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BOOK OF ABSTRACTS

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New materials combining properties of liquid crystals and inorganic semiconductor quantum dots

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The development of new materials allows for creating composites that combine properties of liquid crystals (LCs), LC polymers and inorganic nanoparticles (NPs). Such systems may be considered as perspective metamaterials for applications in different areas of optical technologies and microelectronics. The major goal of this report is to synthesize new LC systems. having chiral structure and to analyze the capabilities of those molecules to serve as chiral shells at the surface of quantum dots that can ensure their strong interactions with LC matrices. The basic approach for the synthesis of new anisotropic chiral carboxylic acids and phenols is described (Figure 1) and their structure is proved by means of H^1NMR spectroscopy, polarimetry, polarized microscopy and DSC.

All chiral systems synthesized show pretty high optical rotation. It makes them to be perspective candidates for creation of chiral shells for such inorganic nanoparticles as CdSe and CdSe(ZnS). B05COOH and B07COOH simultaneously form liquid crystals possessing smectic and chiral nematic phases. Nanoparticles (NP) modified by anisotropic mesogene-like ligands show strong photoluminescence which is compared with that of NPs stabilized by oleic acid, In summary we can conclude that new chiral systems are capable of complex formation interaction with the NPs surfaces and they may be considered for creation of nanocomposite materials. An application of surface modified NPs as dopants for modulating LC properties seems to be one of the major trends of the modern science related to liquid crystals.

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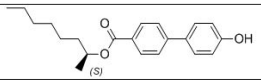
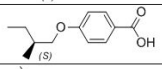
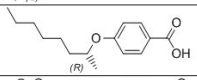
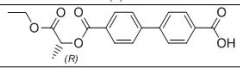
	Структурная формула	Specific optical rotation $[\alpha]_D^{25}$, $\text{deg}\cdot\frac{\text{ml}}{\text{g}}\cdot\frac{1}{\text{dm}}$	Molar optical rotation $[M]_D^{25}$, $\text{deg}\cdot\frac{1}{\text{M}}\cdot\frac{1}{\text{dm}}$
B04OH		-42.23	-137
B05COOH		+12.05	+25.1
B06COOH		-8.44	-21.1
B07COOH		+19.42	+66.4

Figure 1.jpg