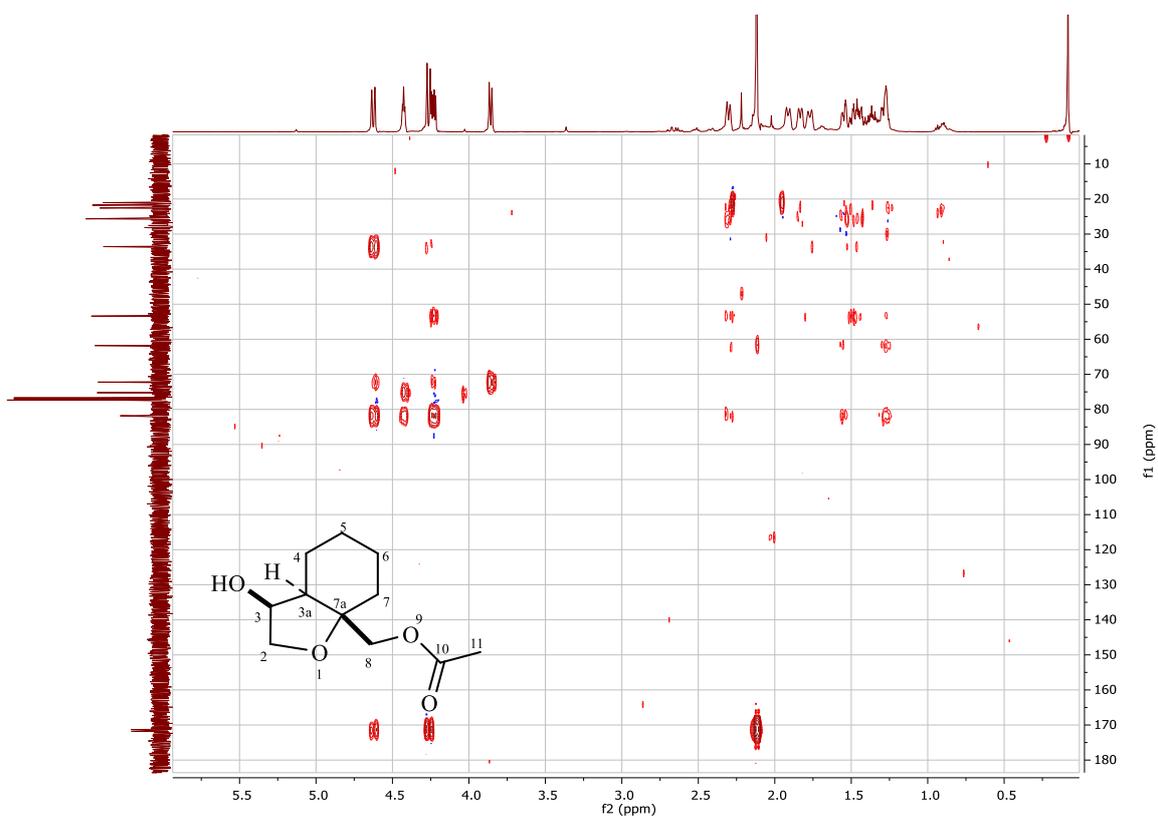


Figure S79. HMBC spectrum of the compound 22.

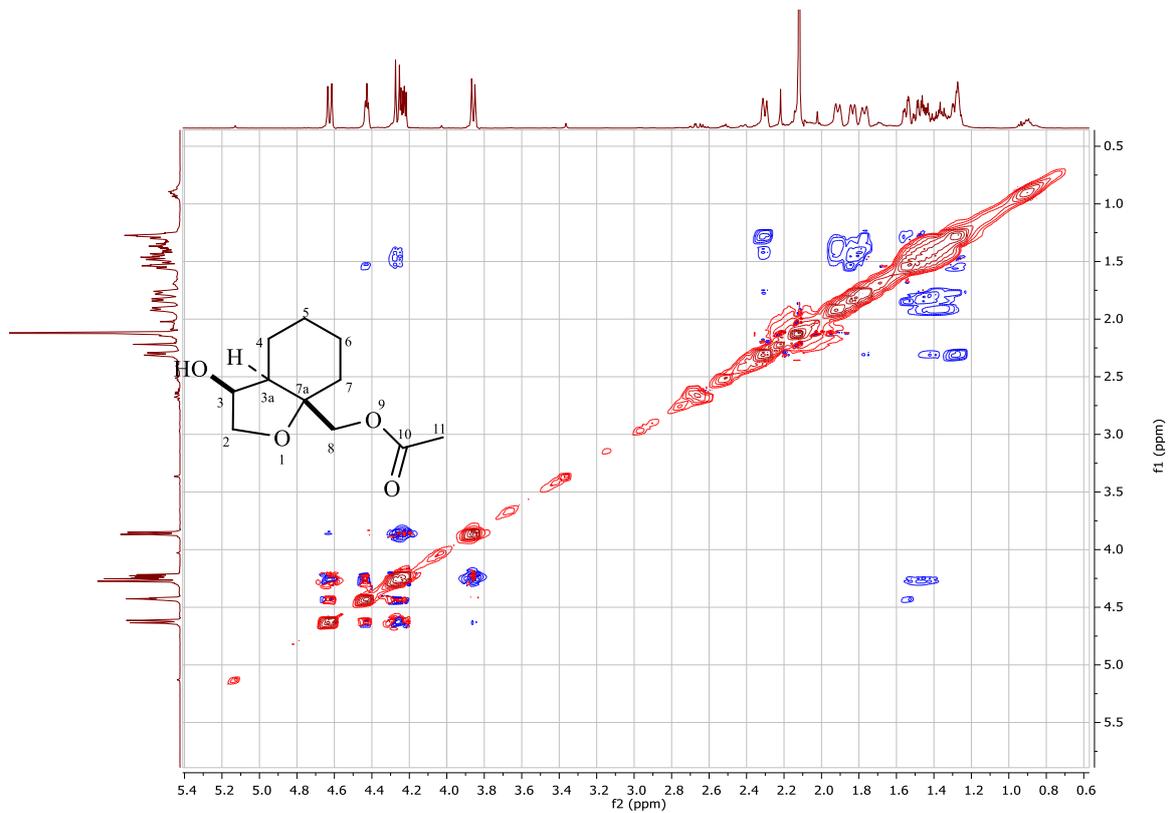


Figure S80. NOESY spectrum of the compound 22.

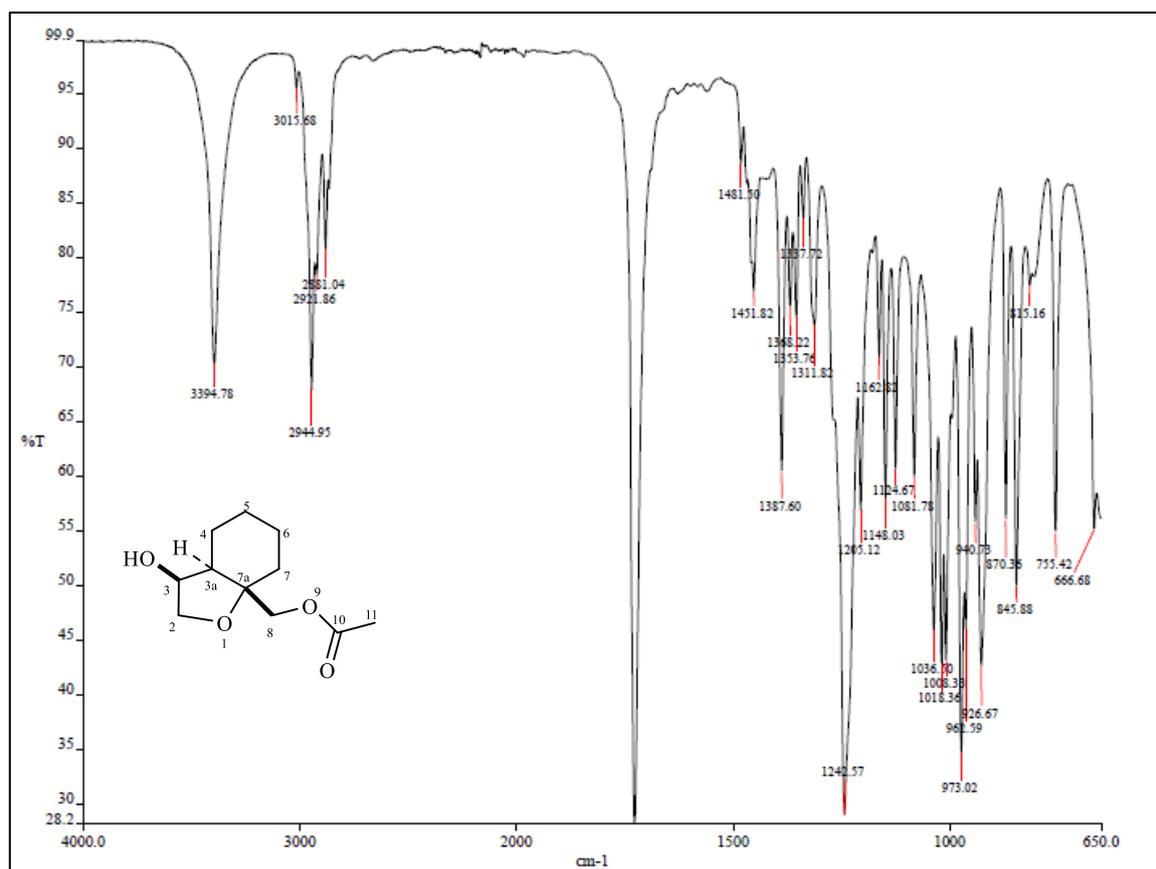


Figure S81. IR-spectrum of the compound 22.

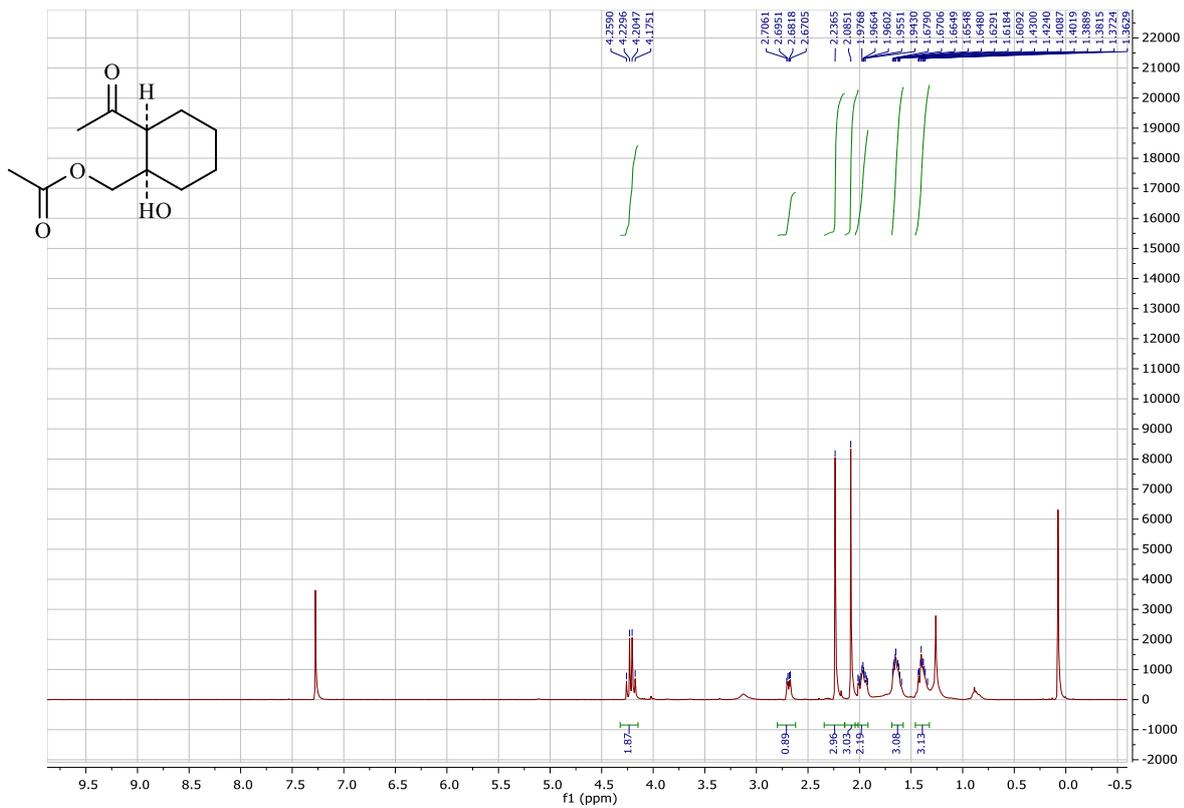


Figure S82. <sup>1</sup>H-spectrum of the compound 29 (CDCl<sub>3</sub>, 400 MHz).

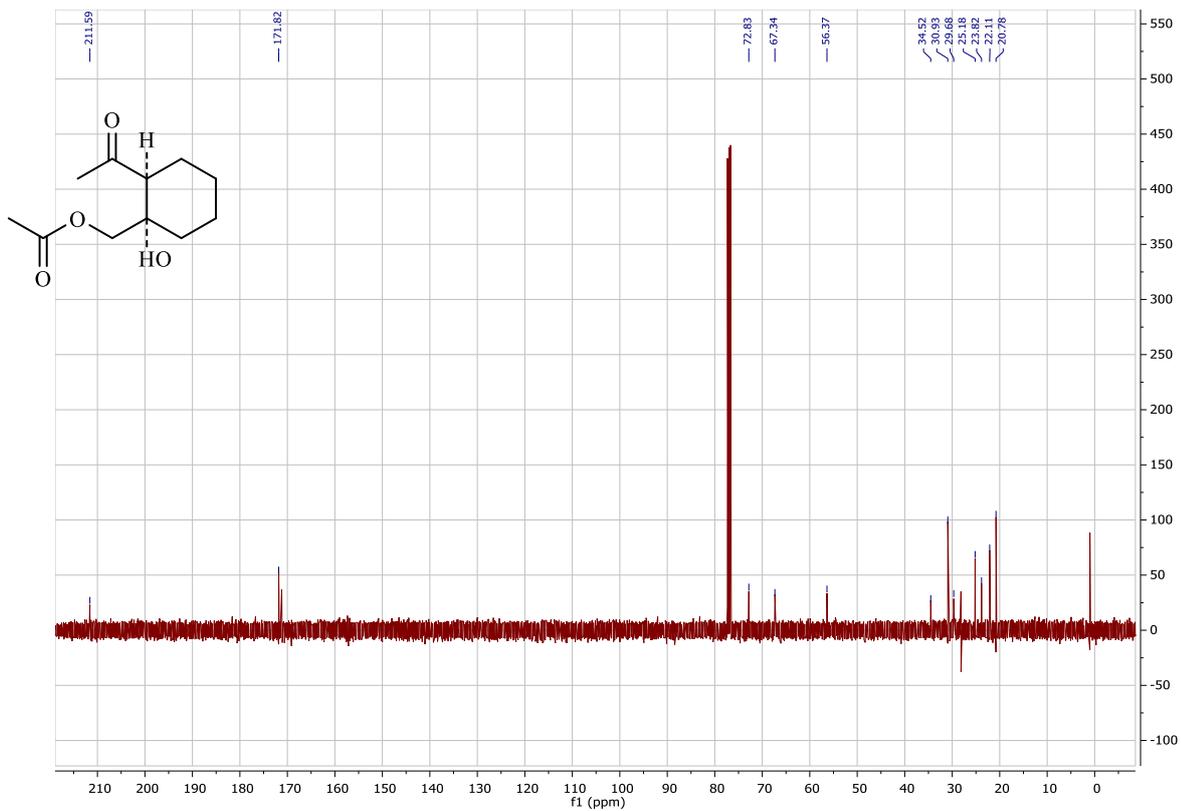


Figure S83.  $^{13}\text{C-NMR}$  spectrum of the compound **29** (CDCl<sub>3</sub>, 100 MHz).

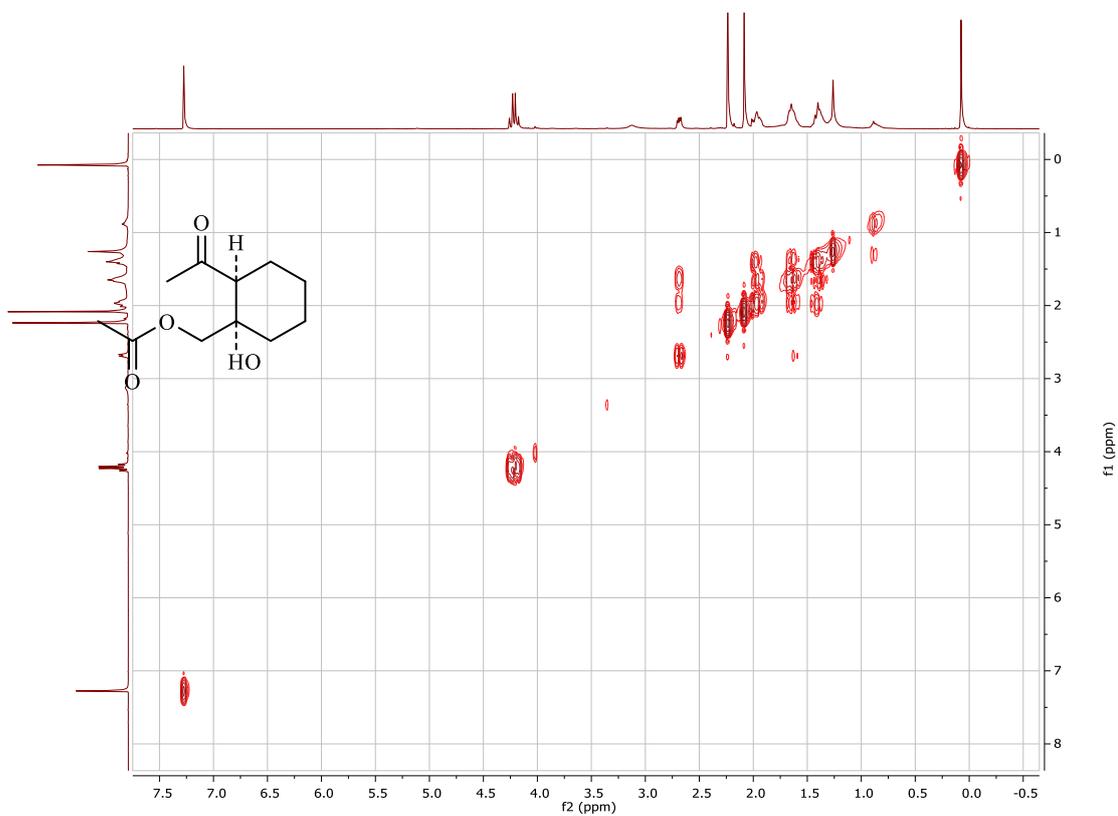


Figure S84. COSY spectrum of the compound **29**.

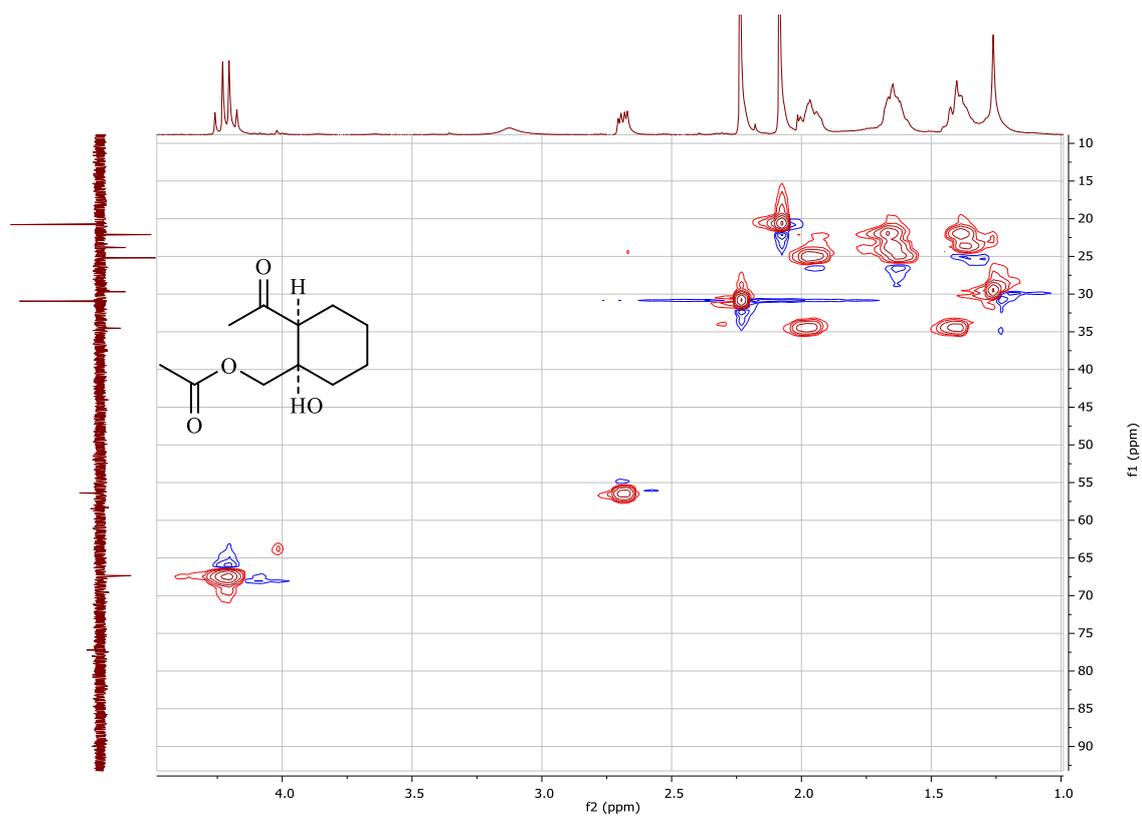


Figure S85. HSQC spectrum of the compound **29**.

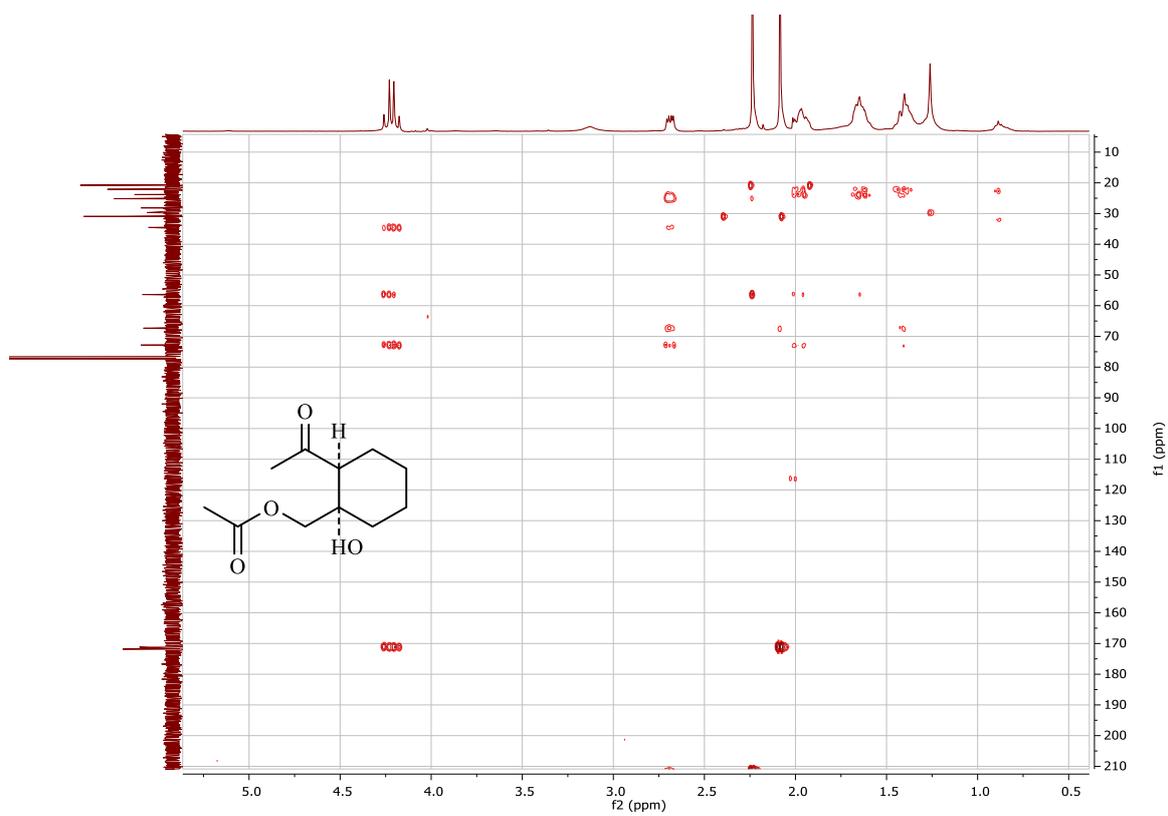


Figure S86. HMBC spectrum of the compound **29**.

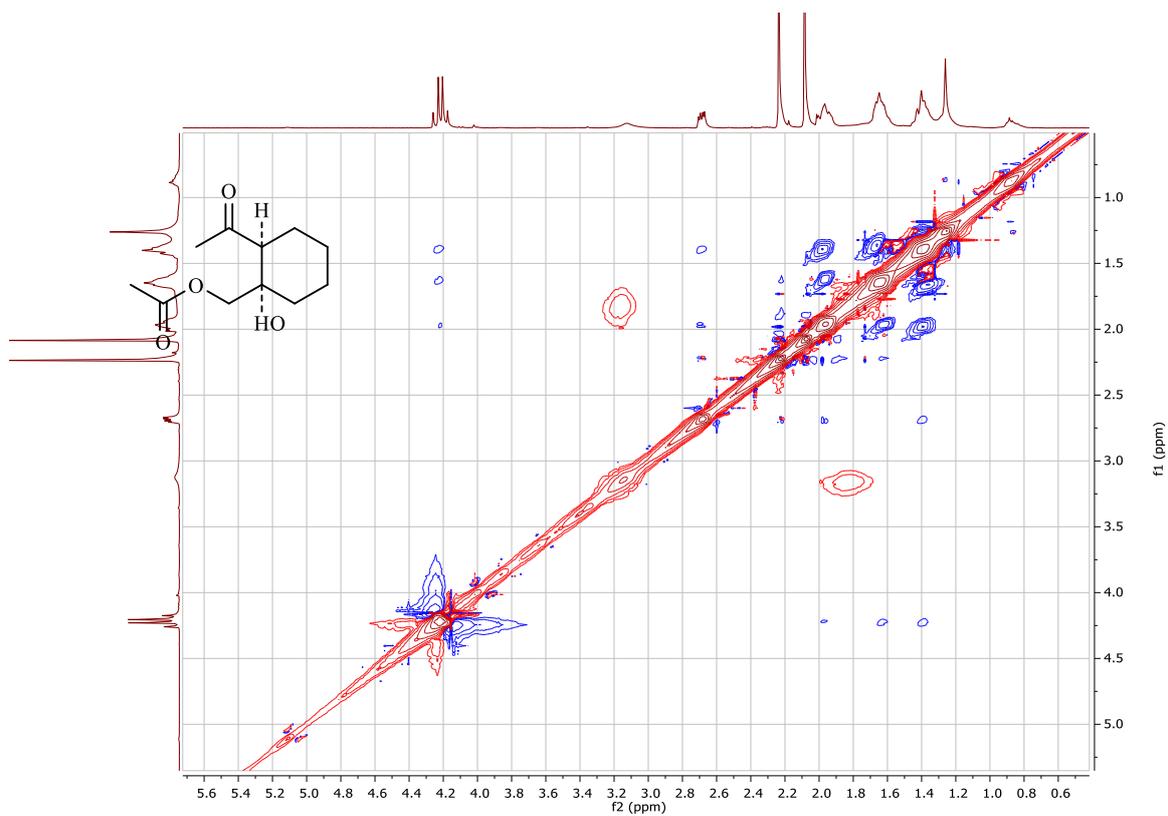


Figure S87. NOESY spectrum of the compound 29.