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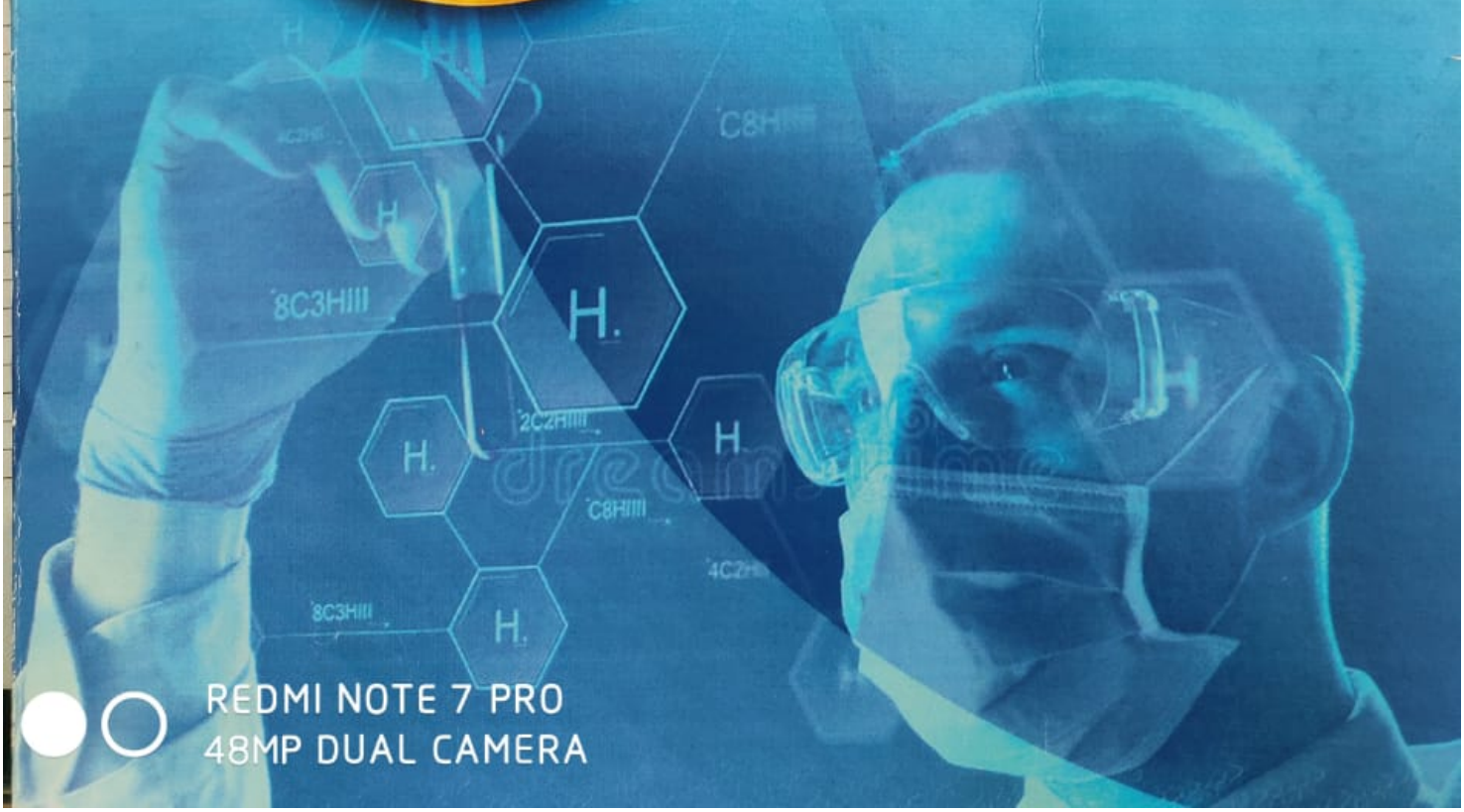

Four ring bent-core mesogens based on 1,3,4-thiadiazole with lateral methoxy substitution: mesomorphic, electro-optical and photophysical studies

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Abstract: New unsymmetrical bent-core molecules based on 1,3,4-thiadiazole bent-core unit with an imine linkage. These new unsymmetrical hockey-stick shaped due to the unequal number of phenyl rings at the two arms of the BCMs. The bent-core molecules possess lateral polar methoxy group at the elongated arm. The molecular structure and purity of the compounds were confirmed by FT-IR and NMR. The mesomorphic behaviour was characterized by POM and DSC and was further confirmed by electro-optical studies. All the compound exhibit enantiotropic nematic (N) phase, along with SmC phase interestingly the lower homologue of the series exhibit (n=4, 8) exhibit cybotactic nematic phase (Ncyb). The photophysical studies were carried out in solution and in the solid state.

Introduction

Bent-core mesogens (BCMs) are regarded as the new sub-class of liquid crystals and have drawn considerable attention after the discovery of two most important fundamental property *viz.*, polar order [1] and macroscopic chirality [2]. The nematic phase formed by the bent-core mesogens is scanty [3-6]. After the theoretical prediction of the biaxial nematic phase (N_B) in the reduced symmetry systems [7], extensive research has been carried out for the N_B phase. Since the biaxial nematic have 1000 times faster responds over uniaxial nematic (N_U) phase towards electric field hence, it can be used to design ultra fast display devices. The BCMs are ideal for the formation of N_B phase due to its shape biaxiality. Recently, 1,3,4-thiadiazole based BCMs drawn considerable interest due to its wide bending angle and large transverse dipole moment along the bisector which is ideal for the formation of biaxial nematic phase, moreover, the high electron deficiency of these heterocyclic rings leads to high