

# 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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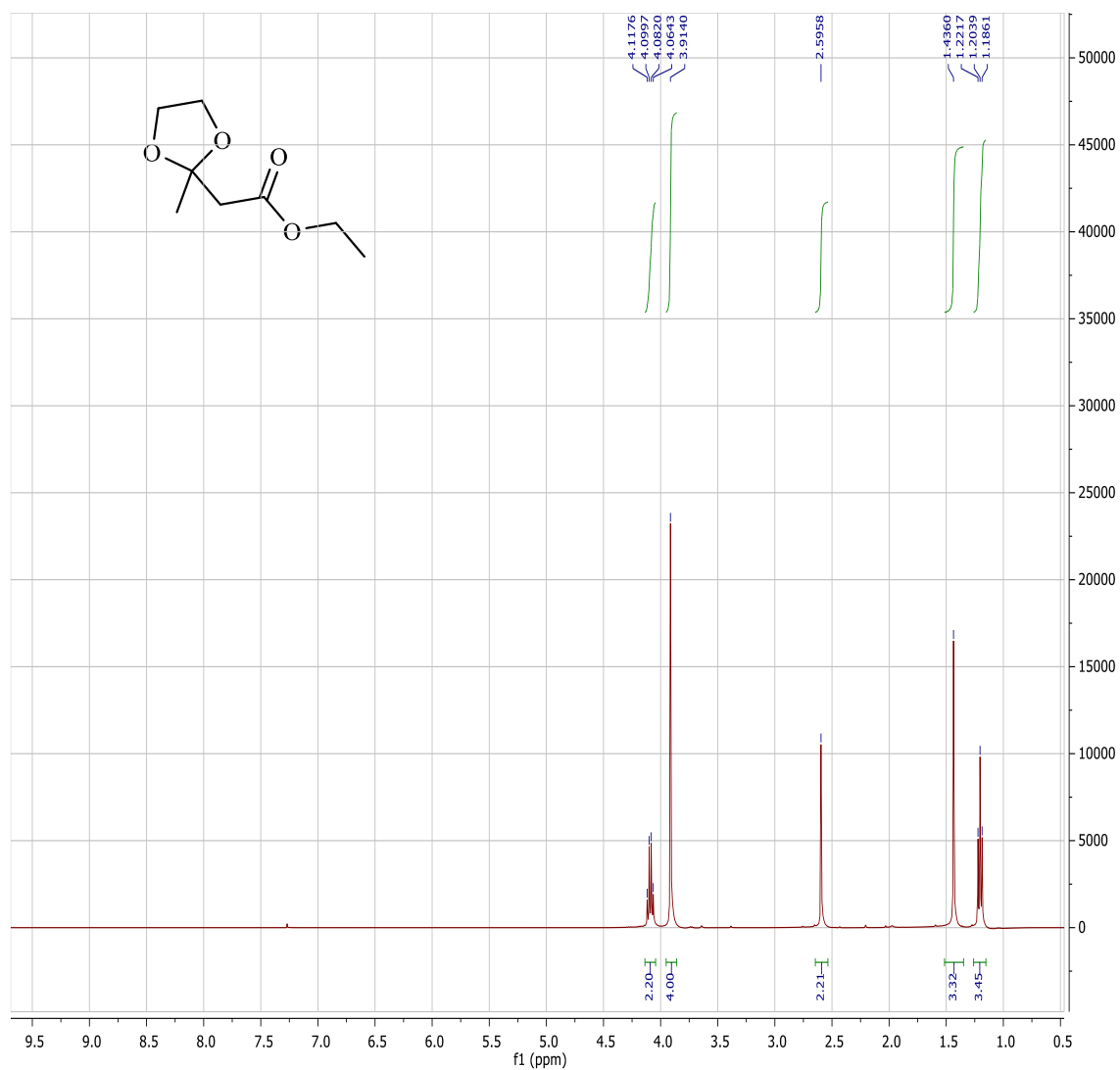


Figure S1.  $^1\text{H}$ -spectrum of the compound **3** ( $\text{CDCl}_3$ , 400 MHz).

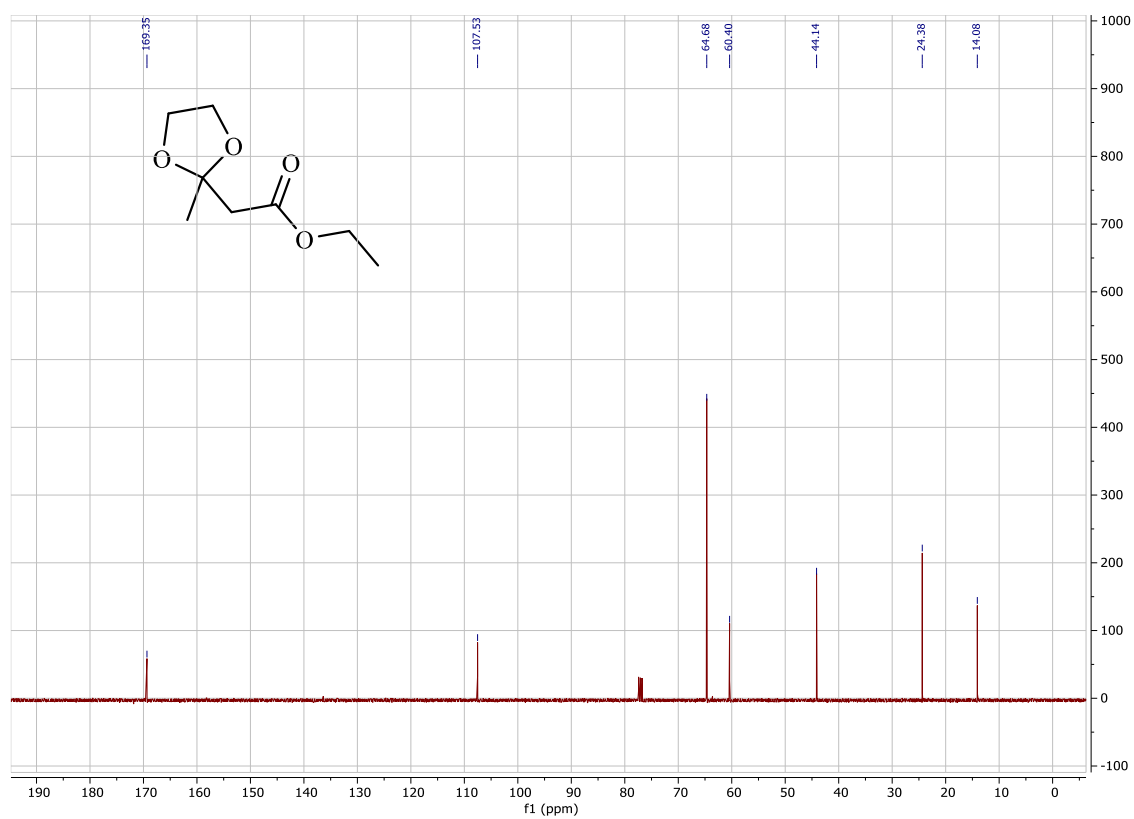


Figure S2.  $^{13}\text{C}$ -NMR spectrum of the compound **3** ( $\text{CDCl}_3$ , 100 MHz).

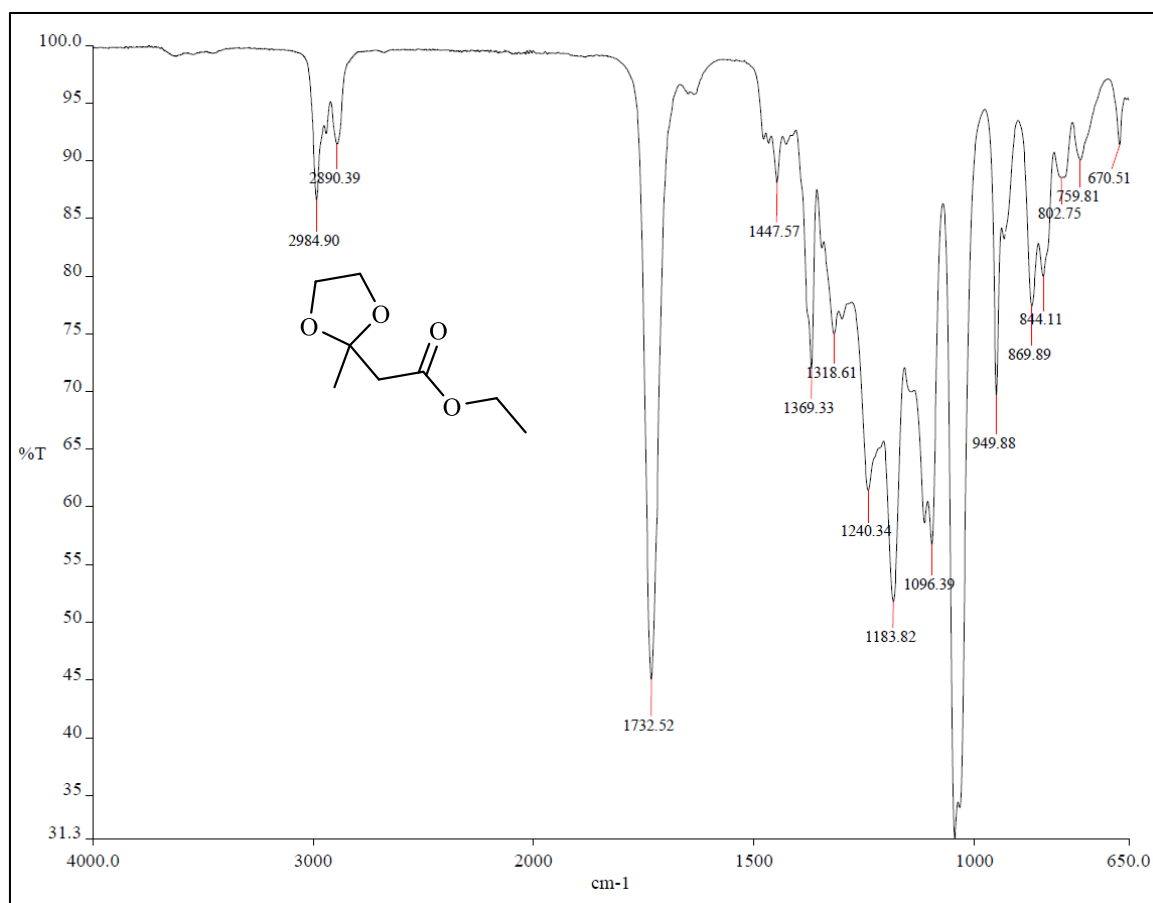


Figure S3. IR-spectrum of the compound 3.



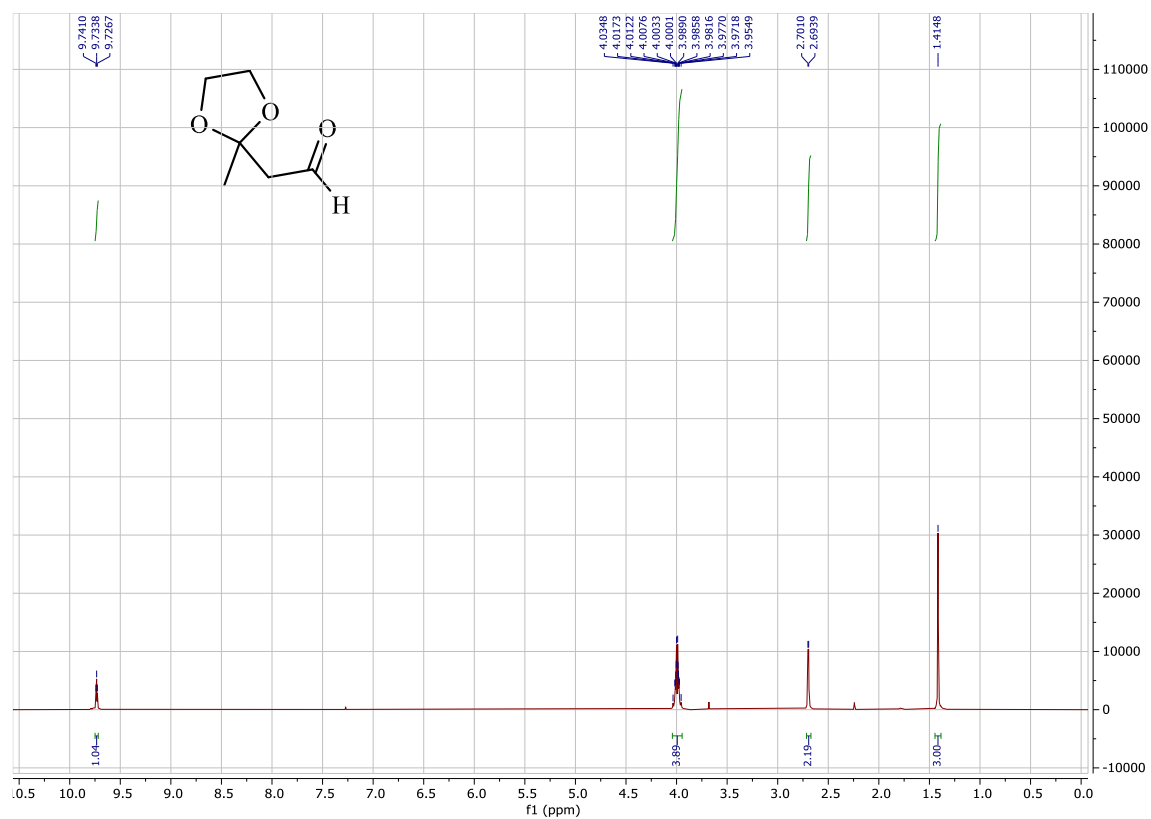


Figure S4.  $^1\text{H}$ -spectrum of the compound **4** ( $\text{CDCl}_3$ , 400 MHz).

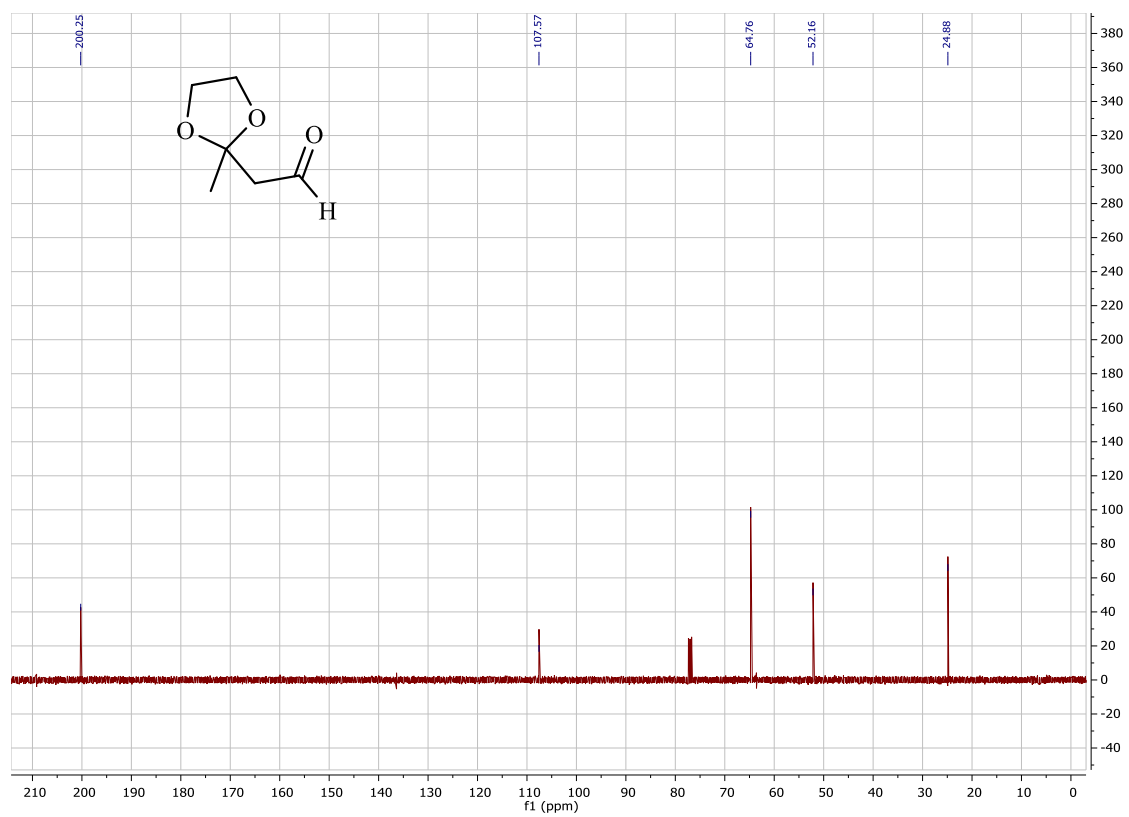


Figure S5. <sup>13</sup>C-NMR spectrum of the compound **4** (CDCl<sub>3</sub>, 100 MHz).

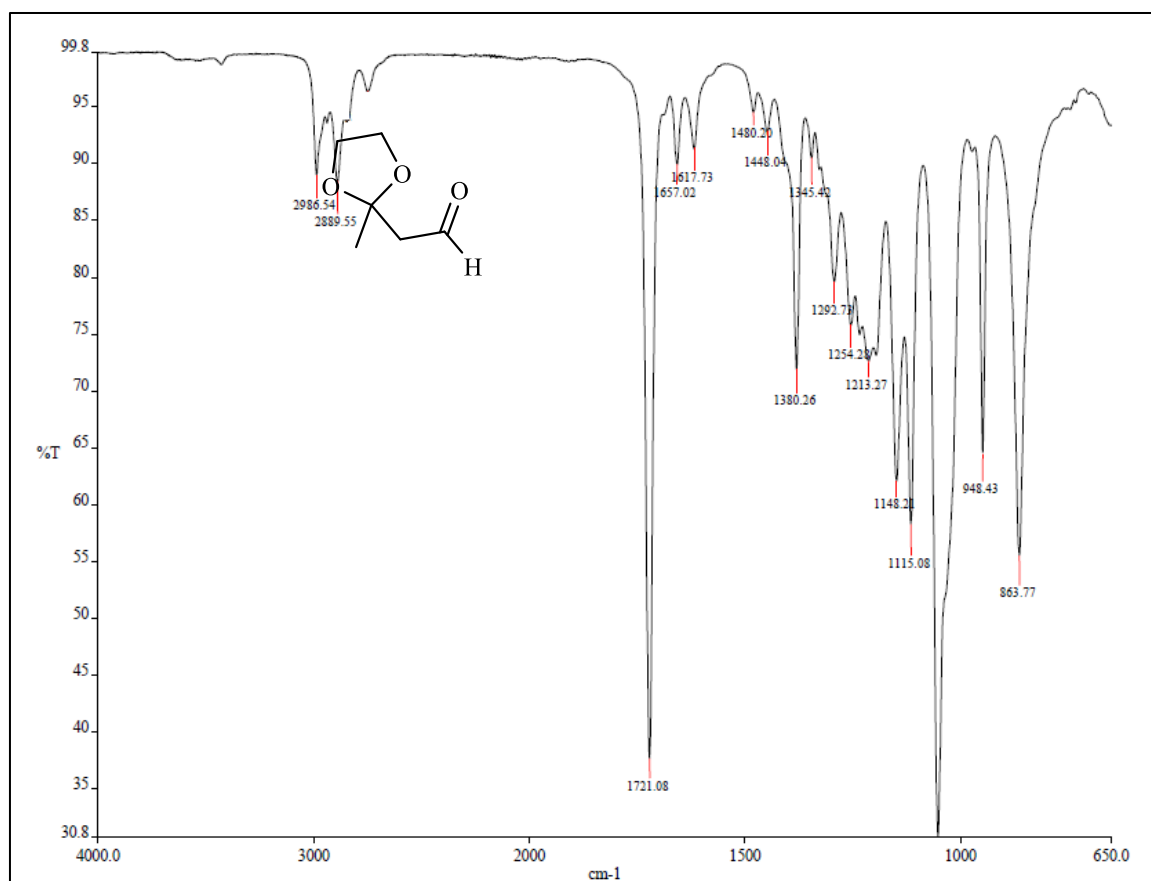


Figure S6. IR-spectrum of the compound **4**.

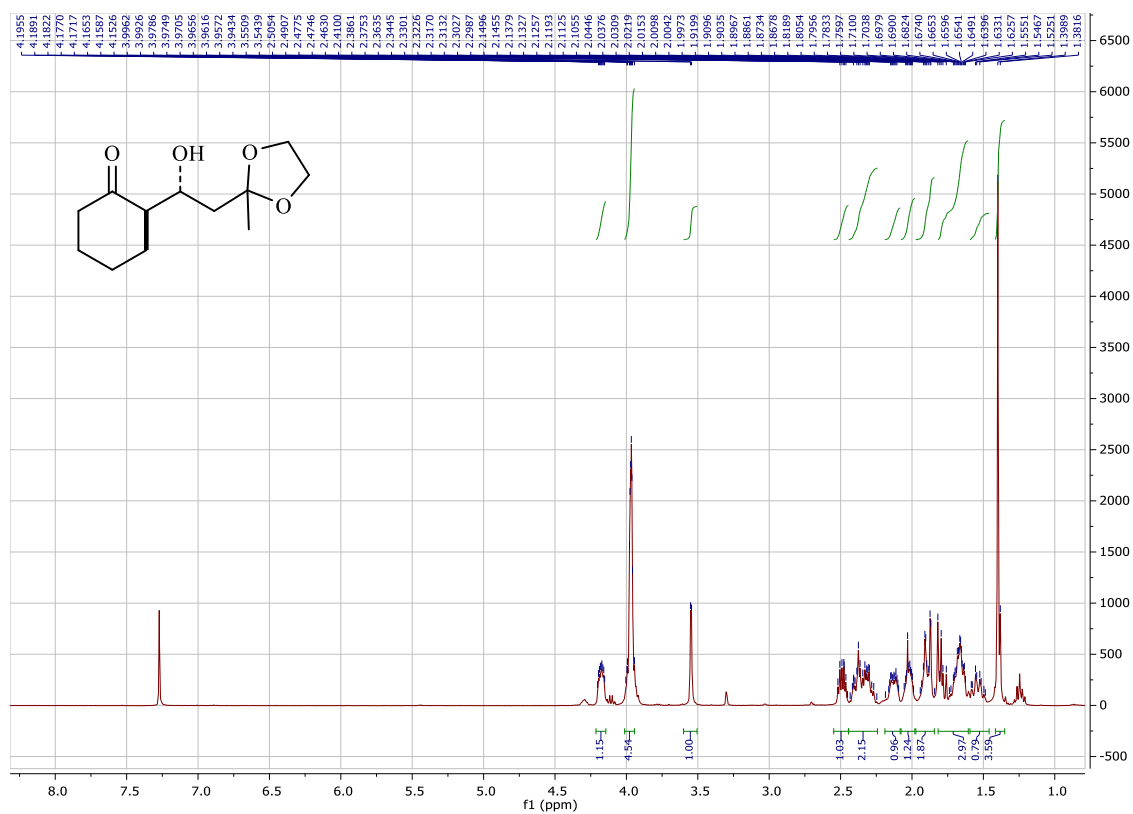


Figure S7. <sup>1</sup>H-spectrum of the compound **5** (CDCl<sub>3</sub>, 400 MHz).

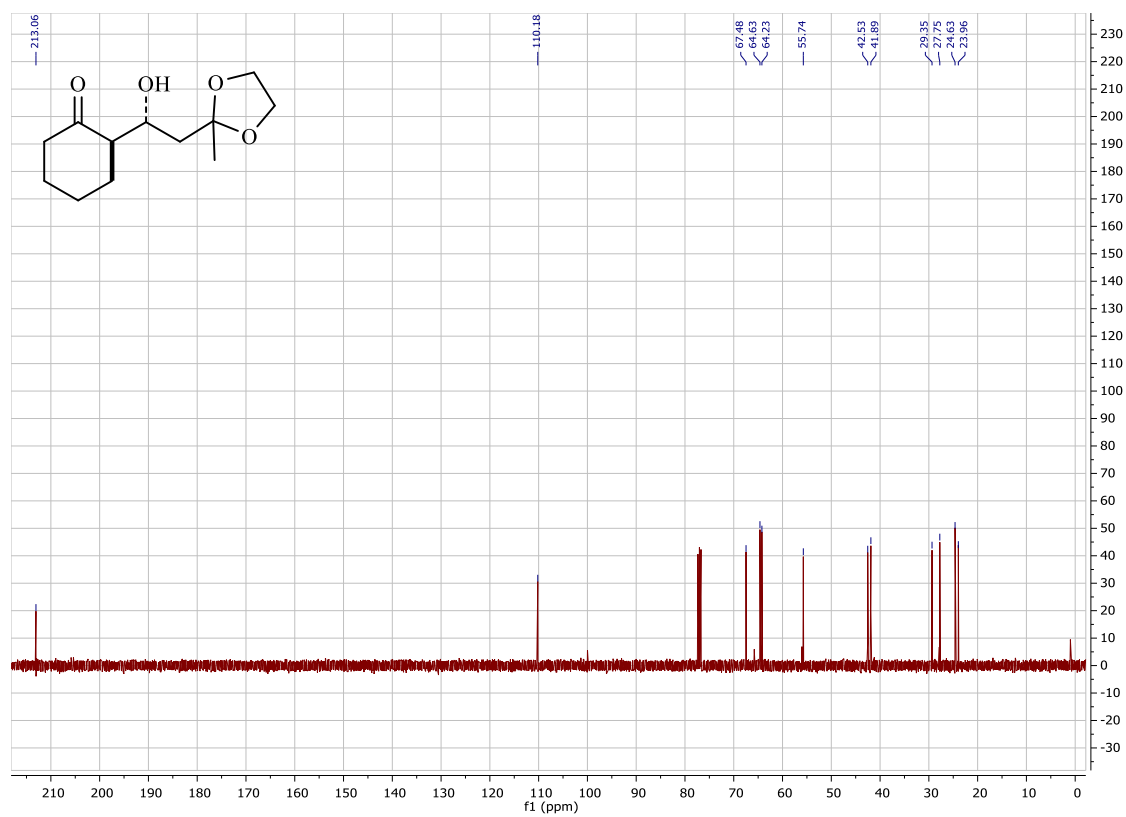


Figure S8.  $^{13}\text{C}$ -NMR spectrum of the compound 5 ( $\text{CDCl}_3$ , 100 MHz).

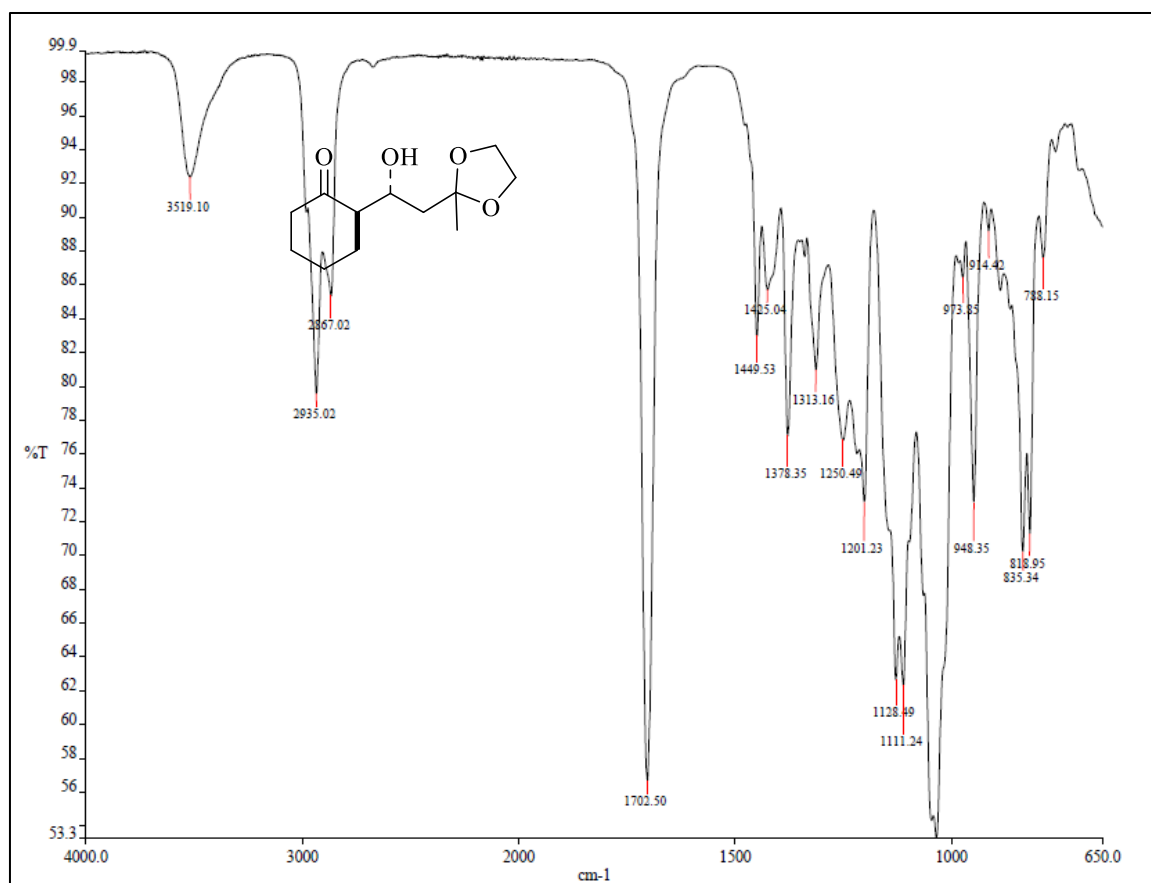


Figure S9. IR-spectrum of the compound 5.

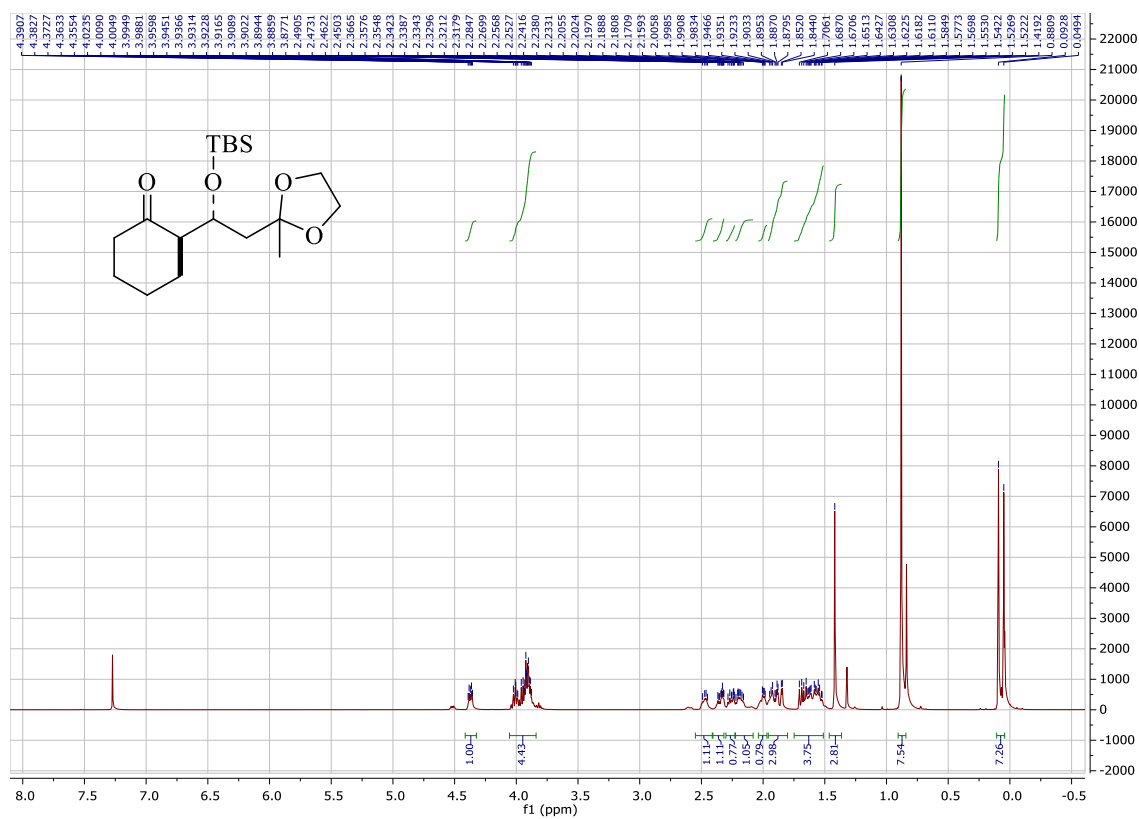


Figure S10. <sup>1</sup>H-spectrum of the compound 6 (CDCl<sub>3</sub>, 400 MHz).

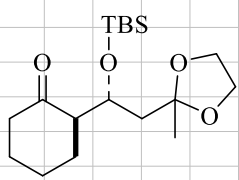


Figure S11. <sup>13</sup>C-NMR spectrum of the compound **6** (CDCl<sub>3</sub>, 100 MHz).



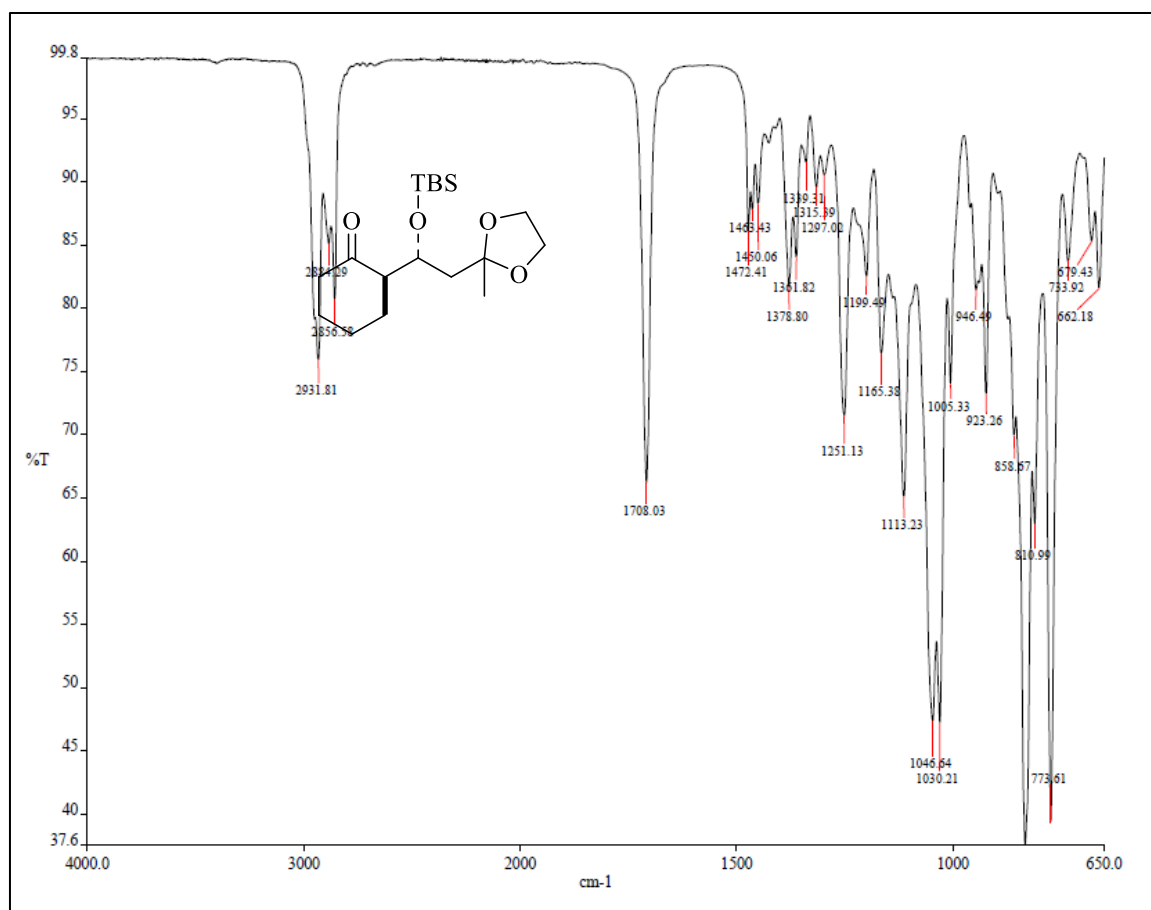


Figure S12. IR-spectrum of the compound 6.

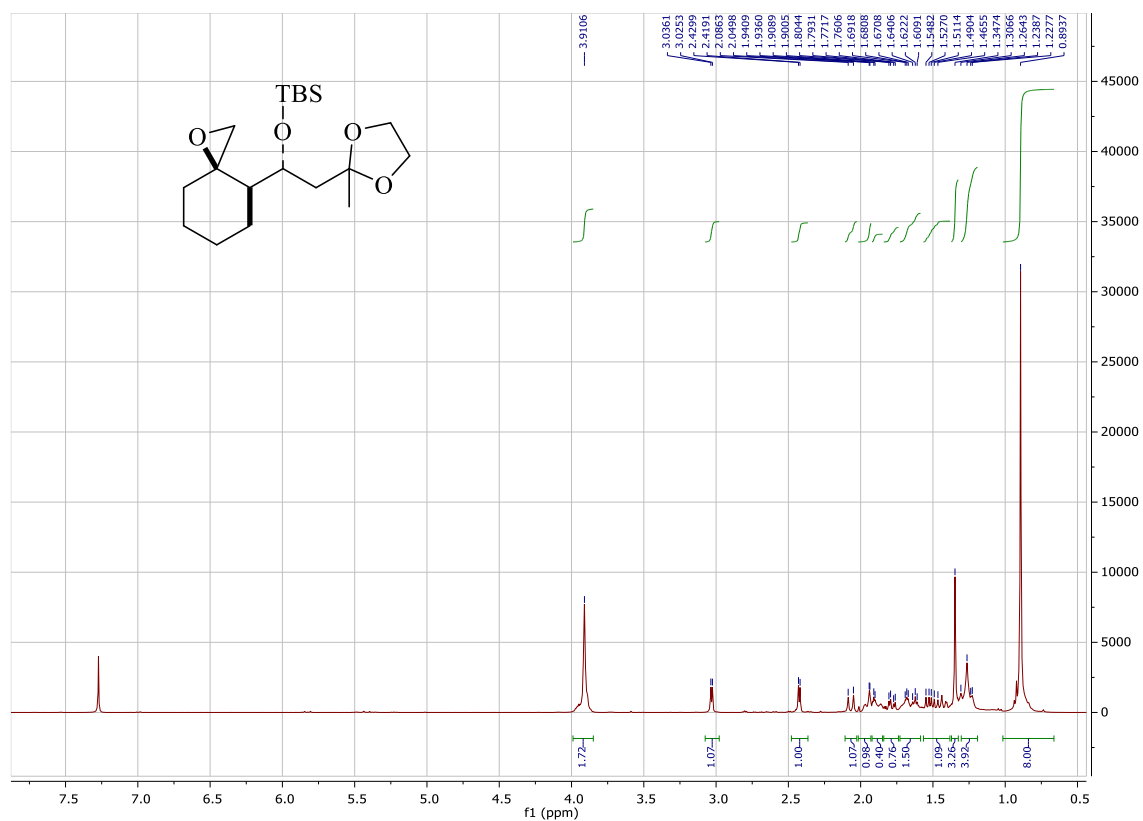


Figure S13. <sup>1</sup>H-spectrum of the compound 7 (CDCl<sub>3</sub>, 400 MHz).

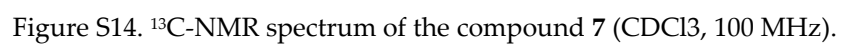


Figure S14. <sup>13</sup>C-NMR spectrum of the compound **7** (CDCl<sub>3</sub>, 100 MHz).

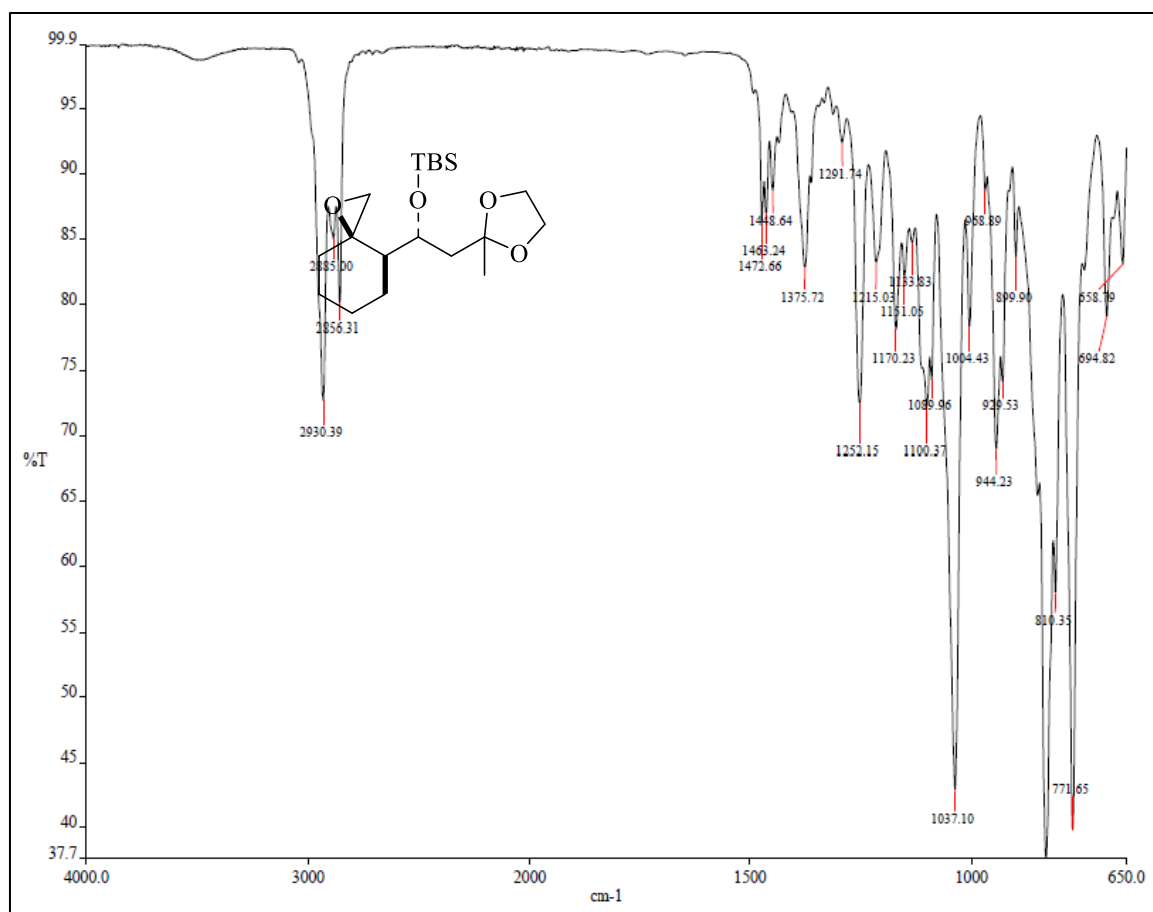


Figure S15. IR-spectrum of the compound 7.

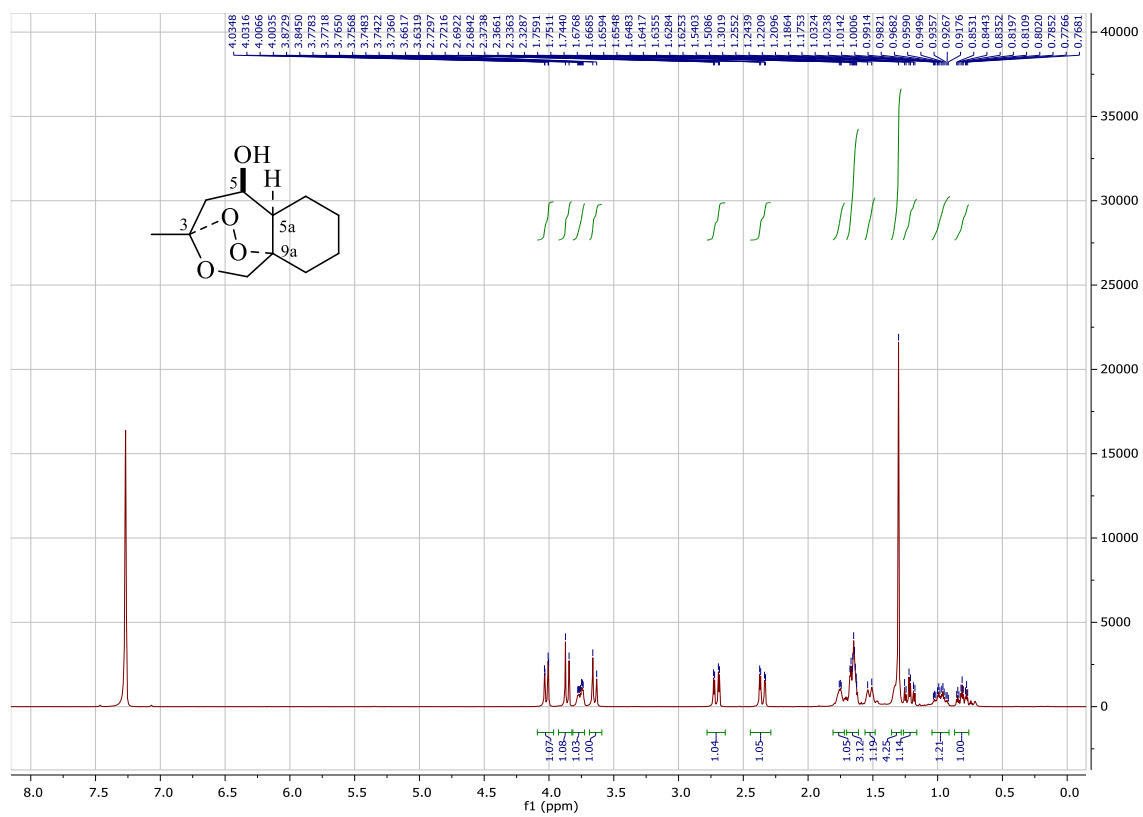


Figure S16.  $^1\text{H}$ -spectrum of the compound *rac-2* (CDCl<sub>3</sub>, 400 MHz).

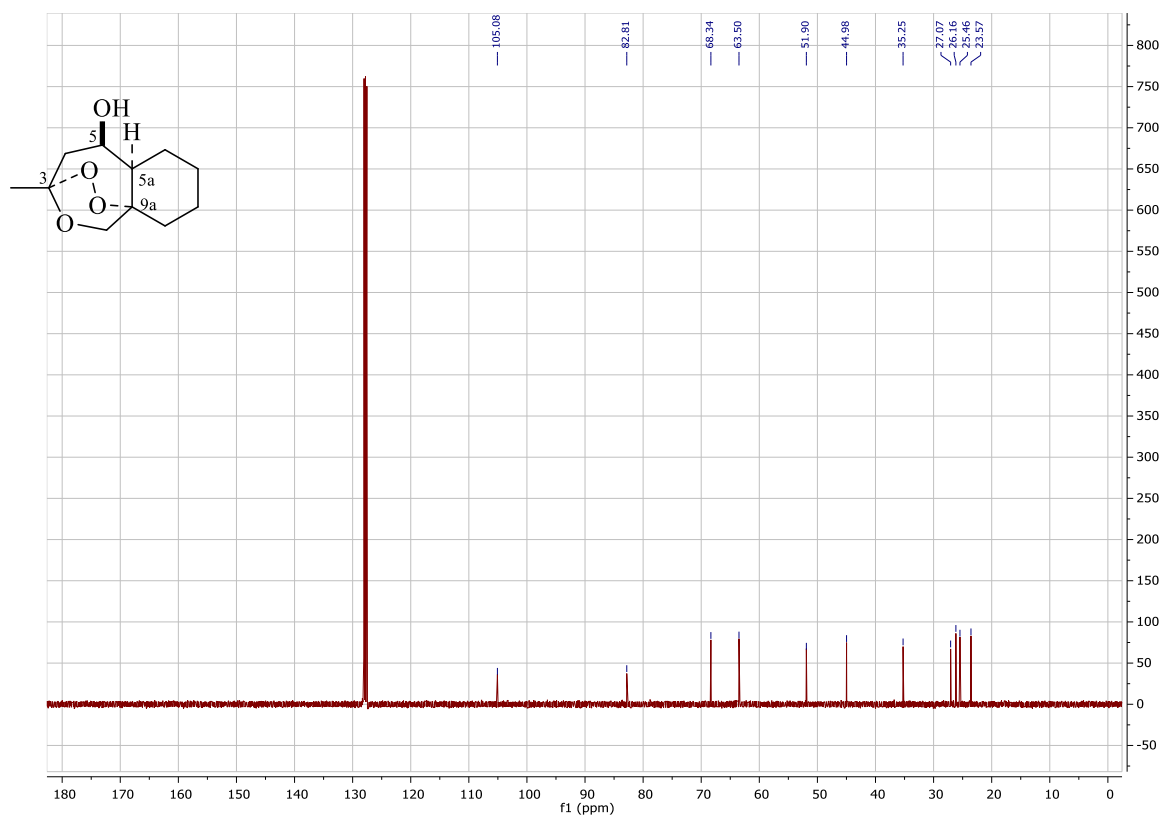


Figure S17.  $^{13}\text{C}$ -NMR spectrum of the compound *rac*-2 ( $\text{CDCl}_3$ , 100 MHz).

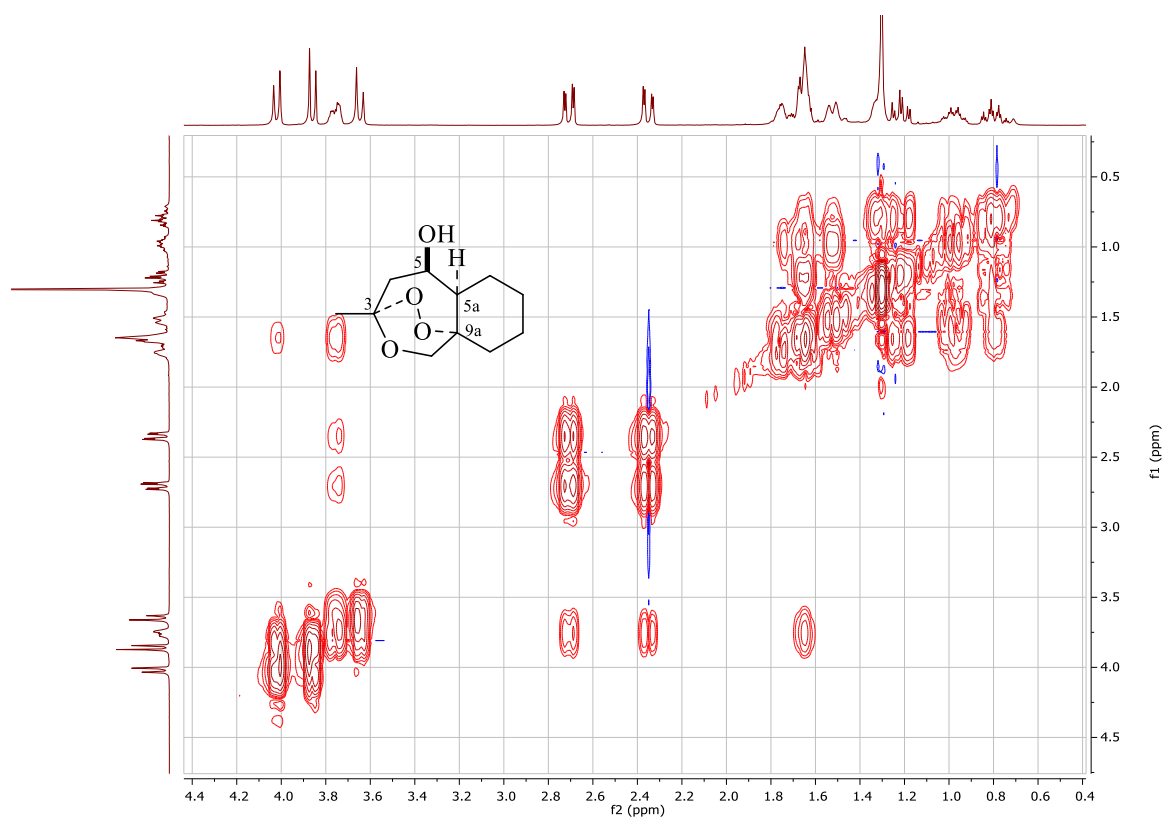
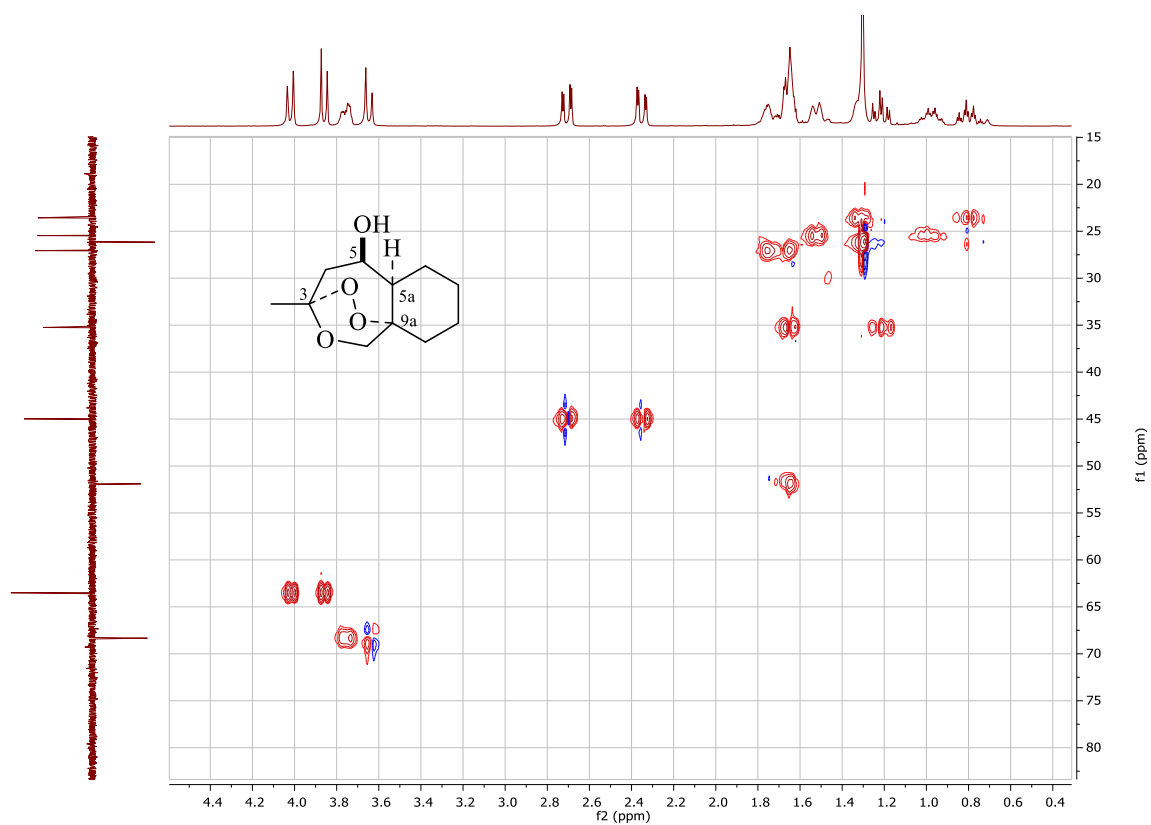


Figure S18. COSY spectrum of the compound *rac-2*



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

Figure



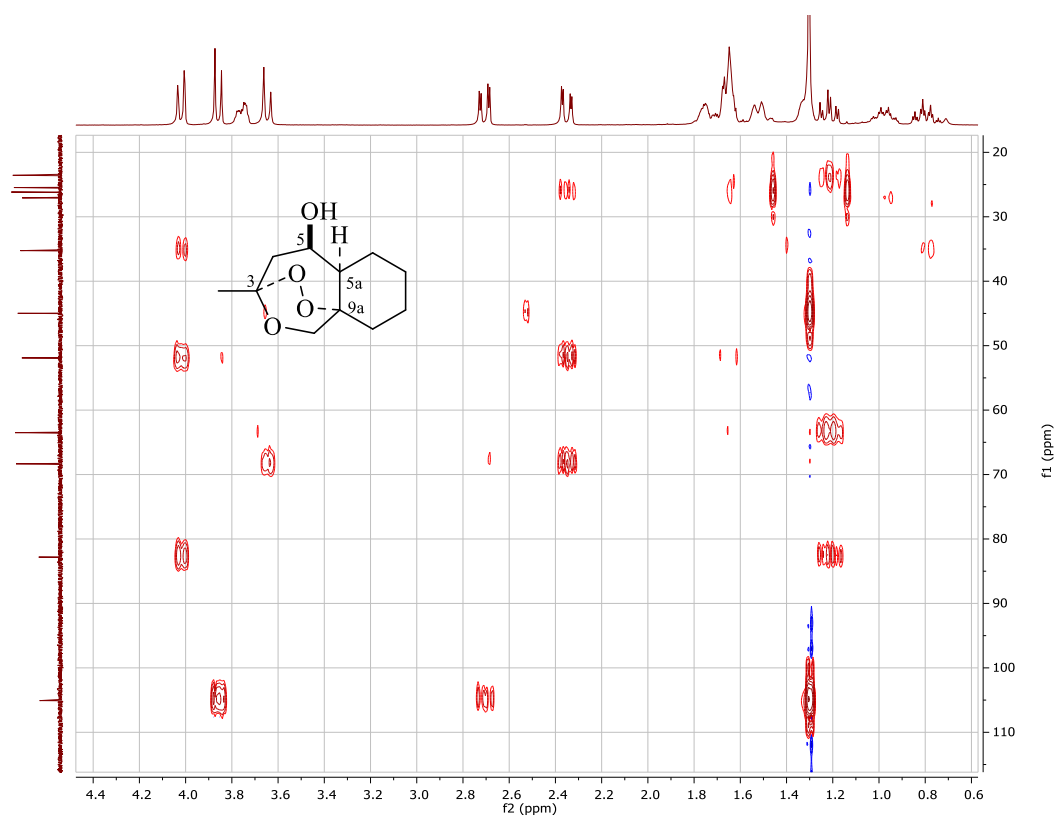


Figure S19. HMBC spectrum of the compound *rac-2*

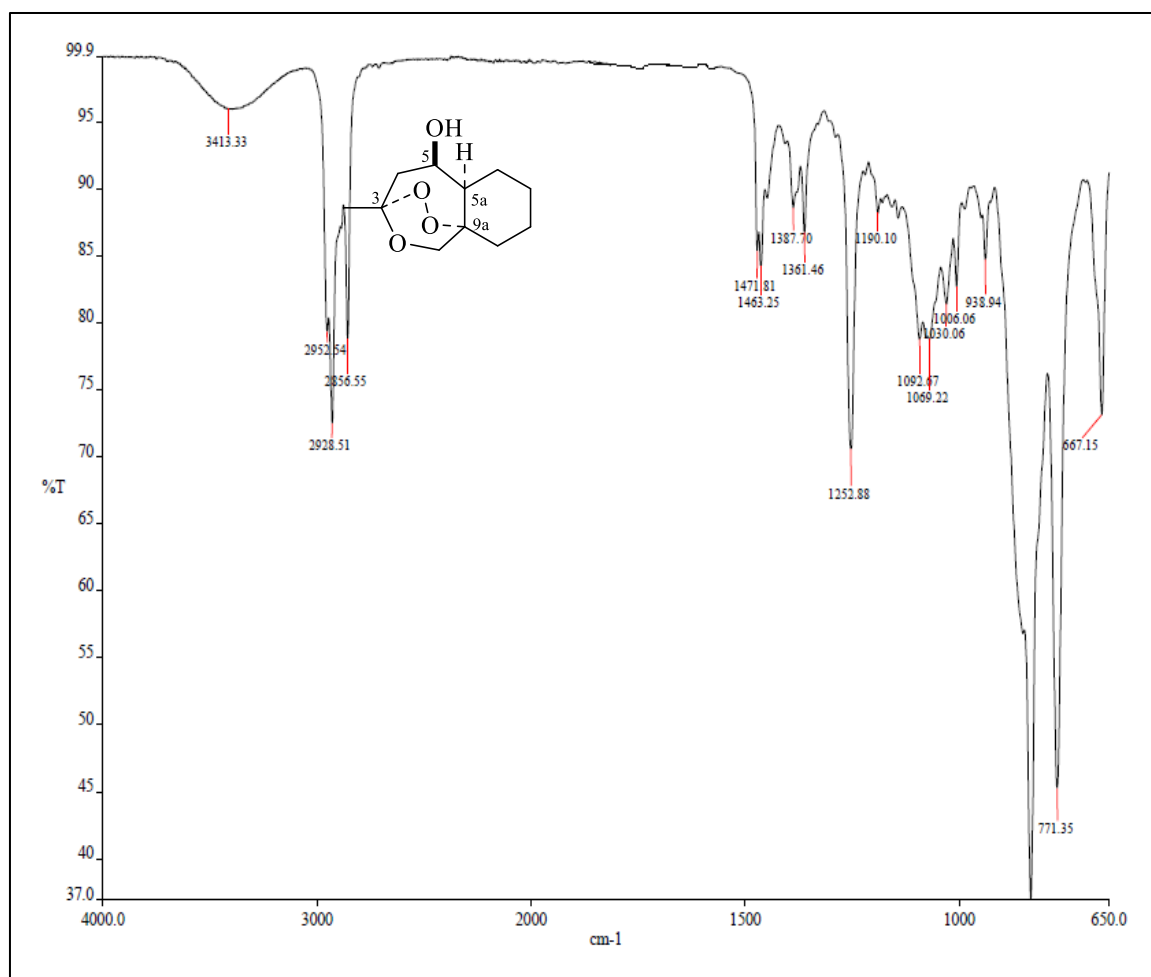


Figure S20. IR-spectrum of the compound *rac-2*

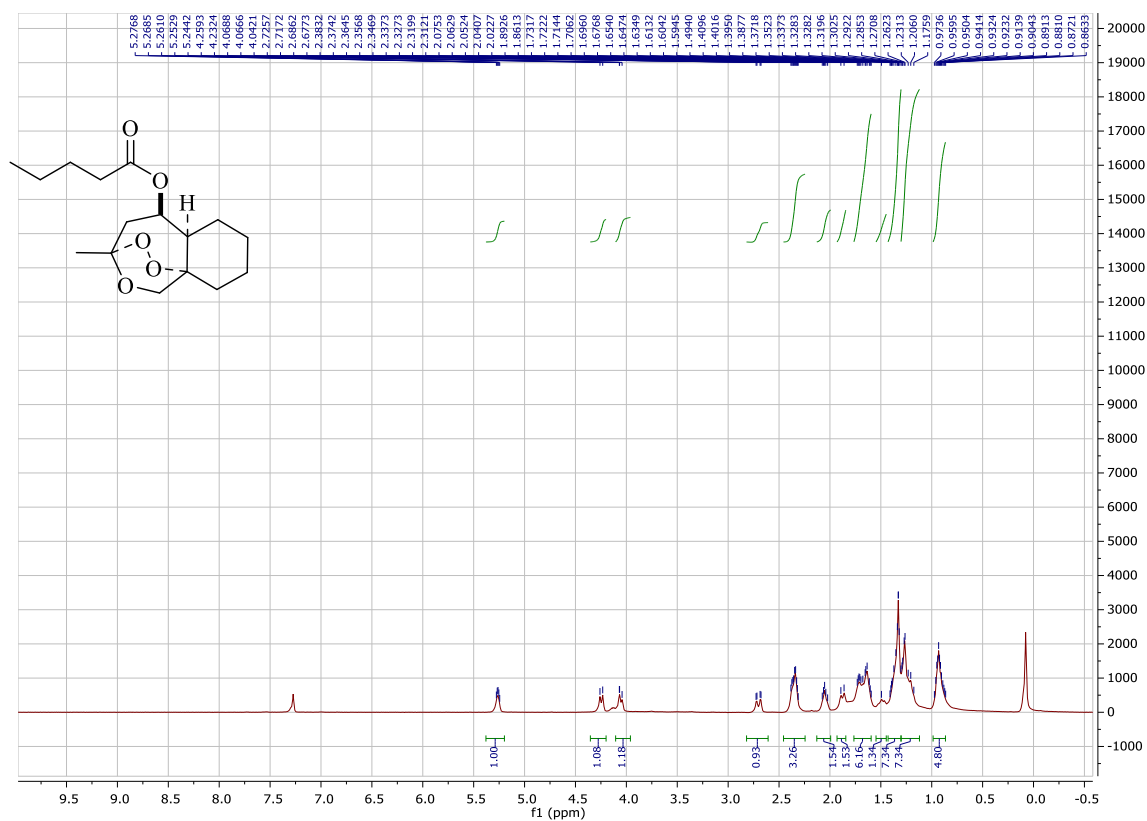


Figure S21. <sup>1</sup>H spectrum of the compound 9 (CDCl<sub>3</sub>, 400 MHz).

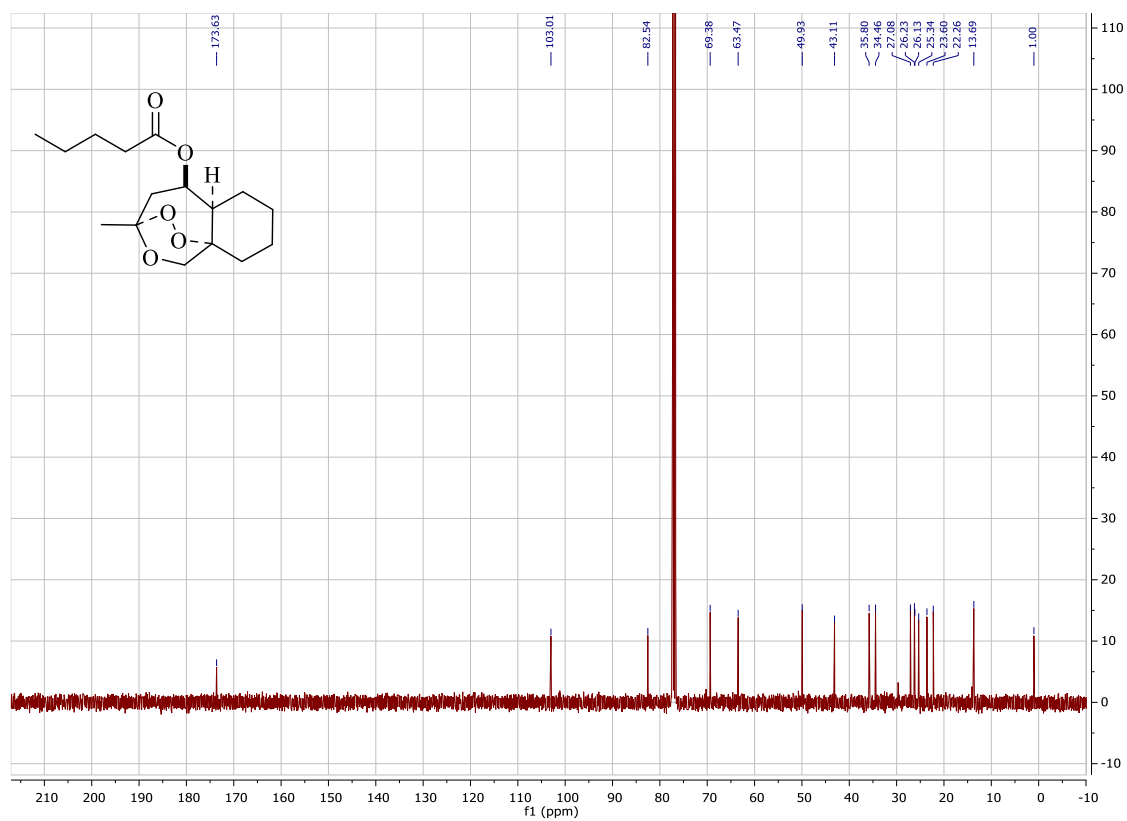


Figure S22. <sup>13</sup>C-NMR spectrum of the compound **9** (CDCl<sub>3</sub>, 100 MHz).

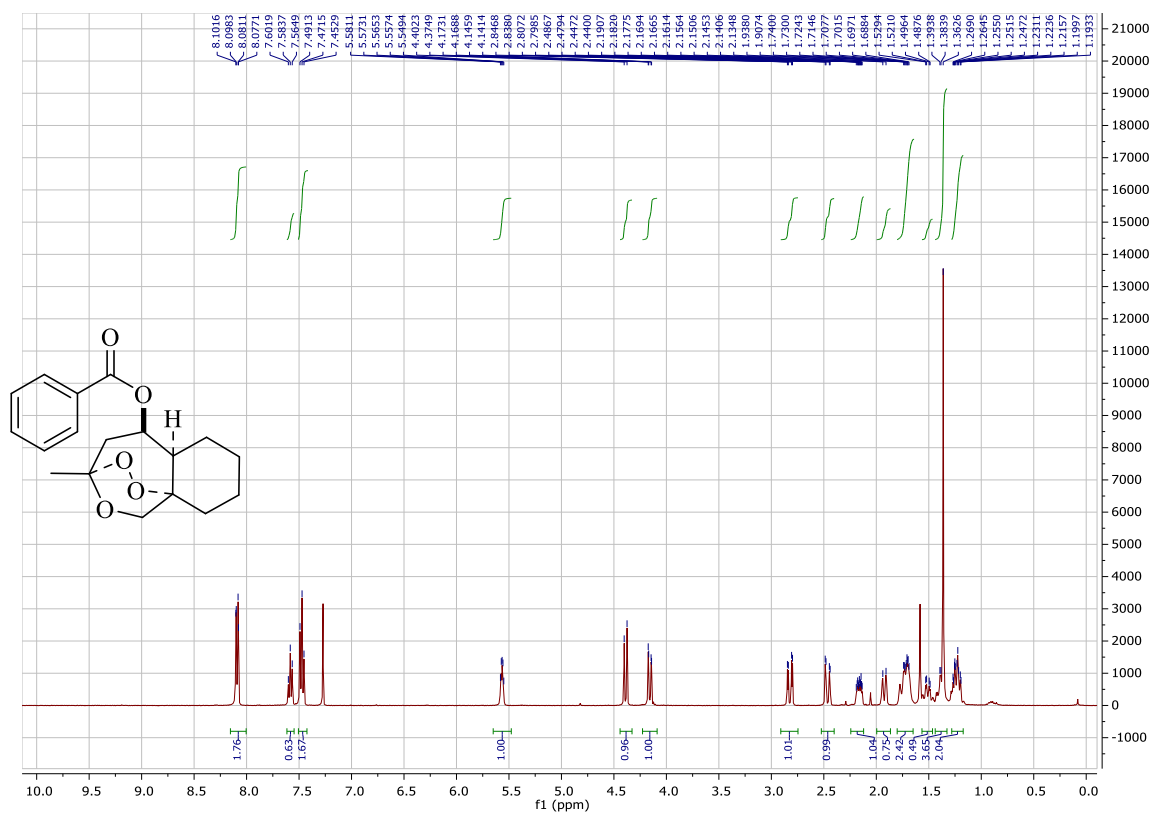


Figure S23. <sup>1</sup>H-spectrum of the compound **10** (CDCl<sub>3</sub>, 400 MHz).

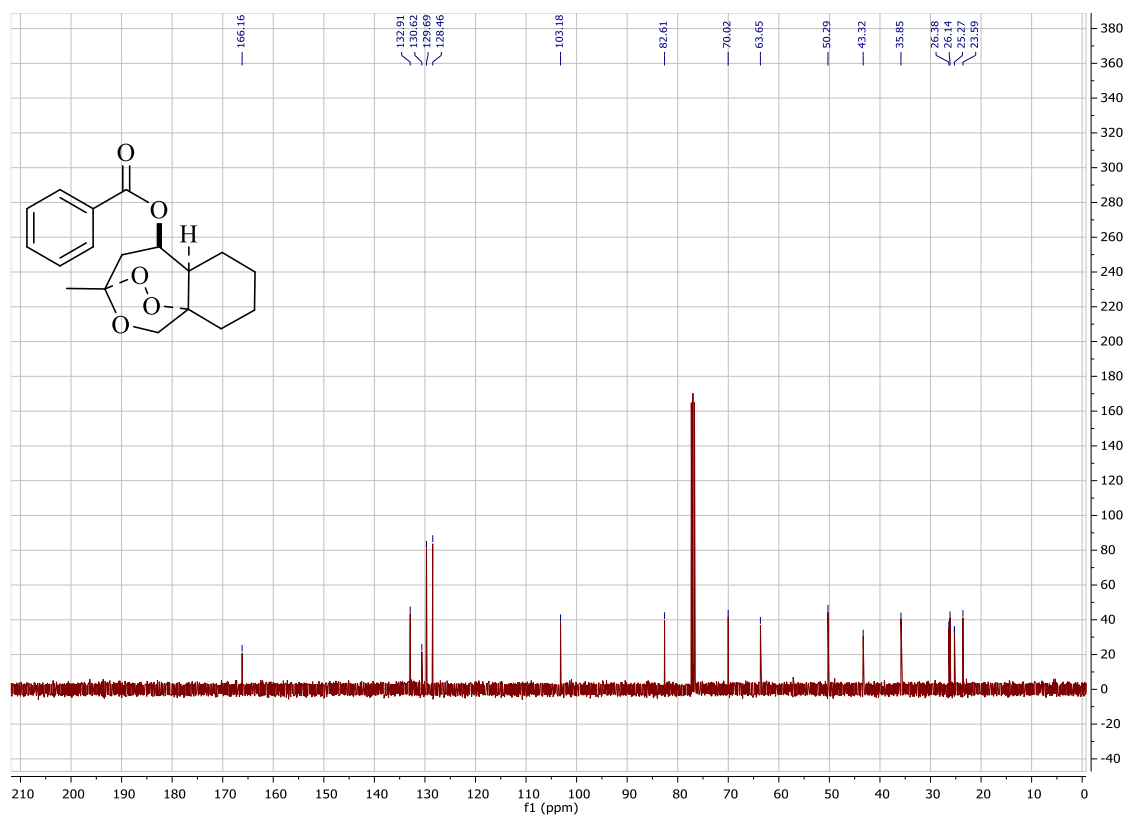


Figure S24. <sup>13</sup>C-NMR spectrum of the compound 10 (CDCl<sub>3</sub>, 100 MHz).

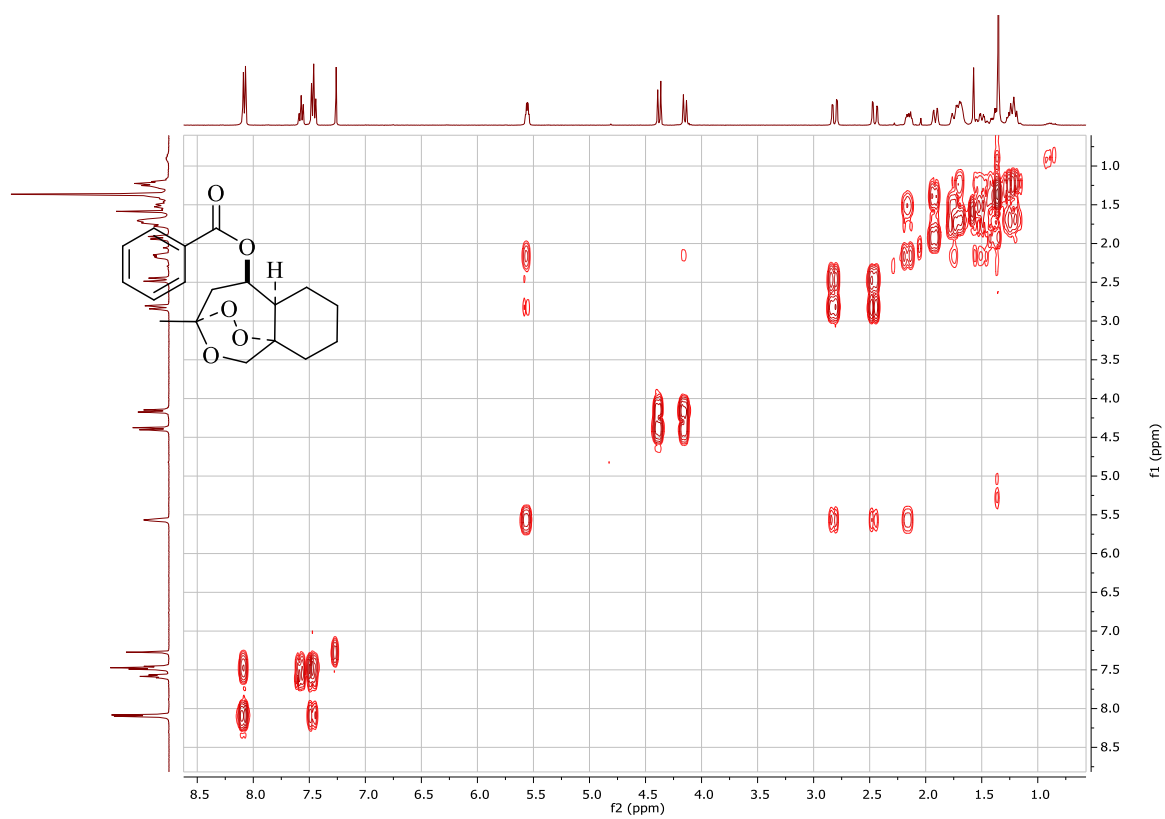
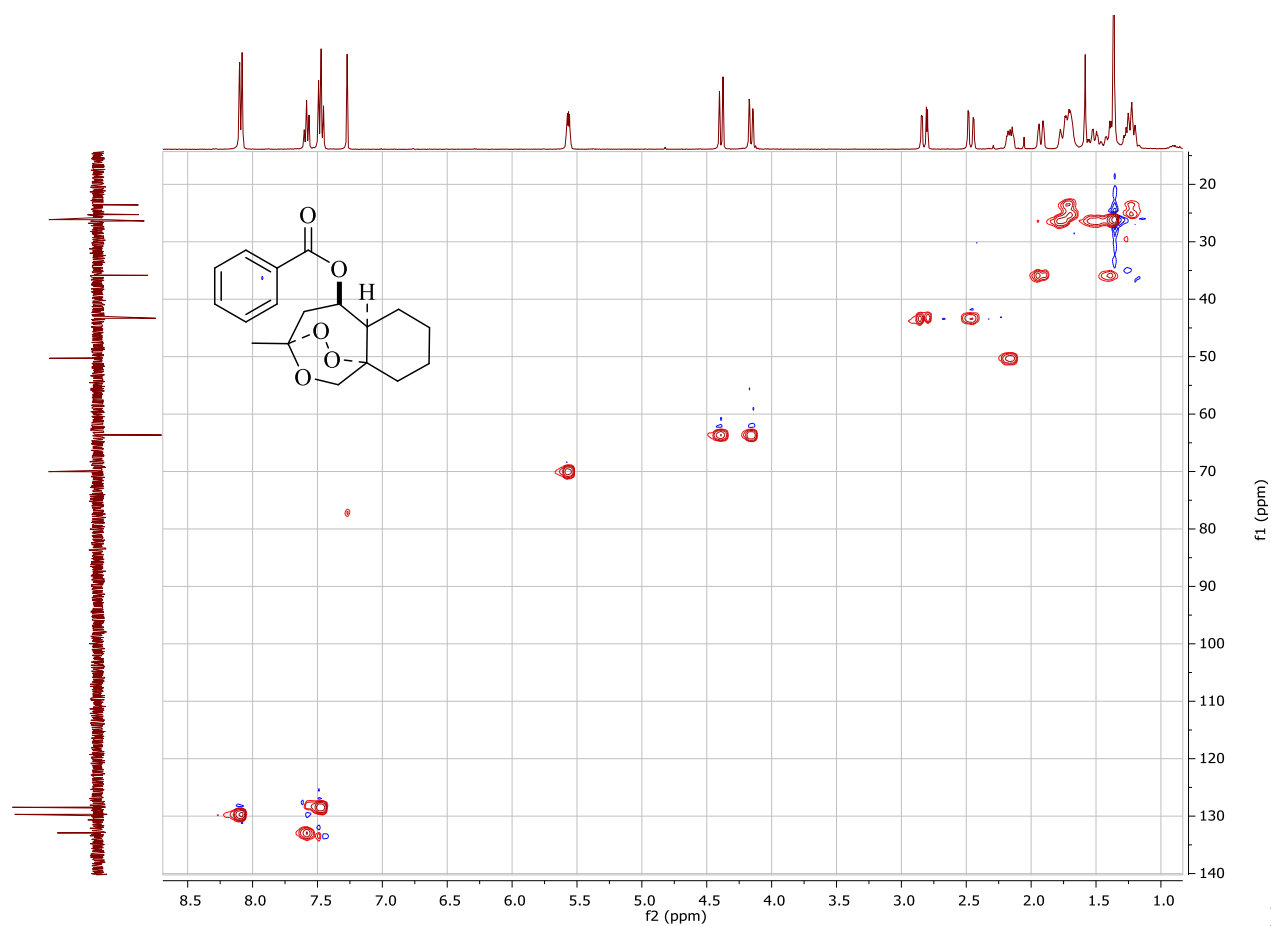


Figure S25. COSY spectrum of the compound 10.



S26. HSQC spectrum of the compound 10.

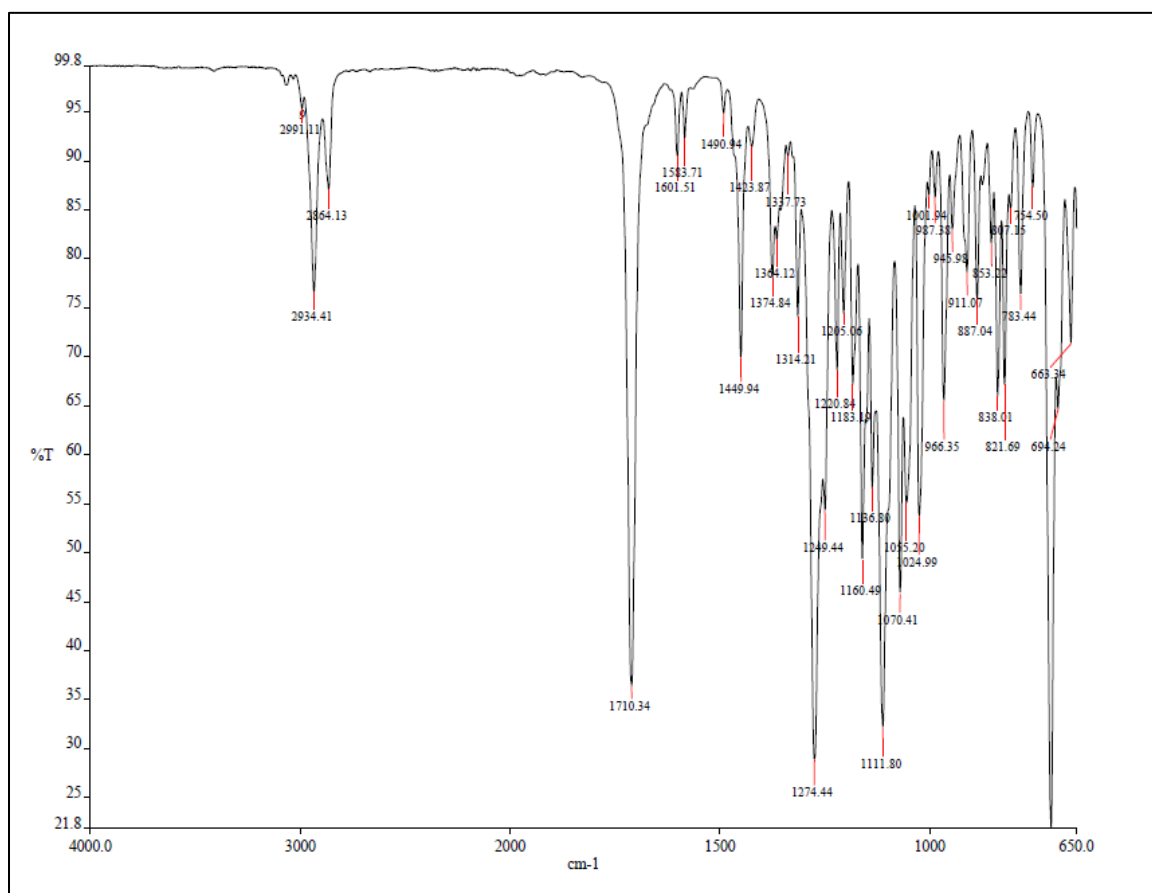
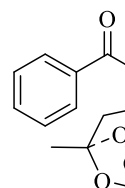


Figure S27. IR-spectrum of the compound 10.





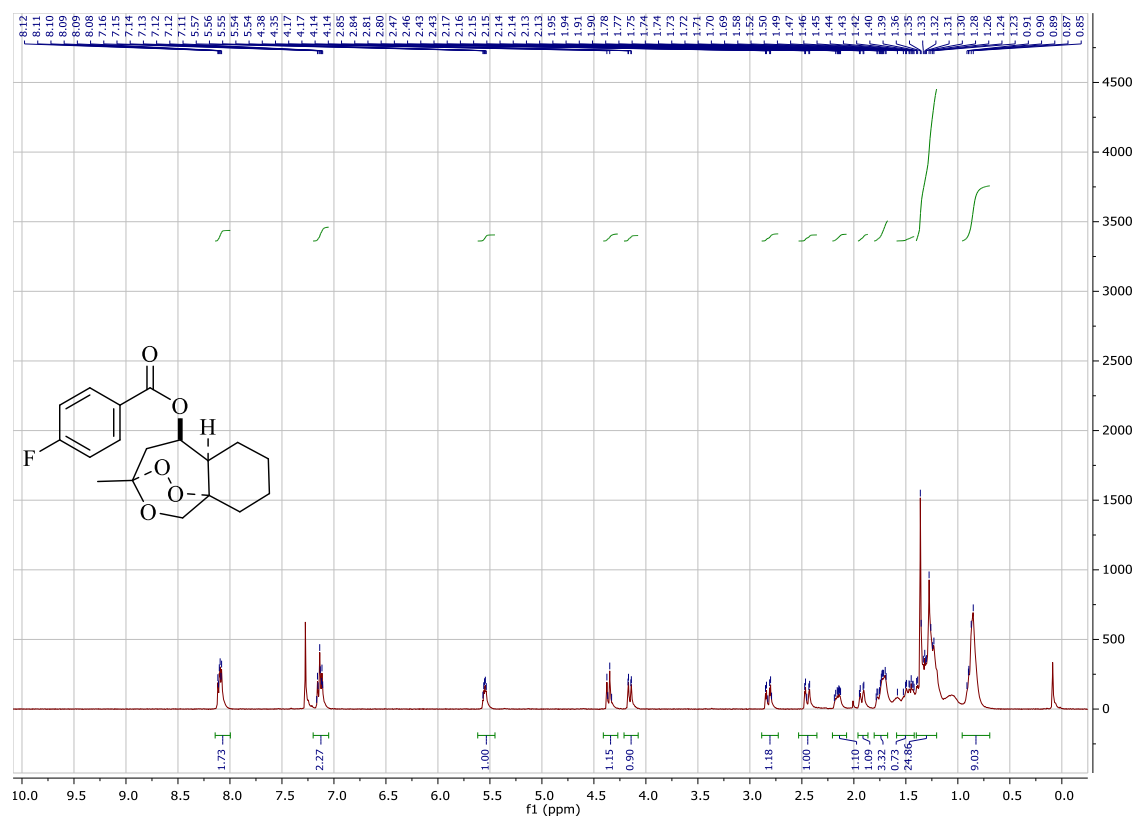


Figure S28. <sup>1</sup>H-spectrum of the compound **11** (CDCl<sub>3</sub>, 400 MHz).

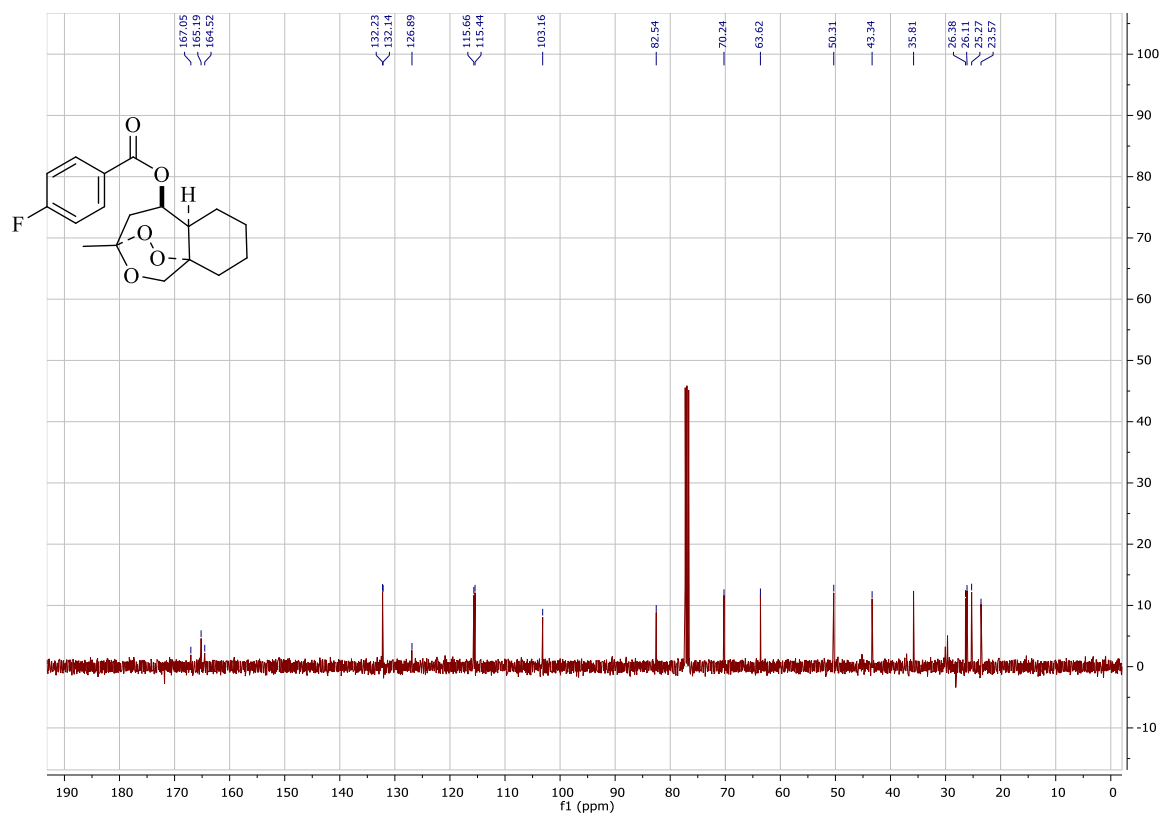


Figure S29. <sup>13</sup>C-NMR spectrum of the compound **11** (CDCl<sub>3</sub>, 100 MHz).

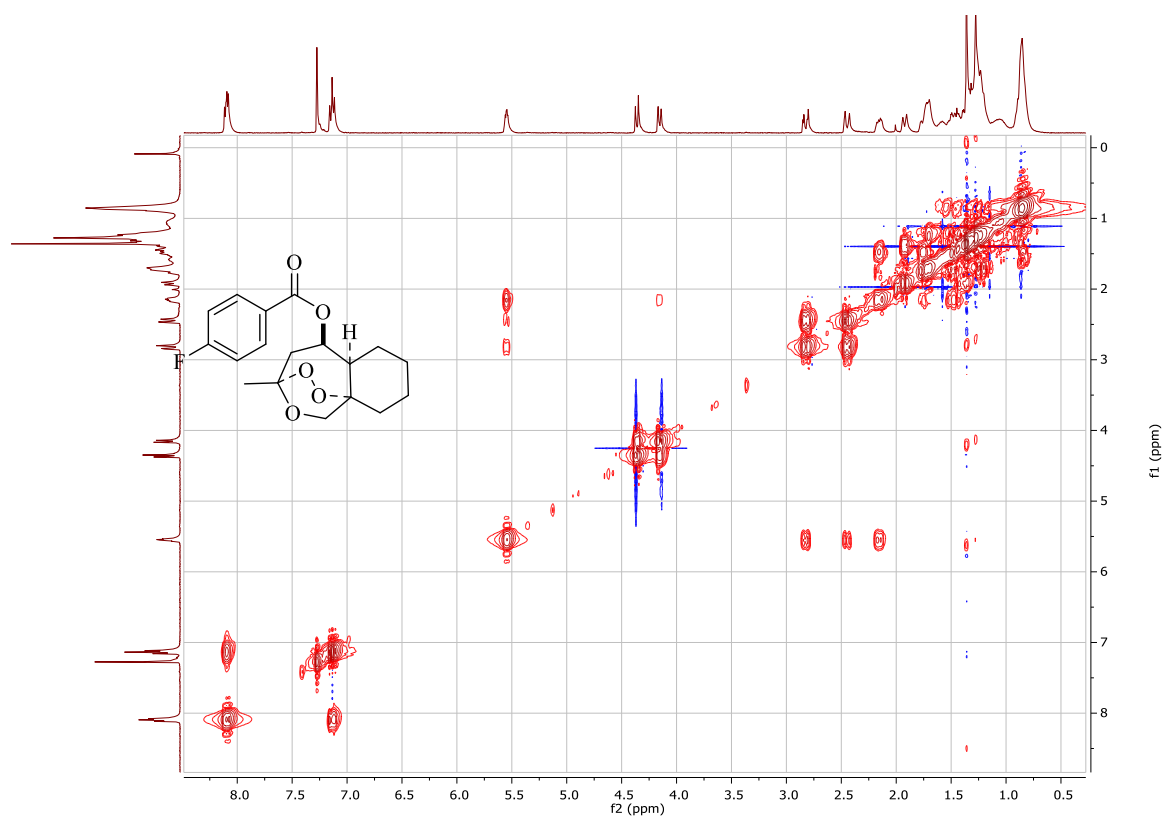


Figure S30. COSY spectrum of the compound **11**.

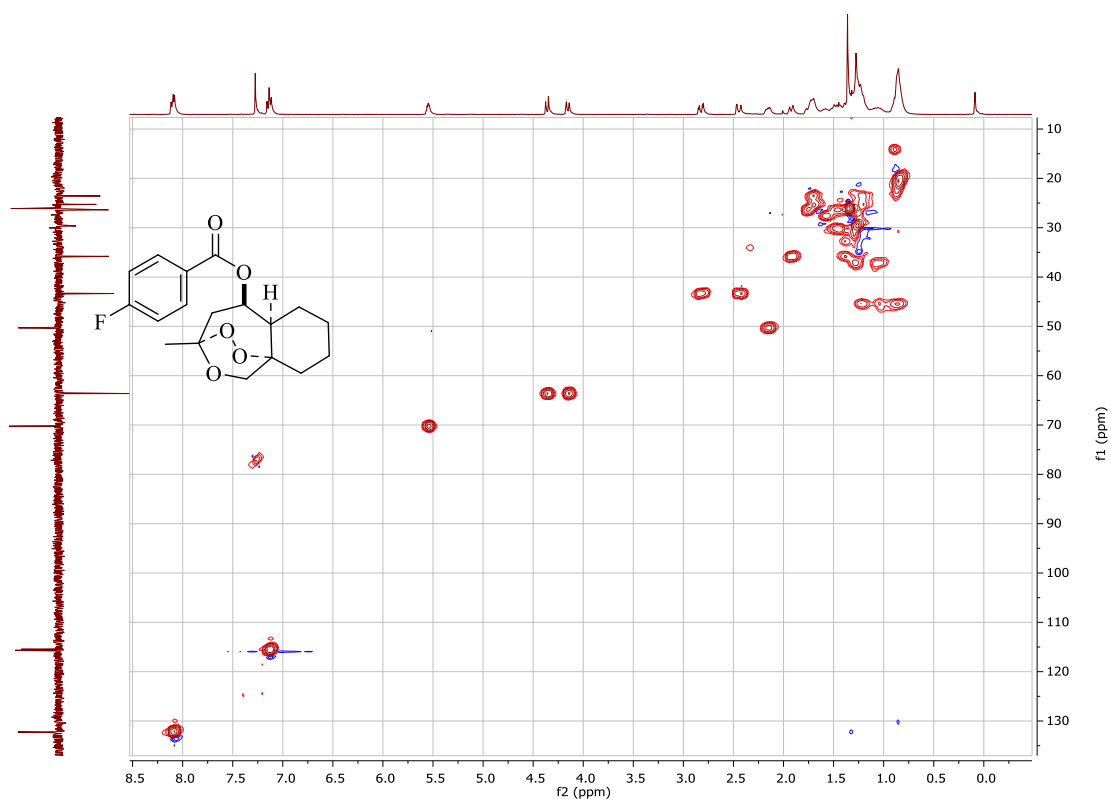


Figure S31. HSQC spectrum of the compound **11**.

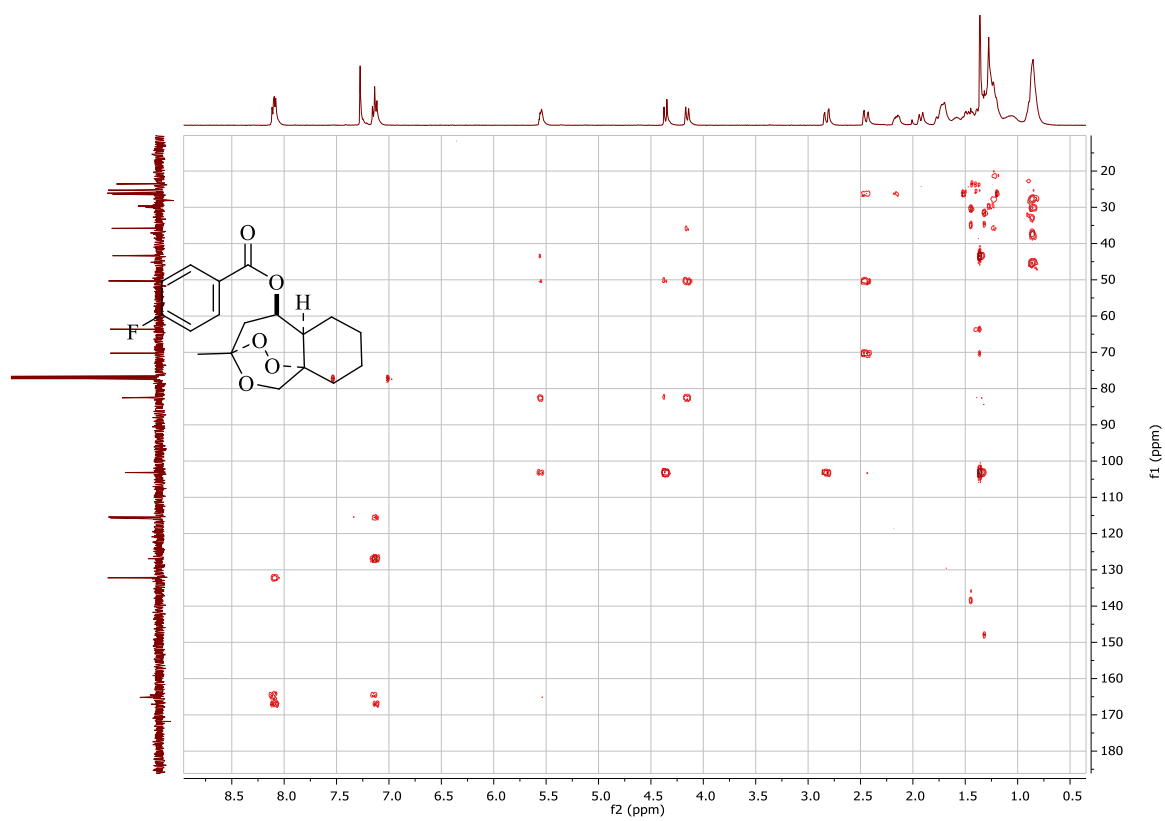


Figure S32. HMBC spectrum of the compound 11.

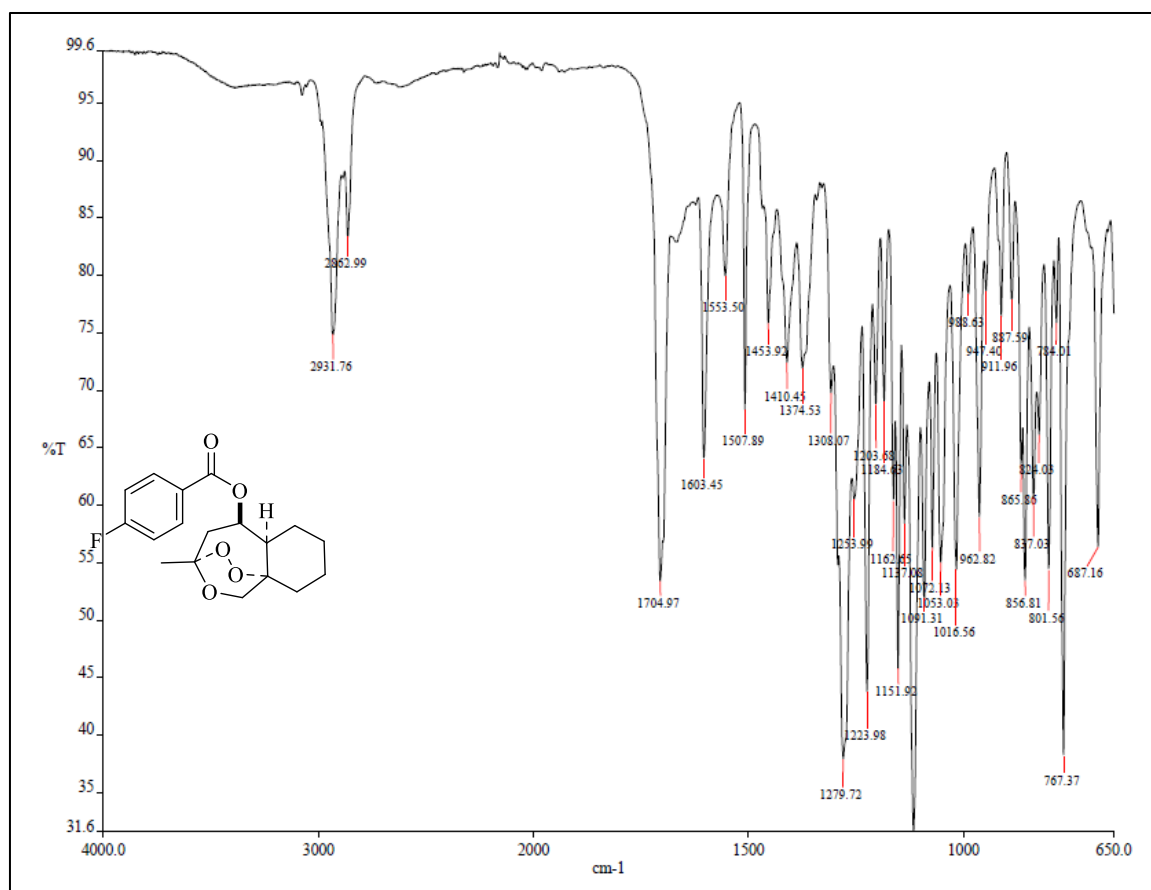


Figure S33. IR-spectrum of the compound **11**.

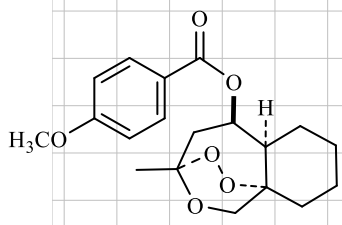


Figure S34.  $^1\text{H}$ -spectrum of the compound **12** ( $\text{CDCl}_3$ , 400 MHz).

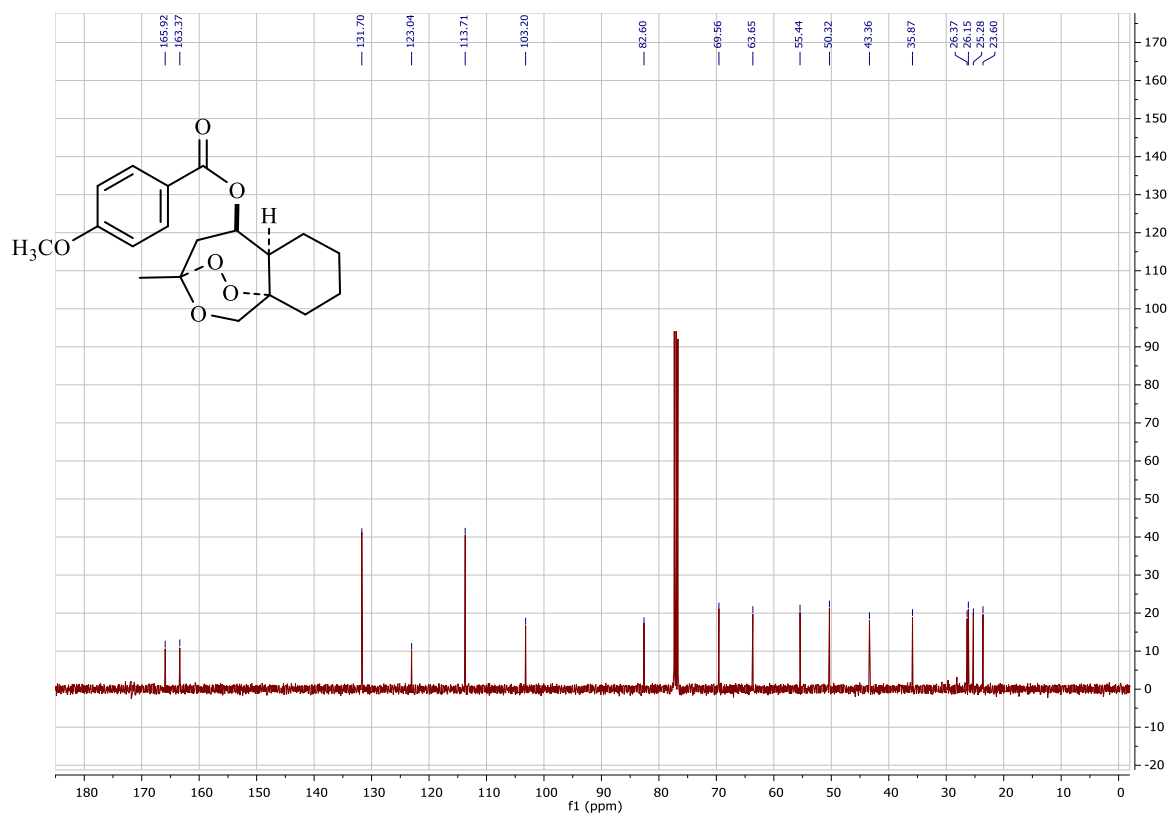


Figure S35. <sup>13</sup>C-NMR spectrum of the compound 12 (CDCl<sub>3</sub>, 100 MHz).



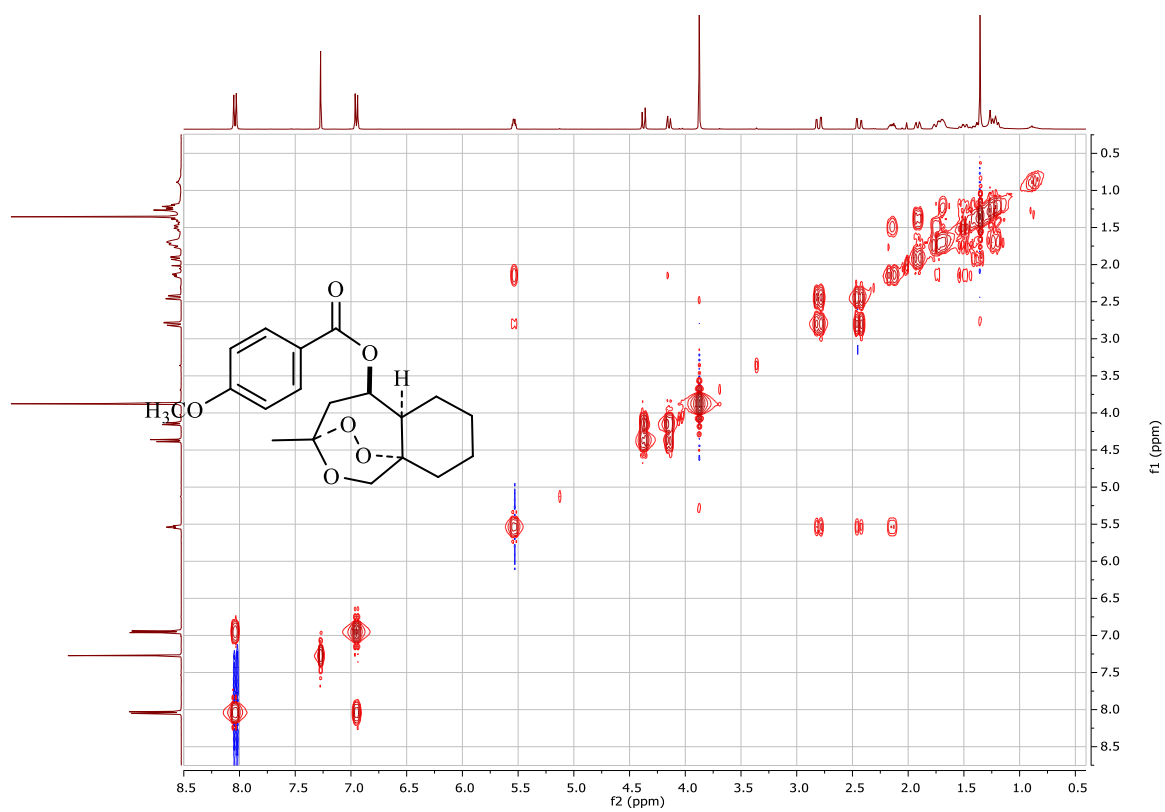


Figure S36. COSY spectrum of the compound **12**.

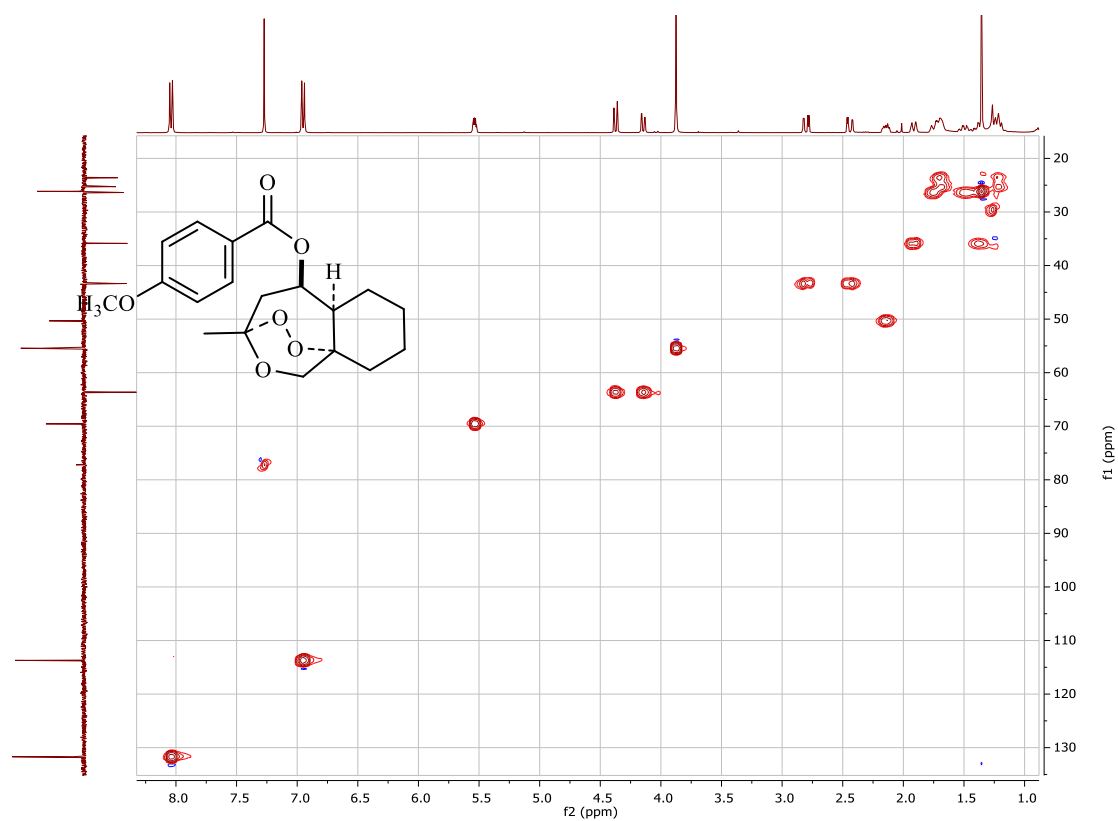


Figure S37. HSQC spectrum of the compound **12**.

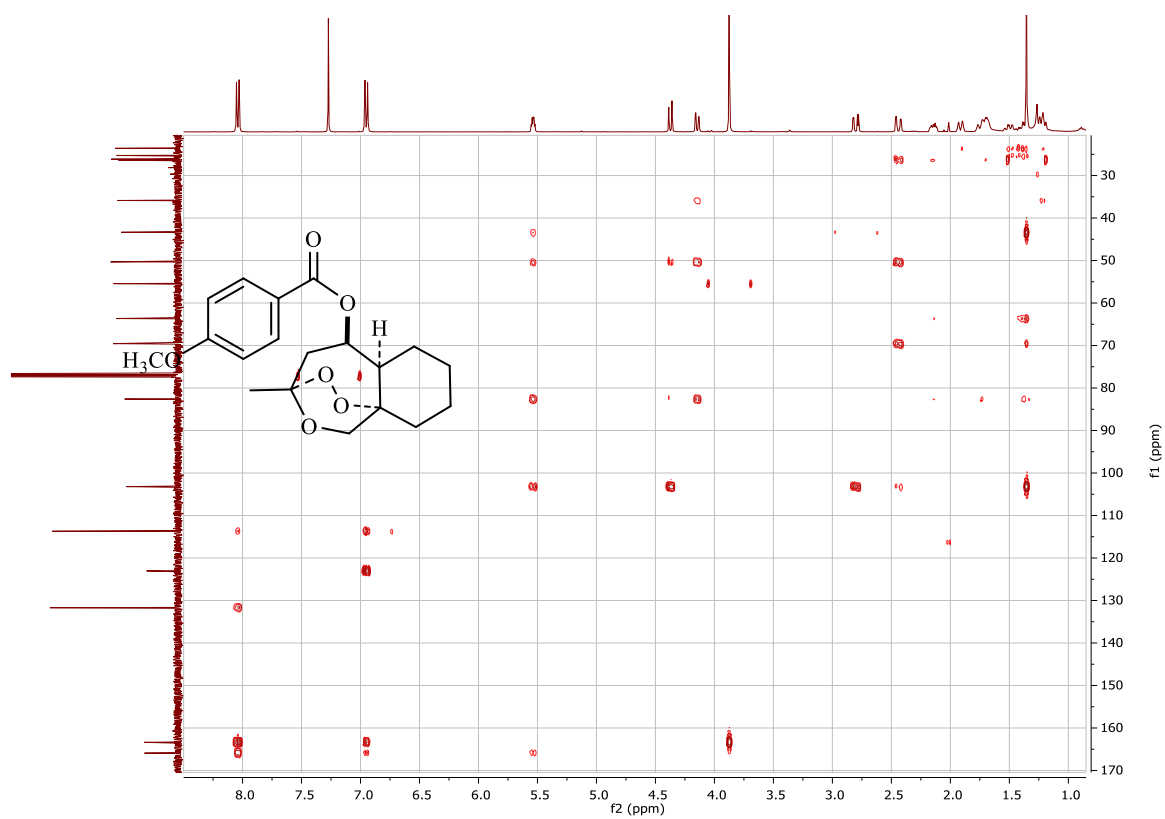


Figure S38. HMBC spectrum of the compound 12.

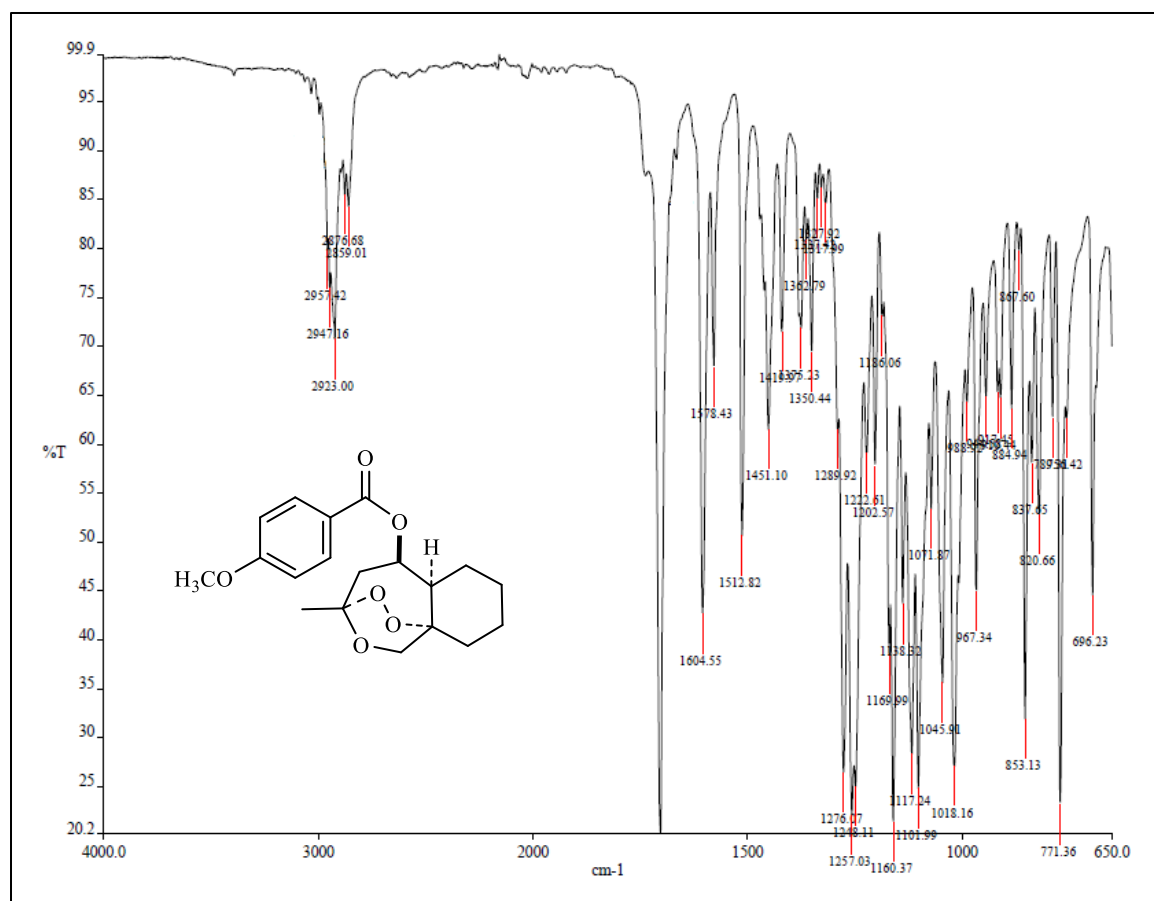


Figure S39. IR-spectrum of the compound **12**.

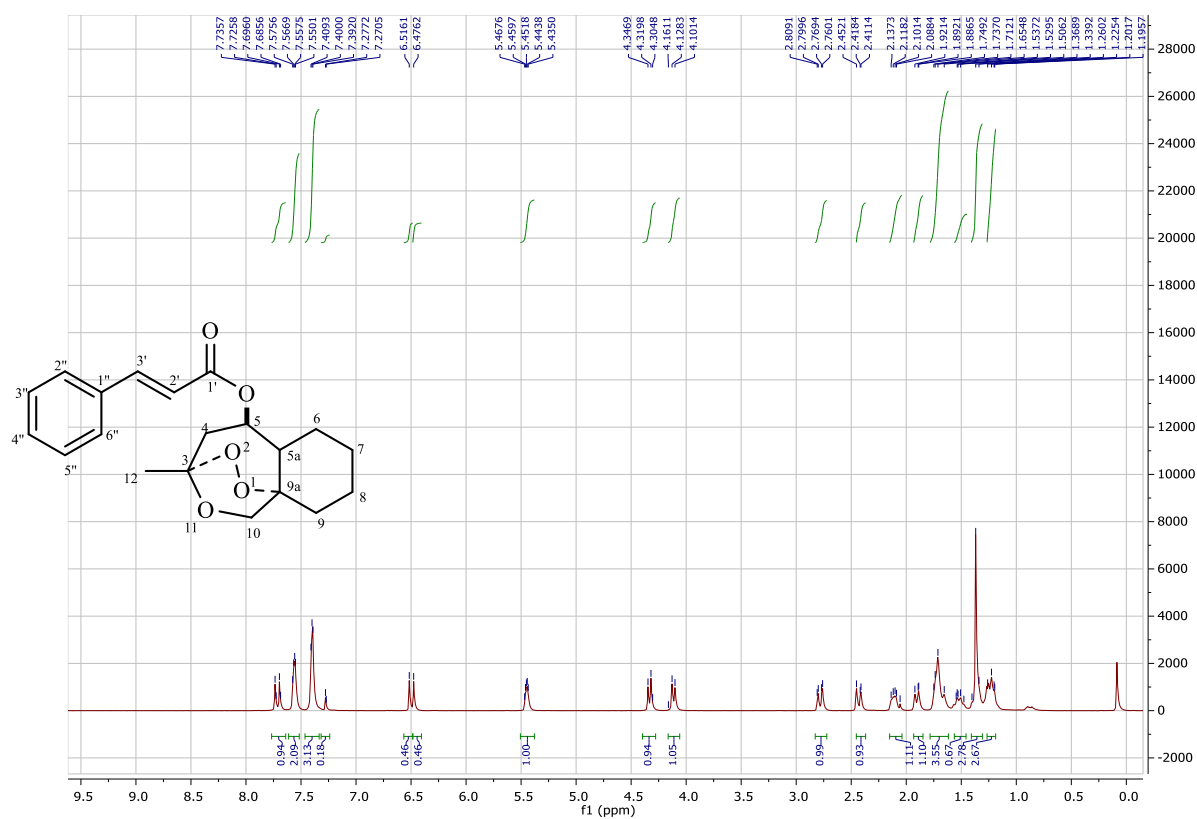


Figure S40.  $^1\text{H}$ -spectrum of the compound **13** ( $\text{CDCl}_3$ , 400 MHz).

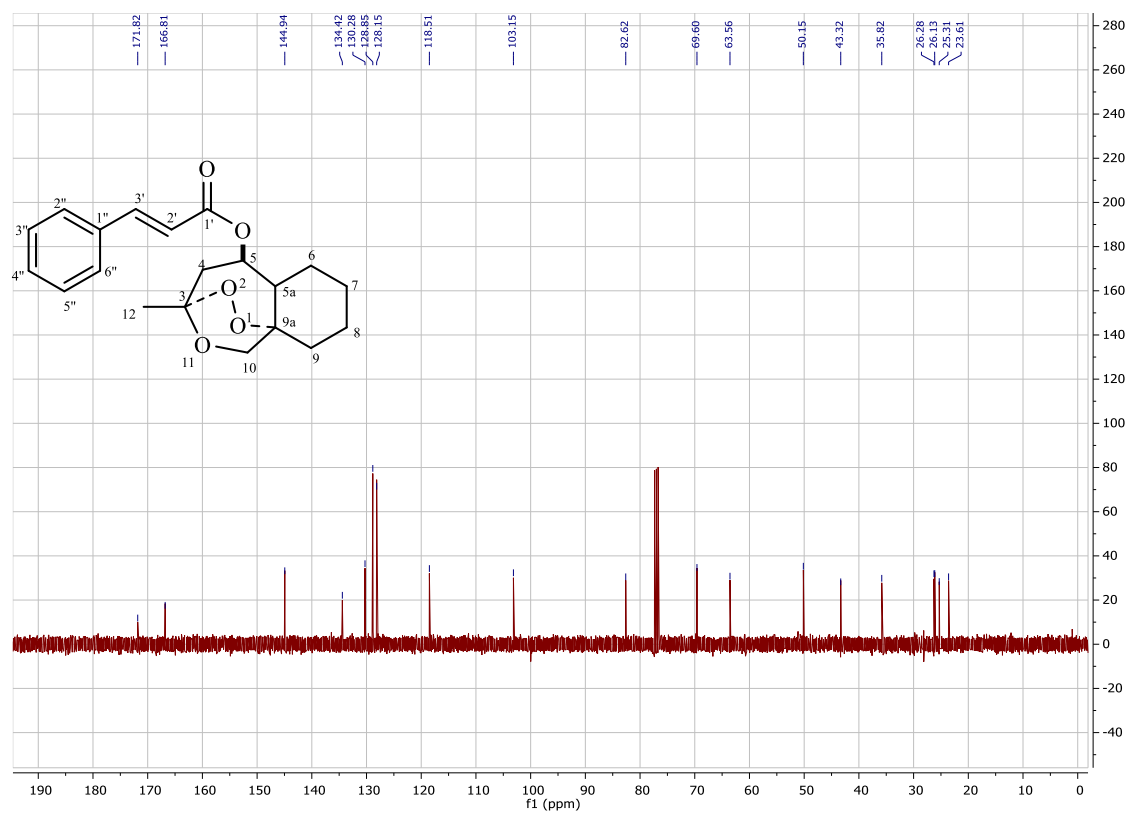


Figure S41.  $^{13}\text{C}$ -NMR spectrum of the compound **13** ( $\text{CDCl}_3$ , 100 MHz).

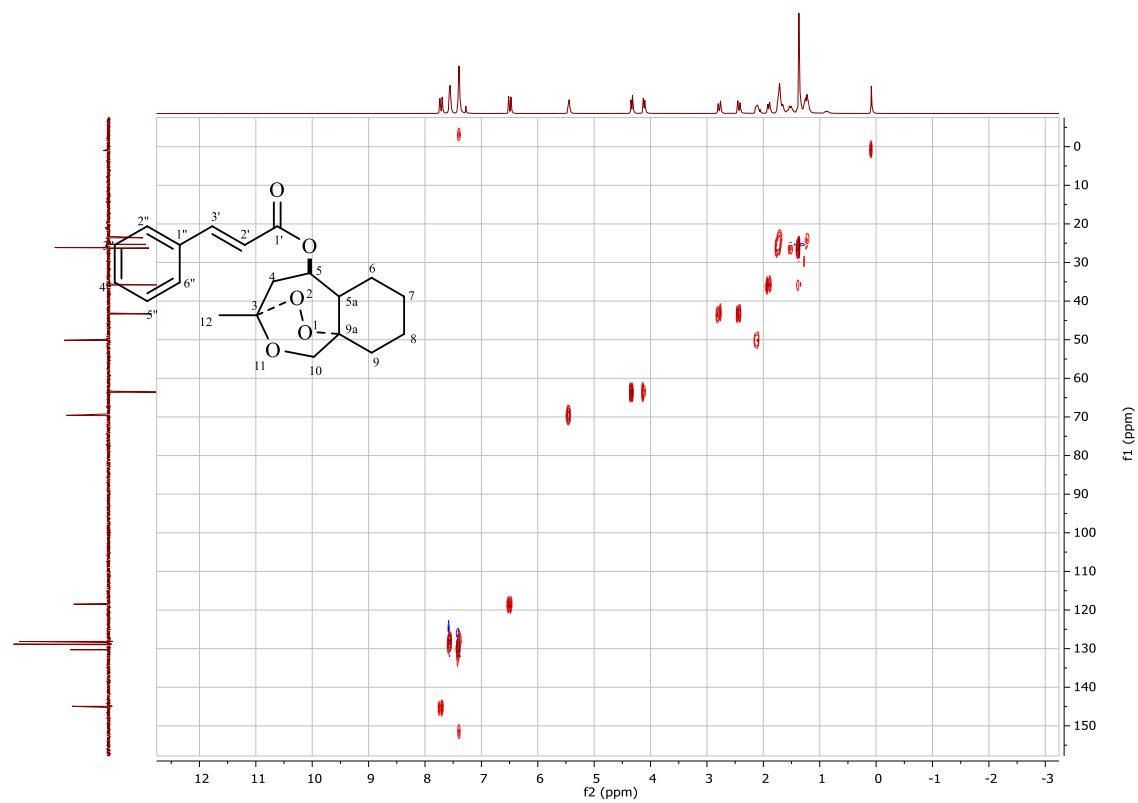


Figure S42. HSQC spectrum of the compound **13**.

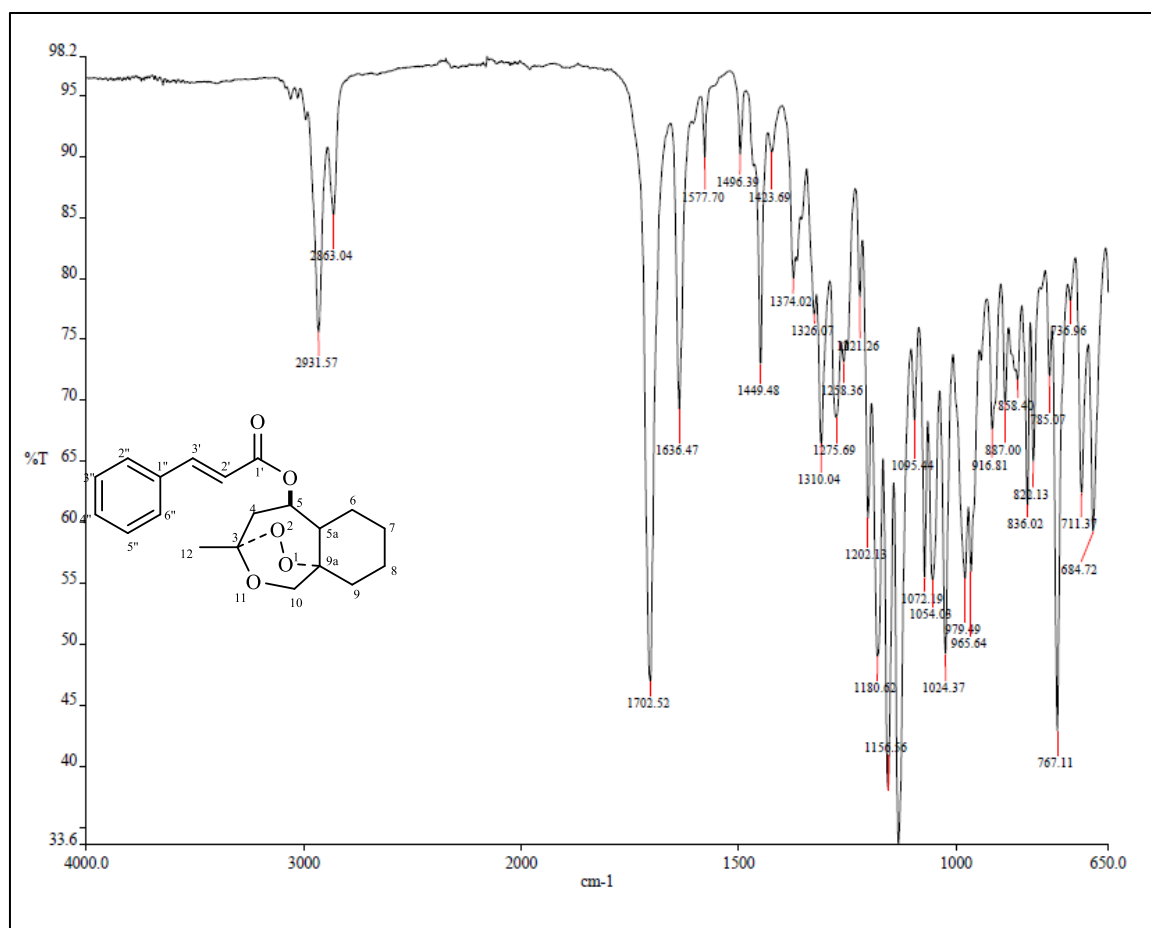


Figure S43. IR-spectrum of the compound 13.



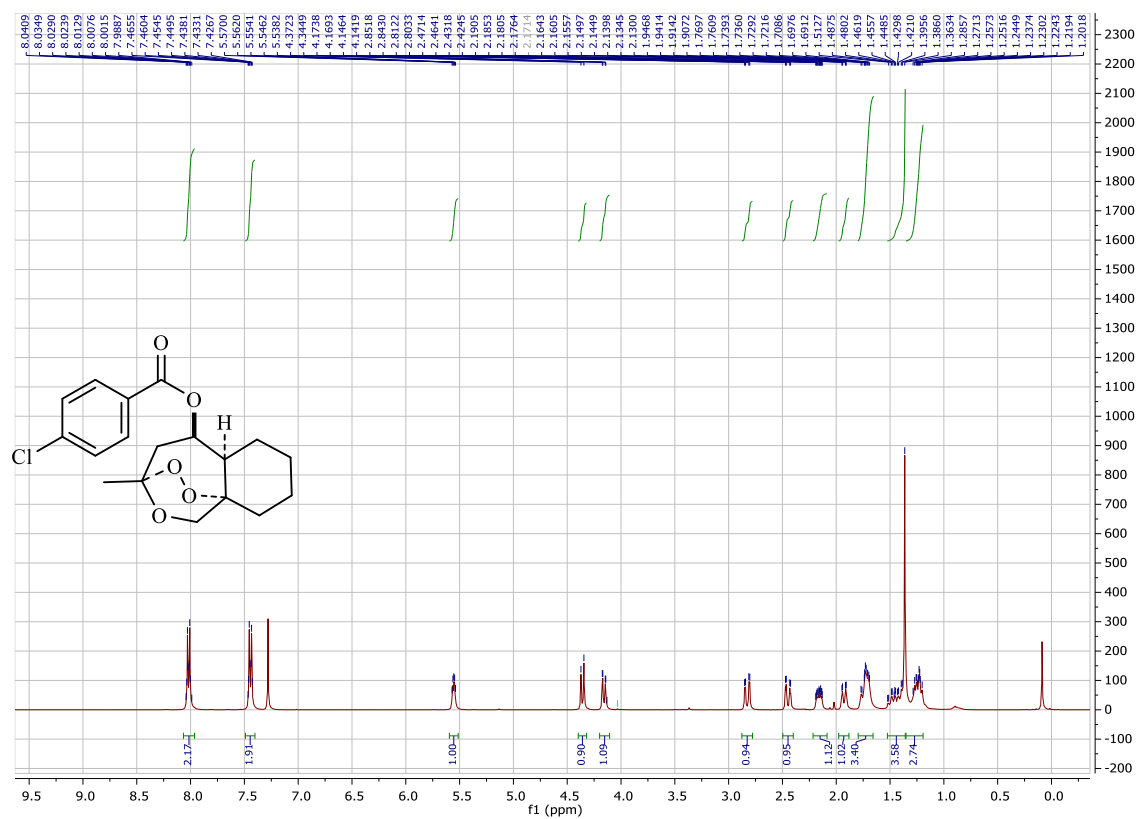


Figure S44. <sup>1</sup>H-spectrum of the compound **14** (CDCl<sub>3</sub>, 400 MHz).

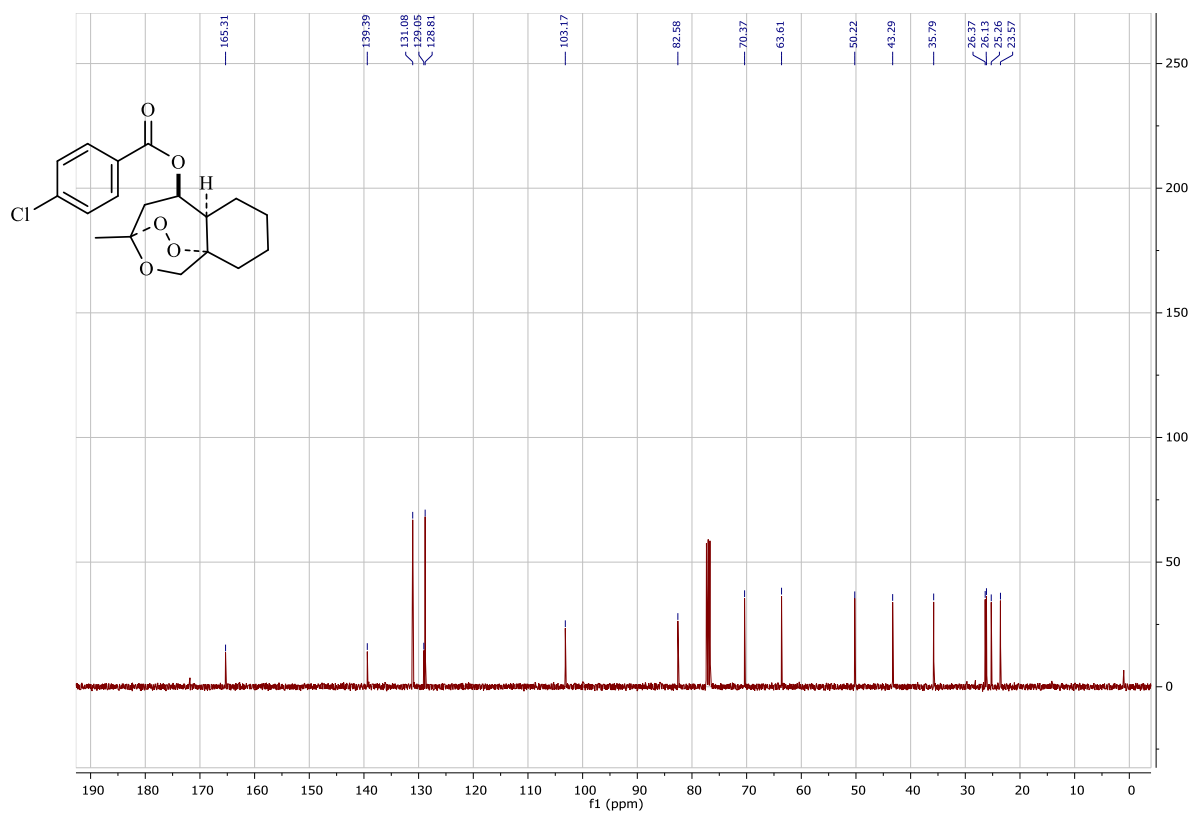


Figure S45.  $^{13}\text{C}$ -NMR spectrum of the compound **14** (CDCl<sub>3</sub>, 100 MHz).

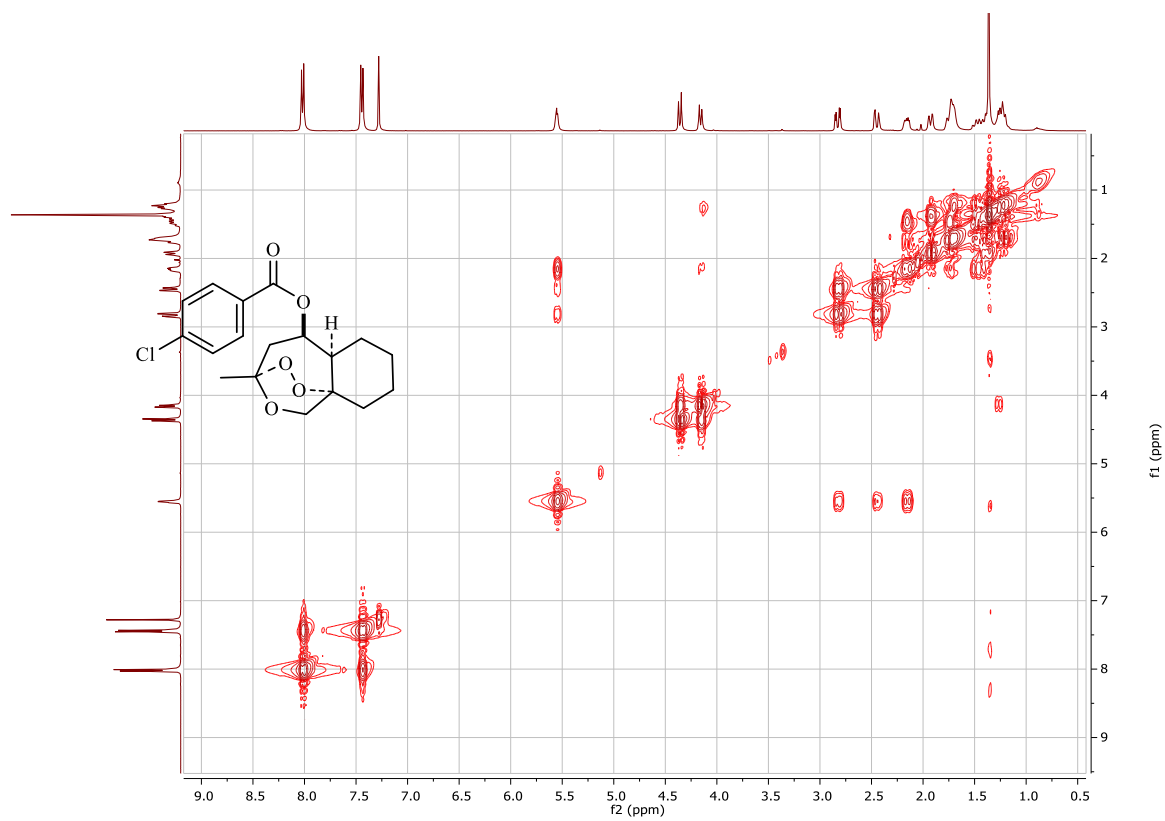
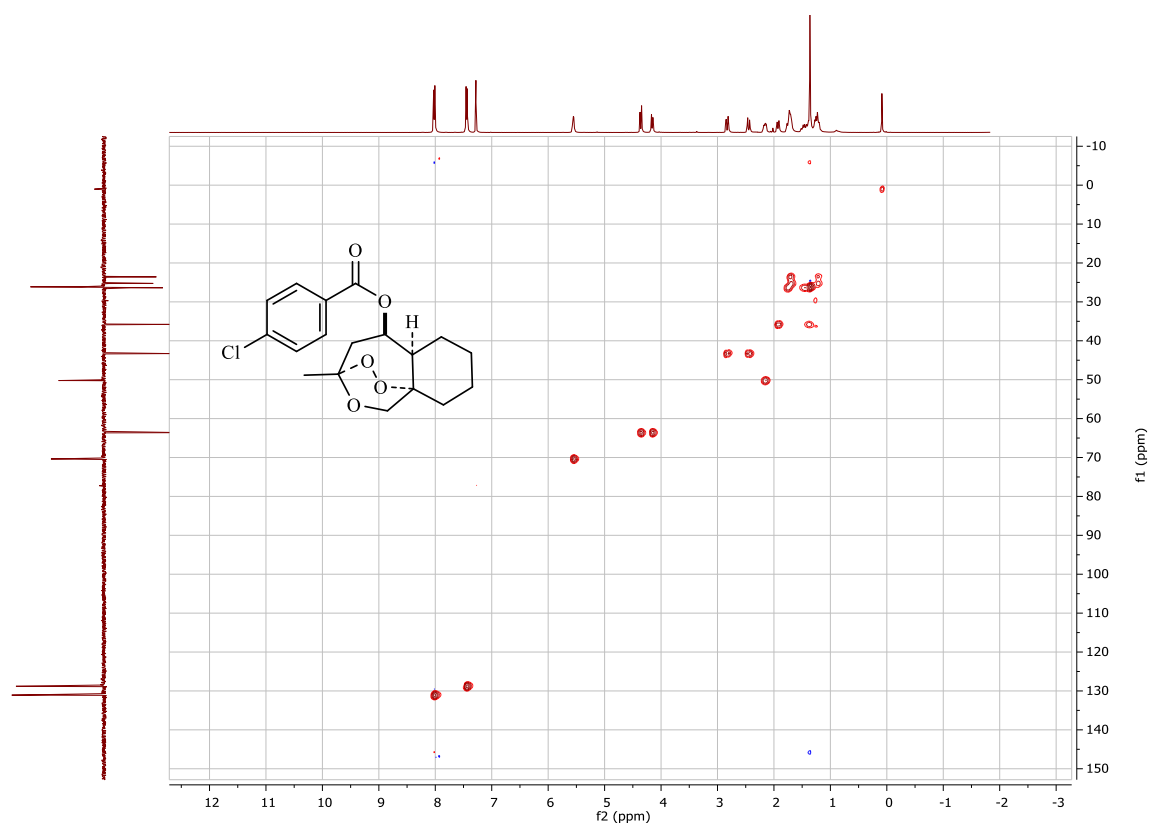
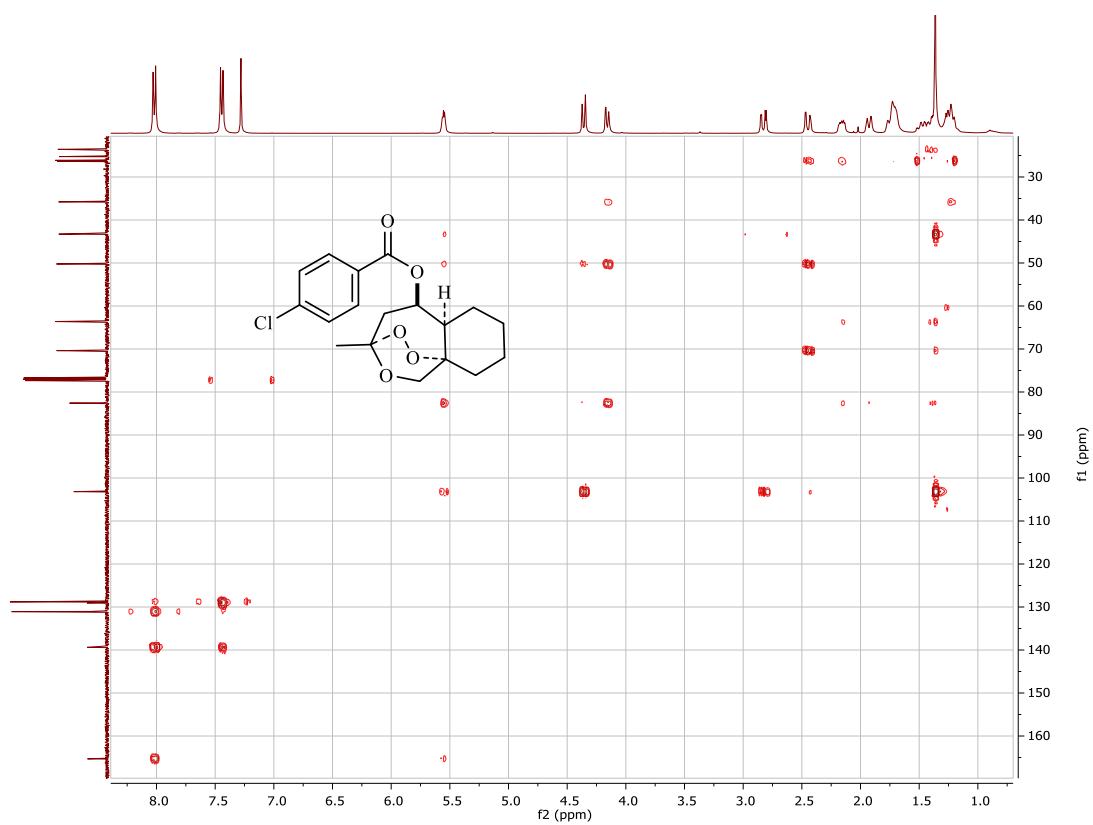


Figure S46. COSY spectrum of the compound **14**.



S47. HSQC spectrum of the compound **14**.

Figure



HMBC spectrum of the compound 14.

Figure S48.

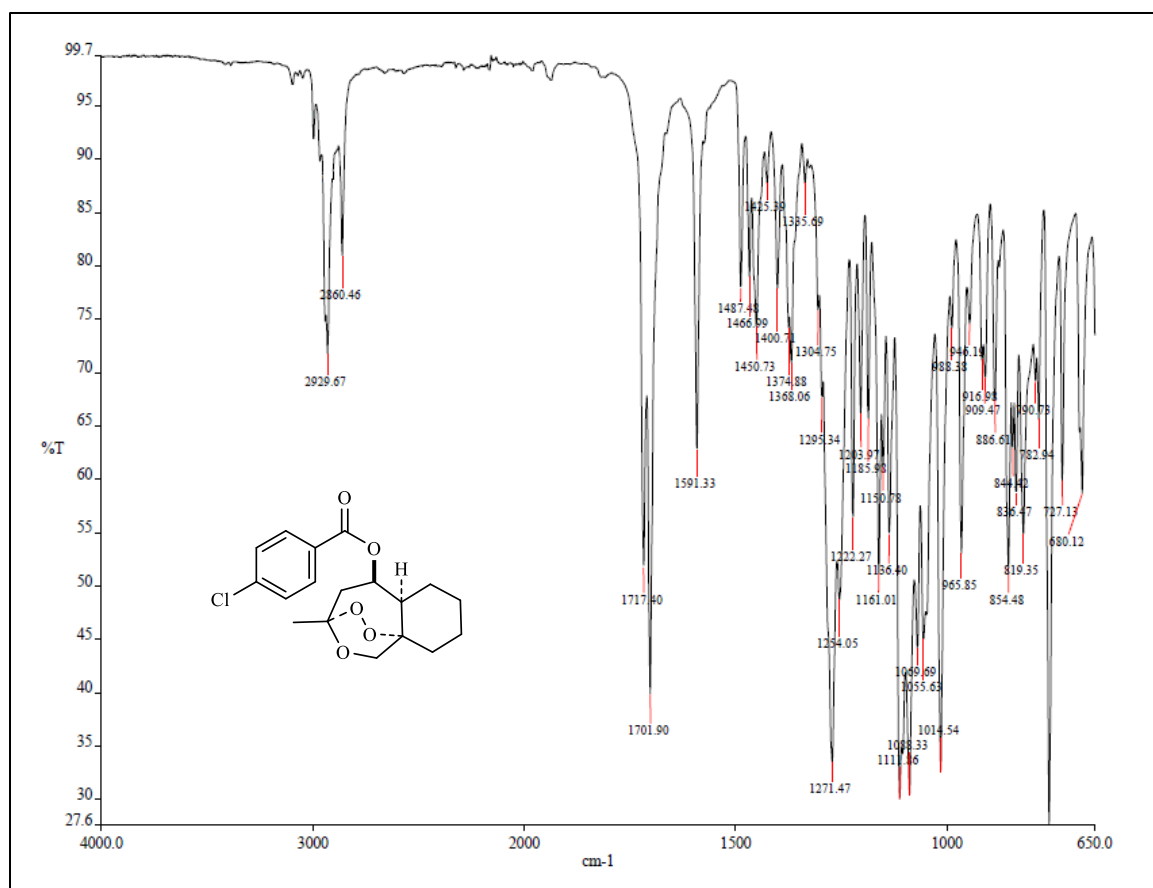


Figure S49. IR-spectrum of the compound **14**.

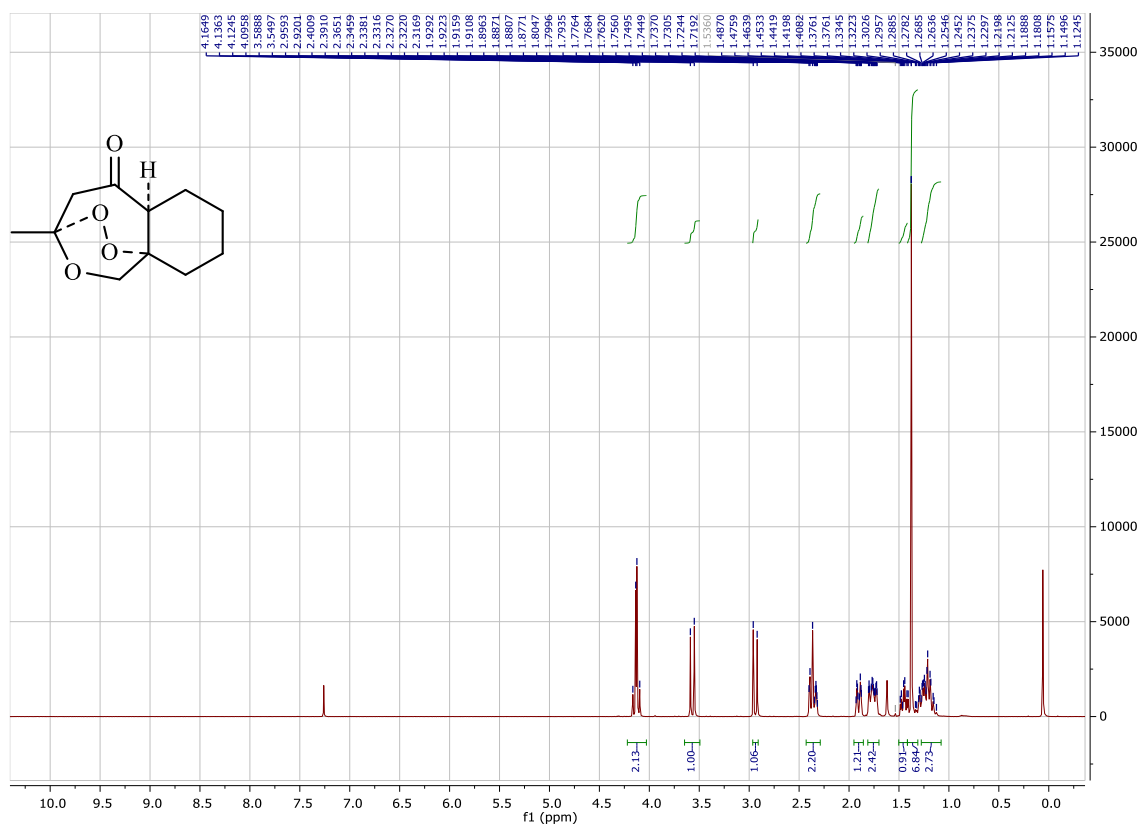


Figure S50. <sup>1</sup>H-spectrum of the compound **15** (CDCl<sub>3</sub>, 400 MHz).

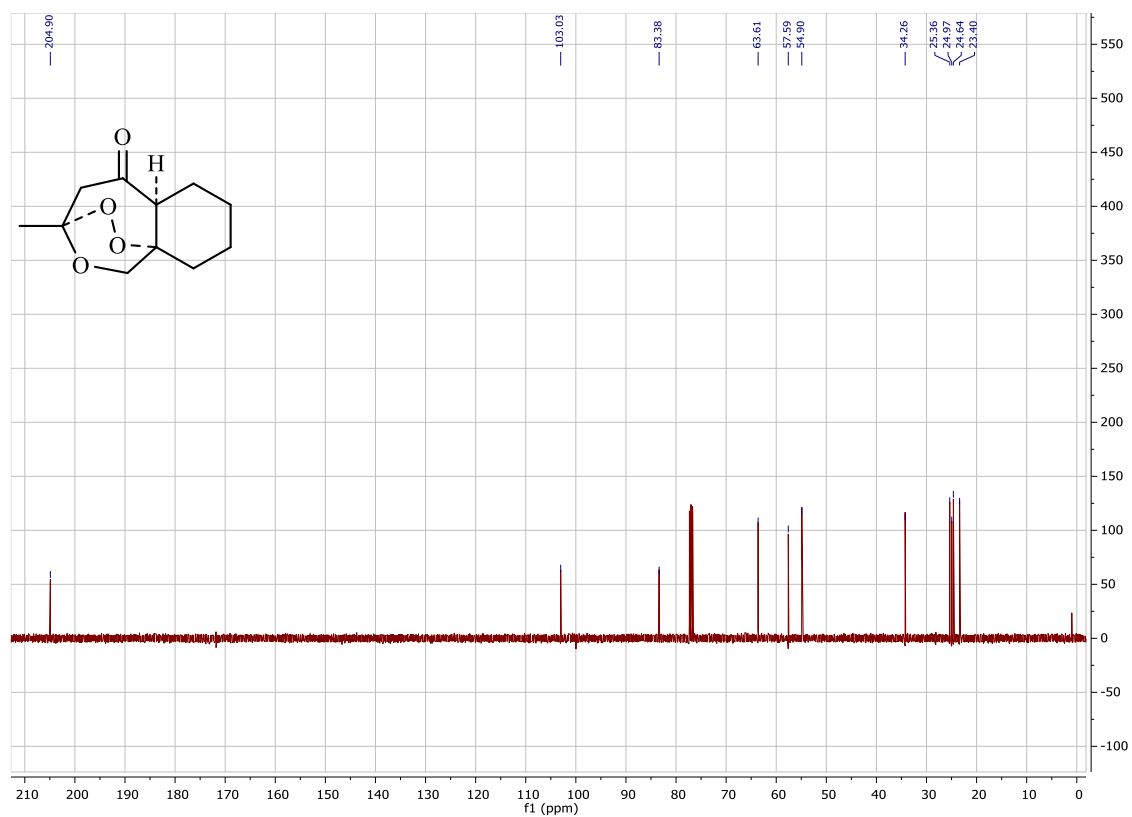


Figure S51.  $^{13}\text{C}$ -NMR spectrum of the compound **15** ( $\text{CDCl}_3$ , 100 MHz).



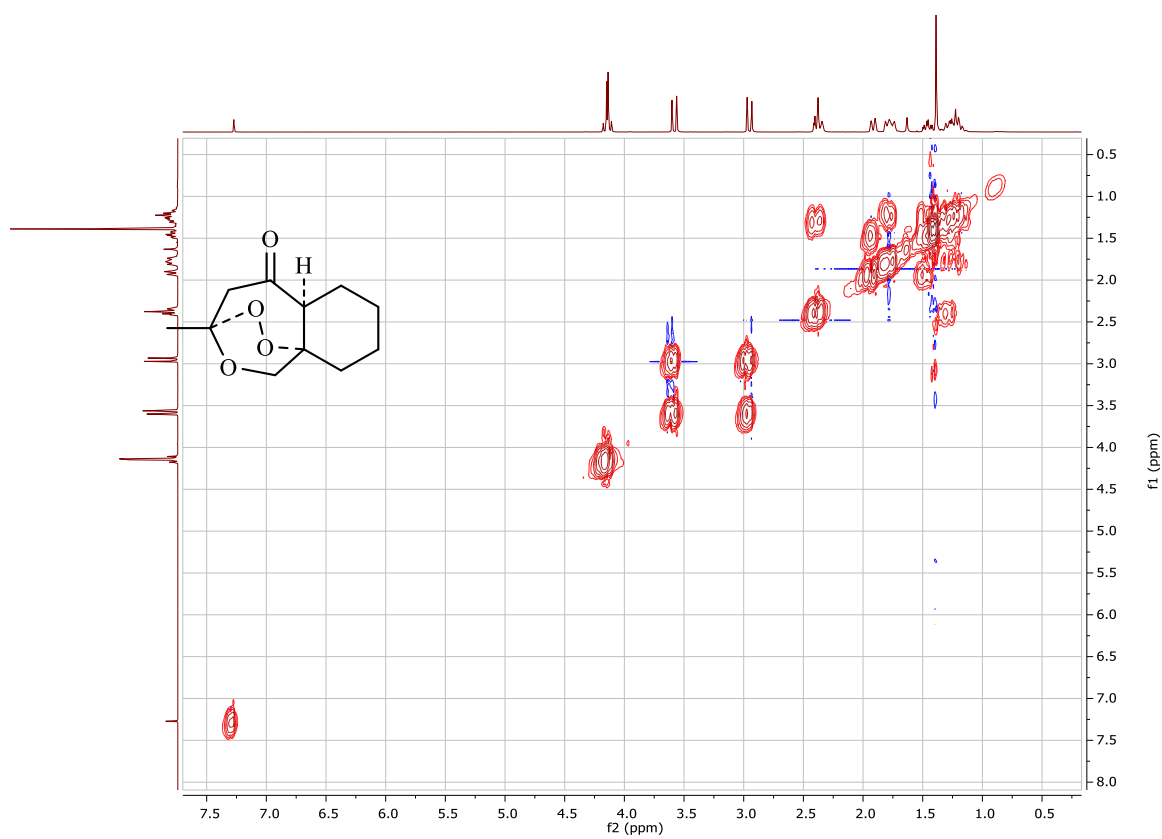


Figure S52. COSY spectrum of the compound **15**.

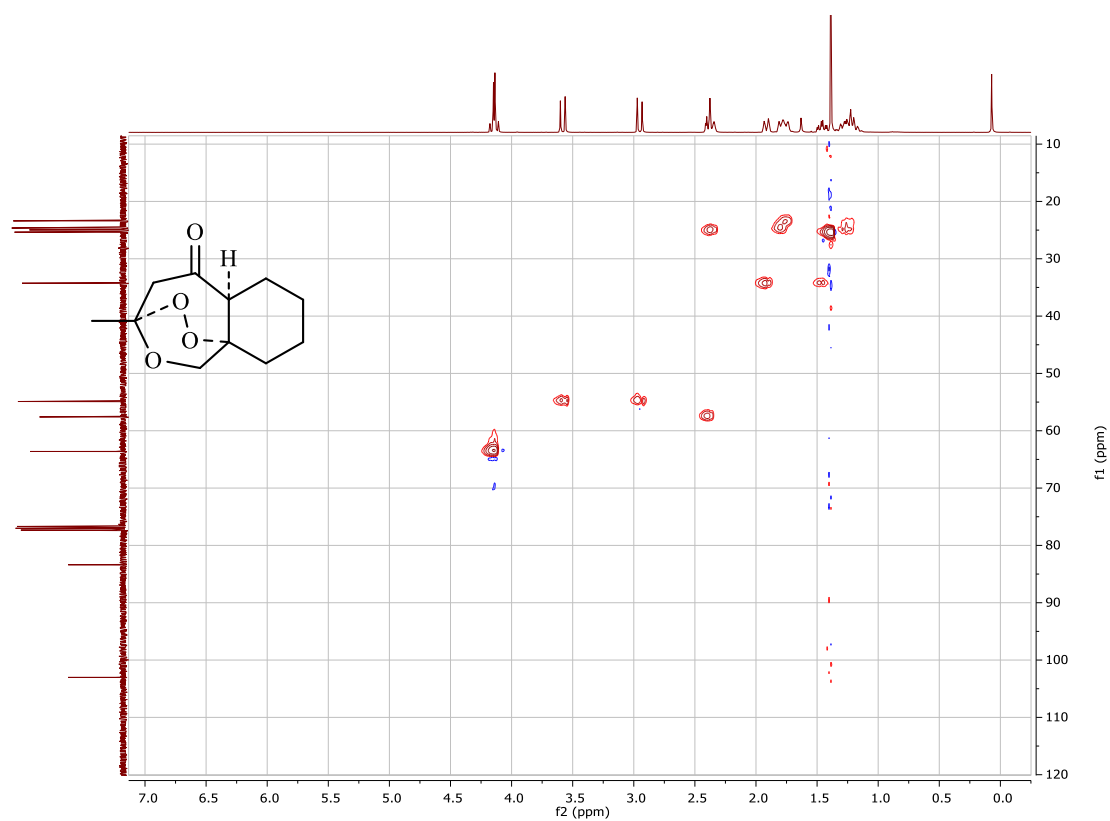


Figure S53. HSQC spectrum of the compound **15**.

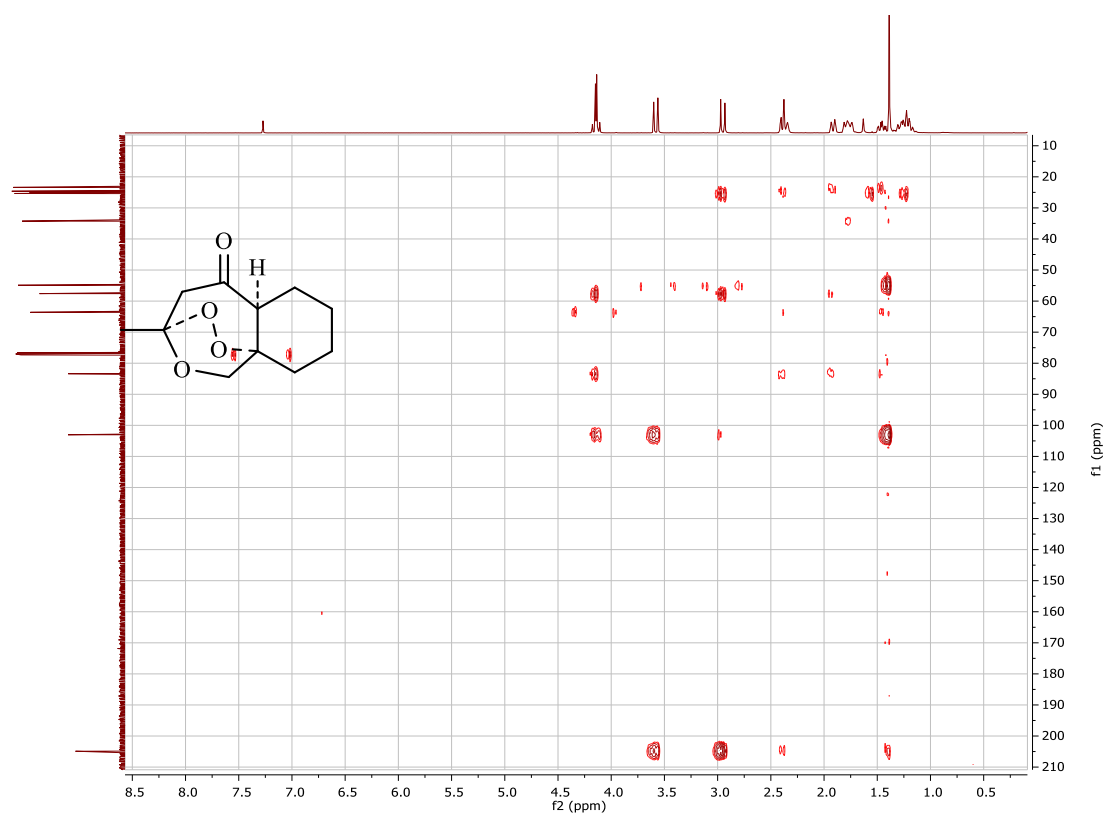
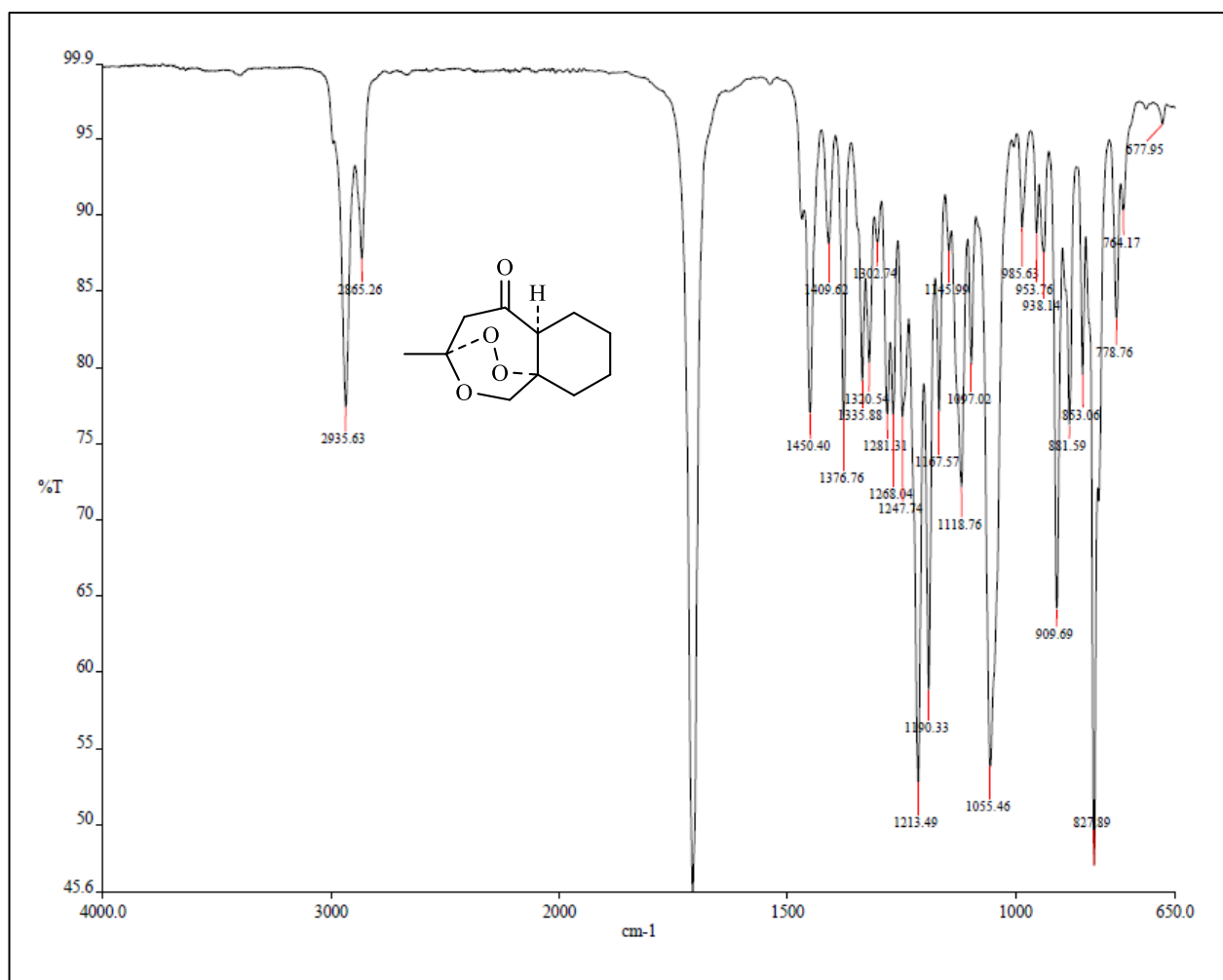


Figure S54. HMBC spectrum of the compound **15**.



IR-spectrum of the compound 15.

Figure S55.

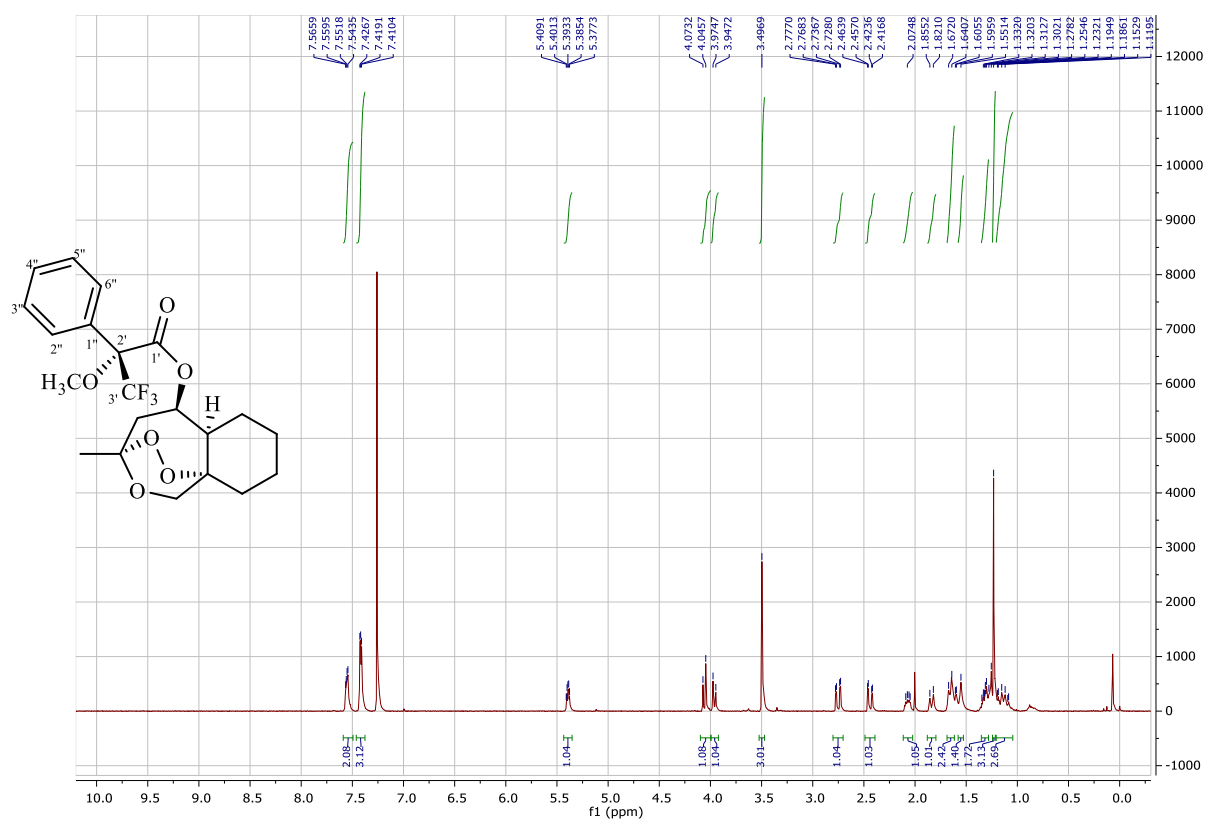


Figure S56. <sup>1</sup>H-spectrum of the compound **19a** (CDCl<sub>3</sub>, 400 MHz).

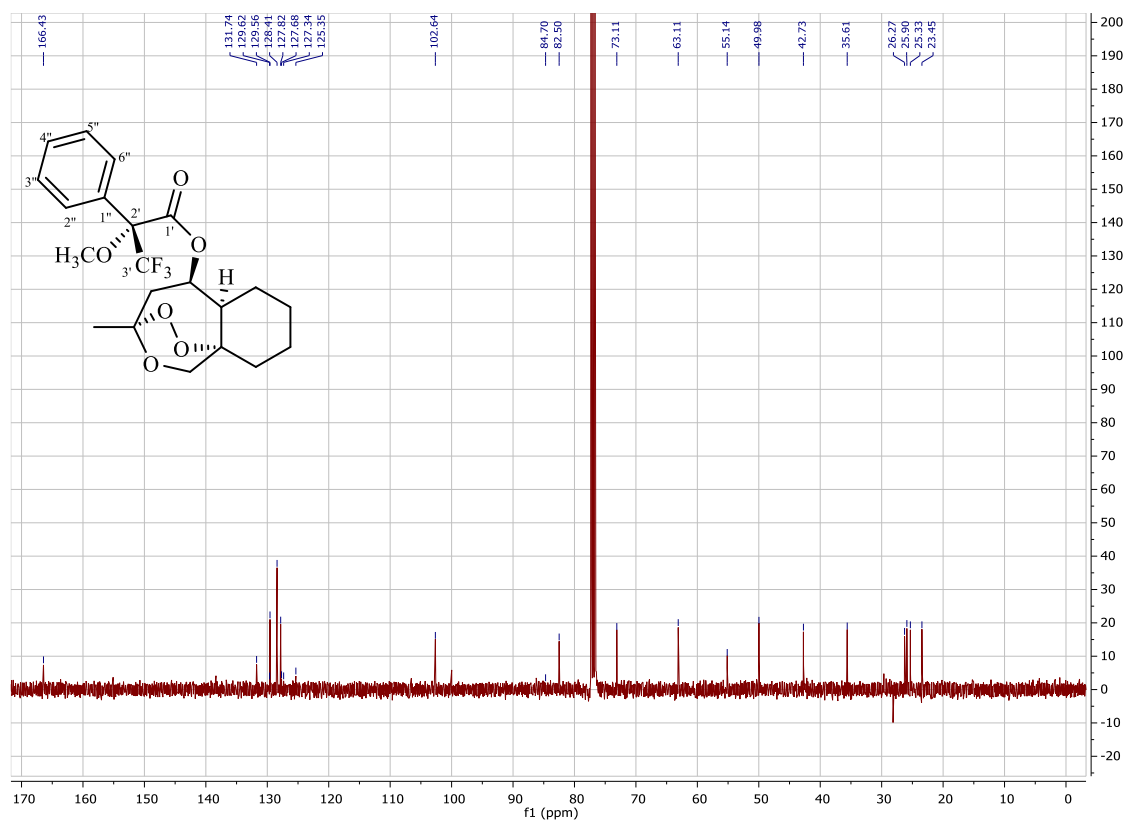


Figure S57.  $^{13}\text{C}$ -NMR spectrum of the compound **19a** (CDCl<sub>3</sub>, 100 MHz).

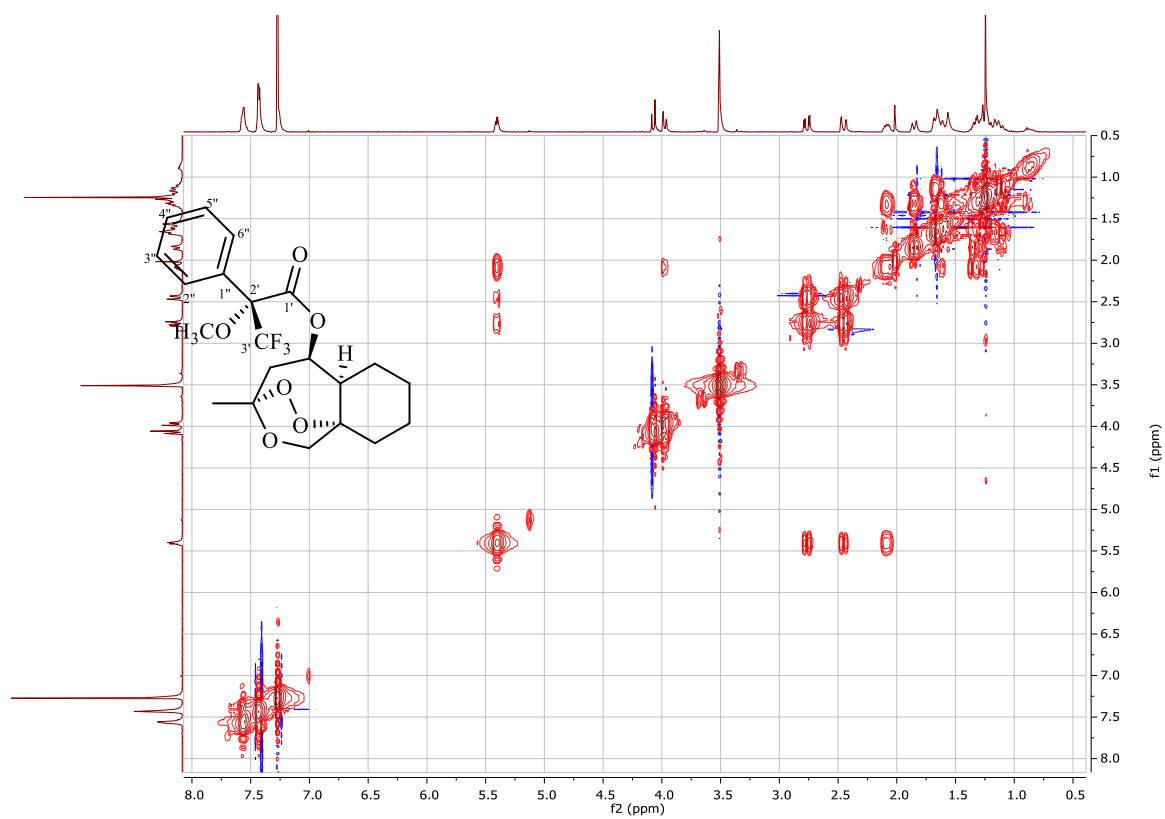


Figure S58. COSY spectrum of the compound **19a**.

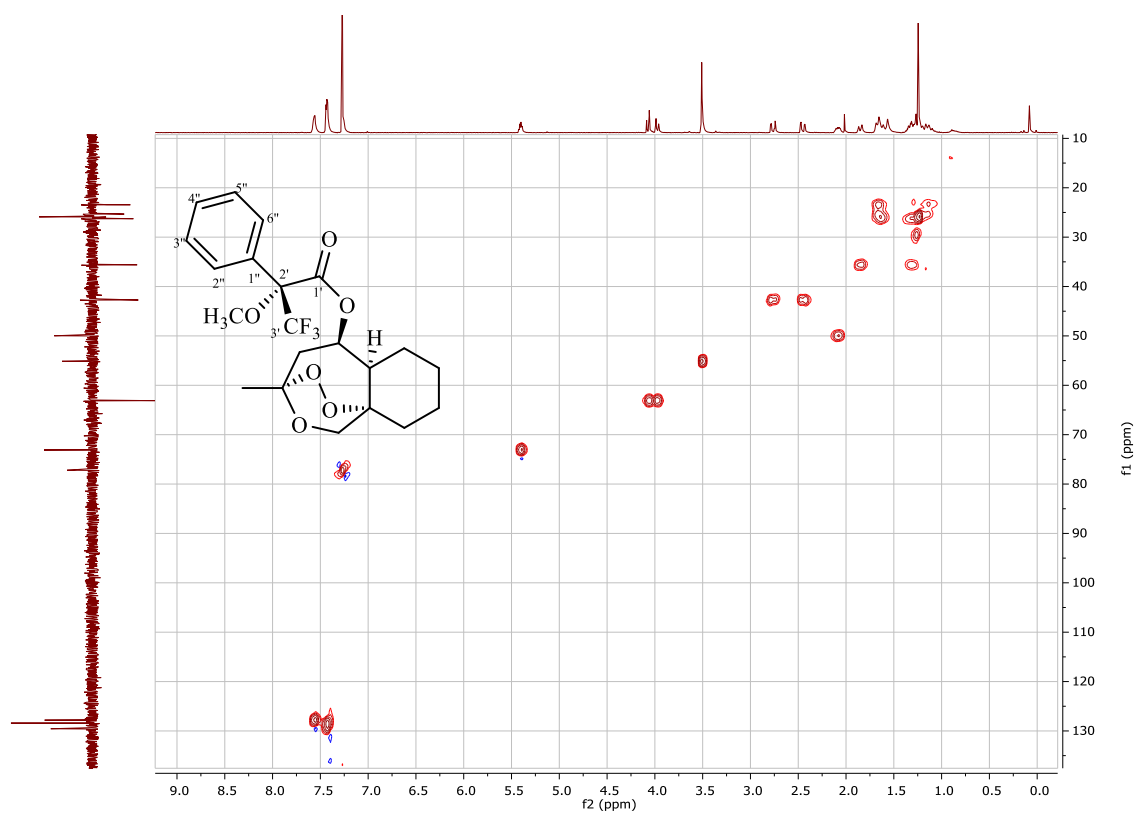


Figure S59. HSQC spectrum of the compound **19a**.



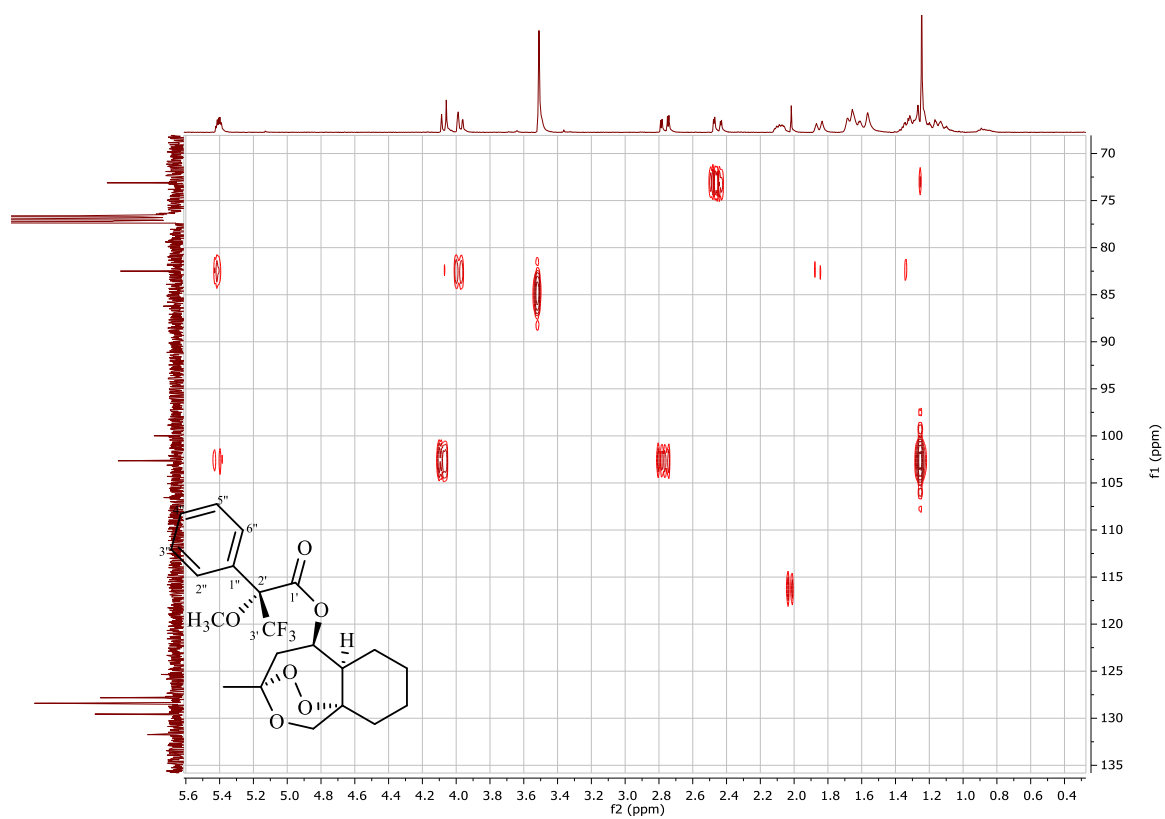
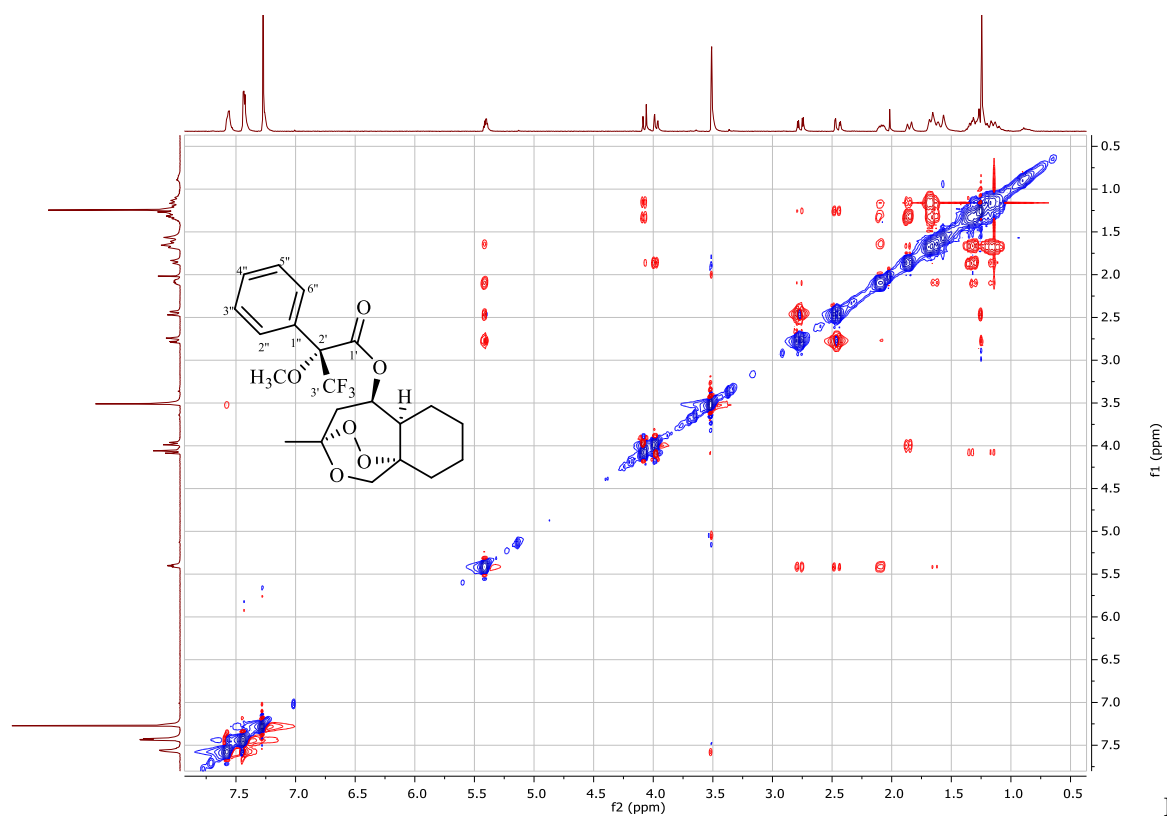


Figure S60. HMBC spectrum of the compound **19a**.



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

Figure S61. NO-

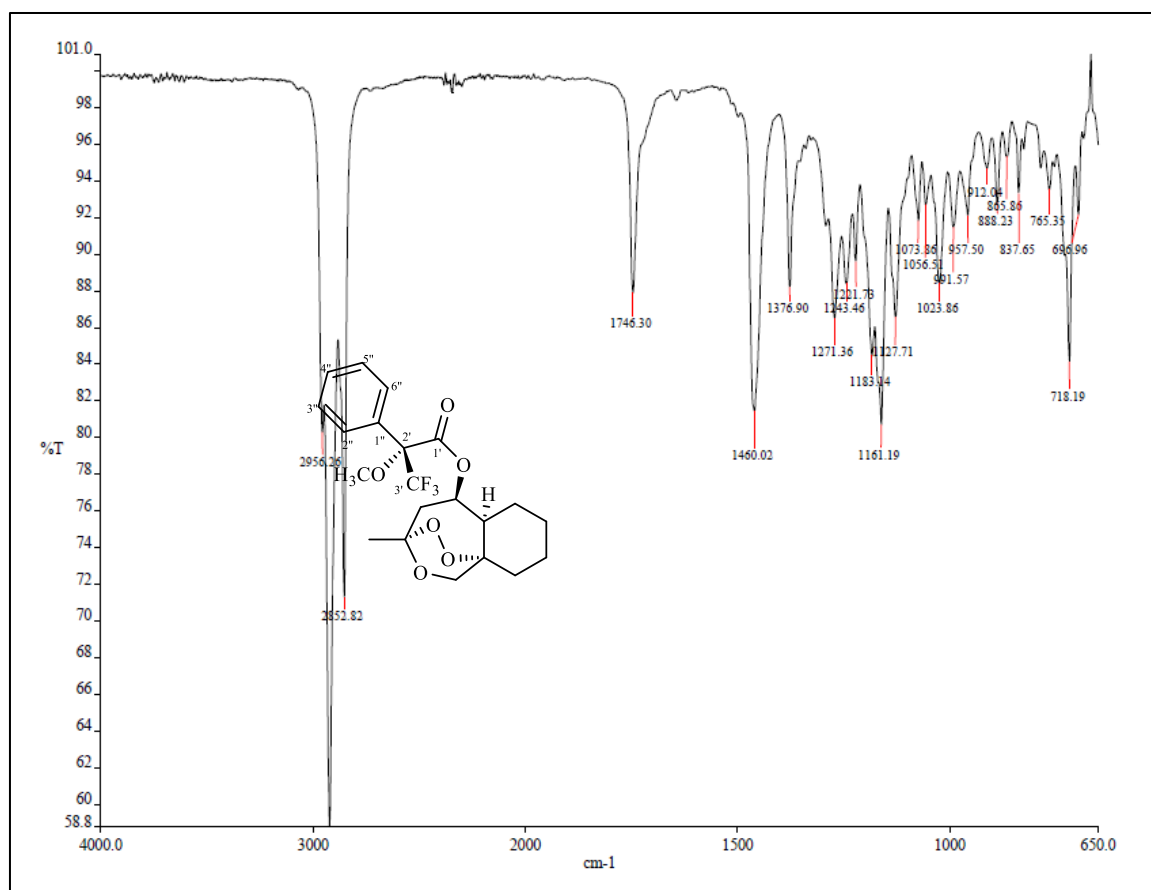


Figure S62. IR-spectrum of the compound **19a**.

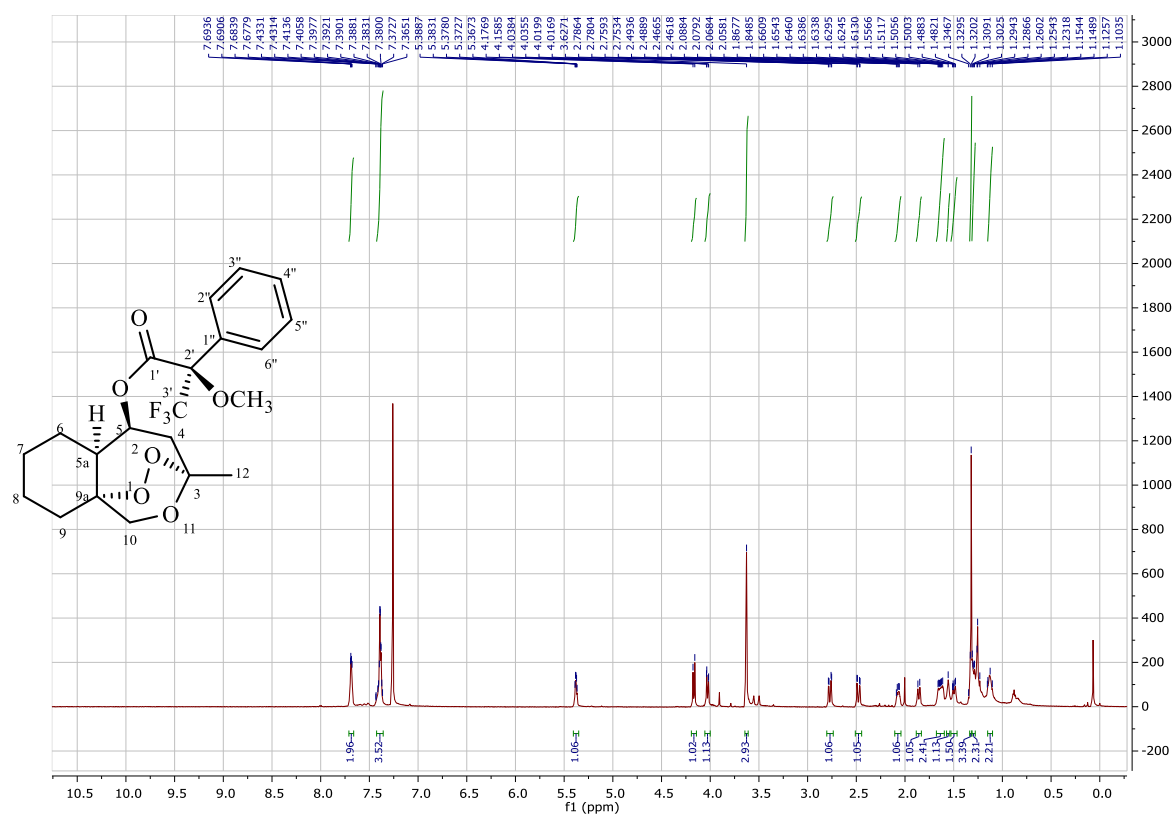


Figure S63.  $^1\text{H}$ -spectrum of the compound **19b** (CDCl<sub>3</sub>, 400 MHz).

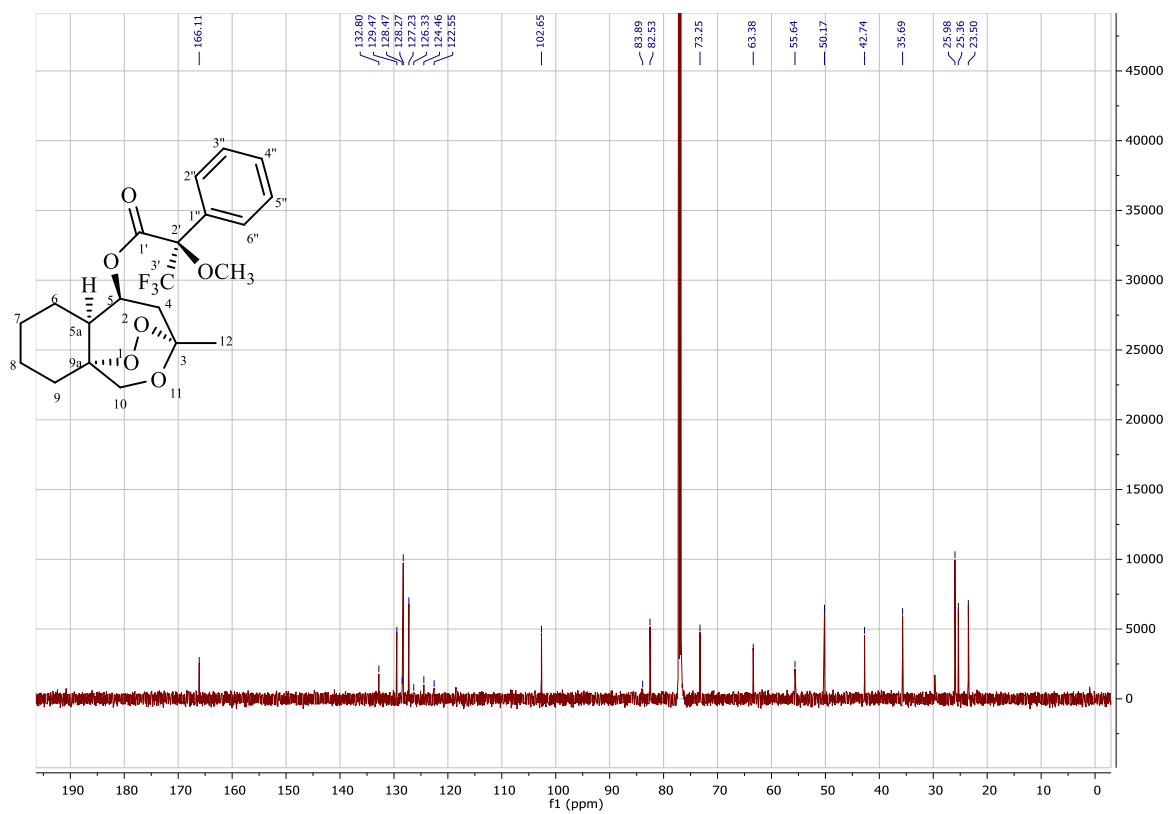


Figure S64. <sup>13</sup>C-NMR spectrum of the compound **19b** (CDCl<sub>3</sub>, 100 MHz).

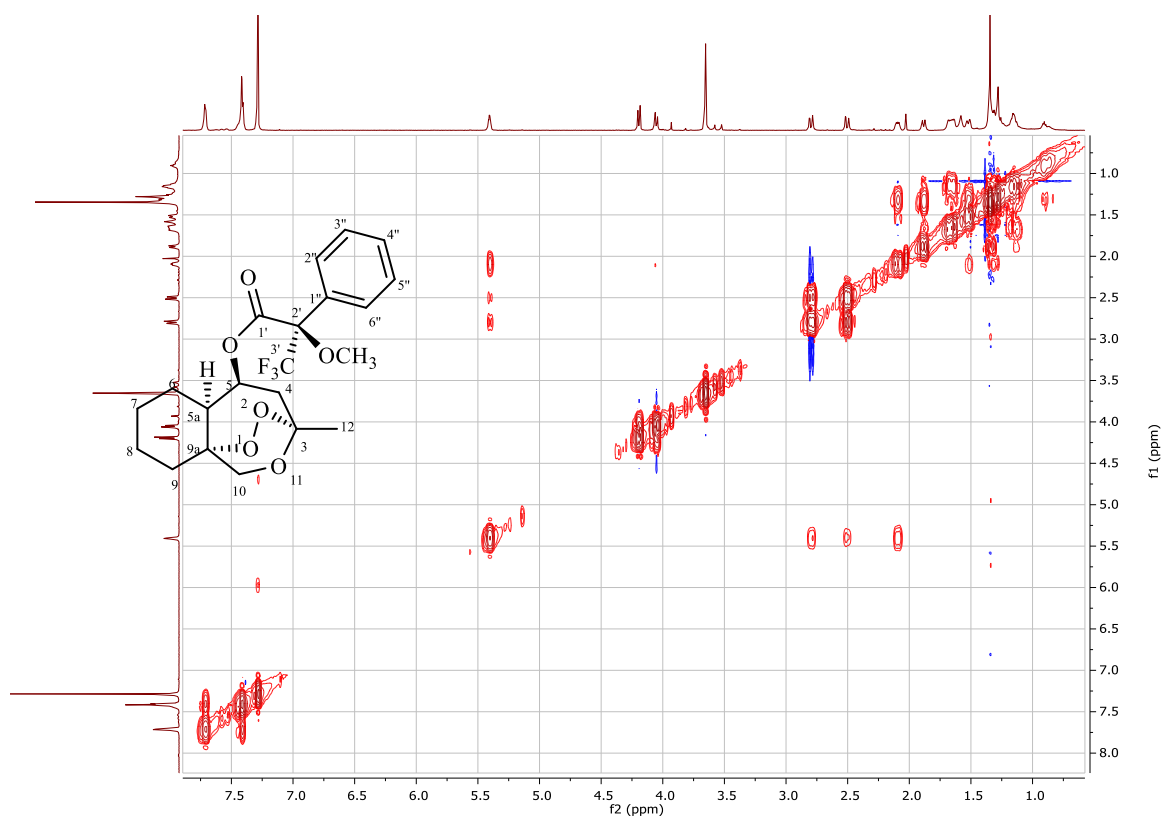


Figure S65. COSY spectrum of the compound **19b**.

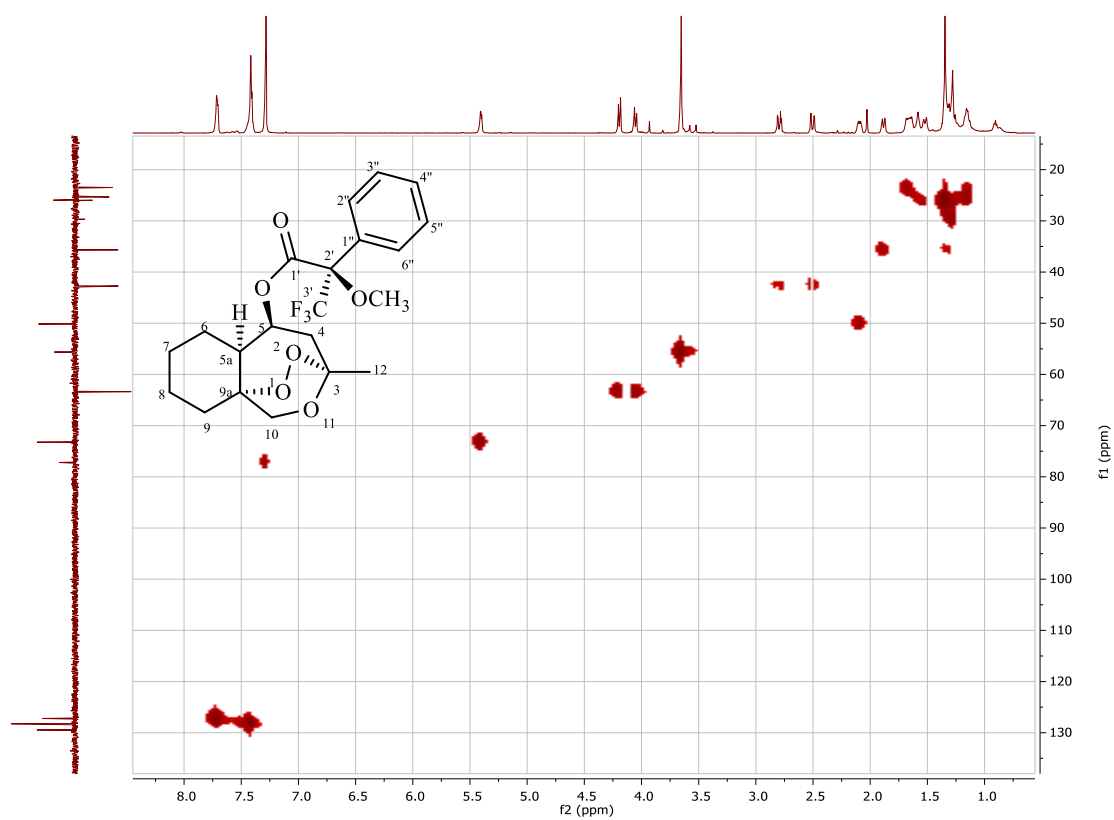


Figure S66. HSQC spectrum of the compound **19b**.

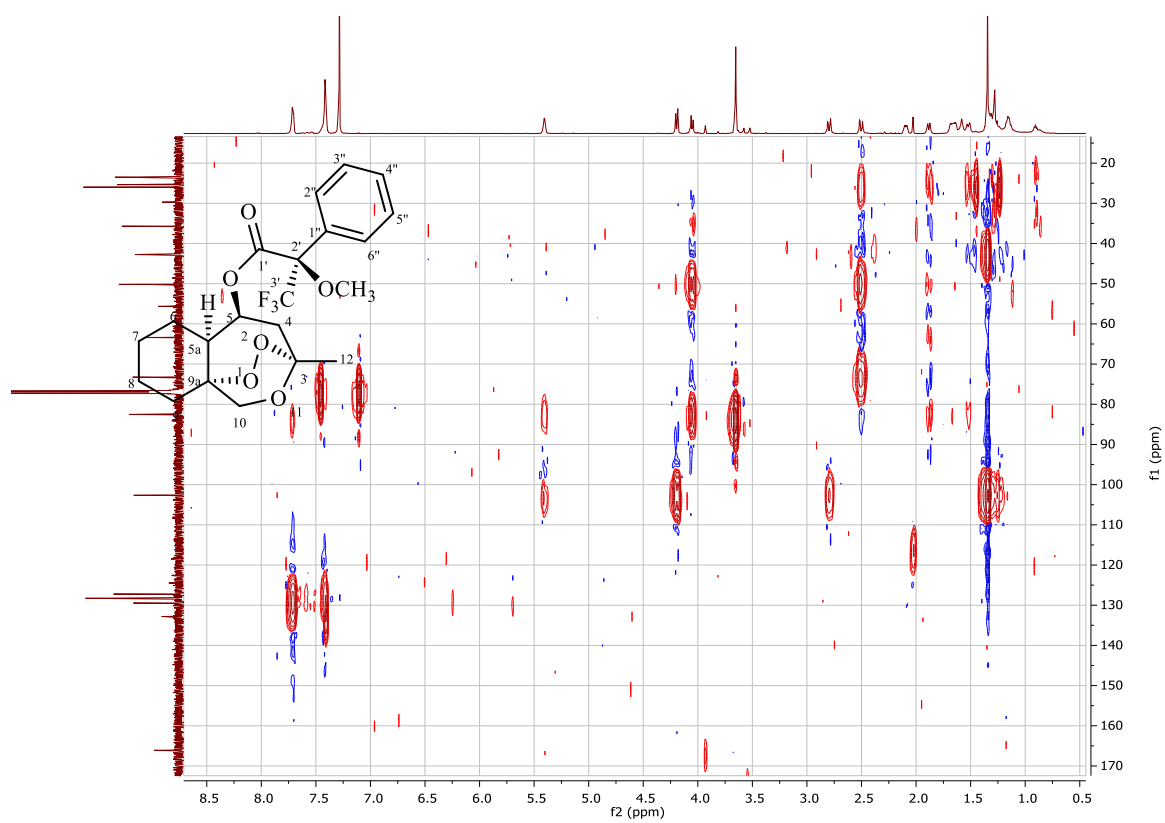


Figure S67. HMBC spectrum of the compound **19b**.

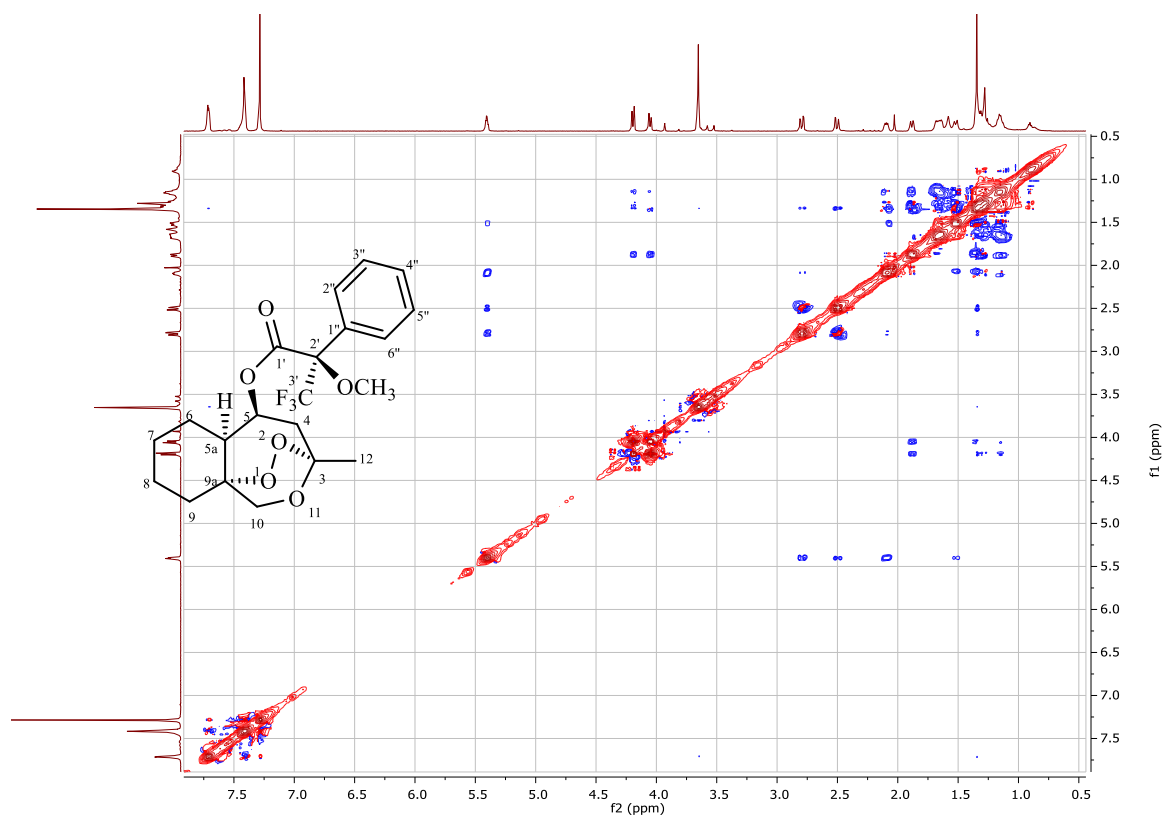


Figure S68. NOESY spectrum of the compound **19b**.



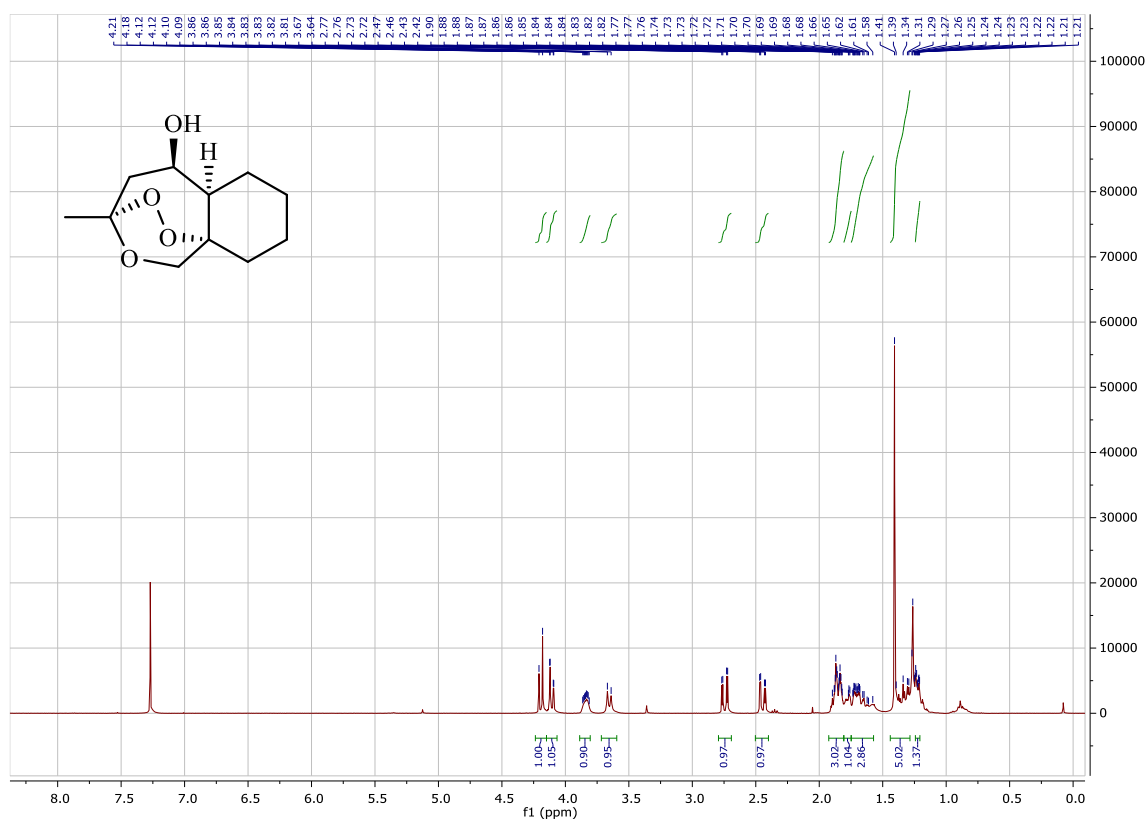


Figure S69. <sup>1</sup>H-spectrum of the compound 2a (CDCl<sub>3</sub>, 400 MHz).

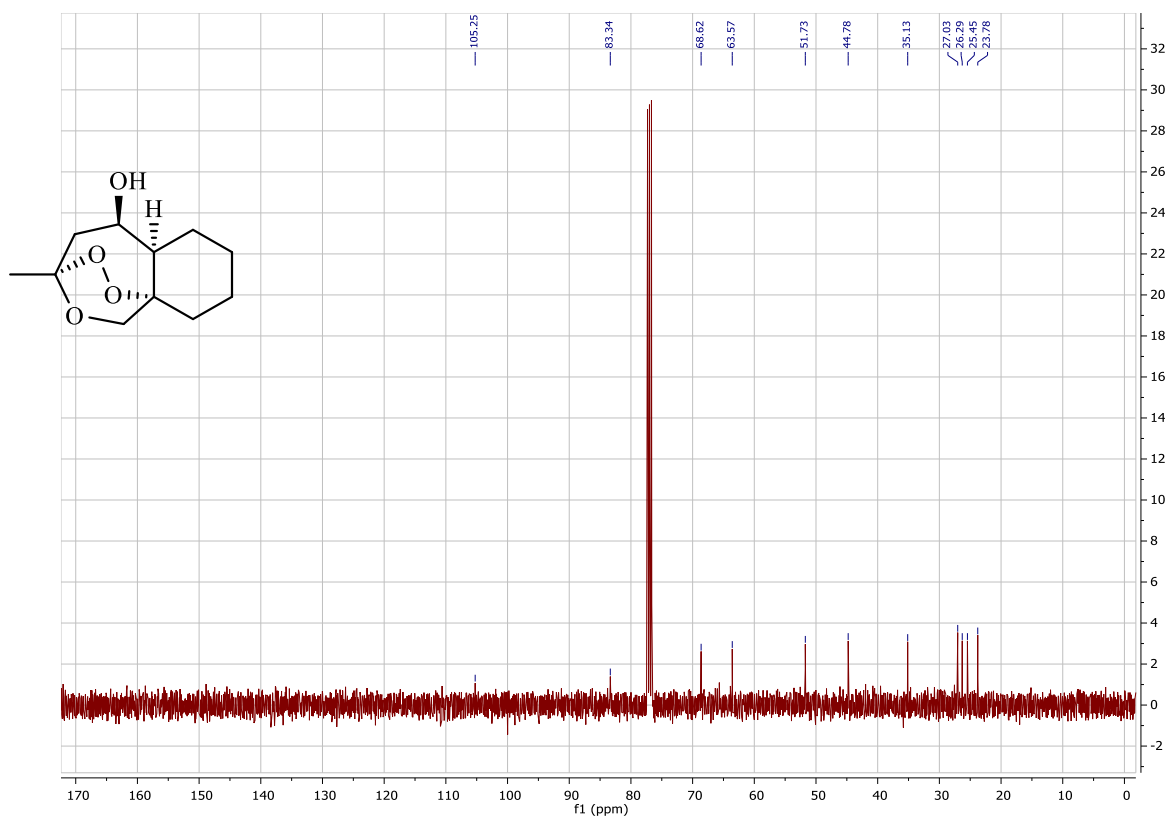


Figure S70.  $^{13}\text{C}$ -NMR spectrum of the compound **2a** (CDCl<sub>3</sub>, 100 MHz).

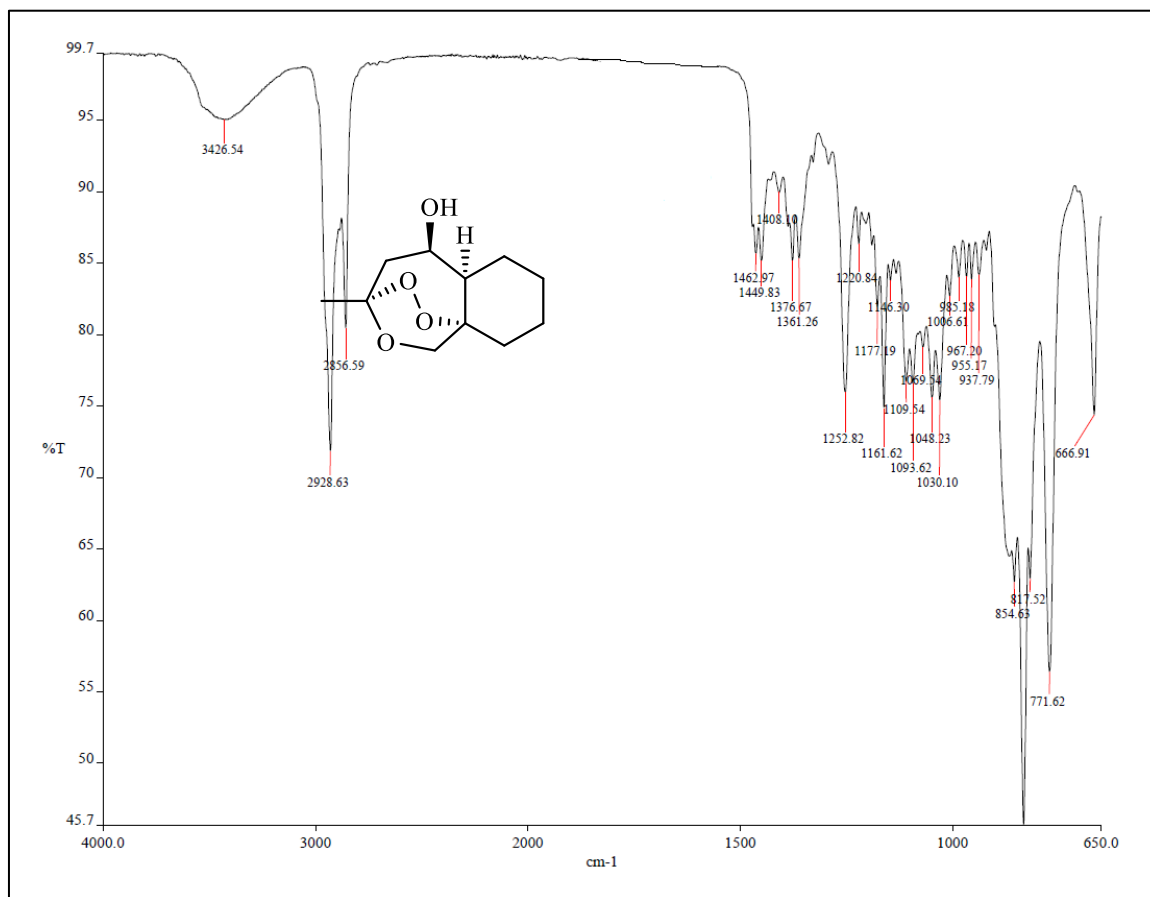


Figure S71. IR-spectrum of the compound **2a**.

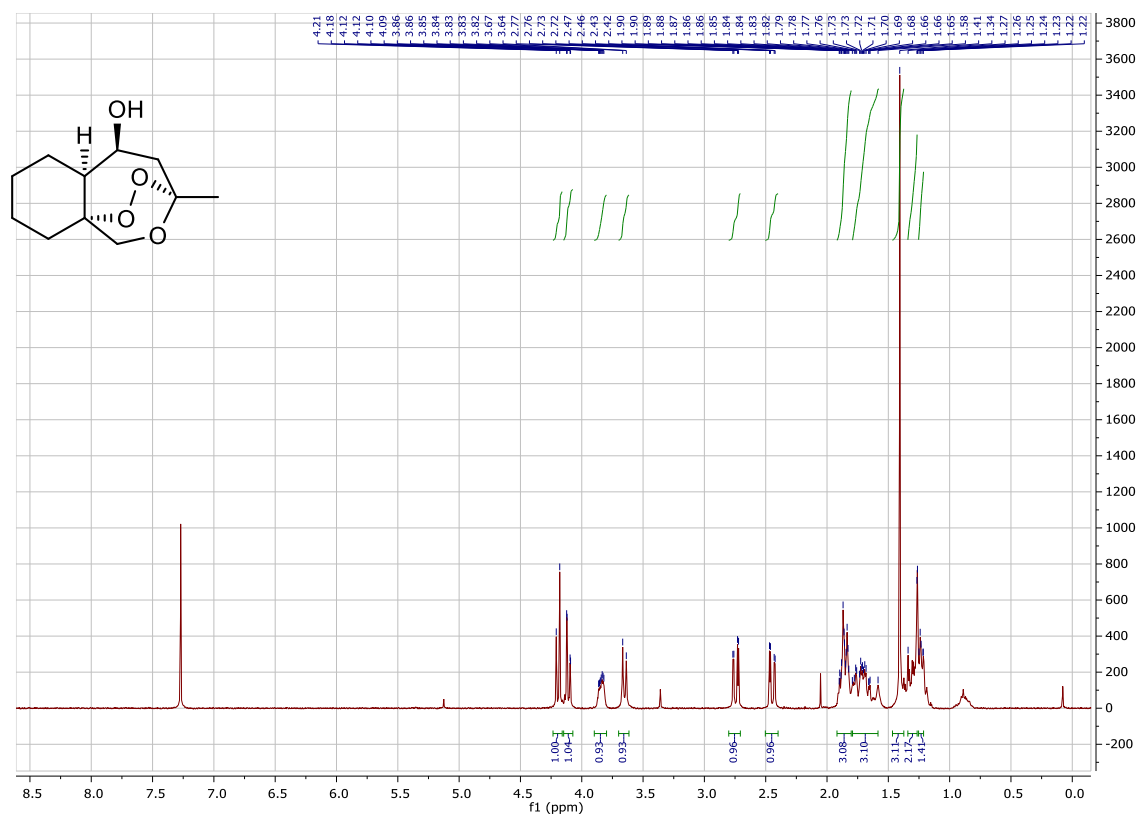


Figure S72. <sup>1</sup>H-spectrum of the compound **2b** (CDCl<sub>3</sub>, 400 MHz).

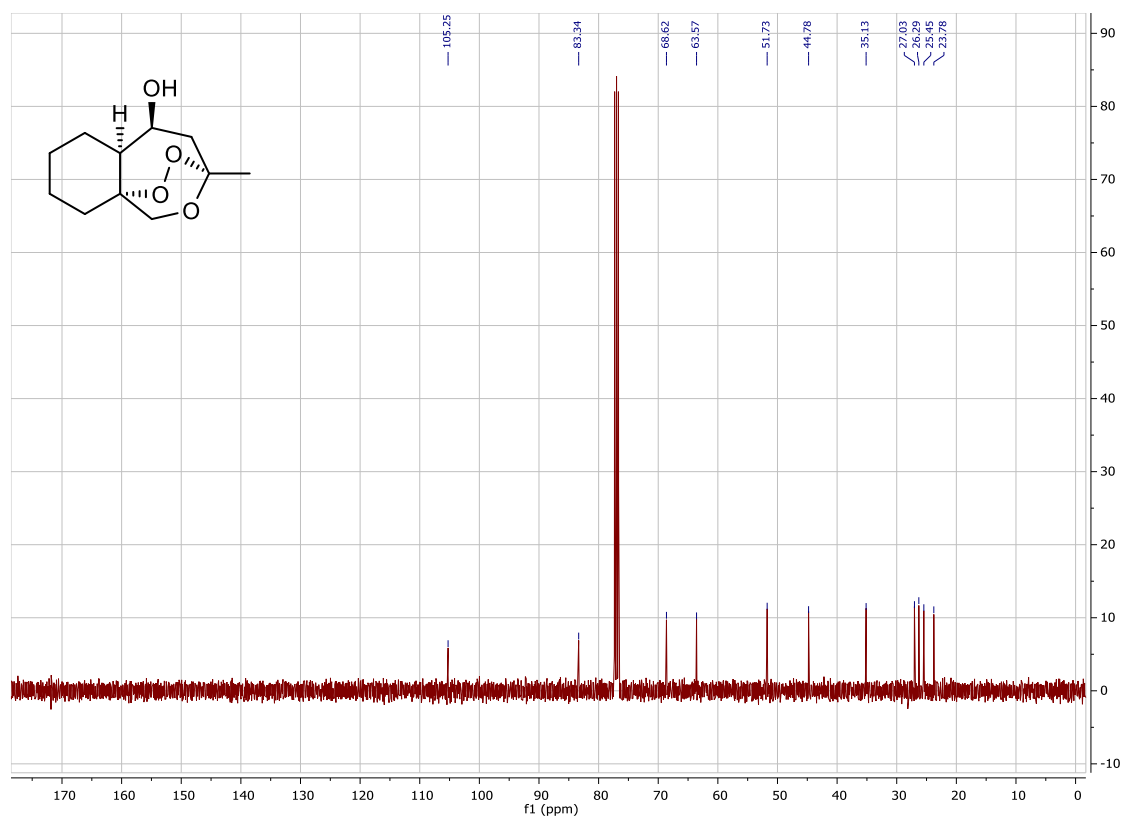


Figure S73.  $^{13}\text{C}$ -NMR spectrum of the compound **2b** (CDCl<sub>3</sub>, 100 MHz).

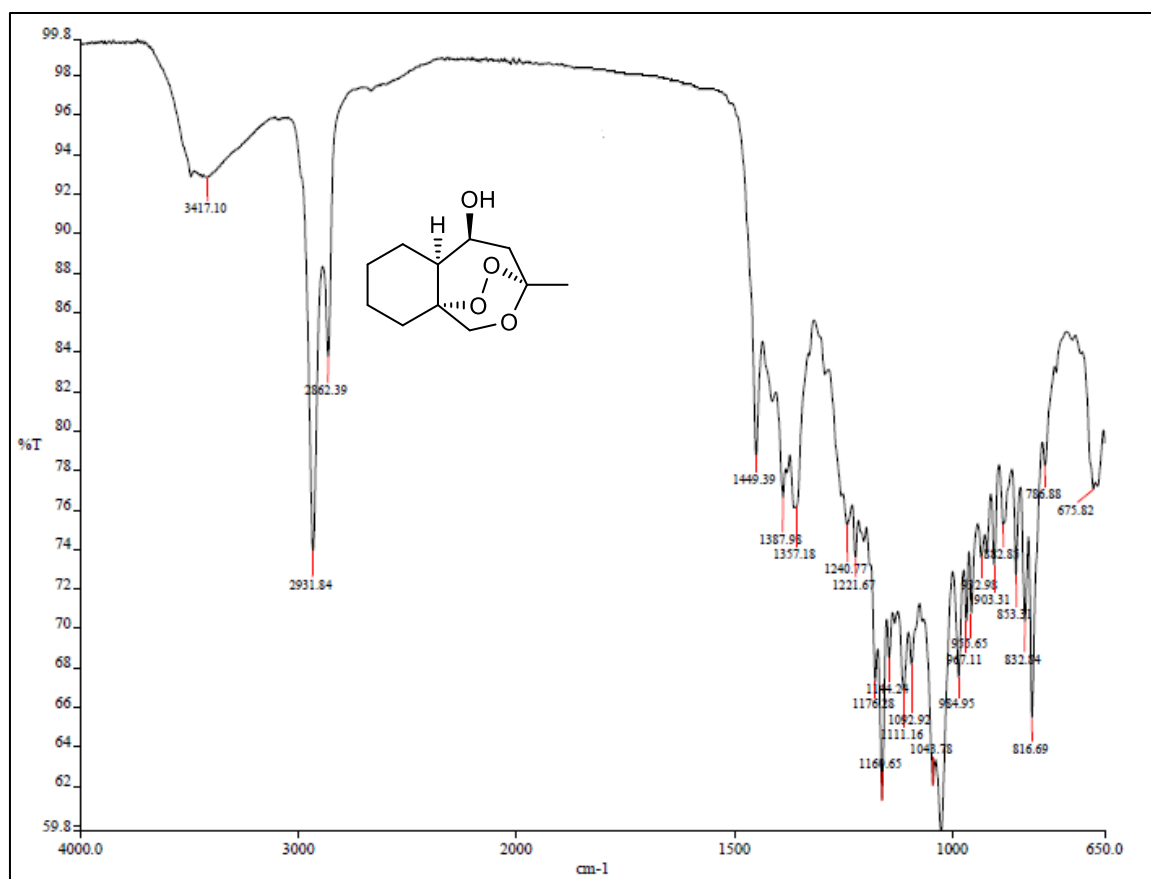


Figure S74. IR-spectrum of the compound **2b**.

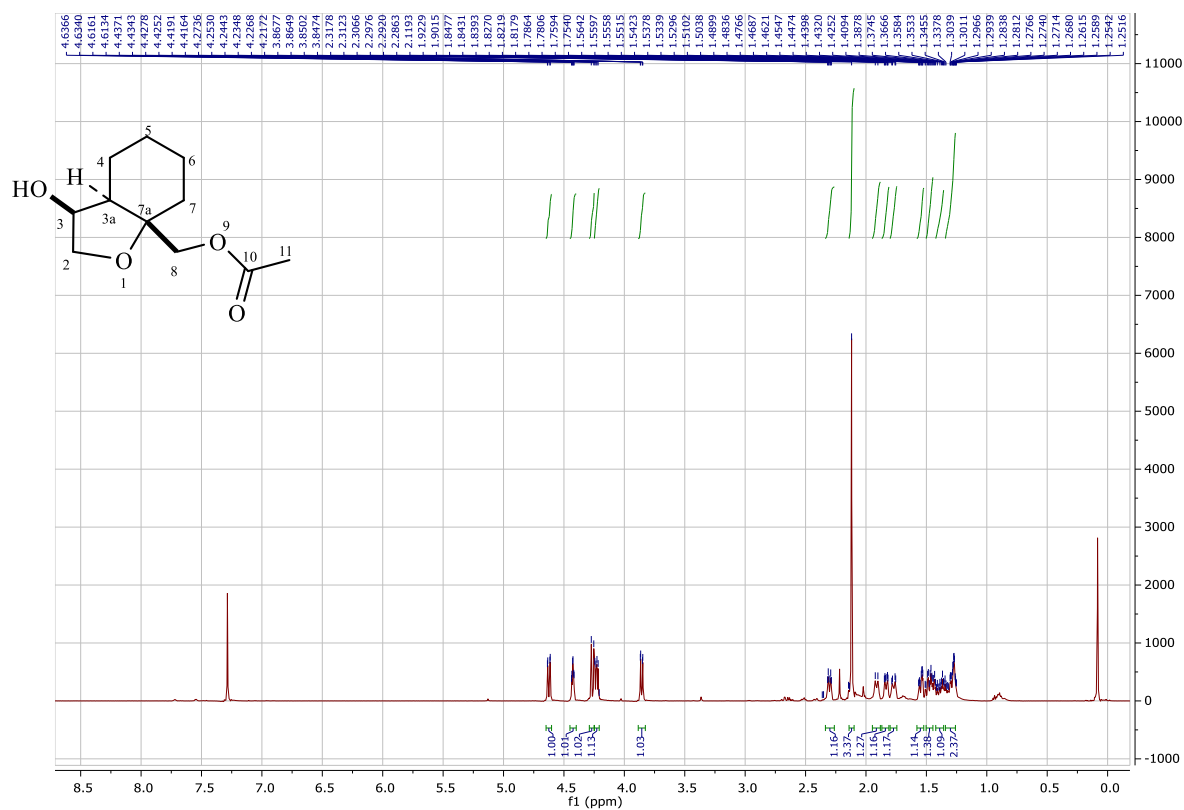


Figure S75. <sup>1</sup>H-spectrum of the compound **22** (CDCl<sub>3</sub>, 400 MHz).

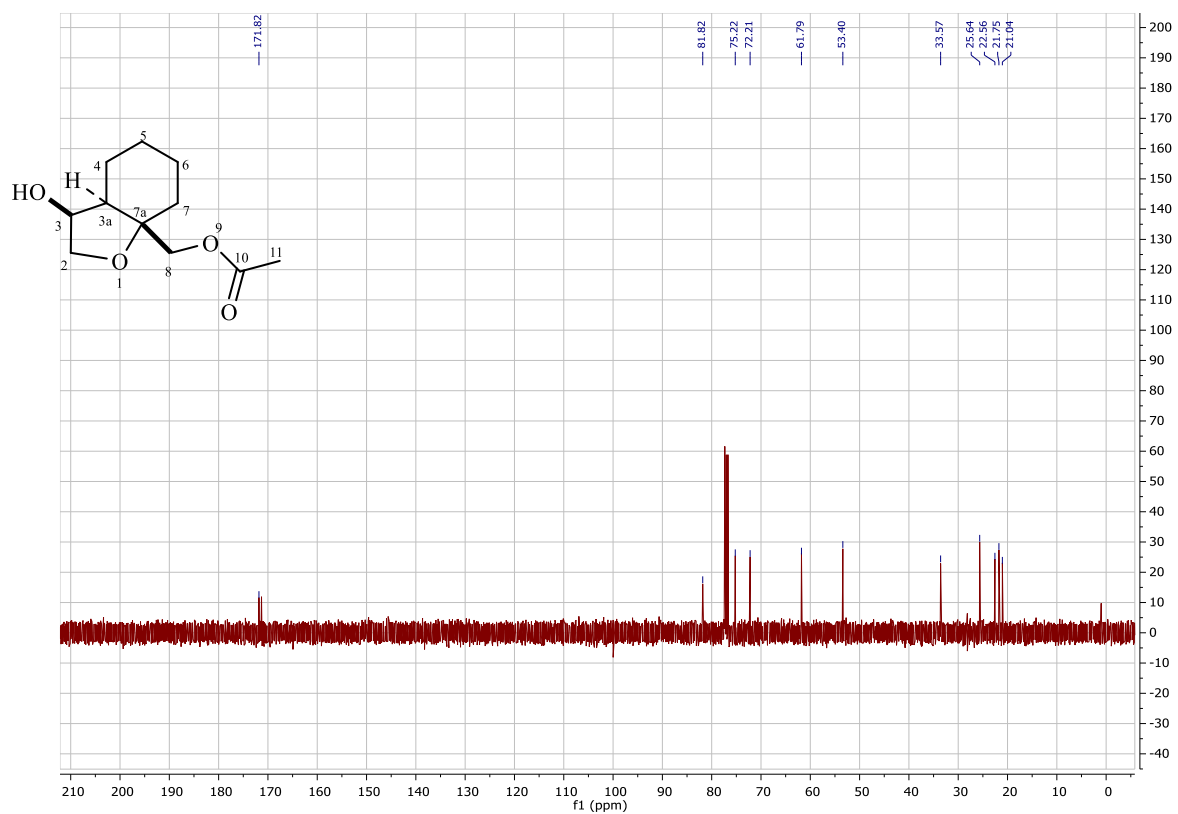


Figure S76.  $^{13}\text{C}$ -NMR spectrum of the compound **22** (CDCl<sub>3</sub>, 100 MHz).





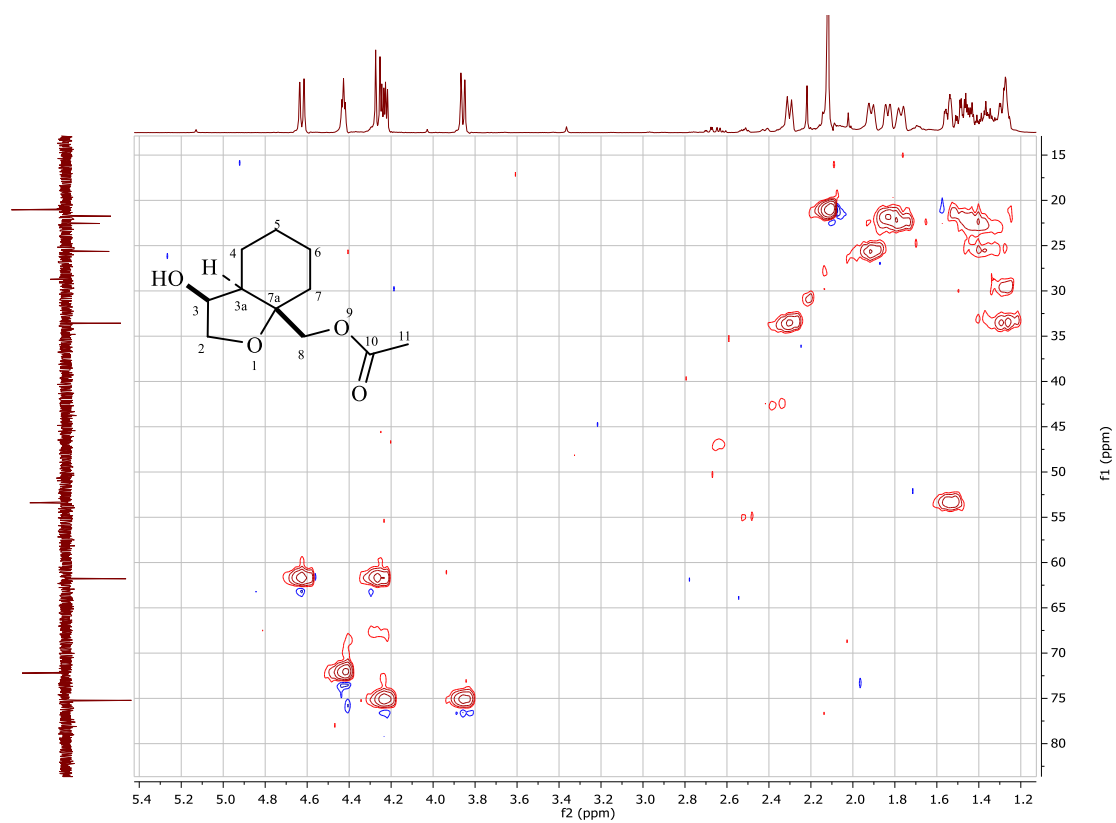


Figure S78. HSQC spectrum of the compound 22.

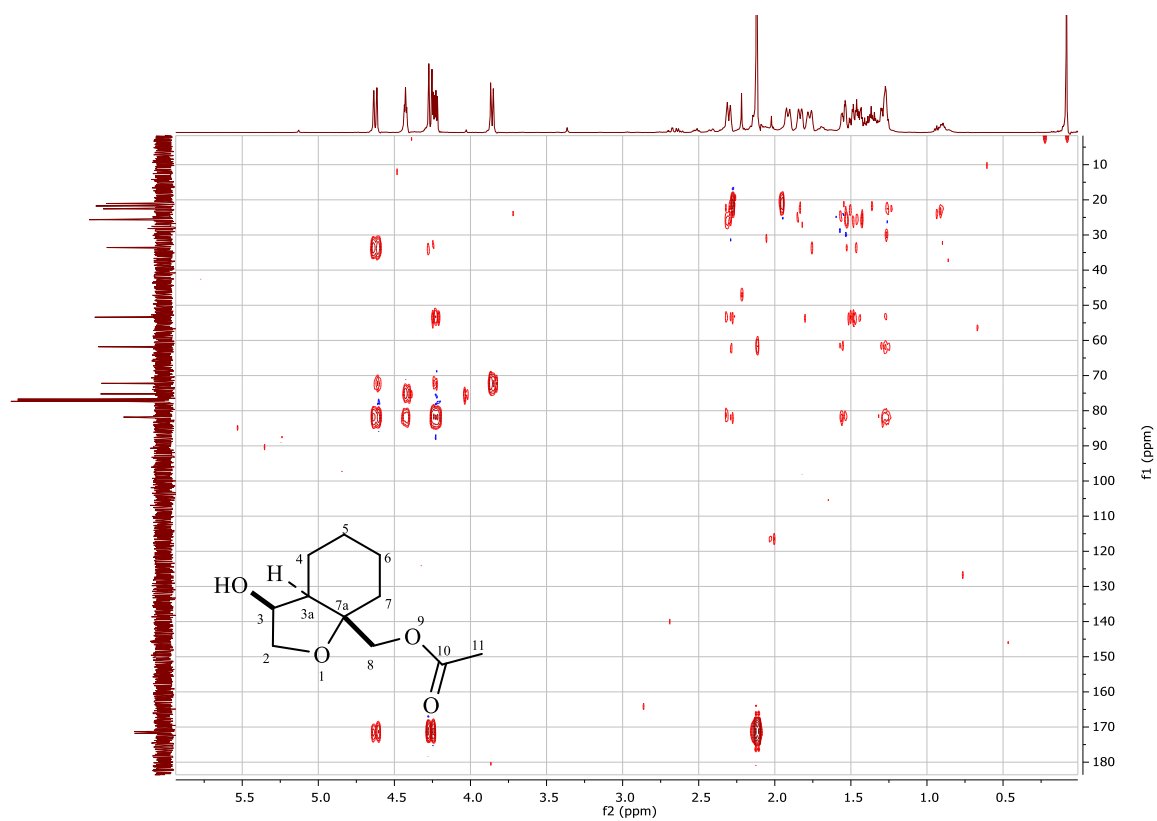


Figure S79. HMBC spectrum of the compound **22**.

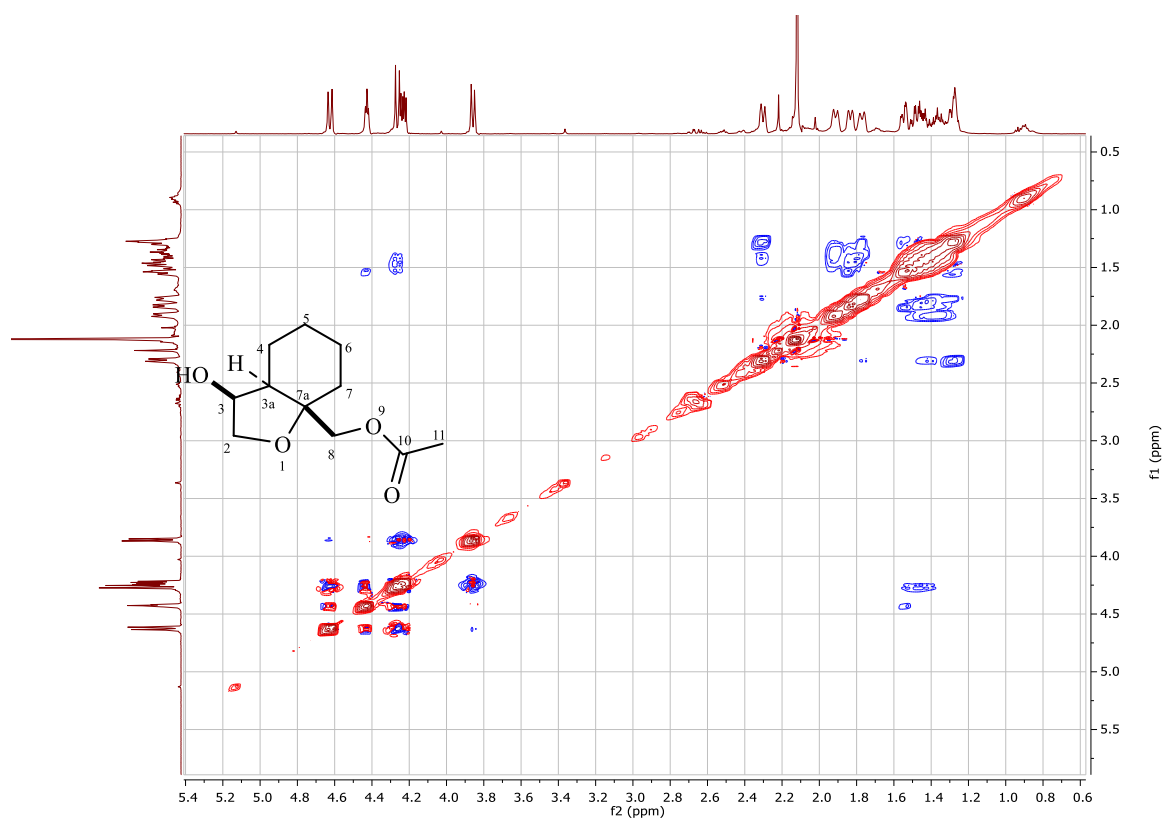


Figure S80. NOESY spectrum of the compound **22**.

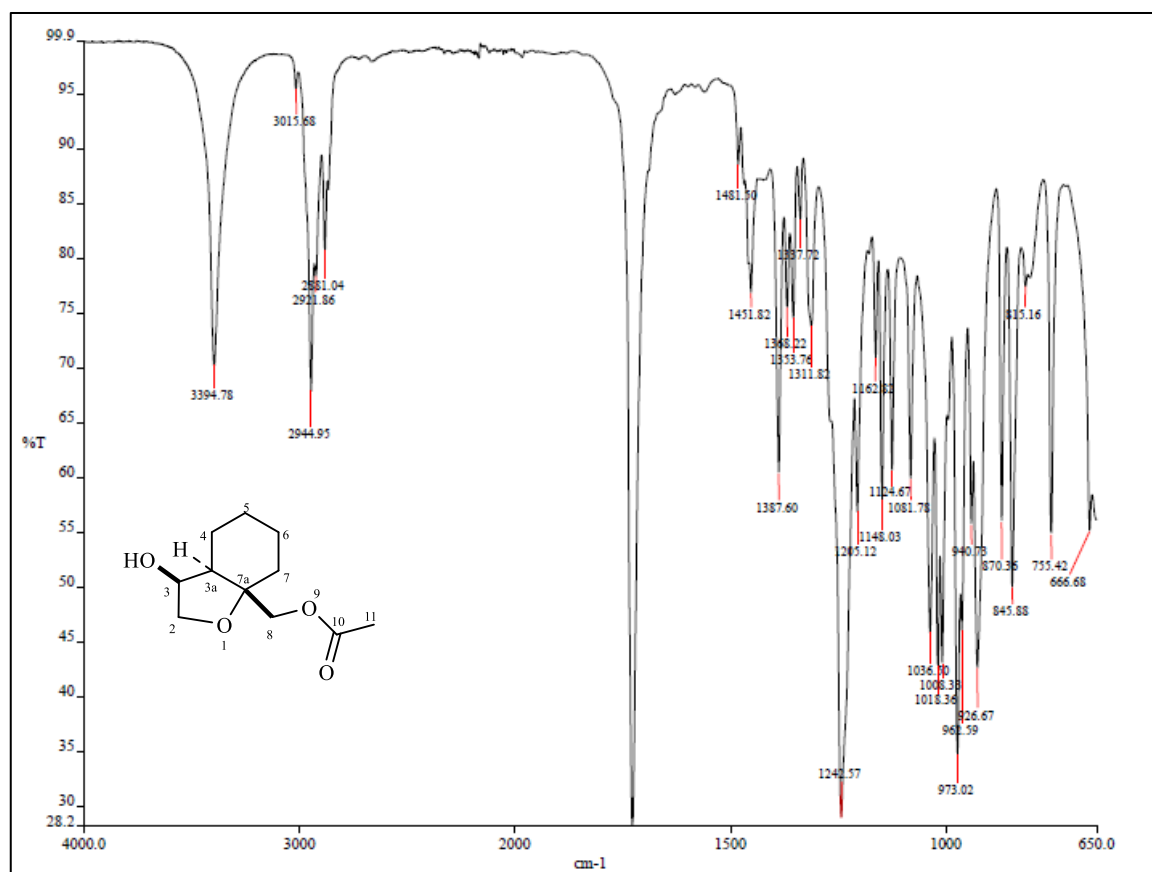


Figure S81. IR-spectrum of the compound 22.

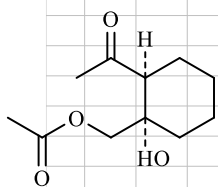


Figure S82.  $^1\text{H}$ -spectrum of the compound **29** ( $\text{CDCl}_3$ , 400 MHz).

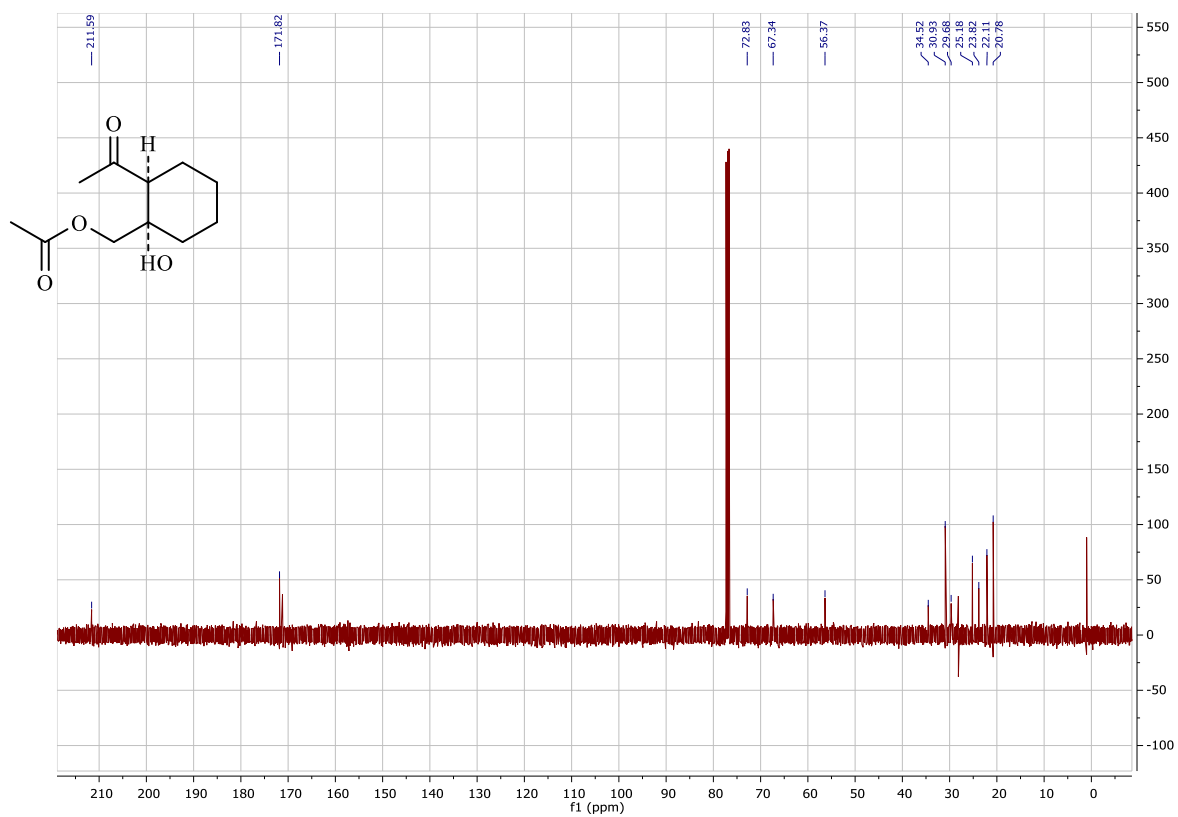


Figure S83.  $^{13}\text{C}$ -NMR spectrum of the compound **29** (CDCl<sub>3</sub>, 100 MHz).

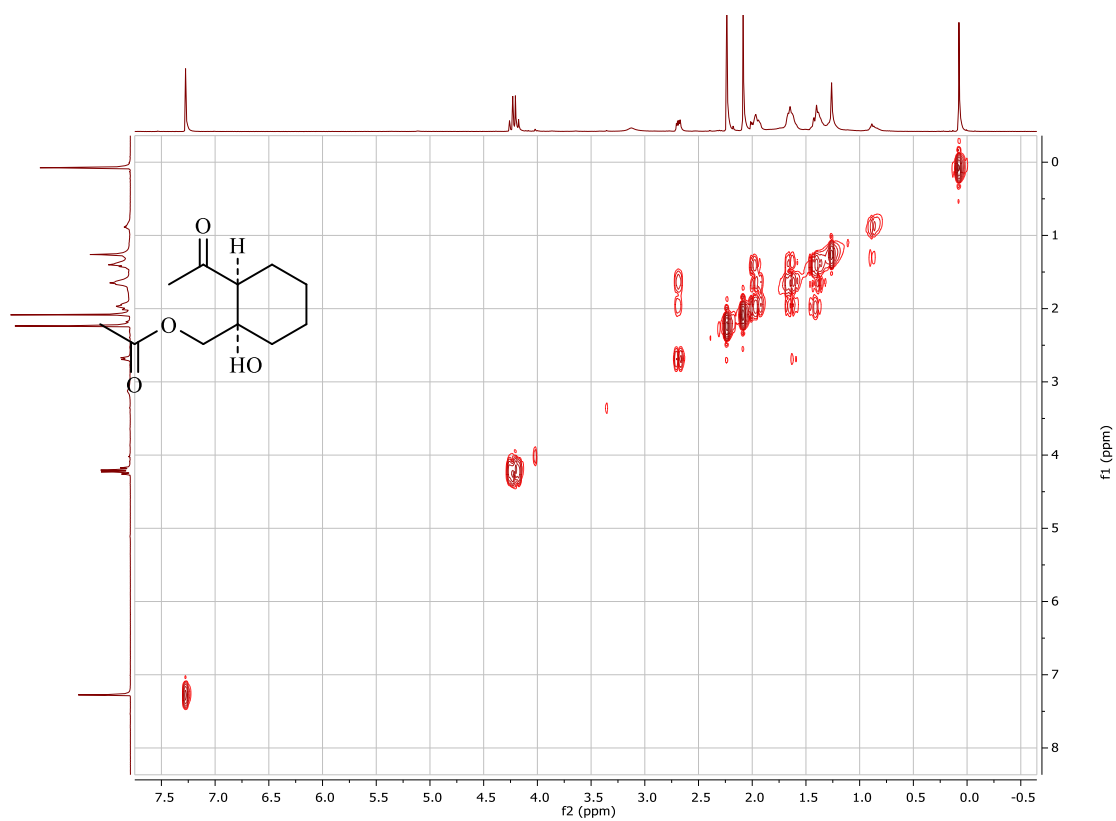


Figure S84. COSY spectrum of the compound **29**.



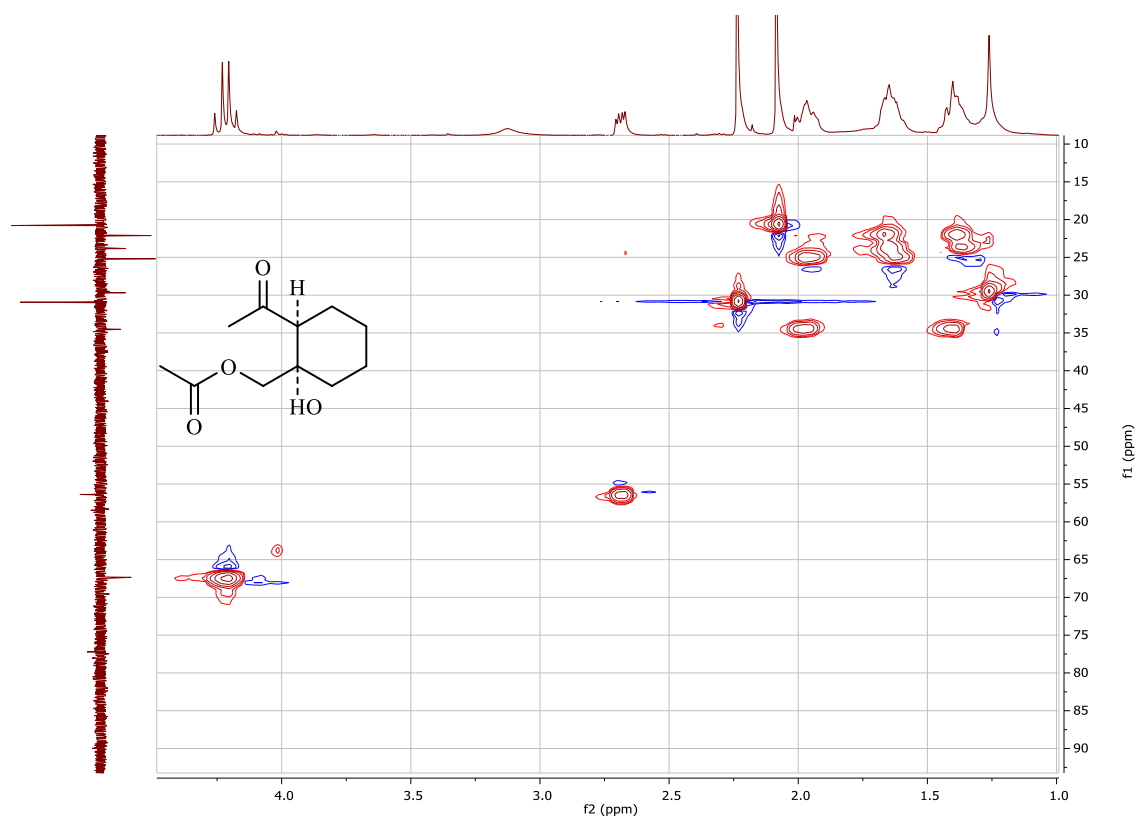


Figure S85. HSQC spectrum of the compound **29**.

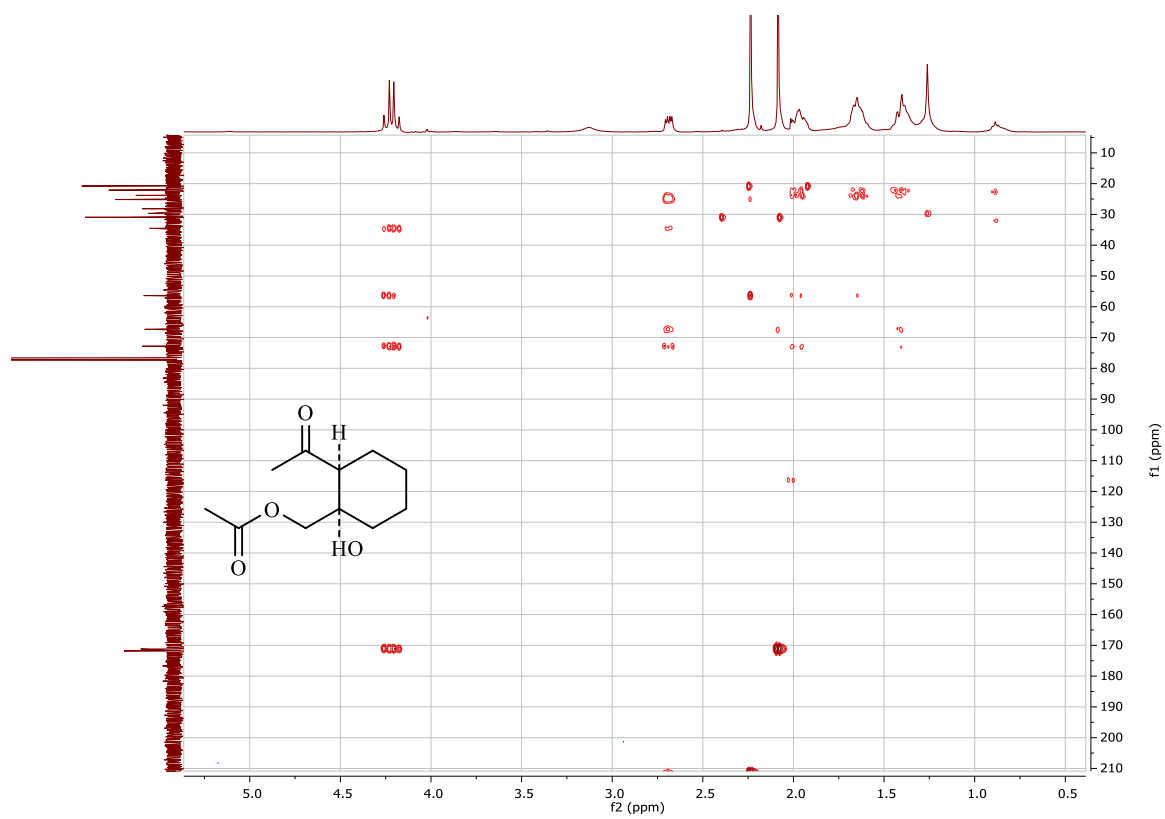


Figure S86. HMBC spectrum of the compound **29**.

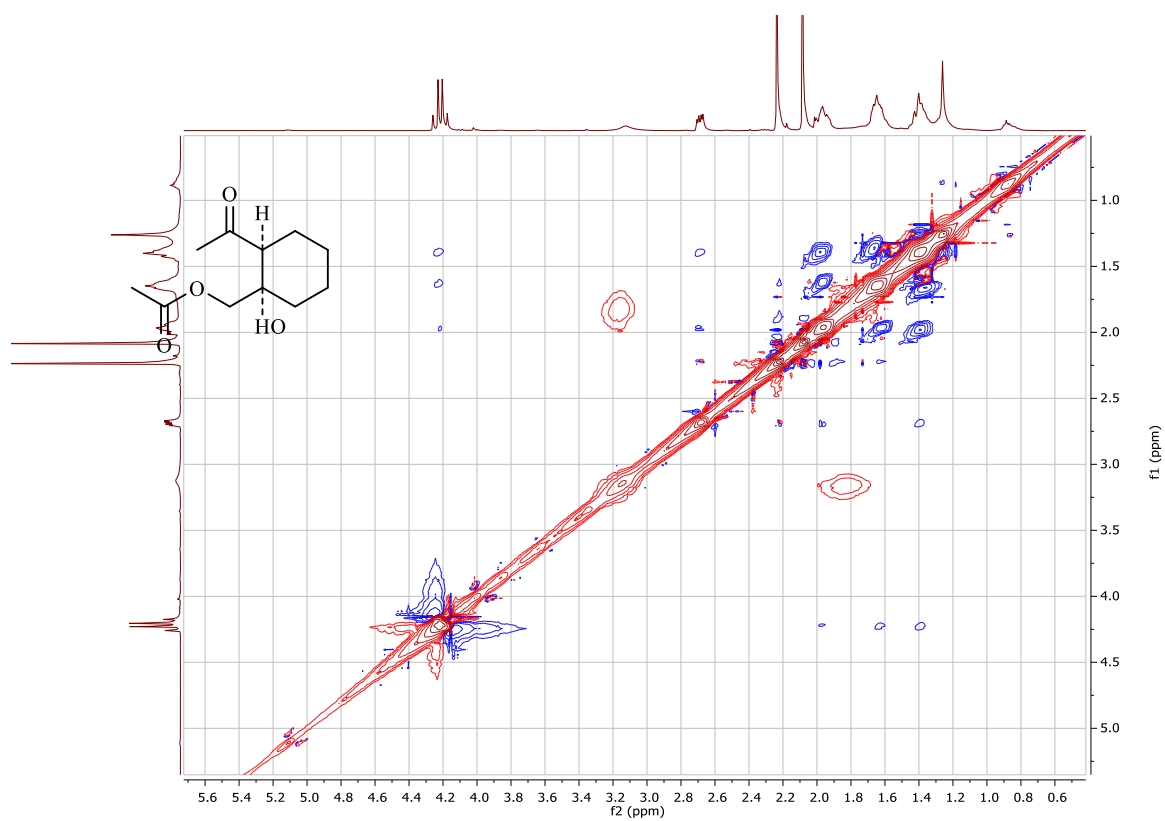


Figure S87. NOESY spectrum of the compound **29**.