



Synthesis and Characterization of New Liquid Crystals Embedded Gold Nanoparticles for Photoswitching Properties

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Abstract



References



Citations



Supplementary Data



Data/Media



Metrics

A new molecular architecture consist of the liquid crystals decorated gold nanoparticles having azobenzenes moieties as the peripheral units connected to gold nanoparticles (Au NPs) via alkyl groups were synthesized and characterized. The mesomorphic properties were investigated by differential scanning calorimetry, polarizing optical microscopy, field emission scanning electron microscope and high-resolution transmission electron microscopy. The thiolated ligand molecules (**3a-c**) showed smectic A phase, whereas gold nanoparticles (**5a-c**) exhibit nematic phase. TEM measurement showed that the functionalized Au NPs are well dispersed without any aggregation and size of the nanoparticles about 2 nm. The *trans*-form of azo compounds showed a strong band in the UV region at ~378 nm for the π - π^* transition, and a weak band in the visible region at ~472 nm due to the n - π^* transition. These molecules exhibit strong photoisomerization behaviour in which *trans-cis* take 18 second for compound **5c**, whereas *cis-trans* take place about 45 min. Thus, the photoswitching behaviour of these materials may be suitably exploited in the field of molecular switches and optical storage devices.

Keywords: GOLD NANOPARTICLES; LIQUID CRYSTALS; MOLECULAR SWITCHES; OPTICAL STORAGE; PHOTOSWITCHING

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