

New U-Shaped Liquid Crystals Azobenzene Derived From Catechol for Photoswitching Properties

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ABSTRACT

A new series of liquid crystals whose molecular structure consists of a U-shaped unit as a central core and two rod-like azobenzenes as the peripheral units are synthesized. The mesomorphic properties were investigated by differential scanning calorimetry, polarizing optical microscopy and X-ray diffraction. The existence of nematic and smectic A phase was confirmed by textures and X-ray diffraction. The *trans*-form of azo compounds showed a strong band in the UV region at ~ 365 nm for the π - π^* transition, and a weak band in the visible region at ~ 450 nm due to the n - π^* transition. These molecules exhibit a strong photoisomerization behavior in which *trans*-*cis* take 50 and 55 s for compounds L4/5 and L4/6, respectively, whereas *cis*-*trans* take place almost 29 and 30 h, respectively. Long thermal back relaxation allows us to realize that optical storage devices with these materials which need longer periods.

KEYWORDS: Azobenzene; U-shaped; Smectic phase; Isomerisation; Photoswitching

DOI: [10.1016/j.molliq.2014.12.022](https://doi.org/10.1016/j.molliq.2014.12.022)