EFFECT OF SOLVENT ON PHOTO PHYSICAL CHARACTERISTICS OF SUBSTITUTED COUMARINS

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Coumarin derivatives are hetrocyclic compounds with a ring oxygen on a carbonyl group and most of them occur as natural products with very efficient fluorescing ability. The photophysical characteristics of the compounds depend on nature and position of a substituent group in the parent molecule and also change due to a change in the surrounding media. Coumarins are widely studied due to their importance as laser dyes, non-linear optical chromophores and as excellent probe to studying solvation dynamics in the homogeneous solutions as well as in organized media$^{1-5}$. The photo physical characteristics of substituted coumarins viz. 4-methyl-5,7-diethoxy coumarin [1], 4-methyl-5-ethoxy-7-methoxy coumarin [2] and 4-methyl-7,8-diethoxy coumarin [3] have been studied by recording their absorption and fluorescence spectra in various polar and non-polar organic solvents. The values of various spectral parameters like half band width, extinction coefficients, relative quantum yield), radiative life time and percentage polarization of all these coumarins in different solvents are calculated. Table [1-3]. The results obtained indicate a close relationship between the solvent polarity and fluorescence quantum yield. The variation is accounted for in terms of the positions of $(\pi\pi)$ and $(n\pi)$. Further the values of percentage polarisation of these molecules in various solvents of different polarity have been calculated and interpreted in terms of Perrin's theory as well as dipole- dipole interaction.