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“Columnar Self-assembly of Bowl-shaped Luminescent Oxadiazole Calix[4]arene derivatives”

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Abstract

In the present investigation, we wish to report a new class of blue light emitting liquid crystalline bowl-shaped molecules based on oxadiazole calix[4]arene has been designed and synthesized. These supramolecular compounds were investigated by polarizing optical microscope (POM), differential scanning calorimetry (DSC), thermo gravimetric analysis (TGA), high temperature X-ray diffraction and photophysical studies. We have prepared total six newly supramolecular derivatives having butyl alkyl bridge with oxadiazole ring and variable trisubstituted side alkoxy chain on the lower rim of calix[4]arene. The present synthesized bowl-shaped molecules are promising to stabilize the hexagonal columnar phase over a broad thermal range. Thermal behavior as well as photophysical behaviors of these new bowl-shaped molecules are extremely dependent on the number and types of peripheral tail group present in the lower rim of calix[4]arene inbuilt with schiff-base linking unit. Additionally, these synthesized oxadiazole calix[4]arene based supramolecular compounds showed blue luminescence in solution as well as thin films under long wavelength UV light. These properties of present material suggest that these may have promising applications in organic electronics.

Key words:- Calix[4]arene, 1,3,4 Oxadiazole, Liquid crystals, schiff-base

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