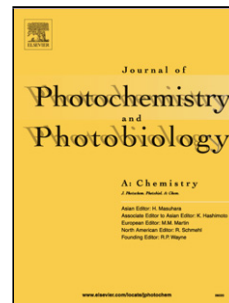


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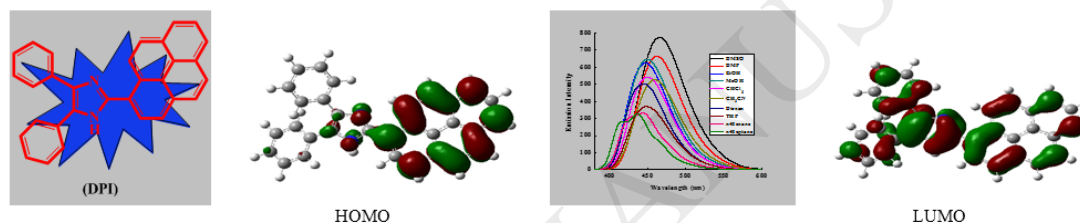
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Graphical Abstract:



Highlights

- One pot synthesis of (4,5-diphenyl-2-(pyren-1-yl)-1H-imidazole (DPI)
- Spectroscopic and photophysical investigations of DPI dye
- Determine the critical micelle concentration (CMC) of CTAB and SDS
- Frontier Molecular Orbitals (FMOs) study of DPI

Abstract:

A one-pot multi-component synthesis of 4,5,-diphenyl-2-(pyren-1-yl)-1H-imidazole (DPI) chromophore was performed by the reaction of benzil, pyrene-1-carboxaldehyde and ammonium acetate in acetic acid. Structure elucidation of DPI chromophore was confirmed by spectroscopic techniques (FT-IR, ¹H-NMR, ¹³C-NMR and mass spectra). The physicochemical and photophysical parameters of DPI chromophore such as extinction coefficient, oscillator strength, dipole moment, stokes shift and fluorescence quantum yield were calculated experimentally and theoretically on the basis of the different solvents polarity to see the effect of the solvents on DPI chromophore. DPI chromophore was also applicable for determination of critical micelle concentration (CMC) of cationic and anionic surfactant such as cetyl trimethyl ammonium bromide (CTAB) and sodium dodecyl sulfate (SDS).

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