

## Supplementary Information for publication

### Synthesis of piperitone-derived halogenated lactones and their effect on aphid probing, feeding, and settling behavior

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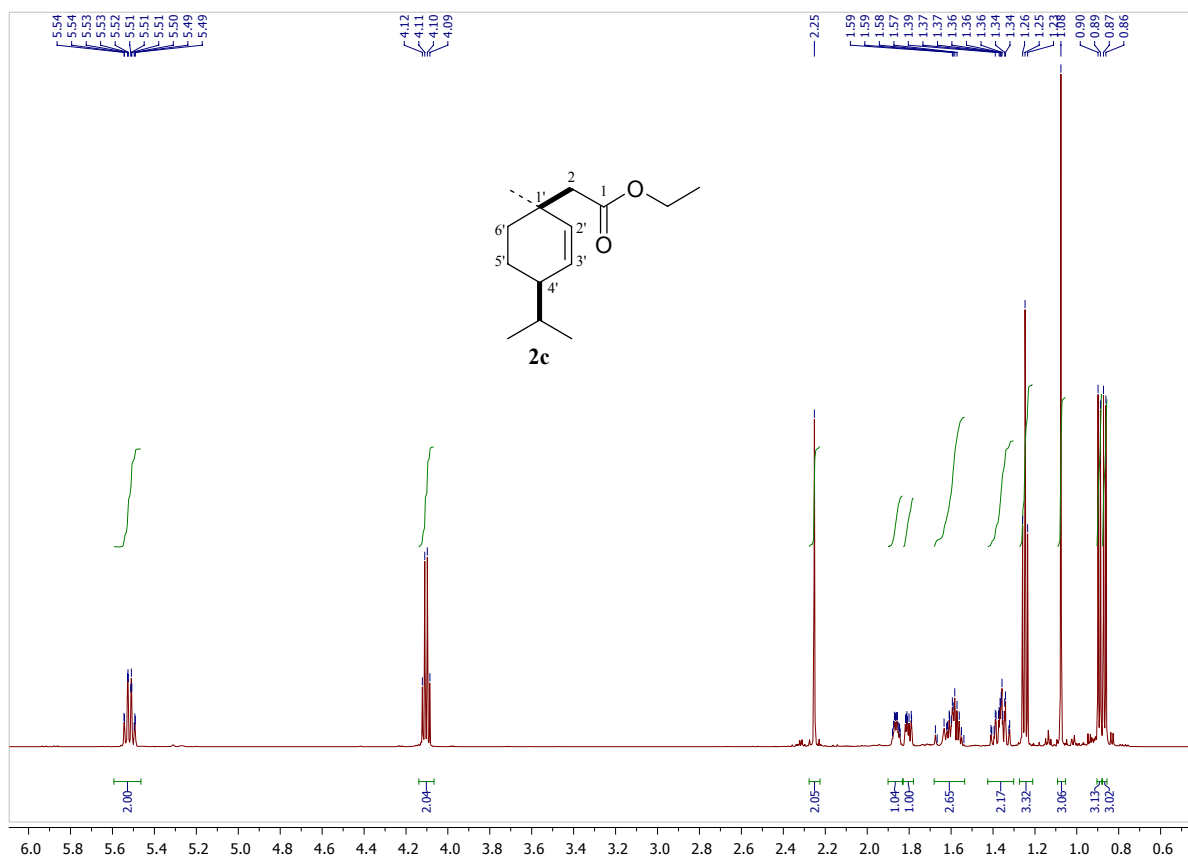


Fig. 1. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 600 MHz) spectrum of **2c**.

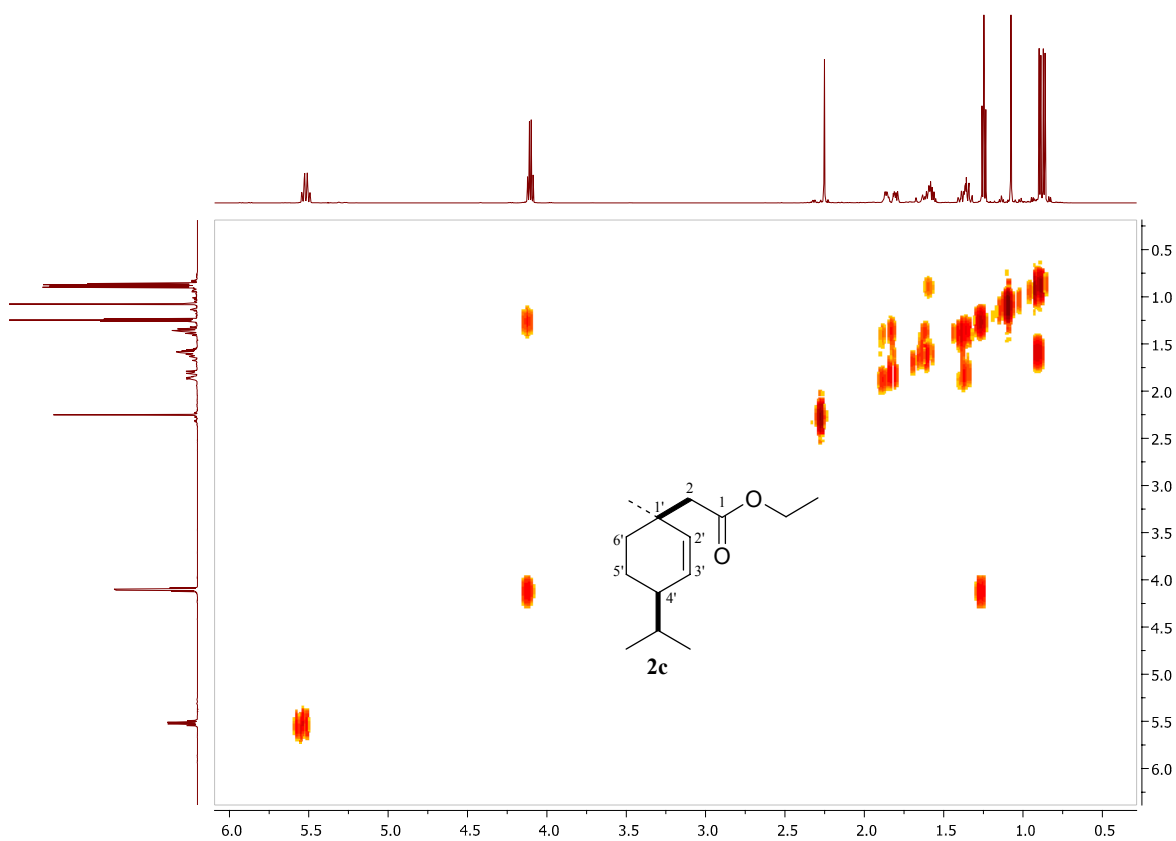
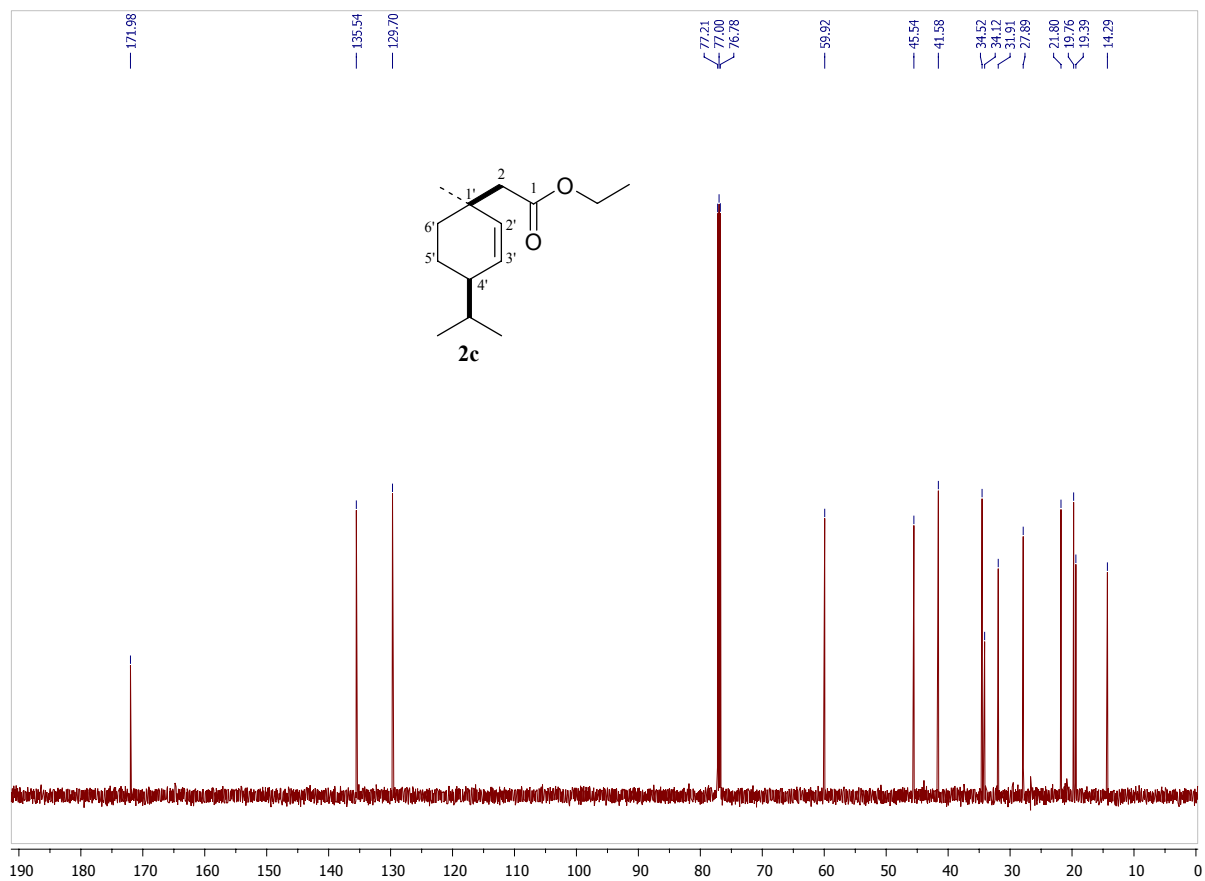
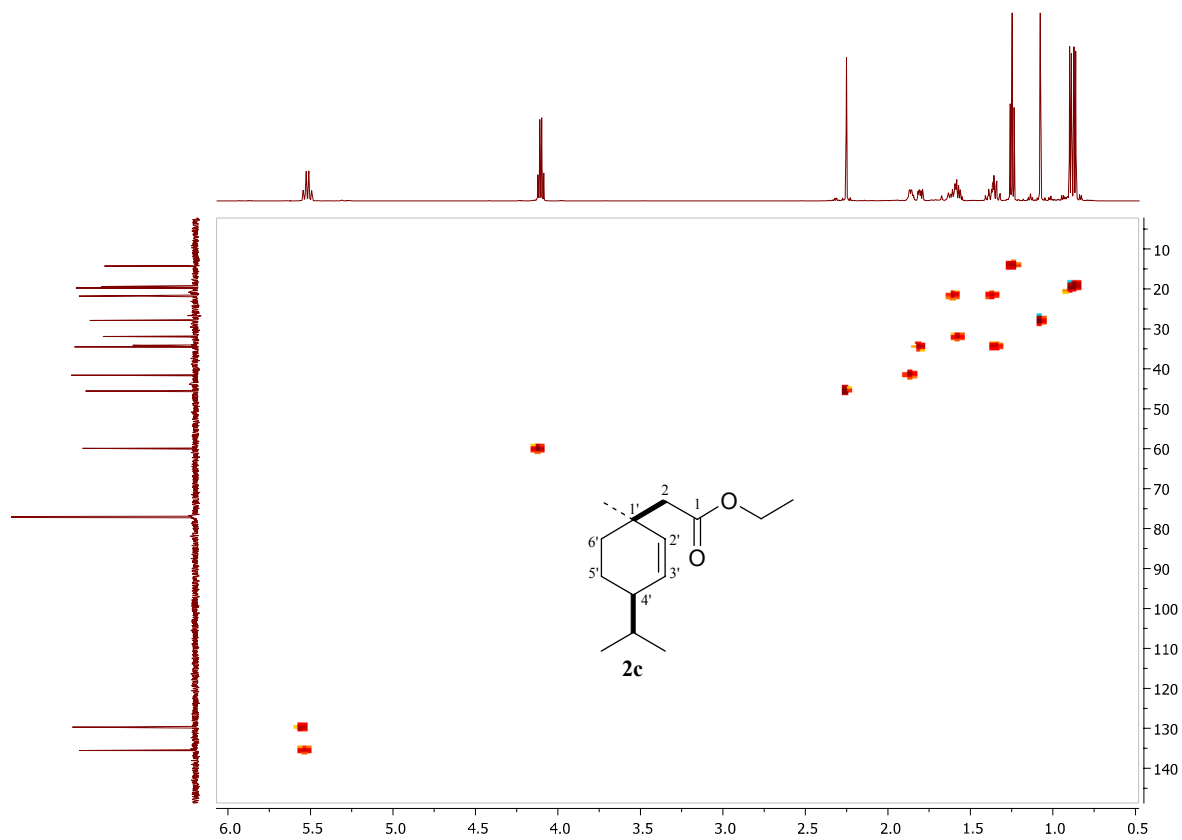


Fig. 2. COSY spectrum of **2c**.



**Fig. 3.**  $^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 151 MHz) spectrum of **2c**.



**Fig. 4.** HSQC spectrum of **2c**.

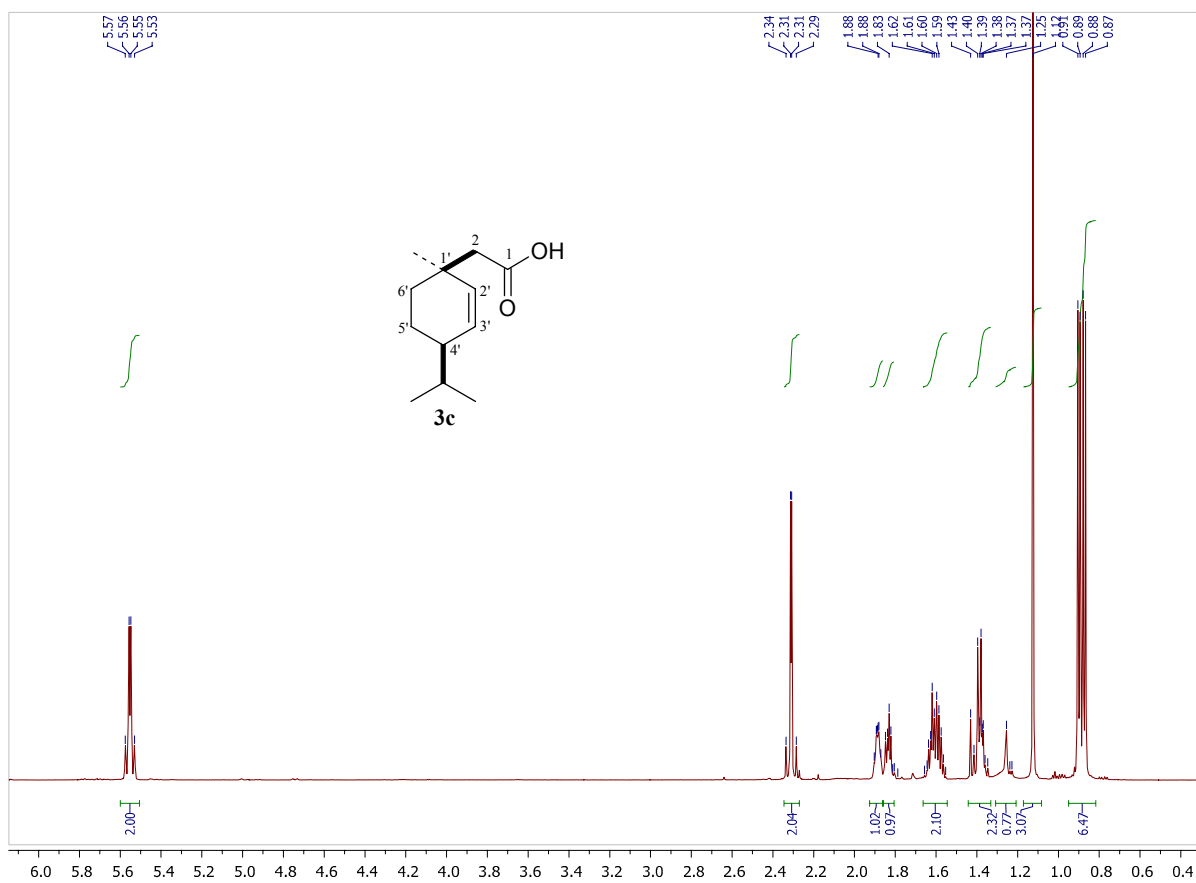


Fig. 5.  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz) spectrum of **3c**.

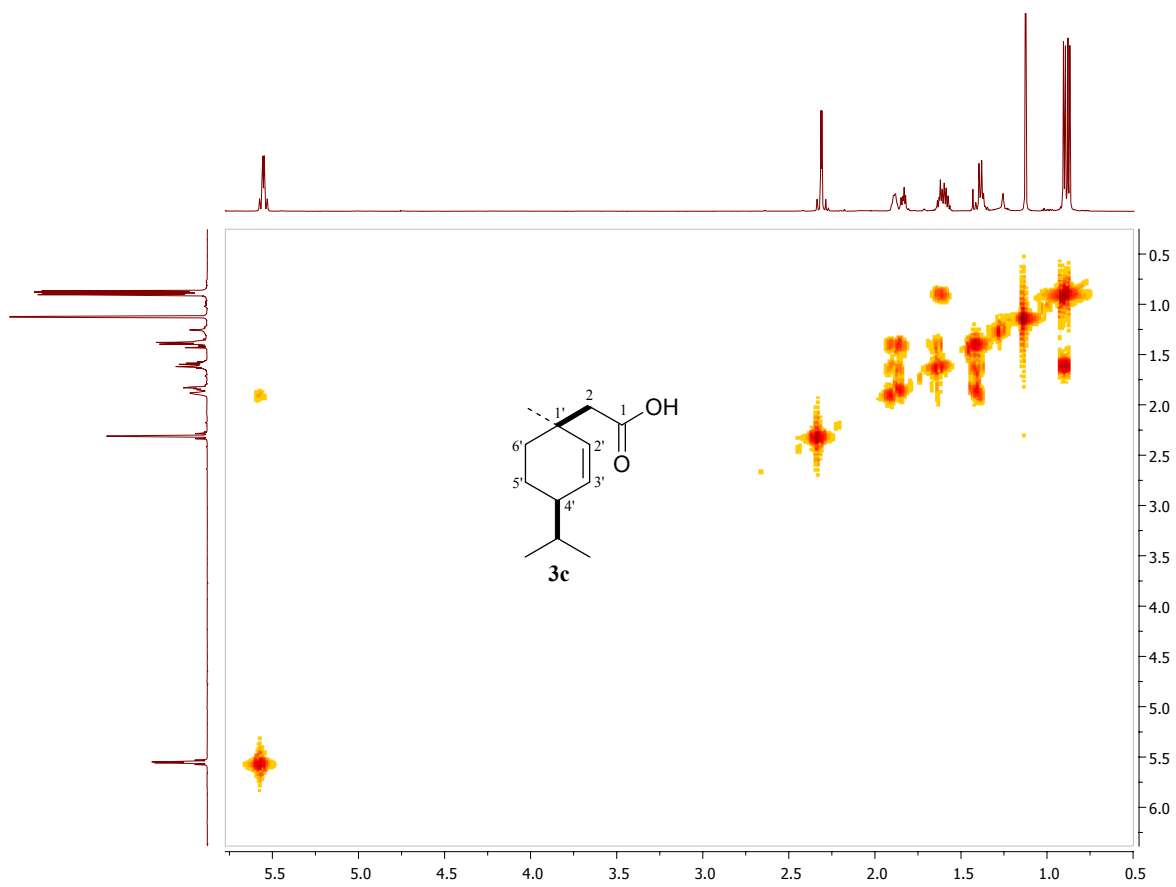
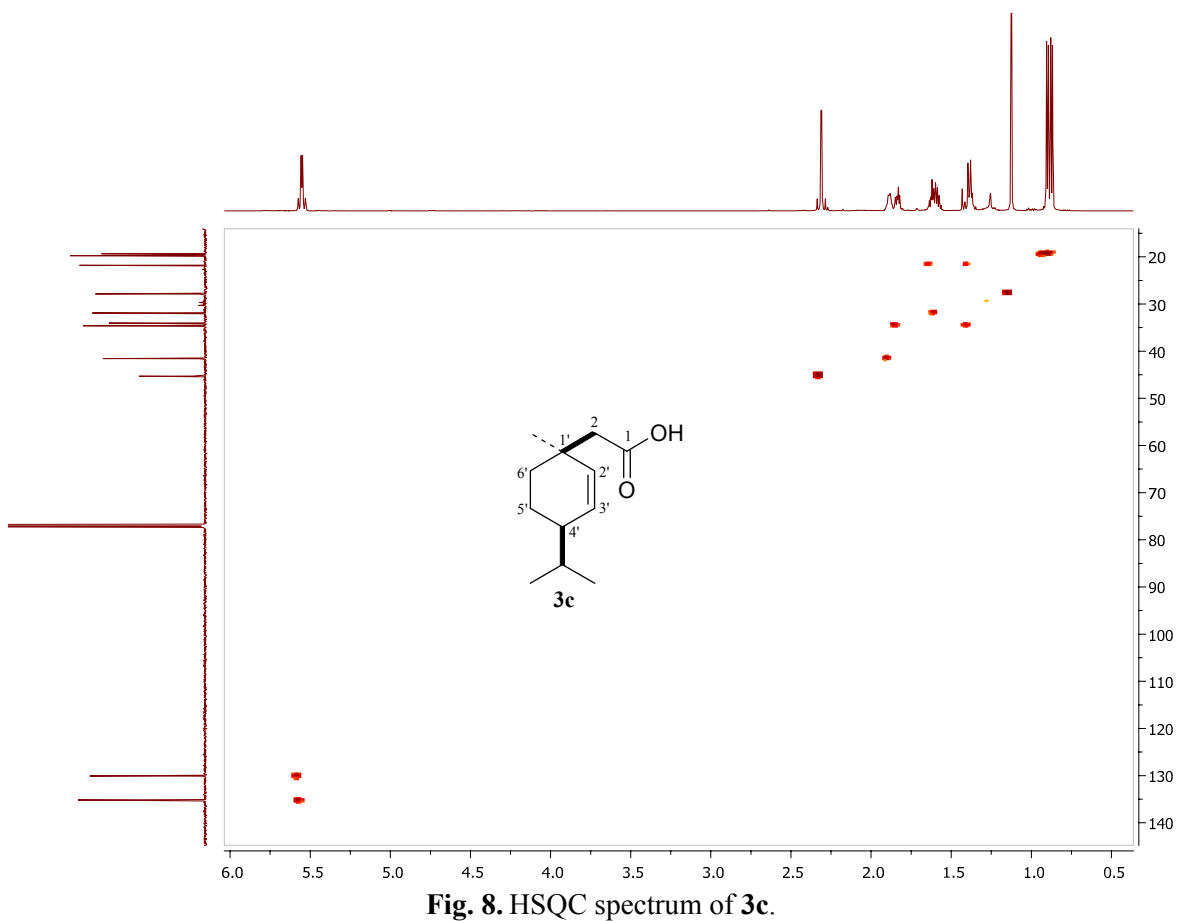
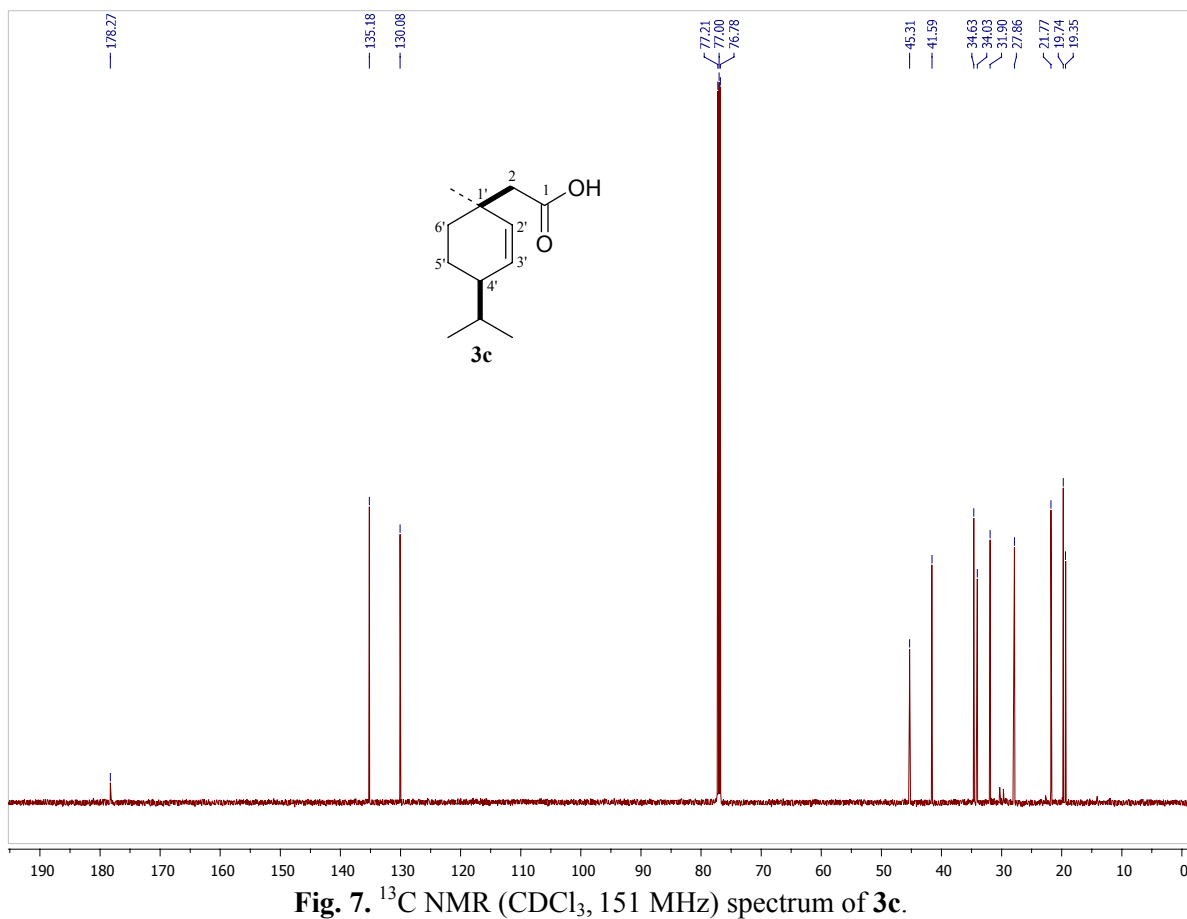


Fig. 6. COSY spectra of **3c**.



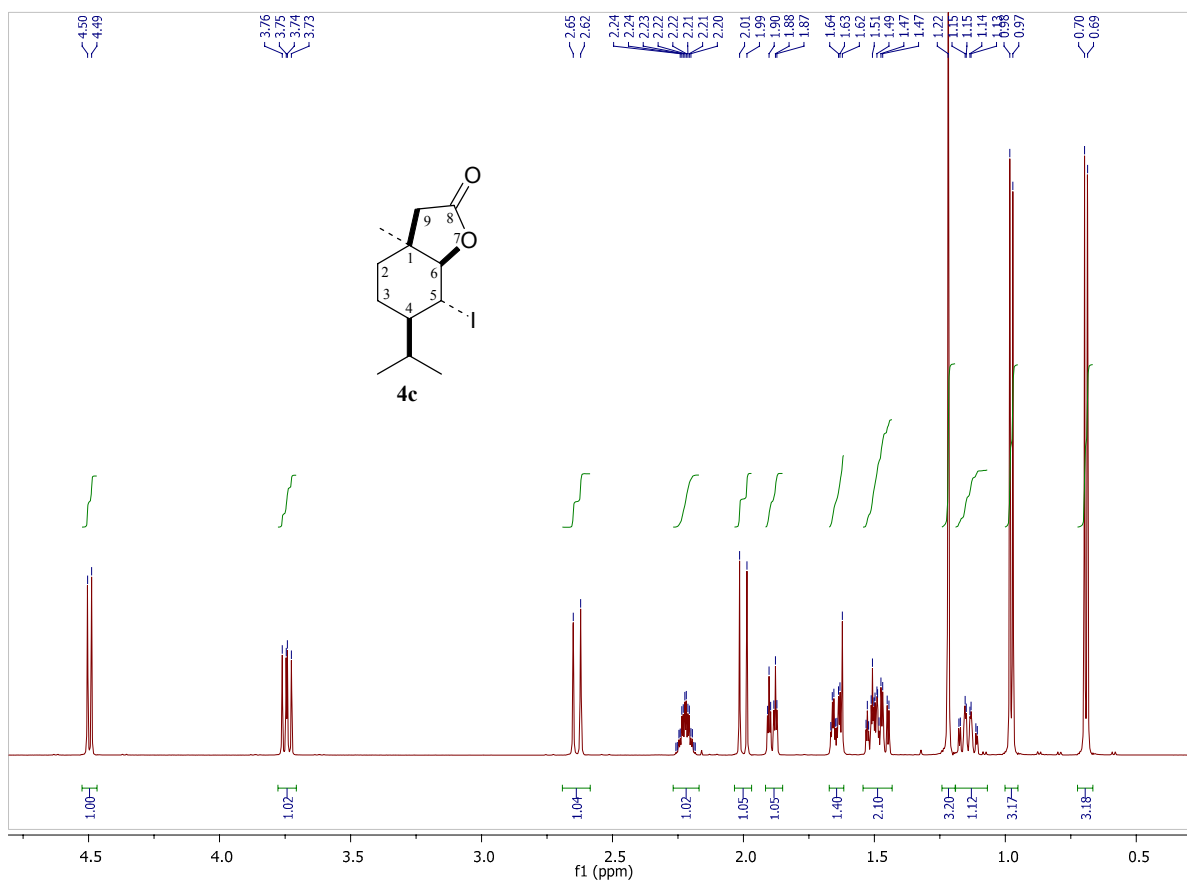


Fig. 9.  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz) spectrum of **4c**.

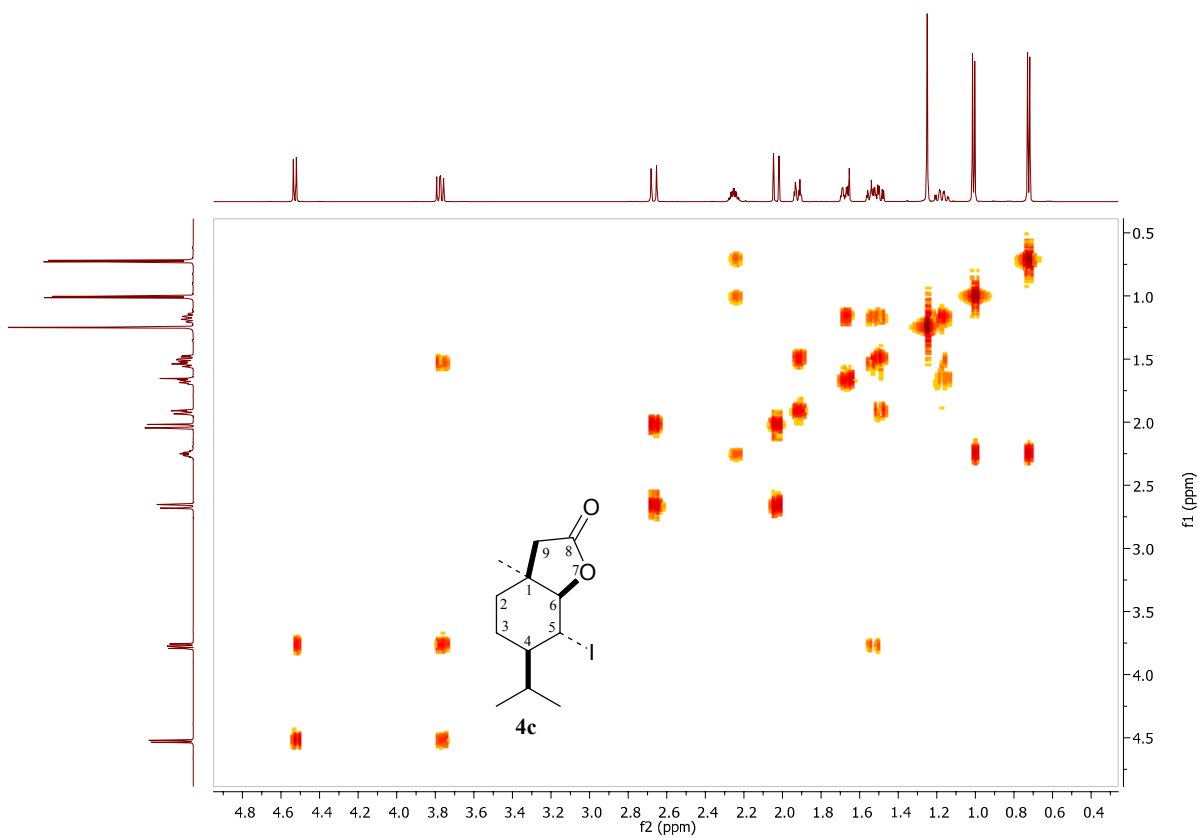


Fig. 10. COSY spectrum of **4c**.

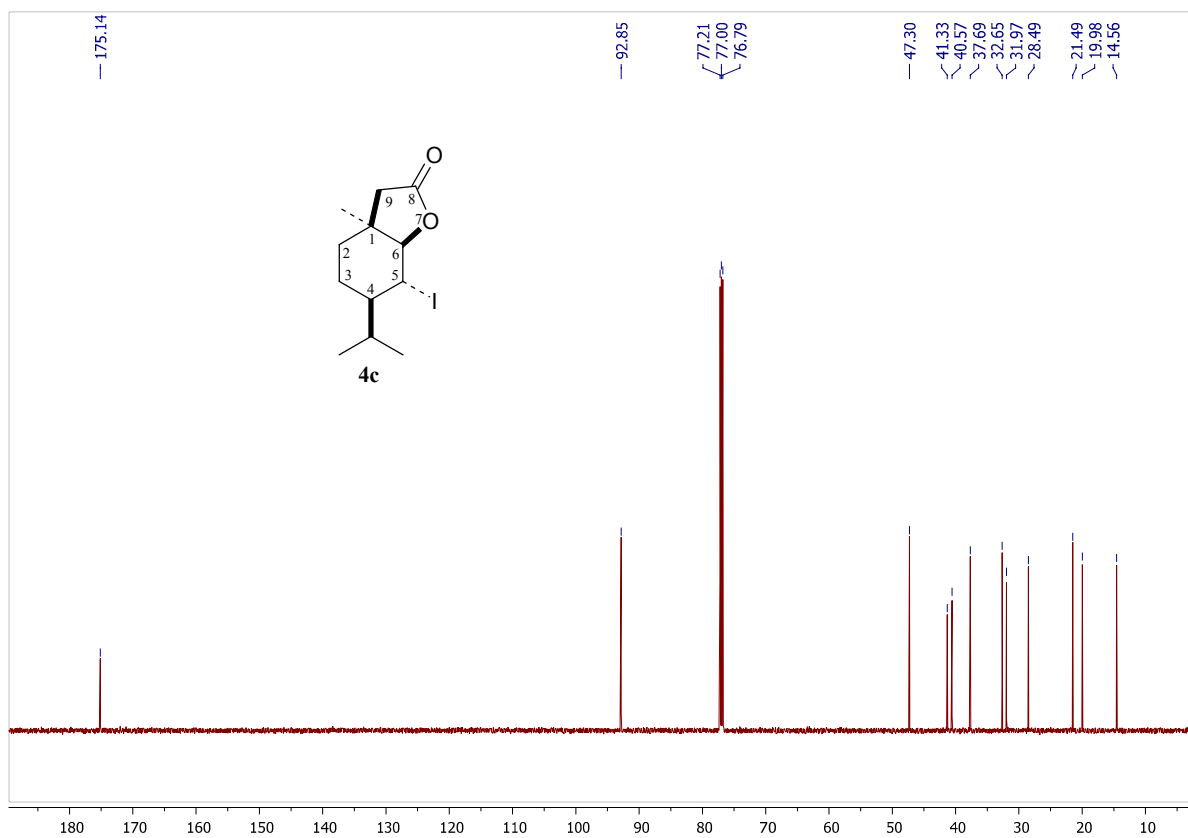


Fig. 11.  $^{13}\text{C}$  NMR (CDCl<sub>3</sub>, 151 MHz) spectrum of **4c**.

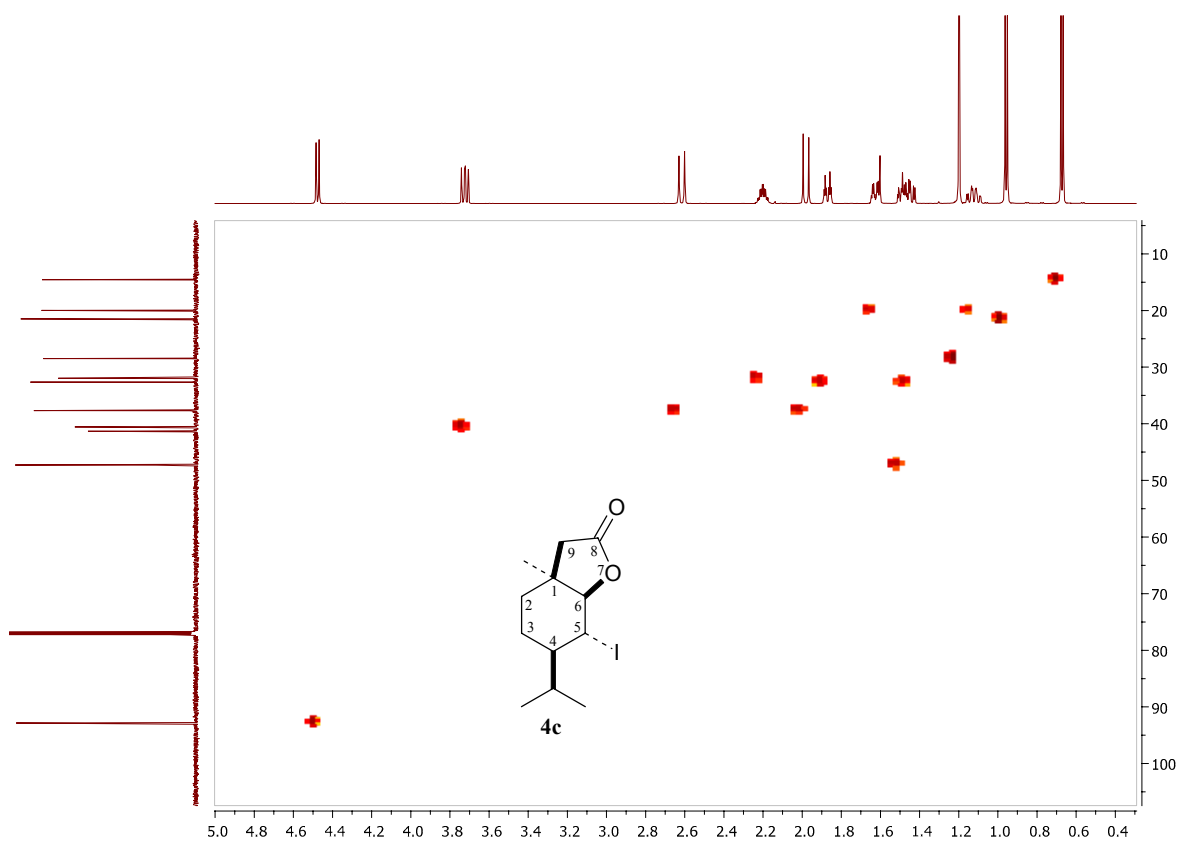


Fig. 12. HSQC spectrum of **4c**.

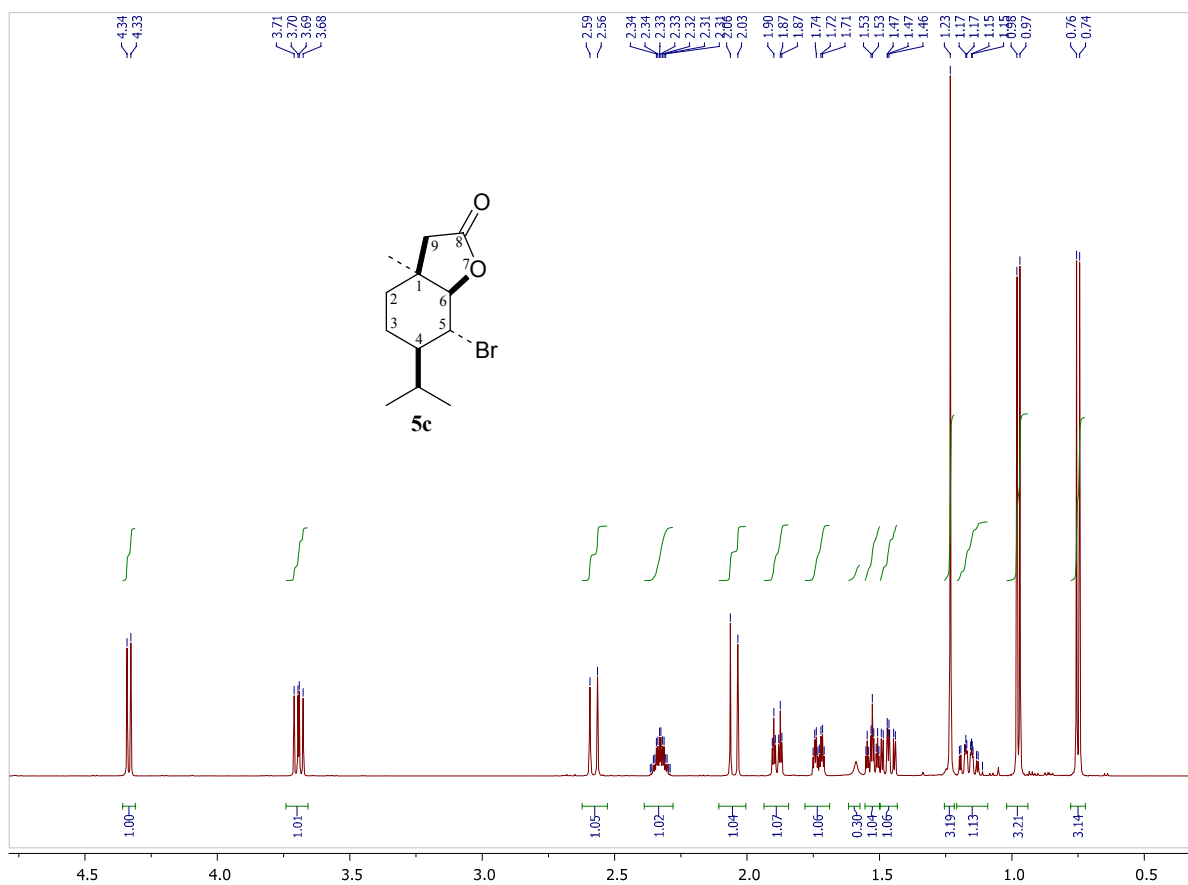


Fig. 13. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 600 MHz) spectrum of **5c**.

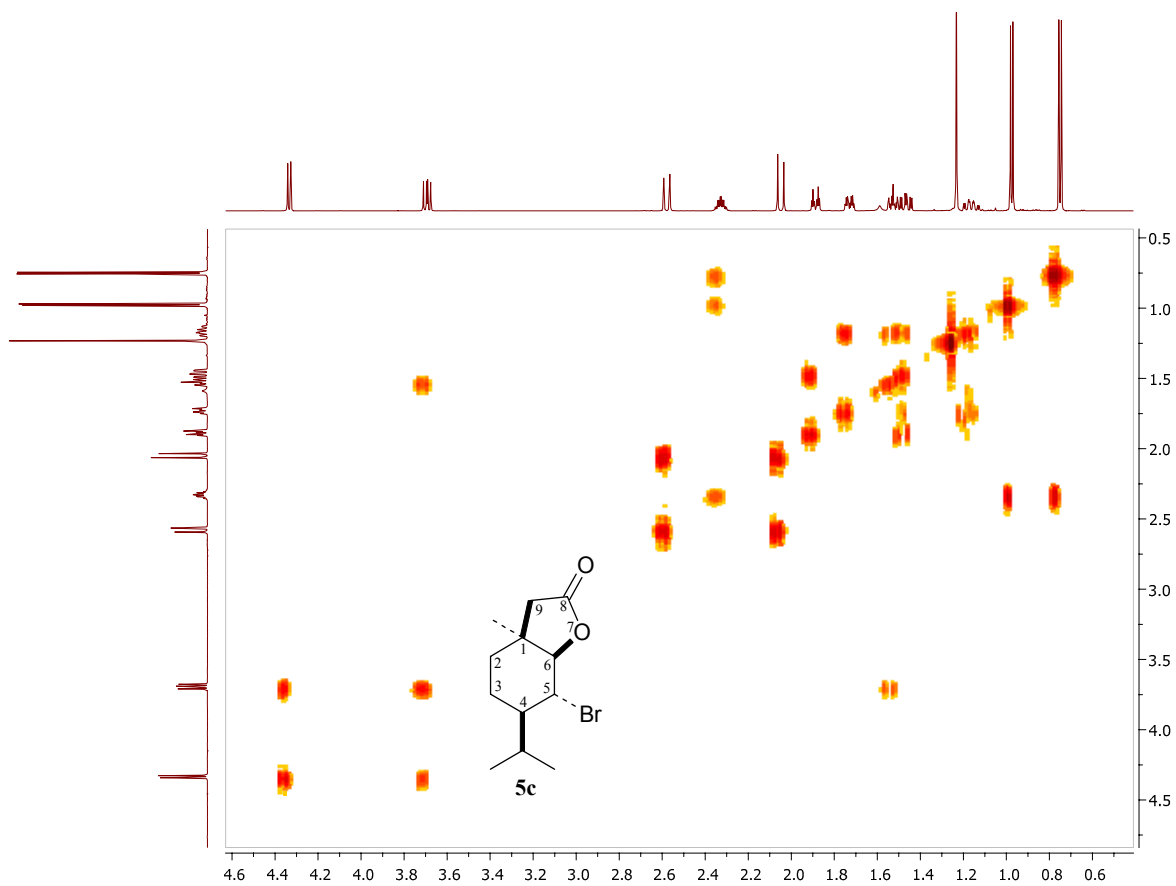
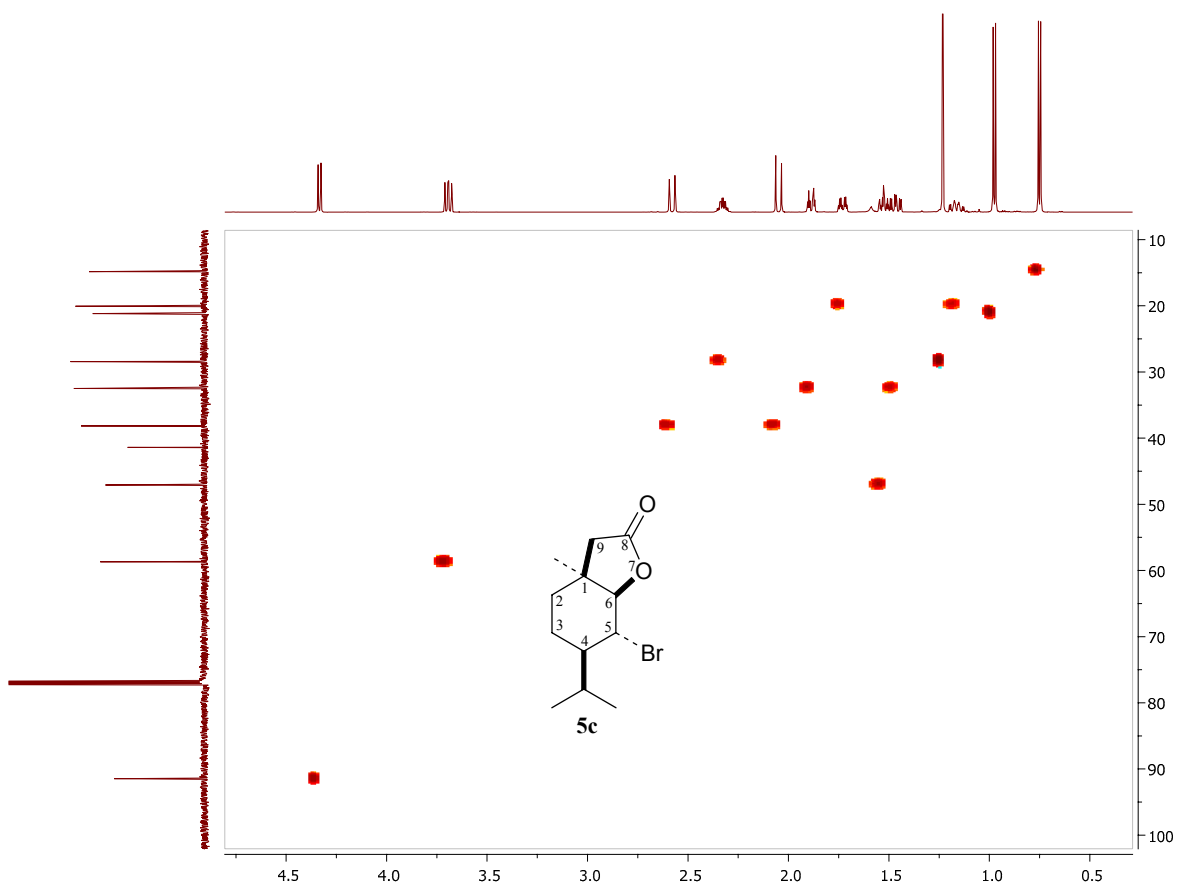
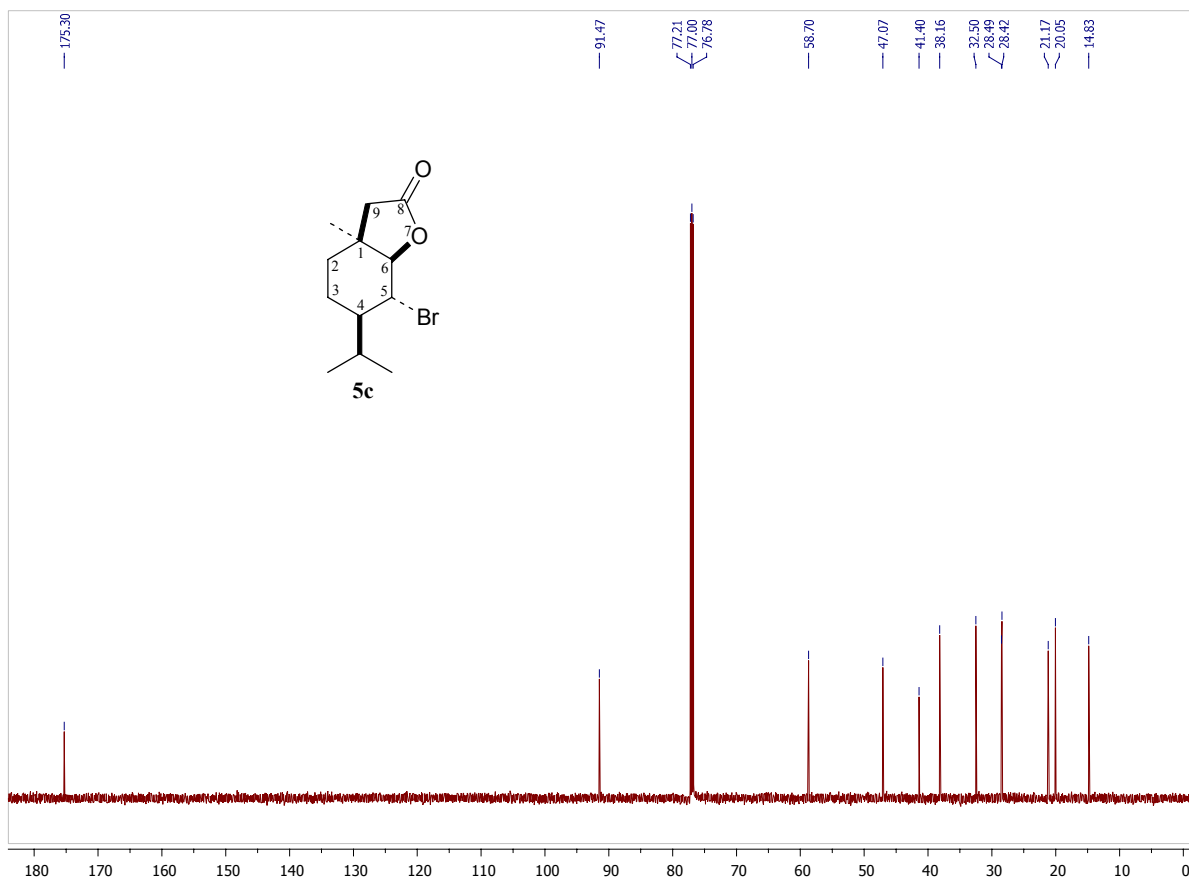
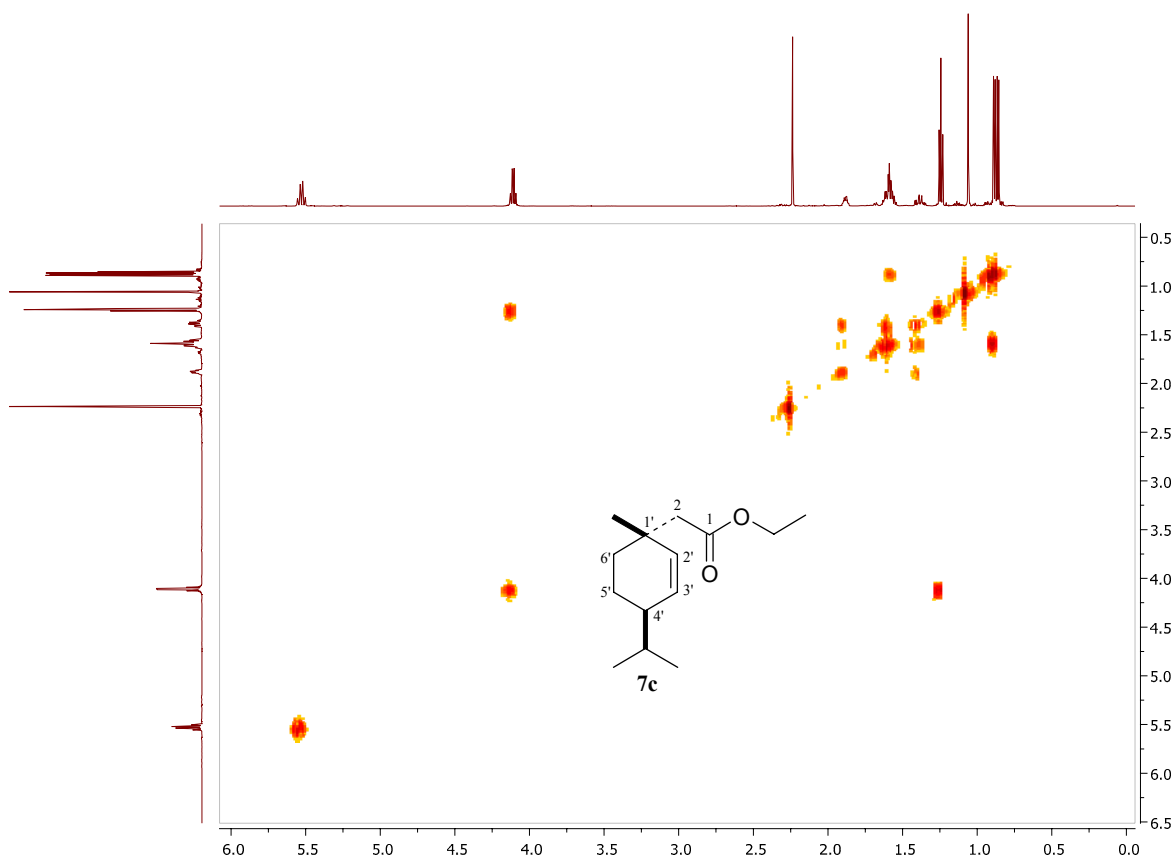
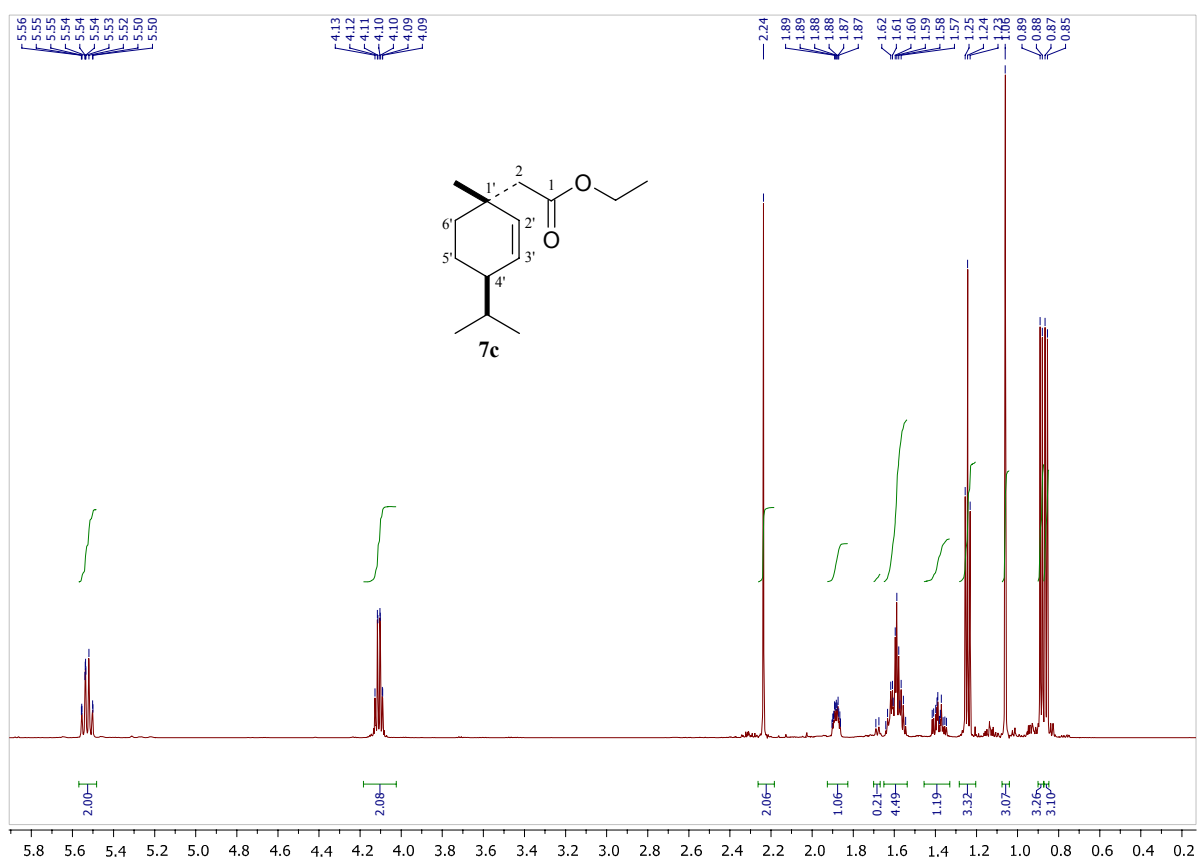


Fig. 14. COSY spectrum of **5c**.







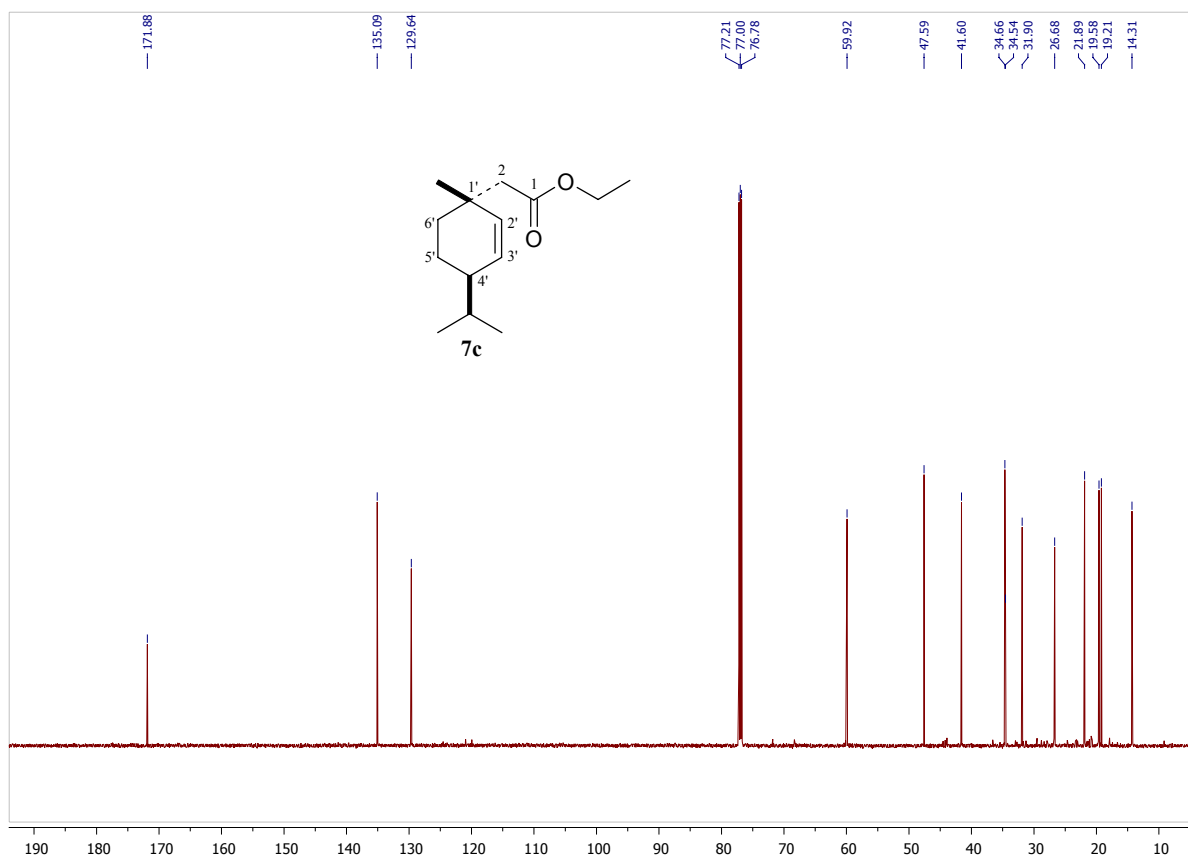


Fig. 19.  $^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 151 MHz) spectrum of **7c**.

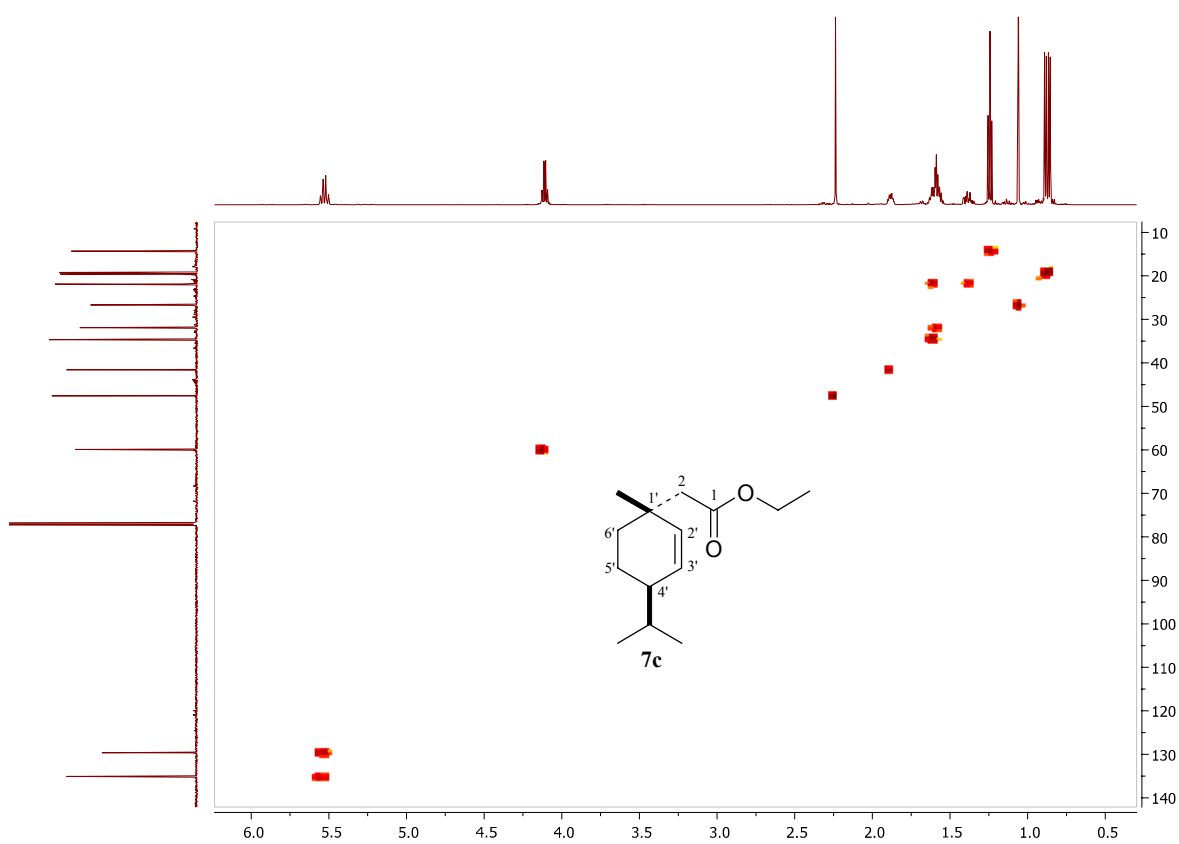


Fig. 20. HSQC spectrum of **7c**.

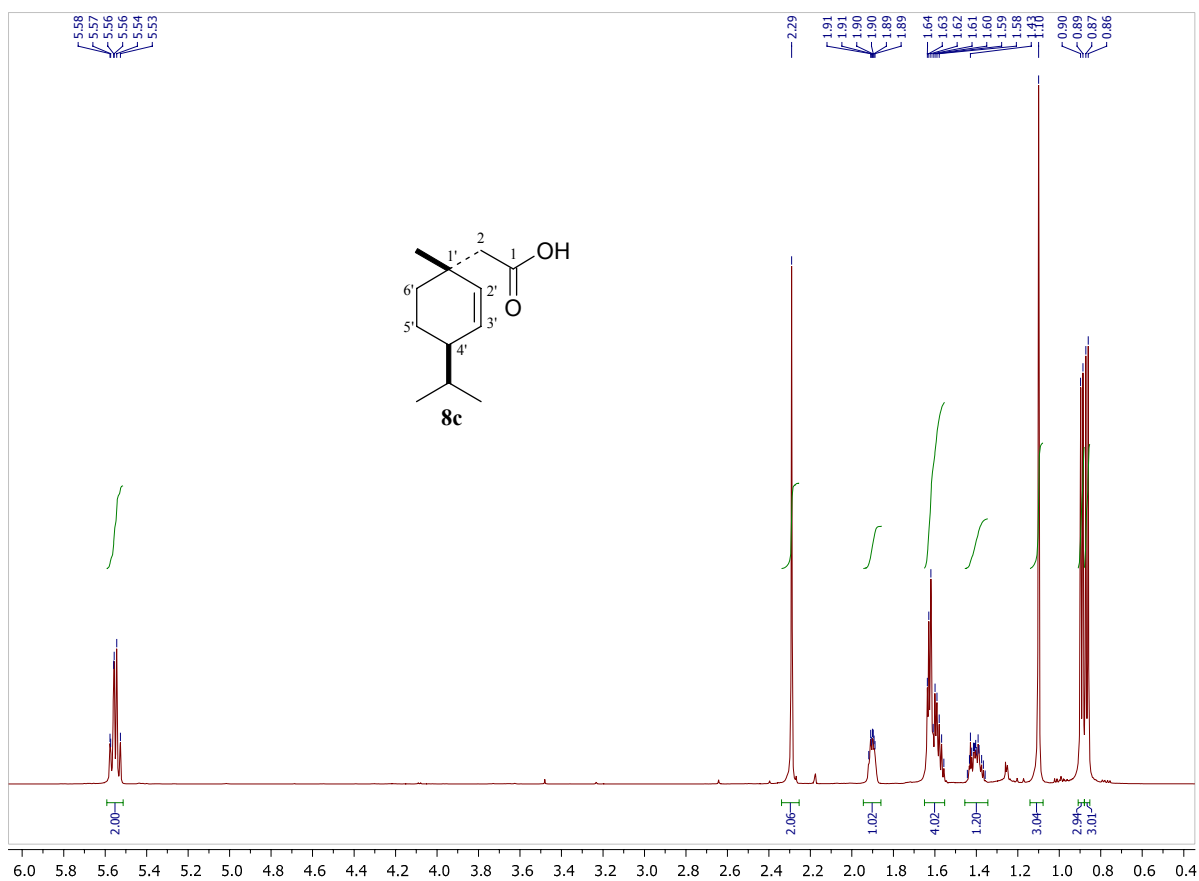


Fig. 21.  $^1\text{H}$  NMR (CDCl<sub>3</sub>, 600 MHz) spectrum of **8c**.

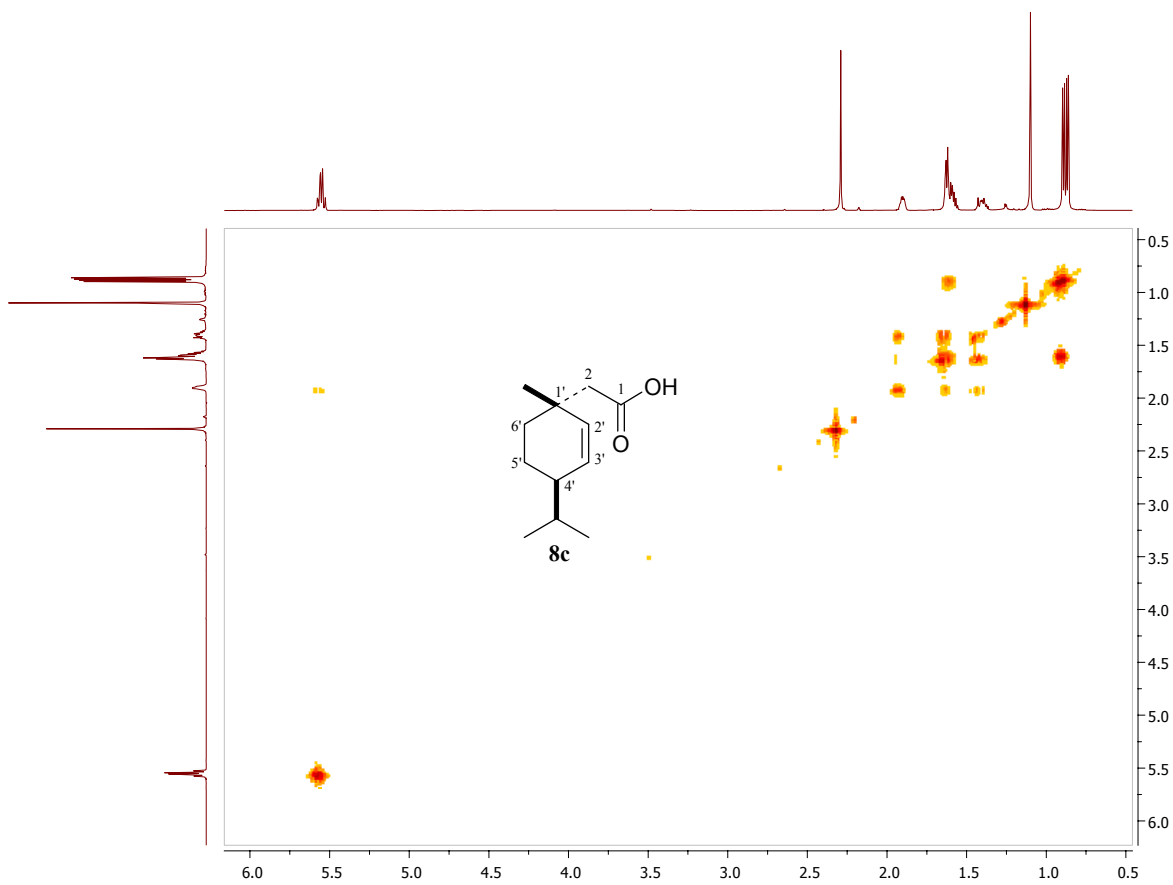
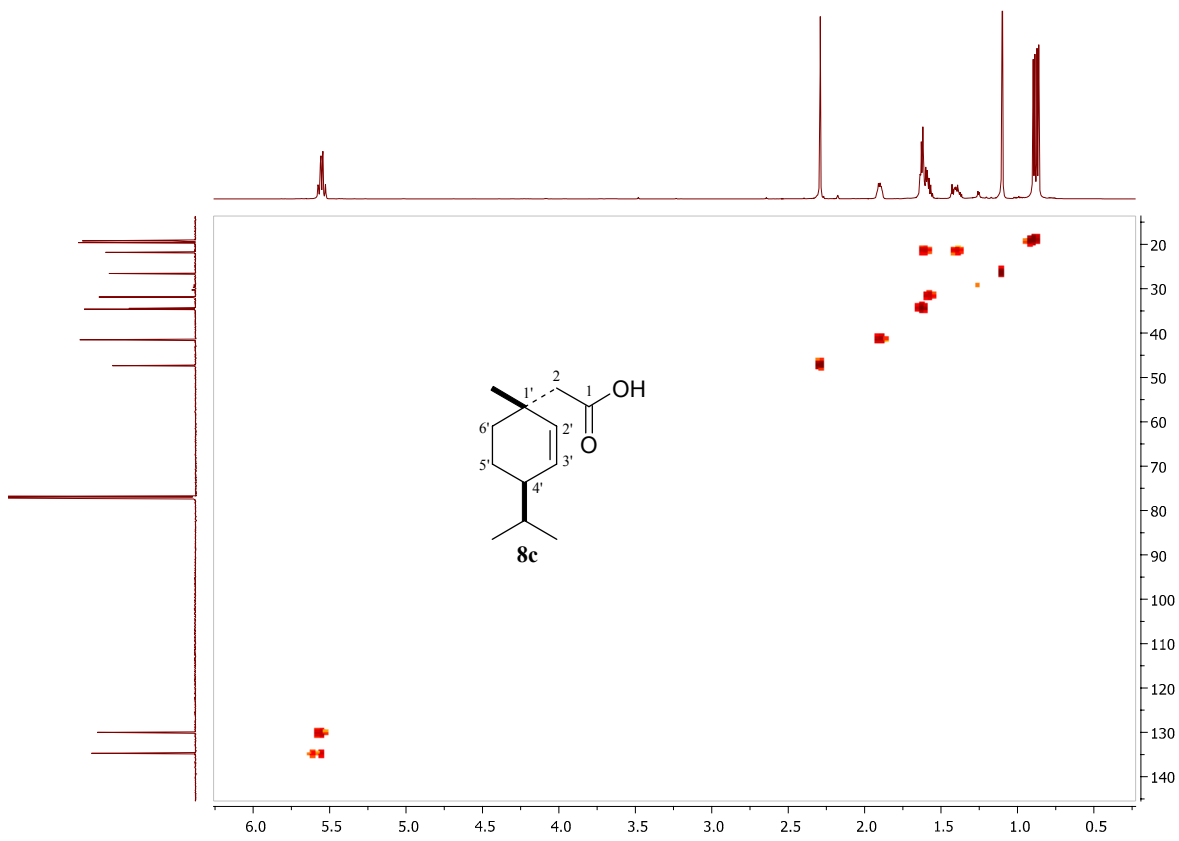
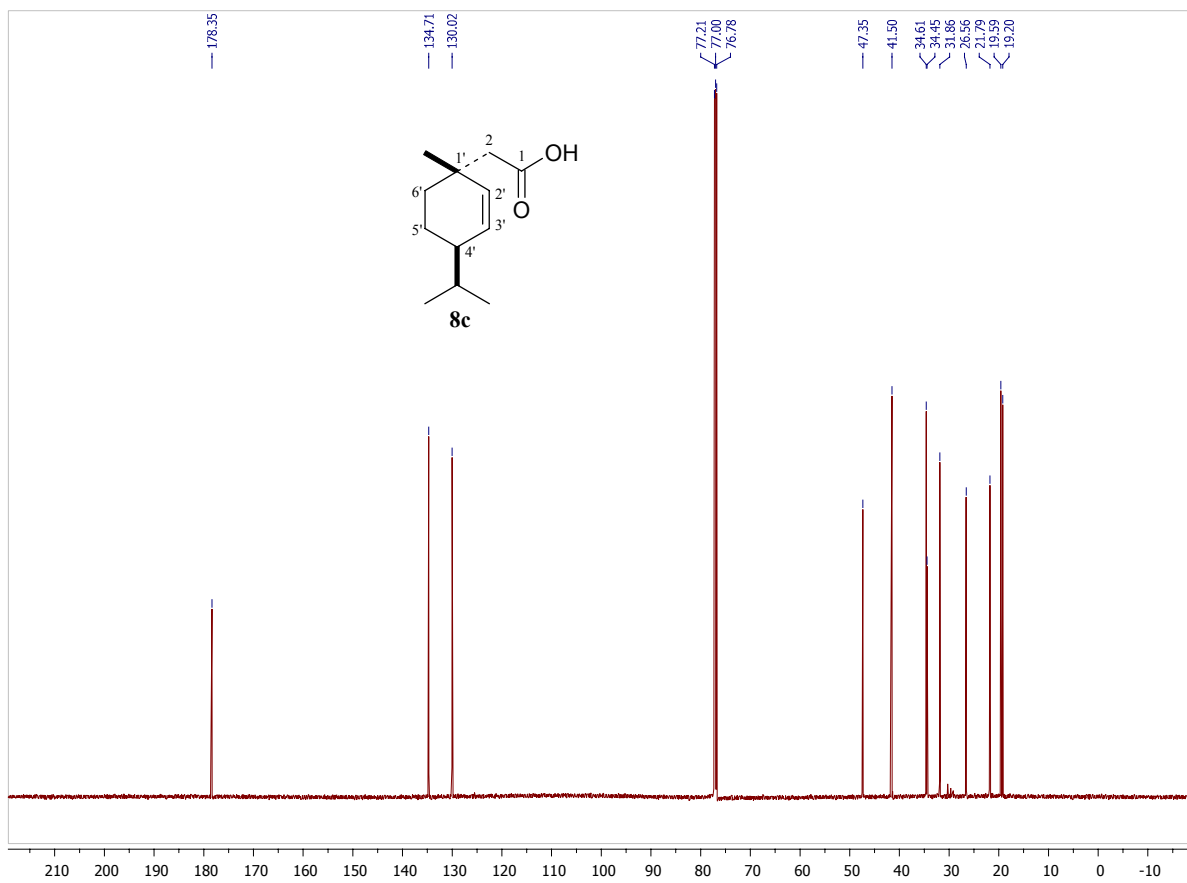


Fig. 22. COSY spectrum of **8c**.



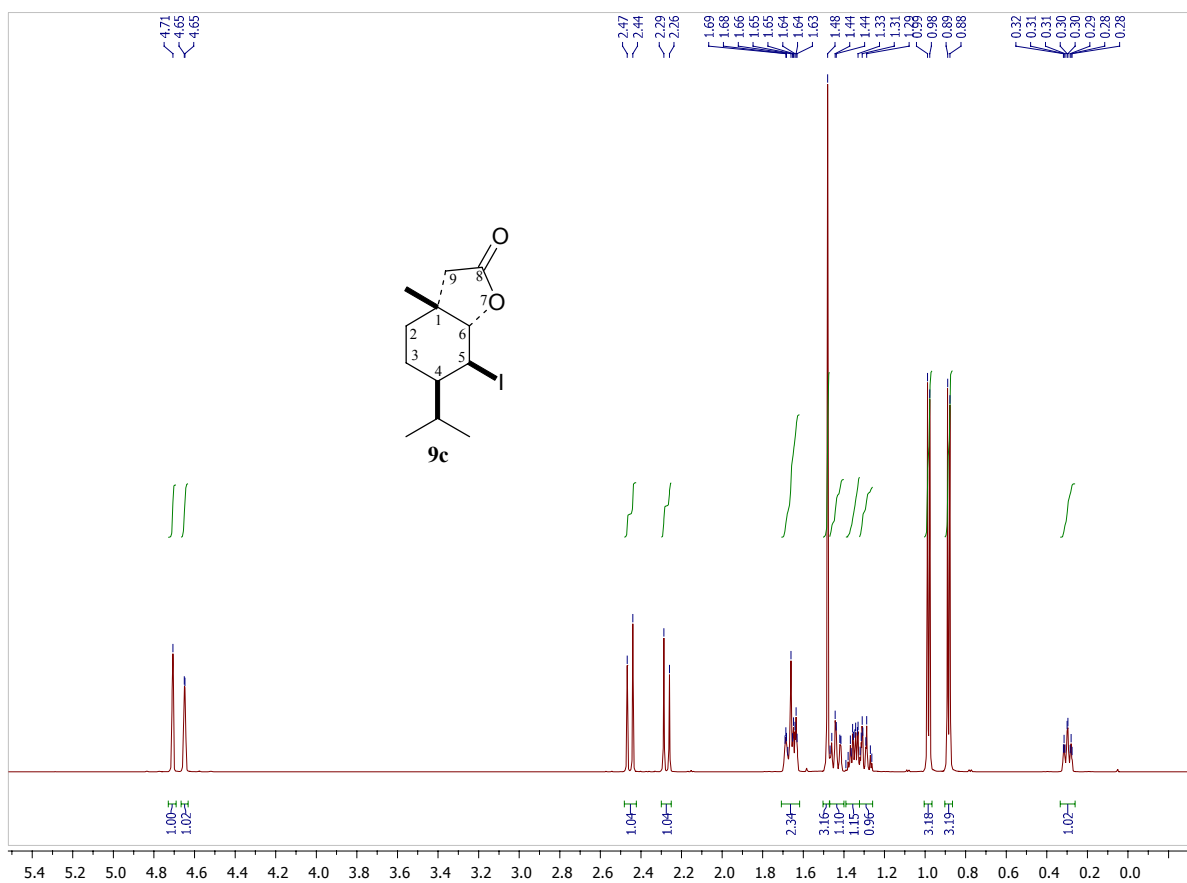


Fig. 25. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 600 MHz) spectrum of **9c**.

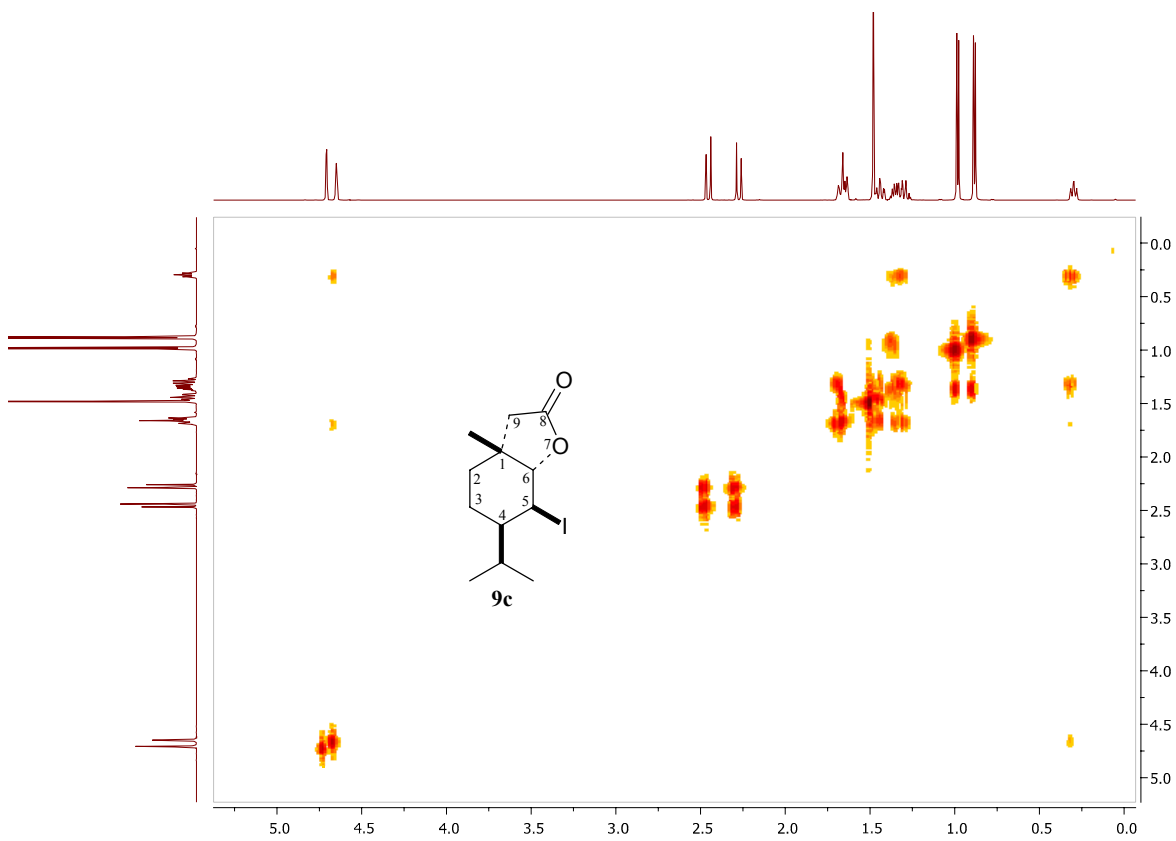
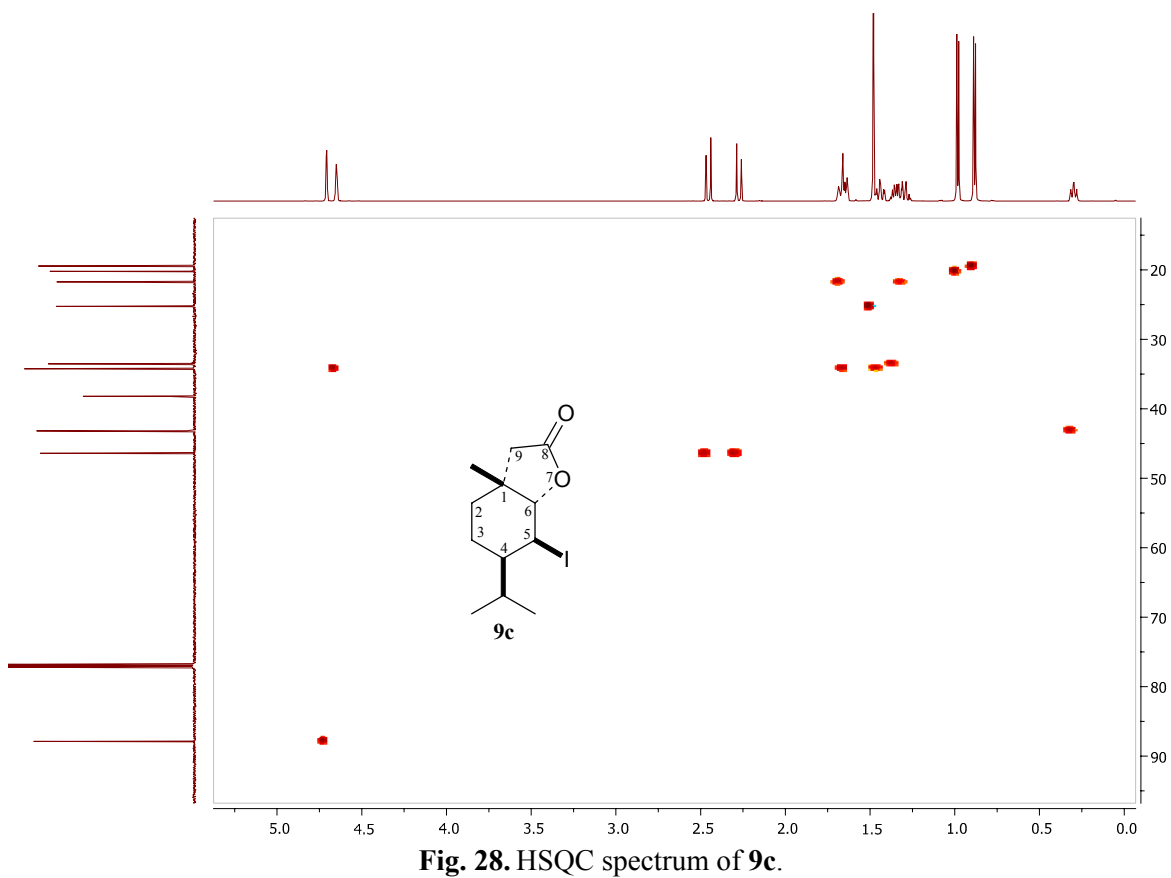
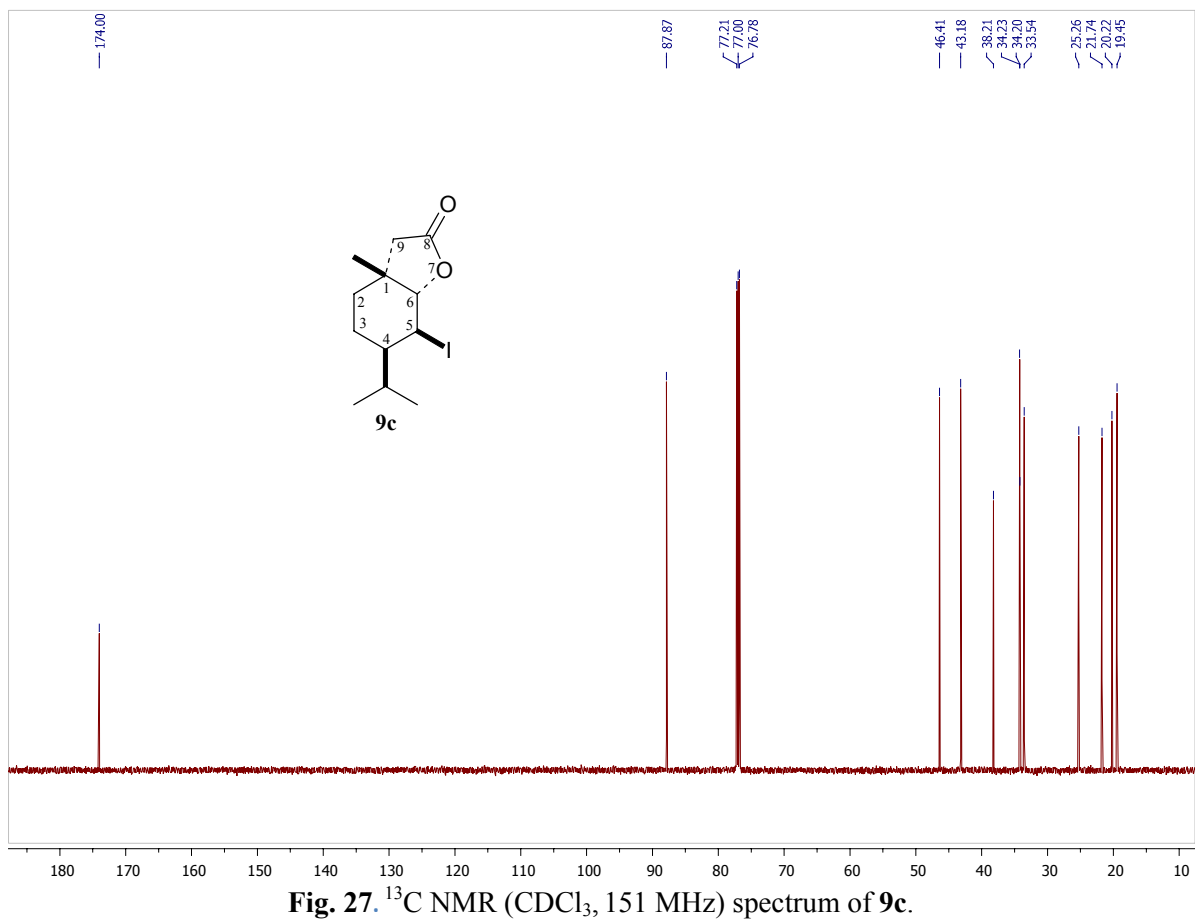


Fig. 26. COSY spectrum of **9c**.



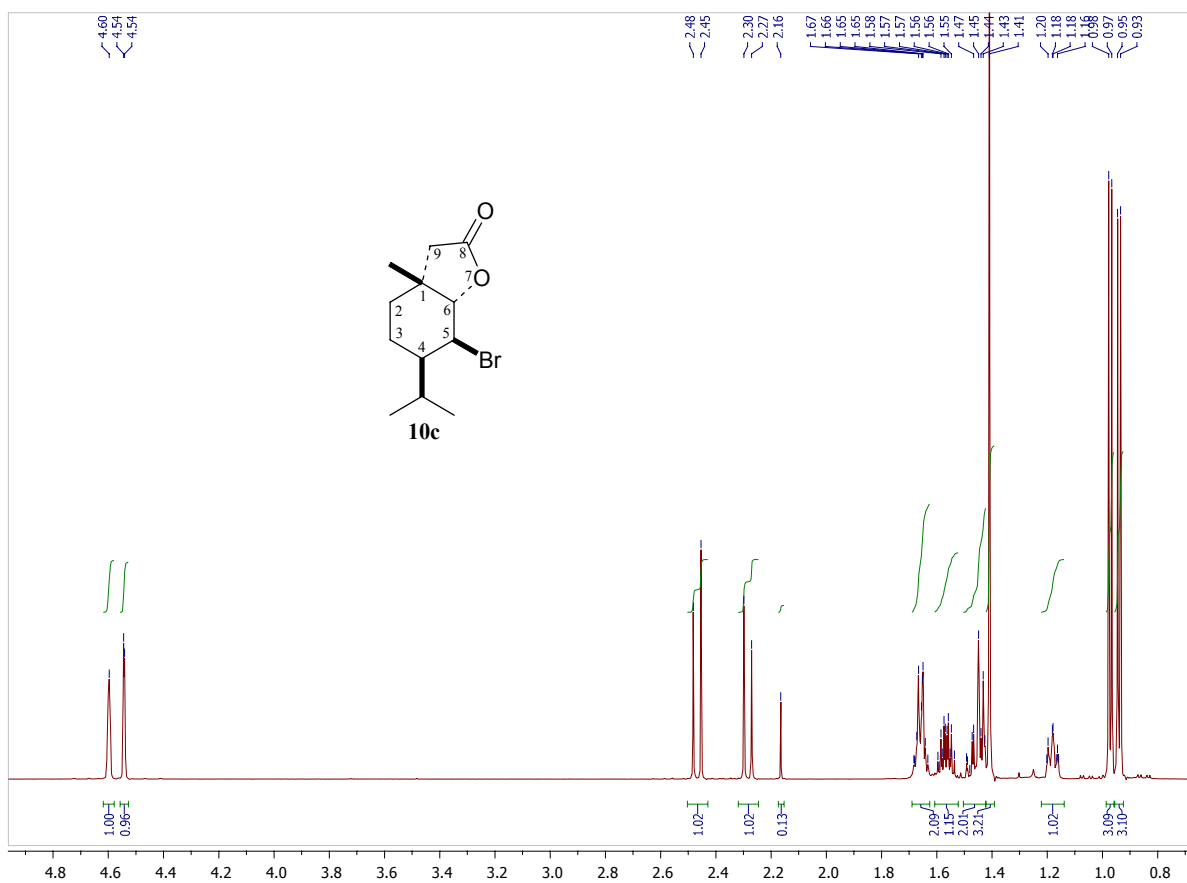


Fig. 29. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 600 MHz) spectrum of **10c**.

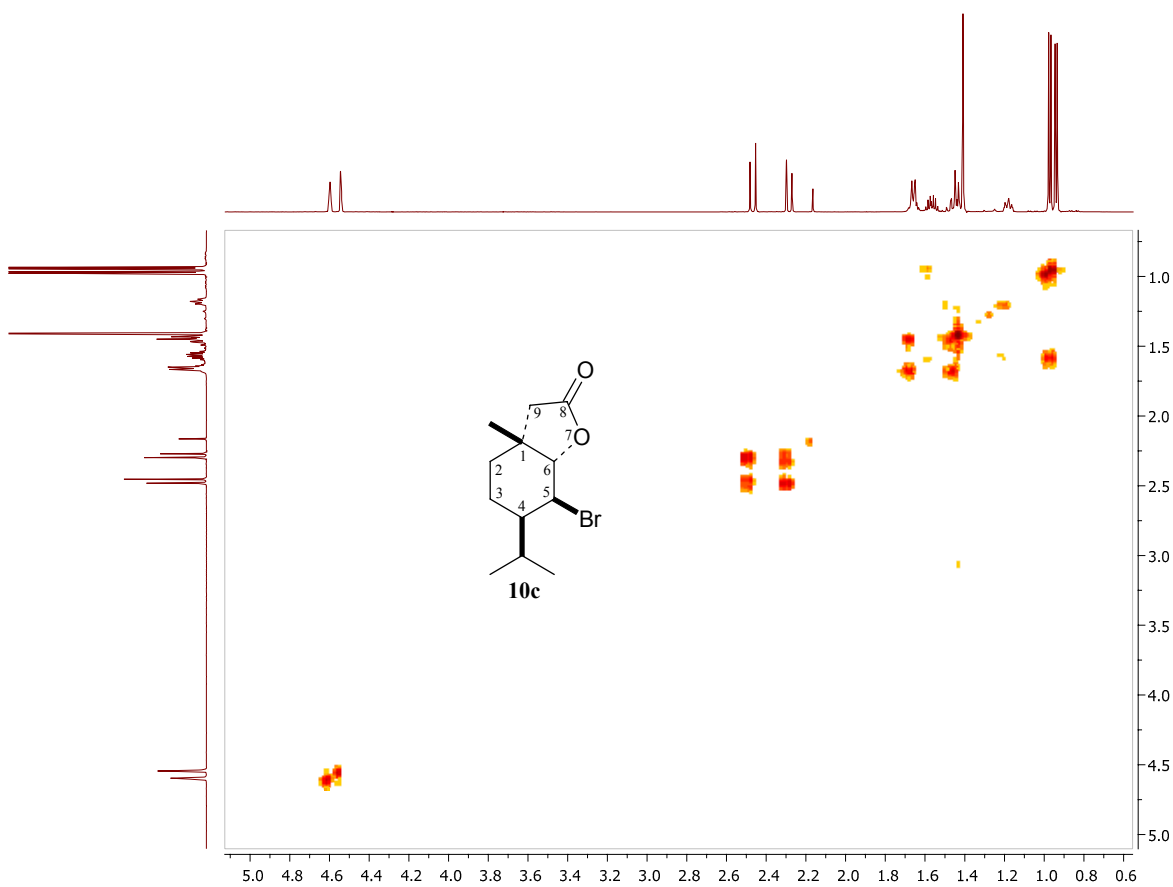


Fig. 30. COSY spectrum of **10c**.



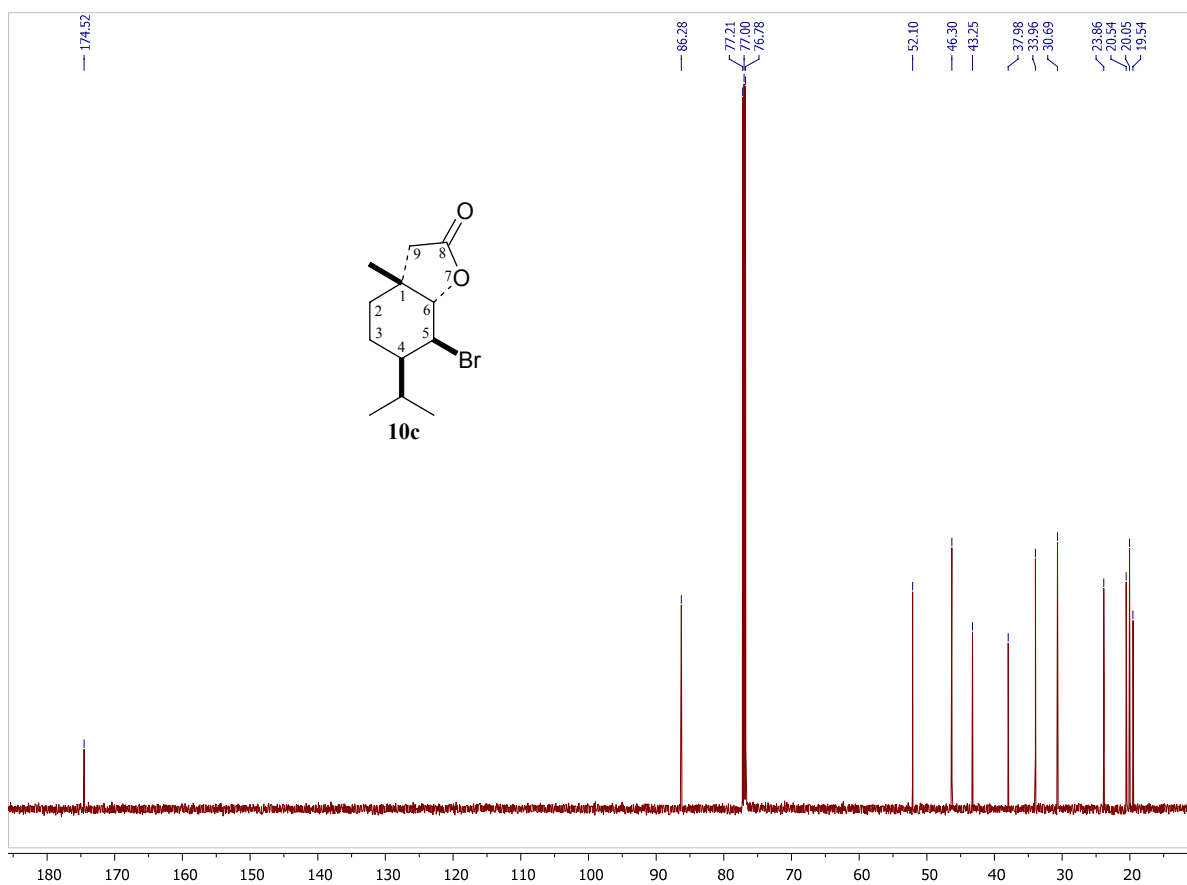


Fig. 31.  $^{13}\text{C}$  NMR (CDCl<sub>3</sub>, 151 MHz) spectrum of **10c**.

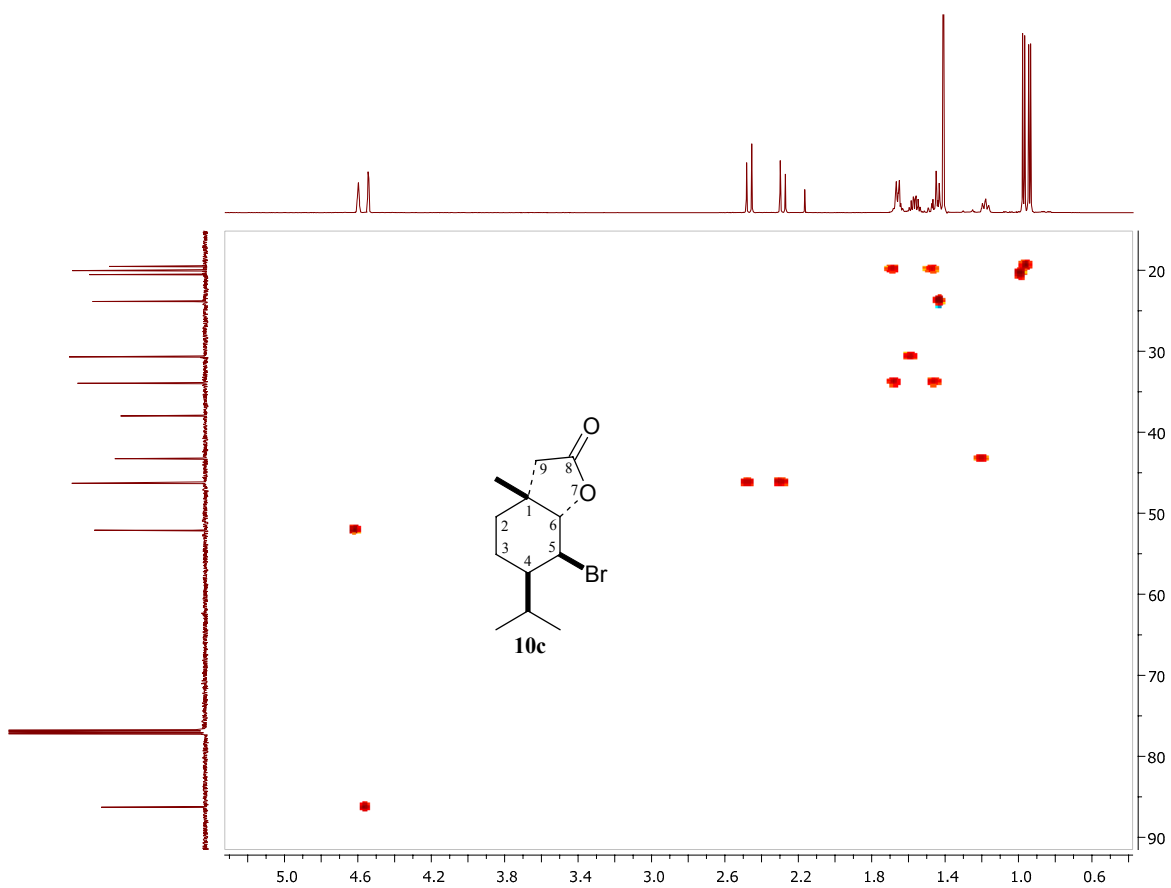


Fig. 32. HSQC spectrum of **10c**.

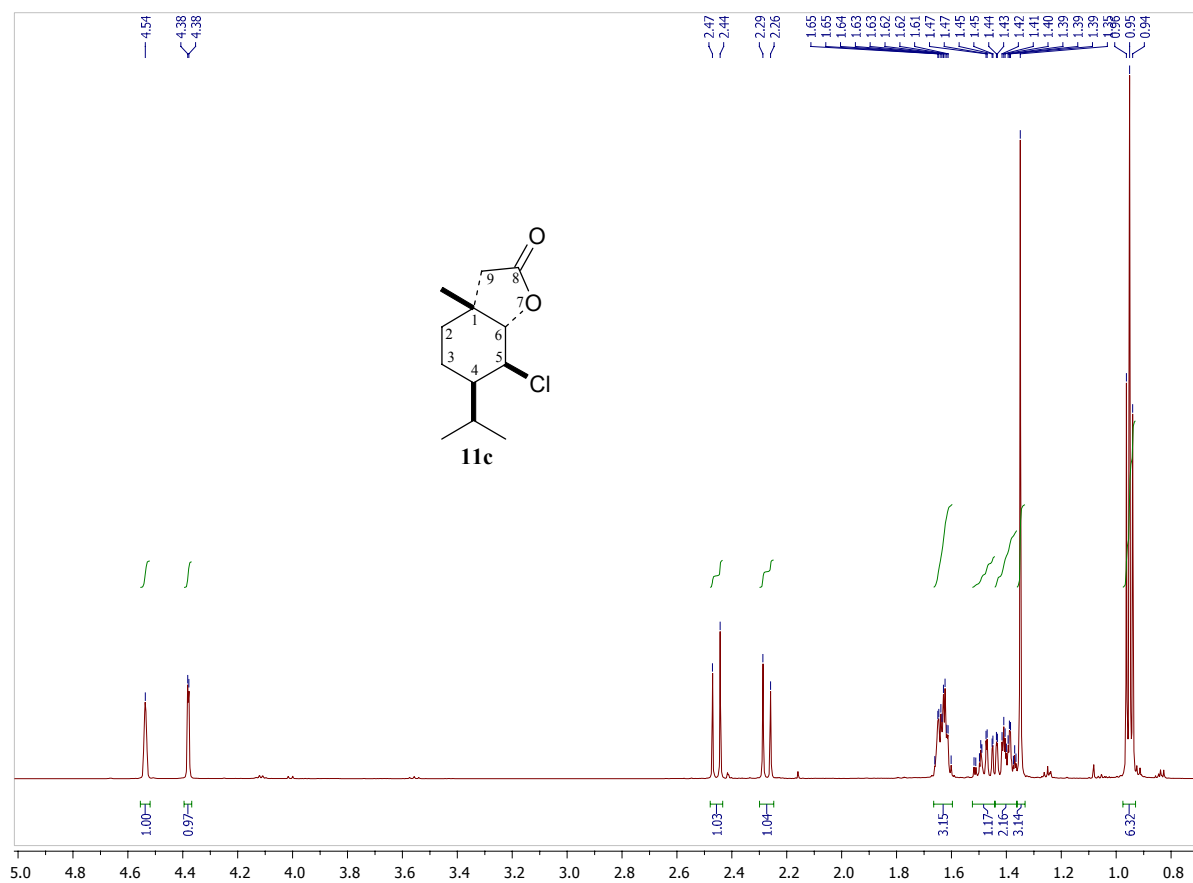


Fig. 33. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 600 MHz) spectrum of **11c**.

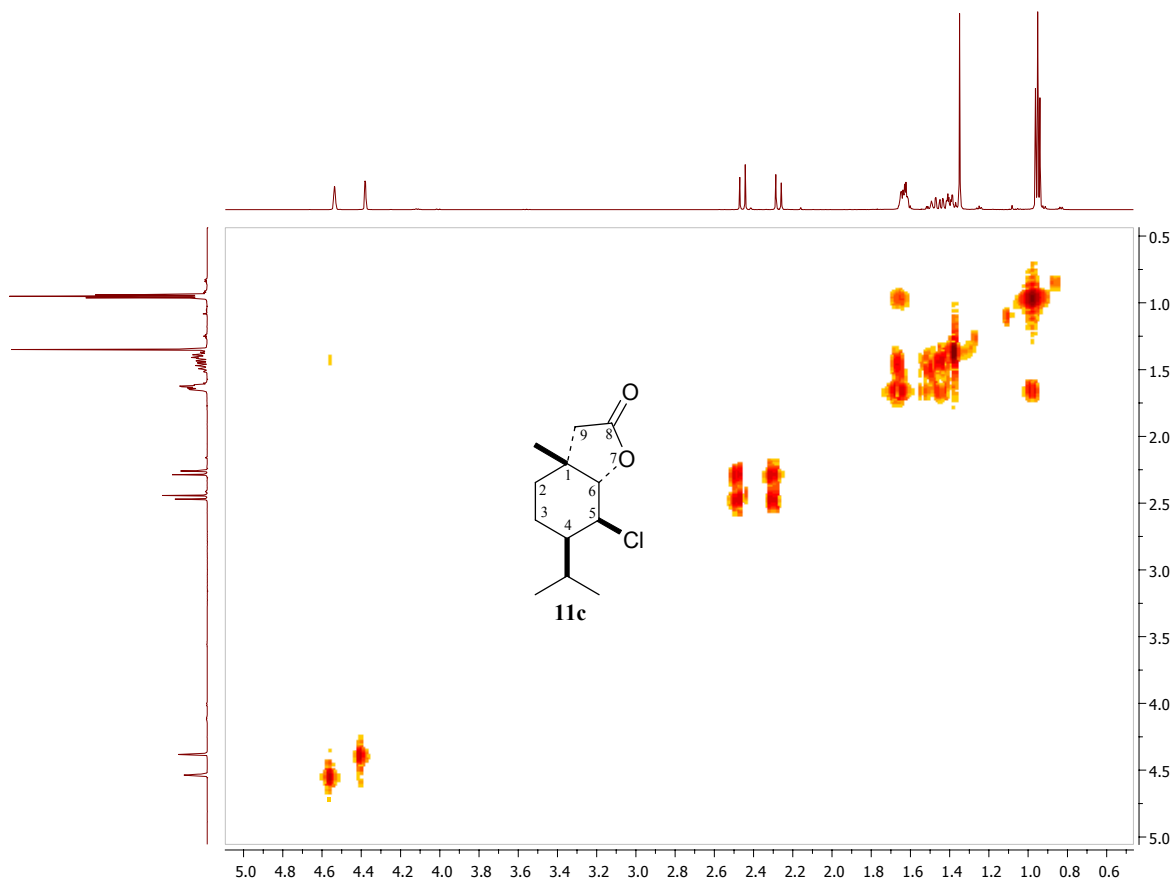


Fig. 34. COSY spectrum of **11c**.

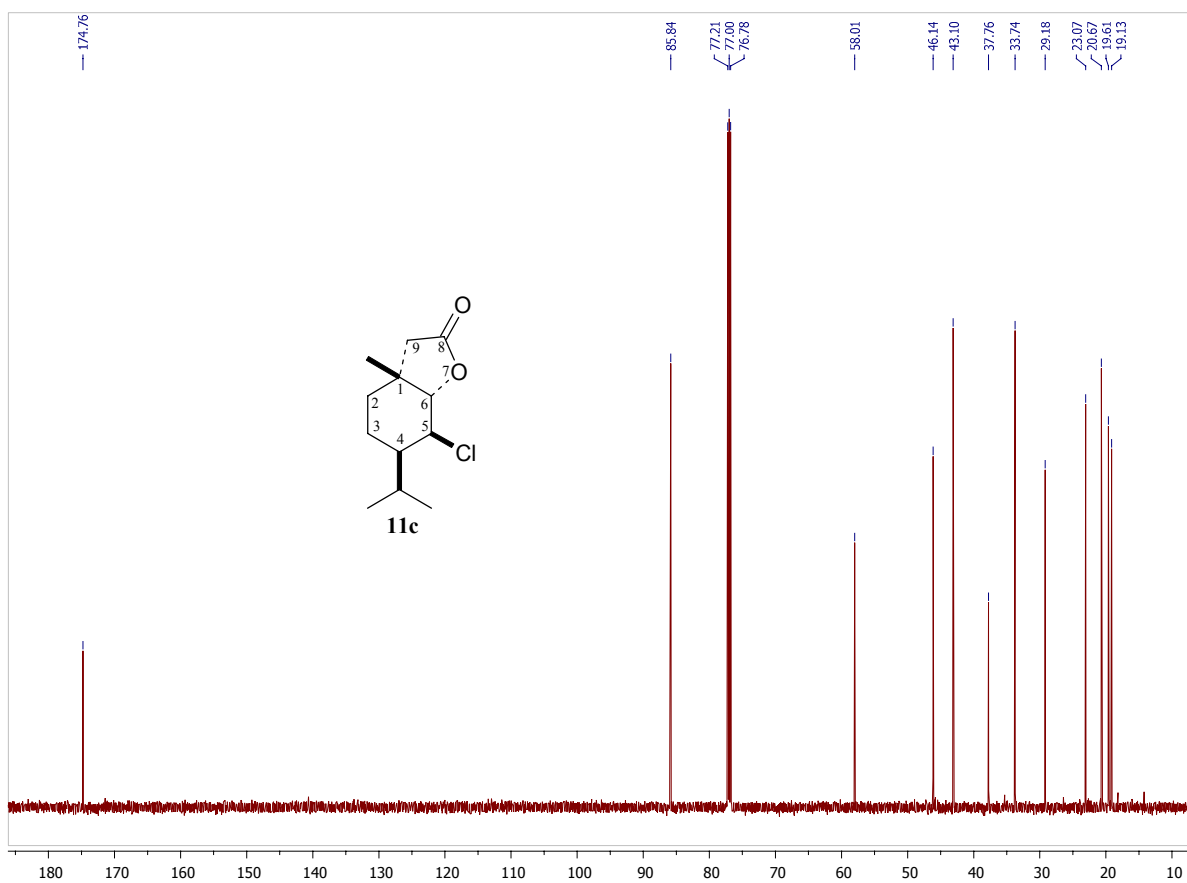


Fig. 35. <sup>13</sup>C NMR (CDCl<sub>3</sub>, 151 MHz) spectrum of **11c**.

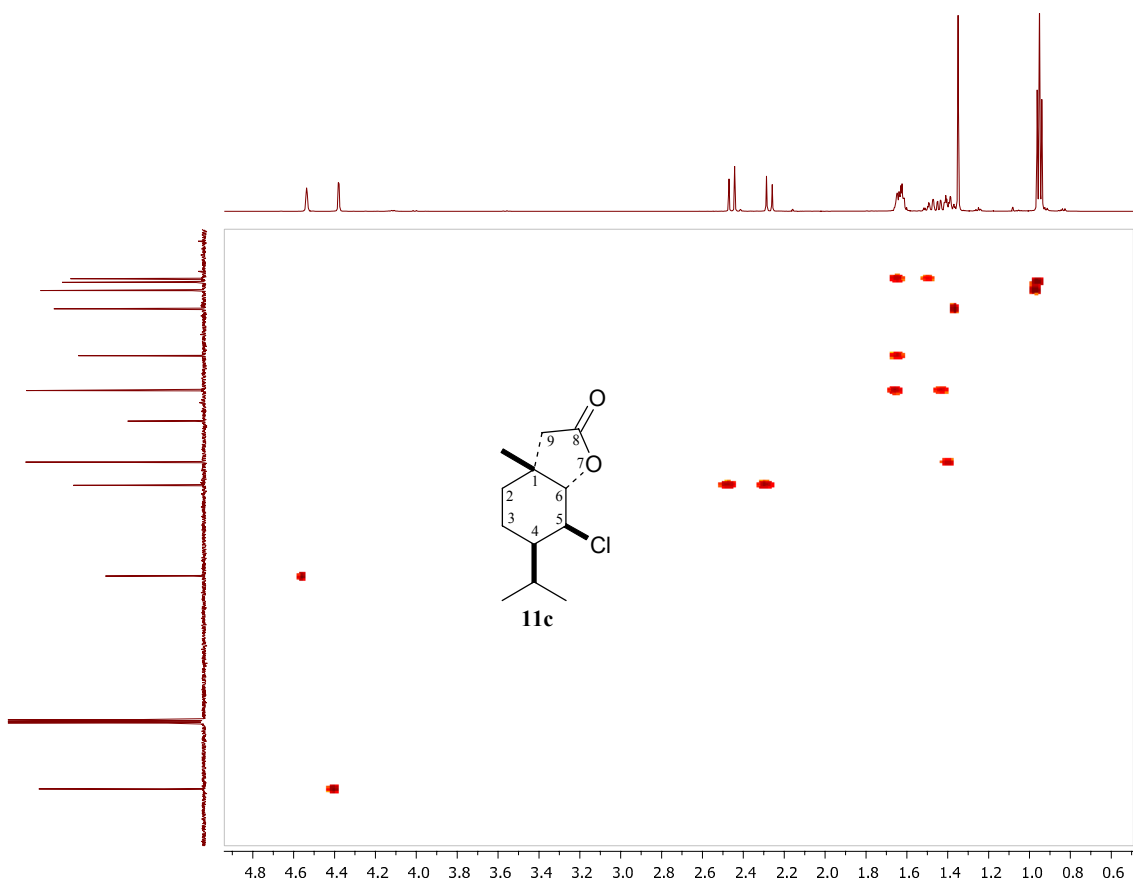
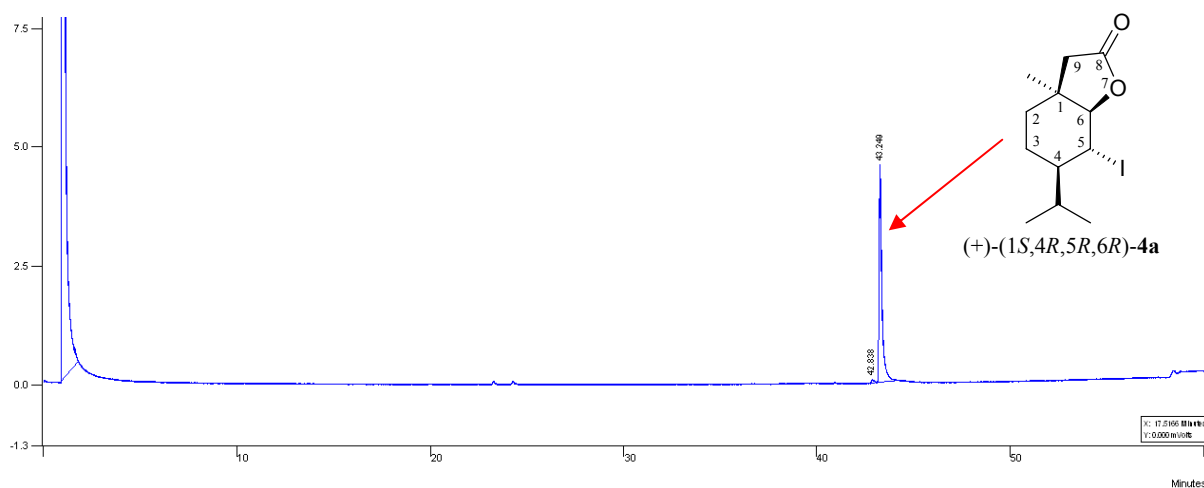
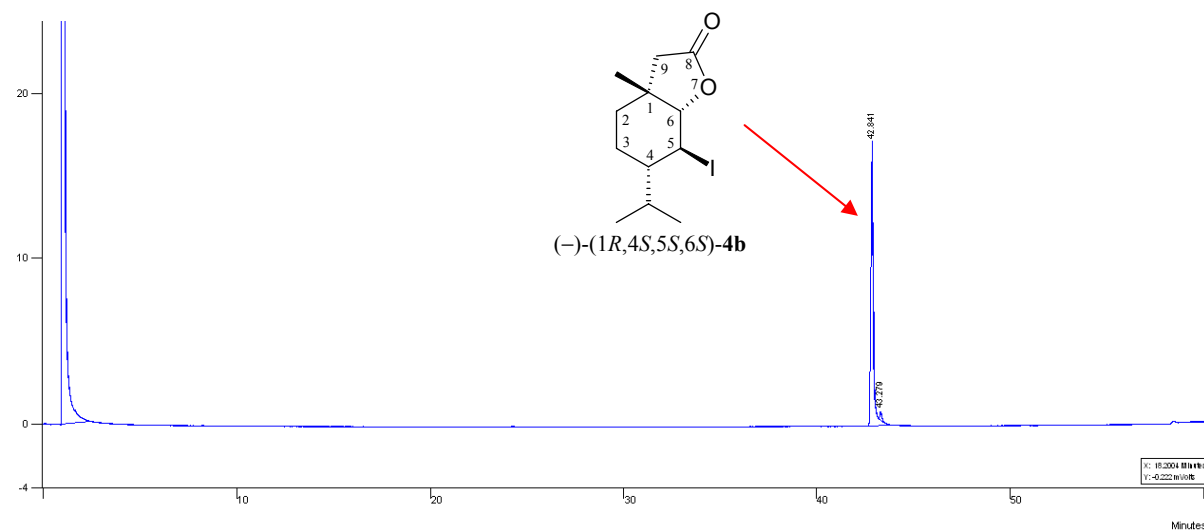


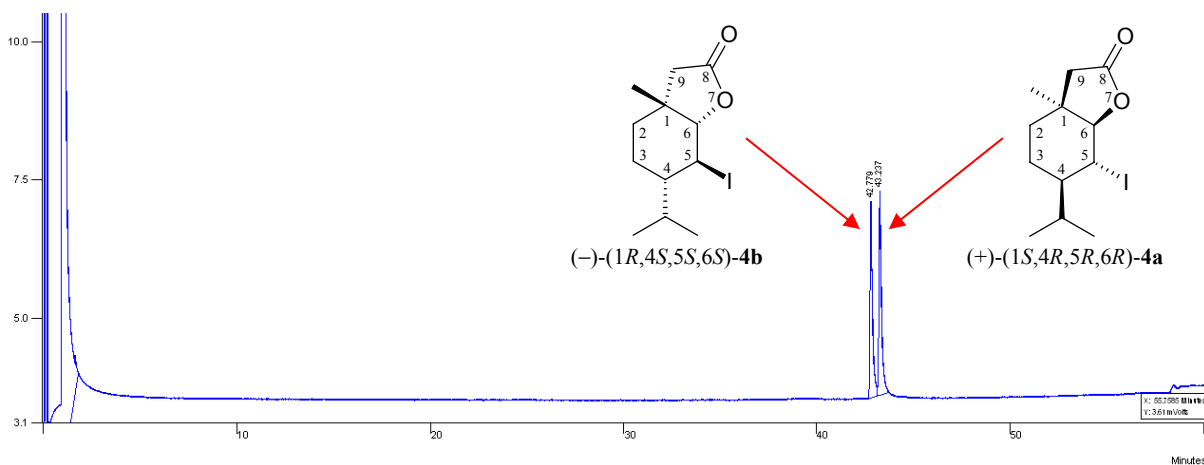
Fig. 36. HSQC spectrum of **11c**.



**Fig. 37.** CGC chromatogram of (+)-**4a** (ee = 97%).



**Fig. 38.** CGC chromatogram of (-)-**4b** (ee = 96%).



**Fig. 39.** CGC chromatogram of (±)-**4c**.

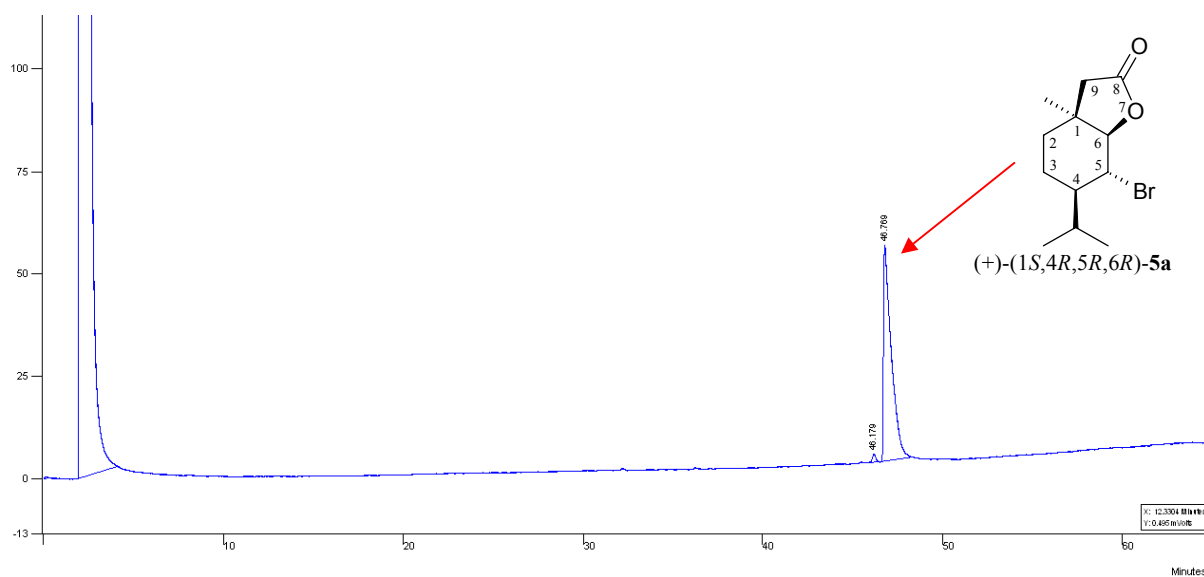


Fig. 40. CGC chromatogram of (+)-5a (ee = 97%).

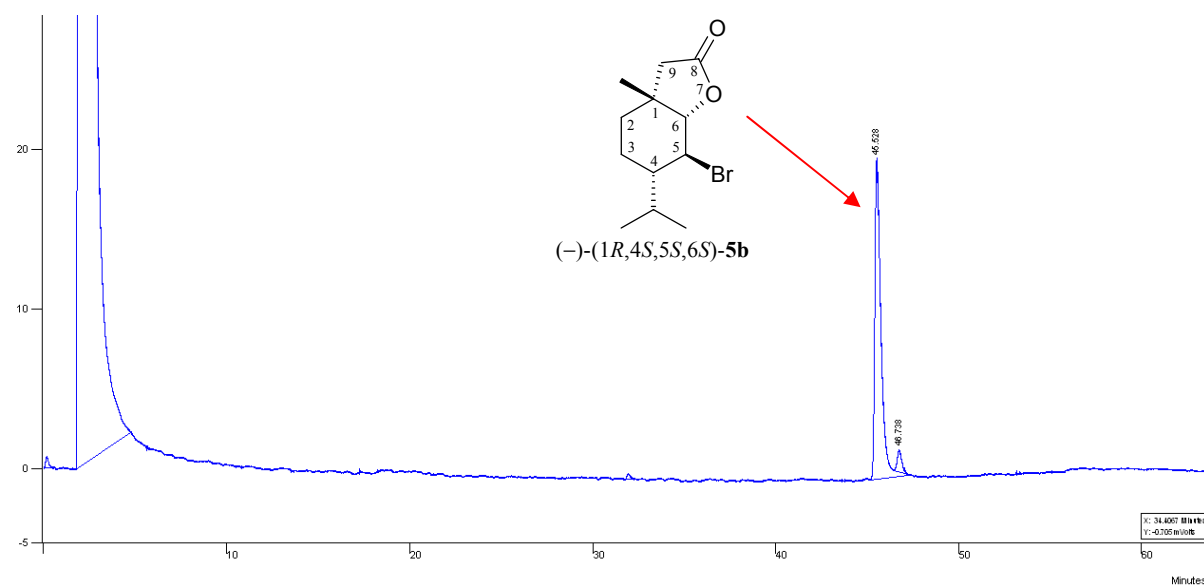


Fig. 41. CGC chromatogram of (-)-5b (ee = 91%).

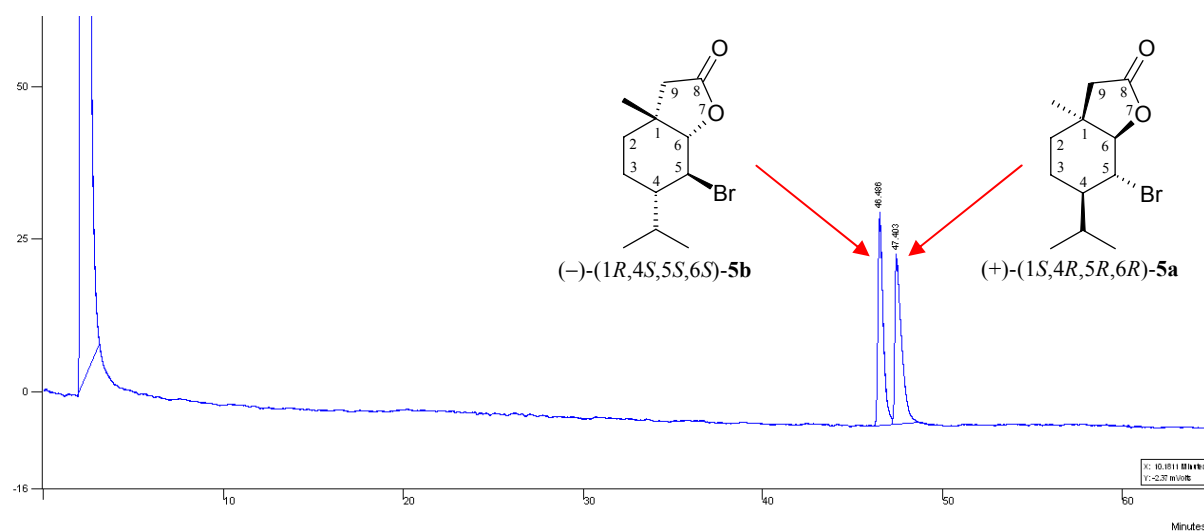


Fig. 42. CGC chromatogram of (±)-5c.

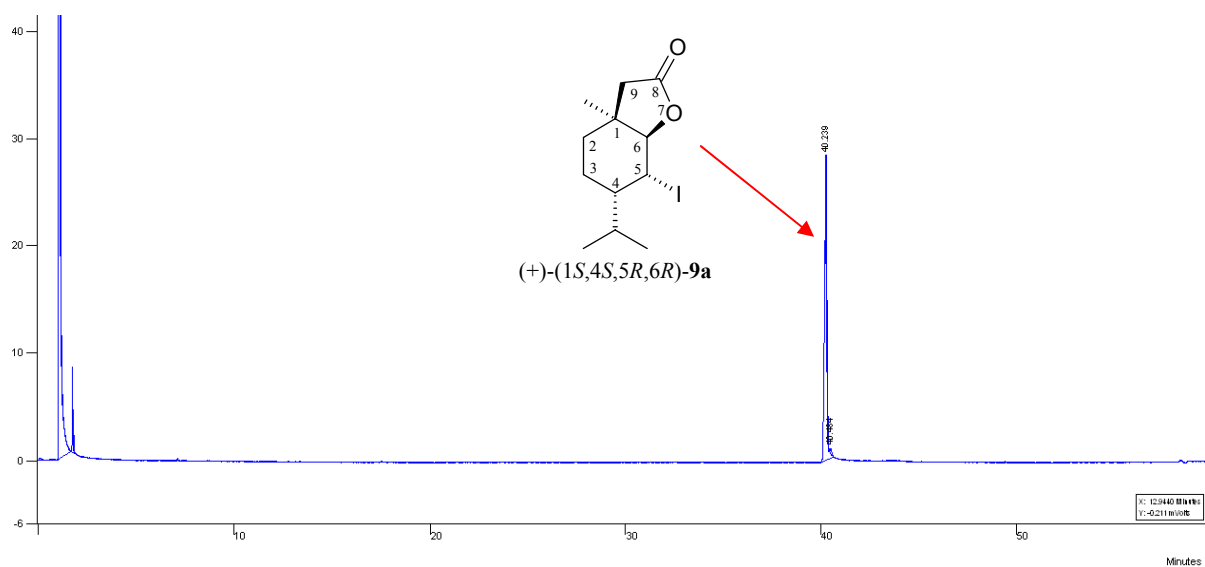


Fig. 43. CGC chromatogram of (+)-**9a** (ee = 98%).

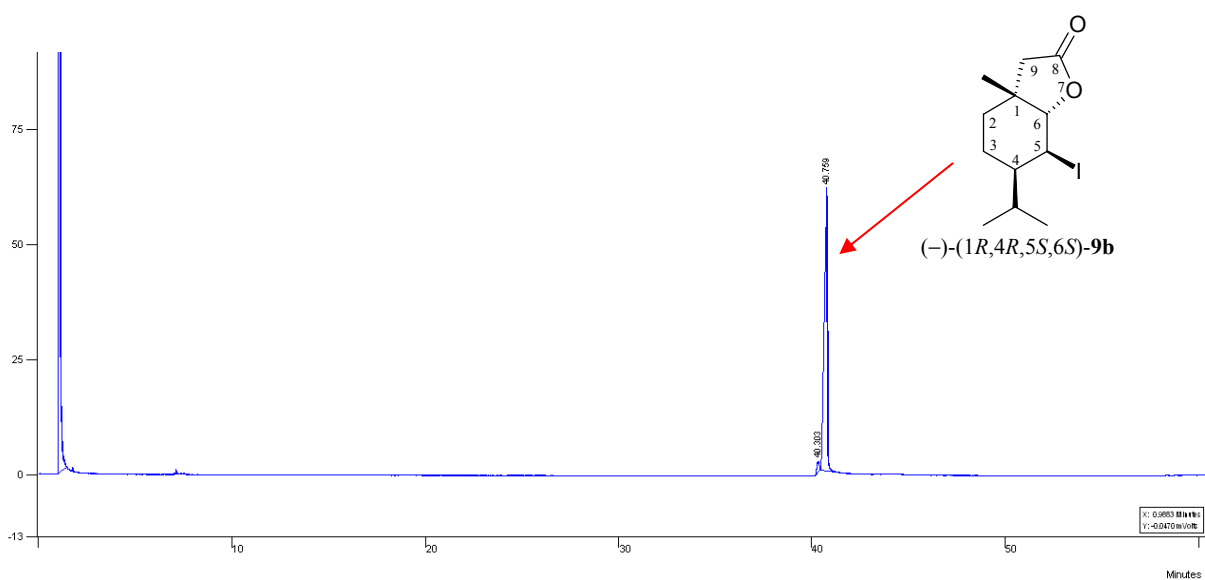


Fig. 44. CGC chromatogram of (-)-**9b** (ee = 94%).

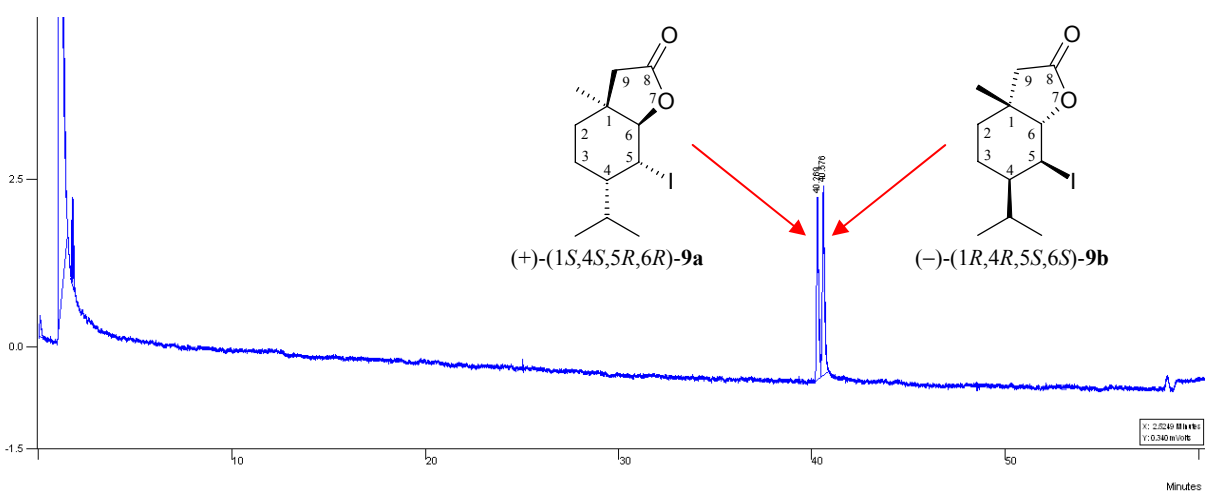


Fig. 45. CGC chromatogram of (±)-**9c**.

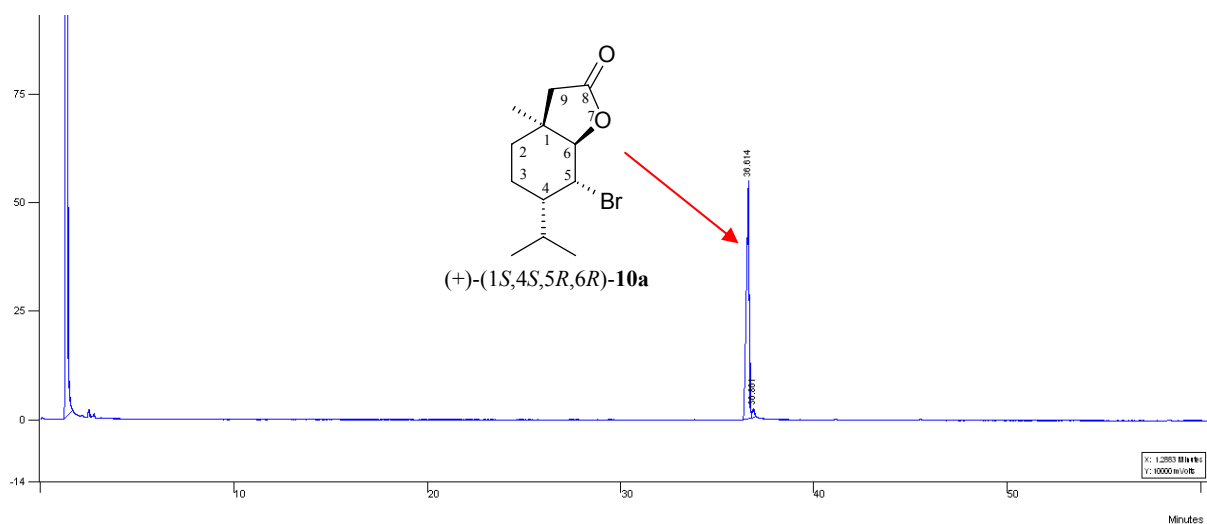


Fig. 46. CGC chromatogram of (+)-10a (ee = 94%).

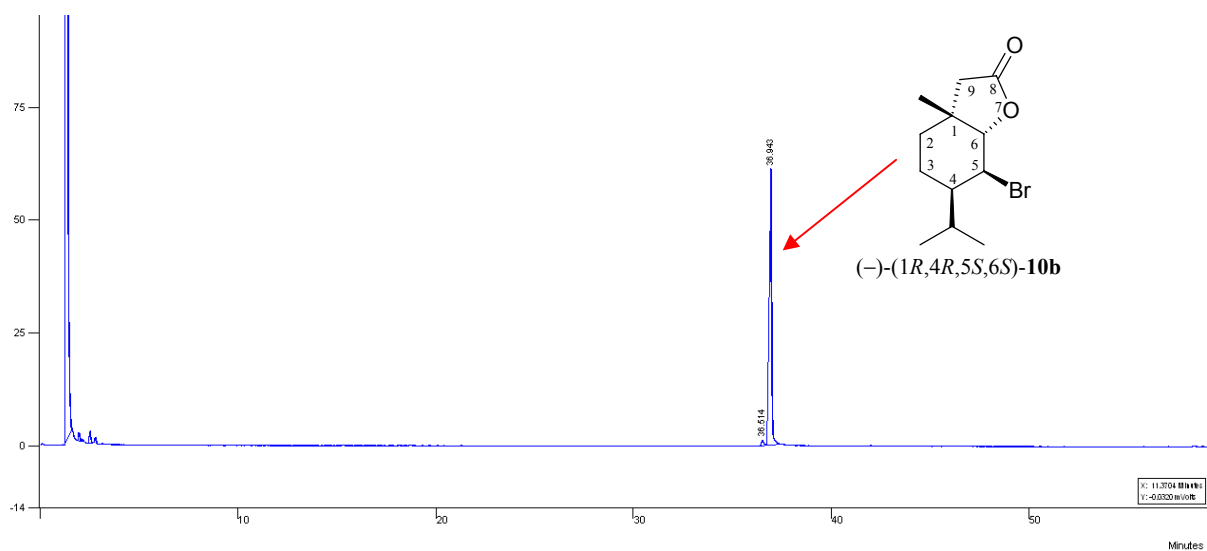


Fig. 47. CGC chromatogram of (-)-10b (ee = 96%).

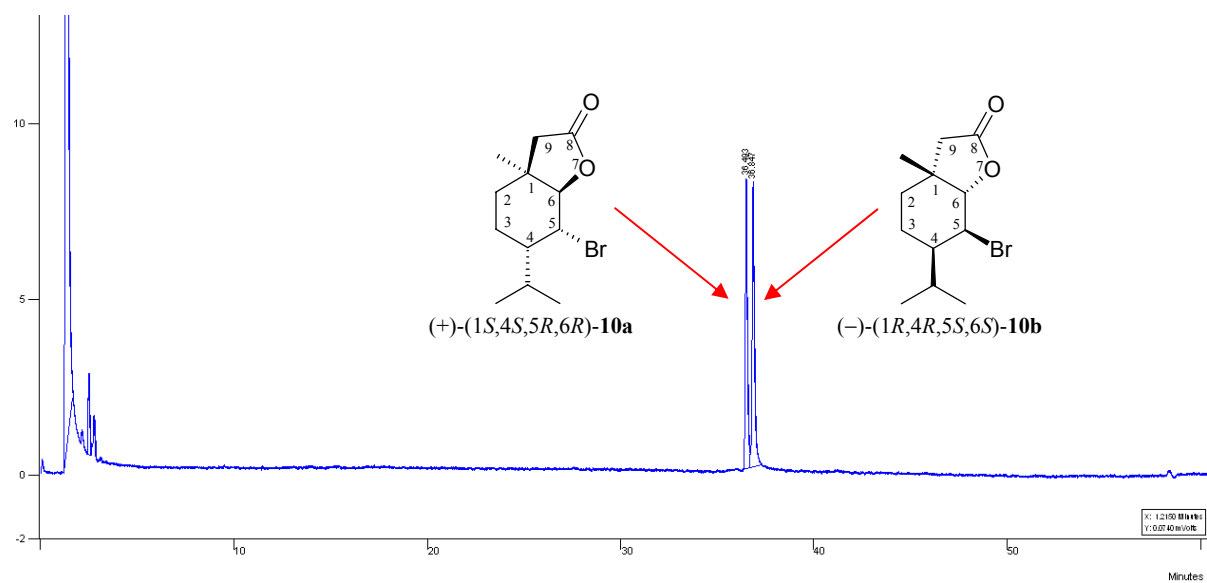
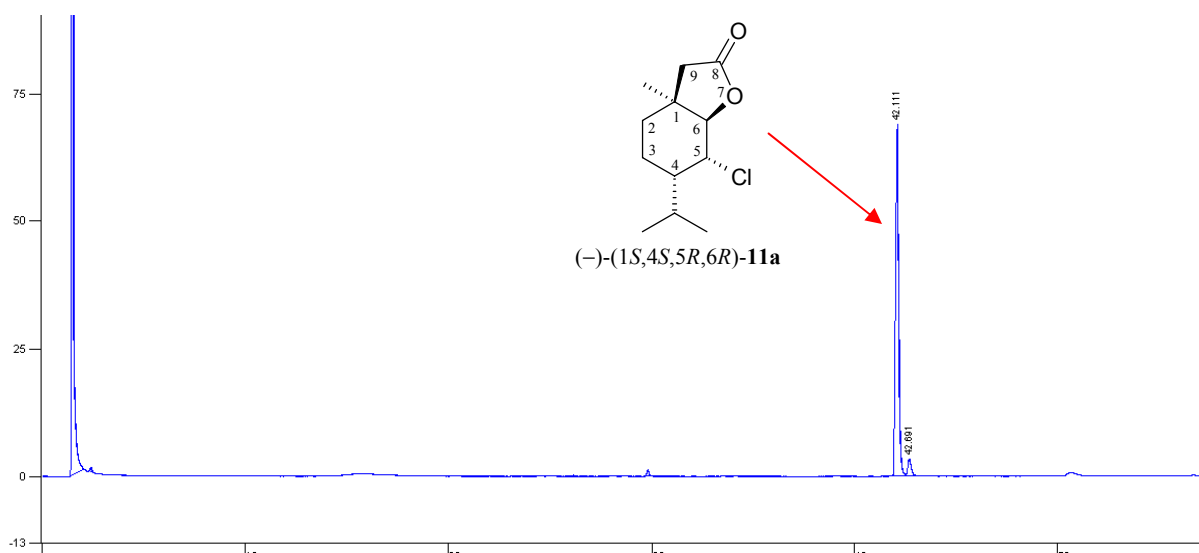
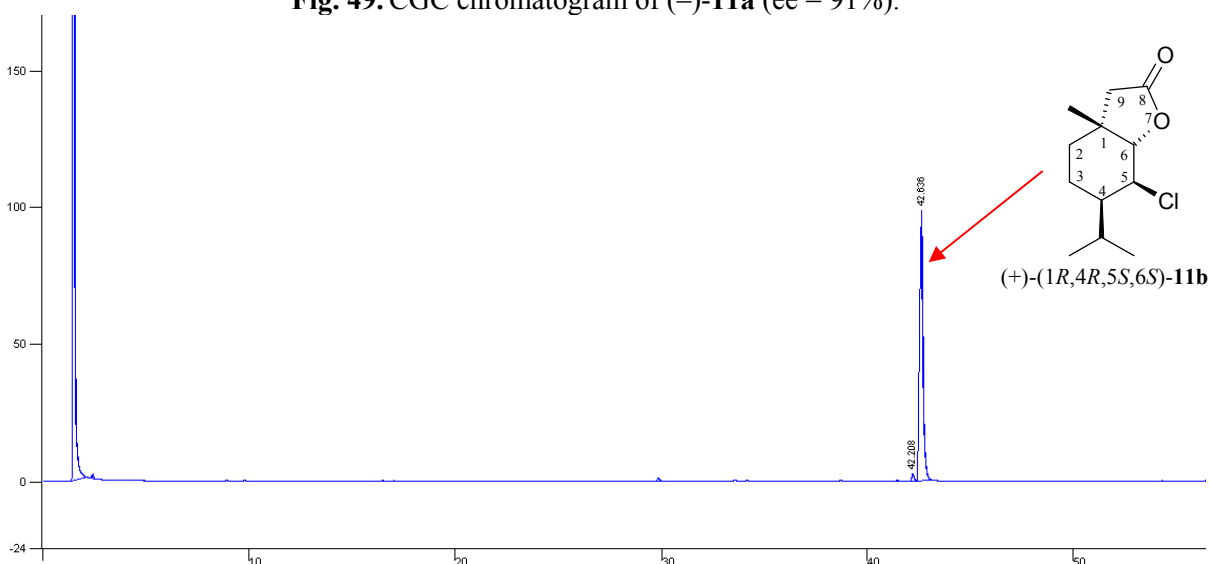


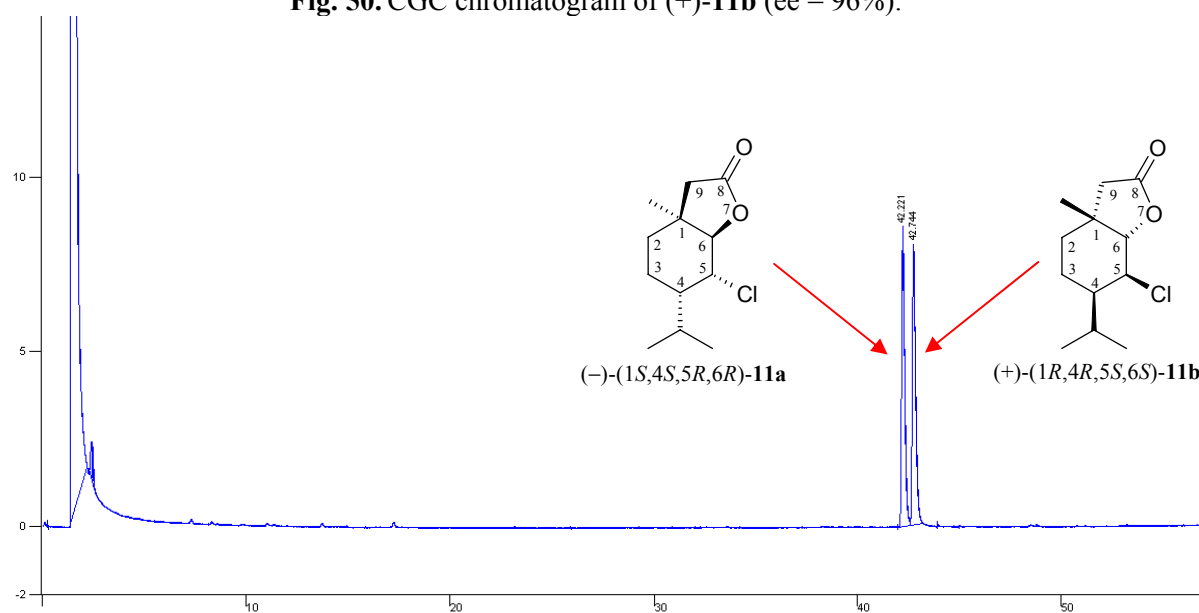
Fig. 48. CGC chromatogram of (±)-10c.



**Fig. 49.** CGC chromatogram of (-)-11a (ee = 91%).



**Fig. 50.** CGC chromatogram of (+)-11b (ee = 96%).



**Fig. 51.** CGC chromatogram of (±)-11c.