

Nanooptics and photonics

Methacrylic polymers functionalized with coumarin side-groups as optically active units

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Various types of photoactive polymers were synthesized with different chromophores in the side chain: polymethylmethacrylates, polyalkylvinilethers, polystyrenes, polyimides, polyacrylamides and many more. The interaction of light with polymers has become significant for various applications. Polymeric materials are in use as photoswitches, optical memories, and solar cells for the generation of energy, some of them can apply for the generation of light.

Photochemical properties of such polymers can be advantageously addressed for photonics and optics. In addition, the spatial organization of the active side chain residues along the polymeric backbone is of critical importance regarding mechanical and structural properties of the material.

Coumarins and their analogues are well-known for their photochemical and photophysical properties. In particular this system undergoes reversible photoinduced $[2\pi s + 2\pi s]$ cycloaddition leading to cyclobutane-based dimers with four possible isomeric configurations [1].

We present preliminary results obtained for thin films of the methacrylic polymers incorporating coumarin side-group as optically active molecule.

1. Kim C., Wallace J., Trajkovska A., Ou J., Chen S. Quantitative assessment of coumarin-containing polymer film's capability for photoalignment of liquid crystals macromolecules // *Macromolecules*, .-2007.-**40**.-P. 8924-8929.