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## Physicochemical, photophysical investigation and micellization of 1-(2,5-dimethylfuran-3-yl)-3-(2,4,5-trimethoxyphenyl)prop-2-en-1-one (DFTP) dye by fluorophotometry

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### Abstract

1-(2,5-Dimethylfuran-3-yl)-3-(2,4,5-trimethoxyphenyl)prop-2-en-1-one (DFTP) was prepared by the reaction of 2,4,5-trimethoxybenzaldehyde and 3-acetyl-2,5-dimethylfuran. Various spectroscopic techniques including EI-MS, FT-IR, H-1-NMR, C-13-NMR spectral and elemental analysis were applied to confirm the structure of DFTP. The effect of different solvents with DFTP has been observed by the electronic absorption and emission spectroscopy. The resulting red shift obtained in the emission spectrum of DFTP as solvent polarity increases, represents a large change in dipole moment of DFTP molecule upon excitation due to intramolecular charge transfer in excited DFTP. Excited state intermolecular hydrogen bonding affects the energy of emission spectrum and fluorescence quantum yield of DFTP molecule. The DFTP dye undergoes solubilization in different micelles and may be used as a probe to determine the critical micelle concentration (CMC) of SDS and CTAB. The photoreactivity and net photochemical quantum yield ( $\phi(c)$ ) of DFTP are determined in different solvents such as CHCl<sub>3</sub>, CH<sub>2</sub>Cl<sub>2</sub>, CCl<sub>4</sub>, and DMSO. The DFTP dye is relatively photostable in DMSO and displays photodecomposition in chloromethane solvents. (C) 2015 Published by Elsevier B.V.

### Keywords

**Author Keywords:** Chalcone (DFTP); Stokes shift; Oscillator strength; SDS; Photoreactivity; CMC**KeyWords Plus:** FIELD-EFFECT TRANSISTORS; LASER ACTIVITY; CHALCONES; ANTICANCER; PHOTOSTABILITY; FLUORESCENCE; DERIVATIVES; FERROCENYL; STABILITY; MICELLES

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