Synthesis and Self-assembled Nanostructures of Rectangular Liquid Crystals

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Abstract

The goal of this study is aimed to synthesize a series of rectangular liquid crystals which structure is in between rod-like and discotic liquid crystals. In this study, two ethynyl groups and two oxymethylene groups were used to link two phenyl groups with the central phenyl core respectively. We successful synthesized two diacrylate monomers **M3** and **M4** which exhibits a nematic phase. The compound **32** with two glucose end groups and its intermediate, compound **28**, reveal smectic phases. Compound **32** covers the widest mesomorphic temperature range of 74 ℃, which melting points is 68 ℃ and its cleaning temperature is 142 ℃. It's UV absorption and PL emission peaks are observed at 293 and 389 nm respectively. Finally, the self-assembling nanostrusture of compound 32 was studied by mixed solvent systems of acetone and THF and DMSO and water. A rod-like morphology was observed by a field-emission SEM.