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Effects of solvent polarity on the absorption and fluorescence spectra of 3-cyano-7-hydroxy-4-methylcoumarin: determination of the dipole moments and application to epifluorescence microscopy.

Abstract

The Absorption and fluorescence emission spectra of 3-cyano-7-hydroxy-4-methylcoumarin (3C7H4M) were studied in solvents of different dielectric constant ϵ and refractive index n . Experimental ground and excited state dipole moments were established by means of solvatochromic shift method. Both the ground state and excited state dipole moments were. Results revealed that the excited state dipole moments of 3C7H4M were higher than those of the ground state. Further it is evident from these results that, the changes in the dipole moments on electronic excitation are small. Since 3C7H4M is more polar in its excited state, polar solvents were chosen in epifluorescence study. The epifluorescent microscopy images of a plant cell stained by 3C7H4M in various polar solvents compared with Iodine are hereby reported.

Keywords

dipole moments, epifluorescence microscopy, spectral shifts

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