Properties of racemic and enantiomeric 4'-(1-methylheptyloxycarbonyl)biphenyl-4-yl 4-[3-(2,2,3,3,4,4,4-heptafluorobutoxy)prop-1-oxy]benzoates

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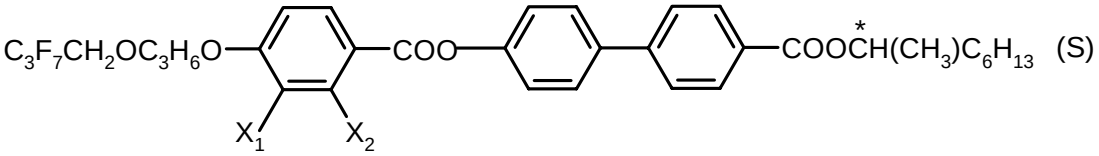
Since few years we have been intensively searching for new orthoconic antiferroelectric liquid crystals with improved properties, which produce perfect dark state and in the consequence very high contrast [1]. They are very perspective for many applications.

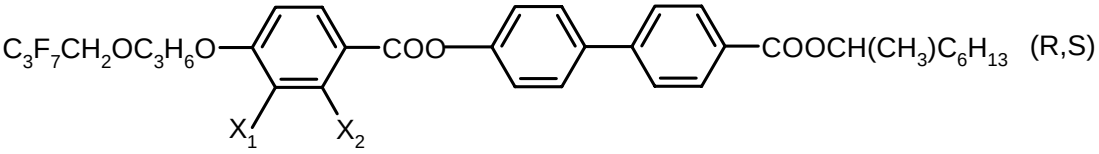
Eight structurally similar esters expressed by general formulas:

I.



Ib=Cr 39.1 SmC_A^* 87.8 Iso

II.



IIb=Cr 60.4 SmC_A 87.0 SmC 88.0 Iso

where a) $X_1=X_2=H$, b) $X_1=H$, $X_2=F$, c) $X_1=F$, $X_2=H$ and d) $X_1=X_2=F$ will be described.

Four enantiomeric (S) and four racemic (R,S) materials were synthesized and characterized. Their mesomorphic properties, such as phase transitions temperatures and enthalpies were measured by polarizing optical microscope and differential scanning calorimetry. All the compounds Ia-Id have only the anticlinic phase in a broad temperature range. The racemic analogouses IIa-IId show also the SmC phase below the isotropic phase, what is shown on the example above. The compounds enable the formulation of orthoconic antiferroelectric mixtures with very long pitch. Examples of mixtures and their electrooptical properties will be also presented.

References

(1) S. Lagerwall, A. Dahlgren, P. Jagemal, P. Rudquist, K. D'have, H. Pauwels, R. Dąbrowski, W. Drzewiński, *Adv.Funct.Mater*. **2001**, *11*, 87-94