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Liquid-crystalline polymorphism of fatty acids esters with 4-nitroazobenzene derivatives

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Contemporary LCD industry is still looking for new materials with very specific physical properties. The azobenzene moiety is very comfortable fragment in designing and synthesis of new structures, giving stable mesophase often with very interesting polymorphism. Additional useful property of azobenzenes for modern optics is their photosensitivity, which allows to design materials corresponding to light [1-3].

This communication will present the synthesis and characterization of two liquid crystal homologous series based on 4-nitroazobenzene. To obtain a homologous series of compounds corresponding phenols were esterified with aliphatic carboxylic acids with presence of dicyclohexylcarbodiimide.

We examined and presented 30 calamitic compounds, 26 of them exhibit the presence of smectic A phase and/or nematic phase. Based on the polarization optical microscope observations and differential scanning calorimetric measurements we will discuss the impact of the length of acid moiety chain and number of aromatic rings for their liquid-crystalline properties. We checked the effect of irradiation for the trans-cis conformation of azobenzene moiety in tested derivatives.

References

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Primary author: PODRUCZNA, Marta (Faculty of Chemistry, University of Wrocław)

Co-author: Prof. GALEWSKI, Zbigniew (Faculty of Chemistry, University of Wrocław)

Presenter: PODRUCZNA, Marta (Faculty of Chemistry, University of Wrocław)

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