

Ferroelectric nematics with fluorine or chlorine at terminal part of the molecule

Pavlo Golub, Martin Cigl, Vladimíra Novotná*, Natalia Podoliak and Dalibor Repčák

Institute of Physics of the Czech Academy of Sciences,

Na Slovance 1999/2, 182 00 Prague Czech Republic

**Corresponding author e-mail: novotna@fzu.cz*

Since the recent discoveries of ferroelectric nematic phase, NF, the ongoing research has been concentrated on the design of such type of molecular structures and on intensive investigations of their physical properties [1]. Recently, we showed the effect of the exchange of oxygen-based electron-donating group (EDG) for even more efficient nitrogen part [2]. In the present research, we experimented with halogen substituents in place of EDG substituent.

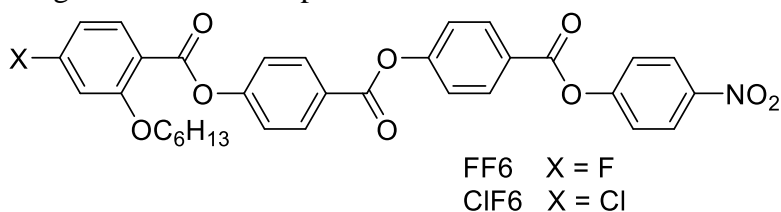


Figure 1. The chemical formula of the compounds studied.

We have studied two new mesogens based on the molecular structure shown in Fig. 1. We found both compounds exhibit the sequence Iso-N-NF phase on cooling from the isotropic (Iso) phase. The NF phase has been proved by several experimental techniques including observation of textures (Fig. 2), polarization and SHG measurements and the dielectric spectroscopy studies.

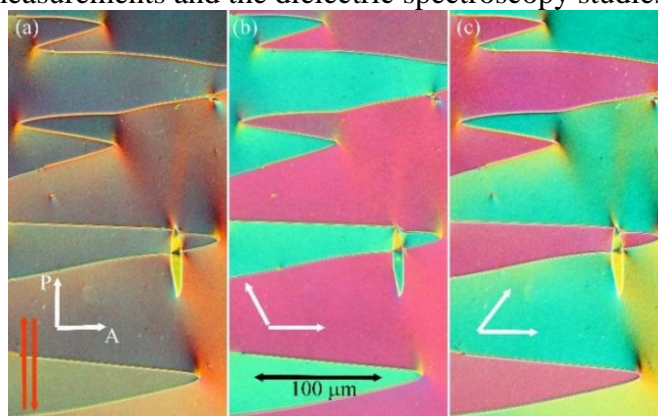


Figure 2: Twisted domains observed in the NF phase for FF6 compound in 5-mm HG cell with antiparallel rubbing. Texture (a) under crossed polarizers, P and A, figures (b) and (c) are with polarizers turned out from orthogonal position. Red arrows mark rubbing directions.

References:

[1] N. Sebastian, et al. *Physical Review E*, **106**, 021001 (2022)

[2] M. Cigl, et al., *Journal of Molecular Liquids*, **385**, 122360 (2023)