Synthesis and properties of ferro- and antiferroelectric esters with a chiral centre based on (S)-(+) -3-octanol

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The structure of the final compounds was confirmed by $^1$H NMR and $^{13}$C NMR nuclear magnetic resonance. NMR spectra were obtained with a Bruker AvanceIII HD 500 MHz spectrometer (field 11.7 T) operating at 500 MHz ($^1$H) and 125 MHz ($^{13}$C); with CDCl$_3$ as the eluent [19]. NMR spectra of all samples were measured at room temperature. Comparison of NMR spectra confirmed the compliance of real structures with the planned structures. The $^1$H NMR spectra of new compounds are shown in Figures 10-21.

Figure 10. $^1$H NMR spectra of compound II.3.(HH) (S) in CDCl$_3$. 
Figure 11. $^1$H NMR spectra of compound II.3.(FF) (S) in CDCl$_3$.

Figure 12. $^1$H NMR spectra of compound II.4F3(HH) (S) in CDCl$_3$. 
Figure 13. $^1$H NMR spectra of compound II.4F3(HF) (S) in CDCl$_3$.

Figure 14. $^1$H NMR spectra of compound II.5.(HH) (S) in CDCl$_3$. 
Figure 15. $^1$H NMR spectra of compound II.6.(HH) (S) in CDCl$_3$.

Figure 16. $^1$H NMR spectra of compound II.5.(HF) (S) in CDCl$_3$. 
Figure 17. $^1$H NMR spectra of compound II.6.(HF) (S) in CDCl$_3$.

Figure 18. $^1$H NMR spectra of compound II.5.(FF) (S) in CDCl$_3$. 
Figure 19. $^1$H NMR spectra of compound II.6. (FF) (S) in CDCl$_3$.

Figure 20. $^1$H NMR spectra of compound II.5. (FH) (S) in CDCl$_3$. 
Figure 21. $^1$H NMR spectra of compound II.6.(FH) (S) in CDCl$_3$. 