

Dimers with chiral spacer – novel material with puzzling properties

Lesac, Andreja*; Ožegović, Antonija*; Šimanović, Aleksandra; Dokli, Irena; Knežević, Anamarija; Šegota, Suzana

*Corresponding author: Andreja.Lesac@irb.hr

Ruđer Bošković Institute, Zagreb, Croatia

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Liquid-crystalline dimers are intriguing materials due to their unique mesomorphism,[1] spontaneous chiral N_{TB} phase formation,[2] and their ability to stabilize specific properties important for technology when used in mixtures.[3] However, dimers with a chiral spacer are rare.

The synthesis and mesomorphic behavior of a novel series of dimers containing 3-aryl-3-hydroxypropanoic ester subunit (Fig. 1) will be presented. The chiral moiety containing the hydroxyl group at the stereogenic center was successfully incorporated into the spacer without losing liquid-crystalline properties in the bent-shaped dimers. These dimers were prepared in both racemic and enantiomerically pure forms, with different spacer lengths, parity, and aromatic mesogenic units. The discussion will focus on the impact of spacer chirality and parity, as well as the effect of different aromatic mesogenic units on chirality transfer from molecular to multiple levels of structural chirality.

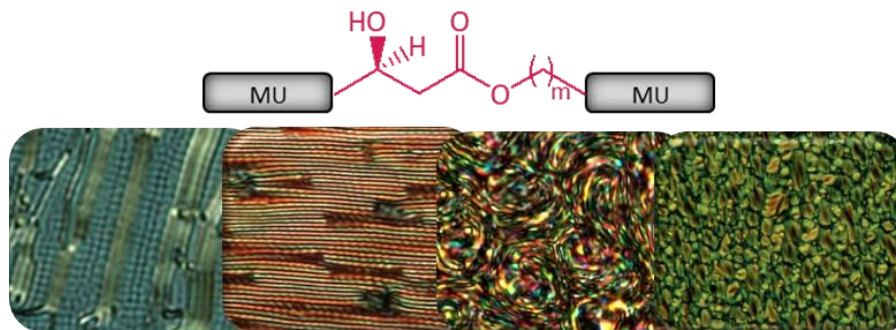


Figure 1: General structure of the chiral dimers and some of their unusual POM textures

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