Substituent Effect On The Fluorescence Behavior Of Some Bis-Dibenimidazolium Dihalide Derivatives

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In recent years particularly bis-benzimidazole compounds have begun to attract particular interest because of their potential use in cancer therapy by the blocking of DNA binding [1, 2]. Benzimidazole derivatives have received much attention and have been extensively studied because of their various pharmacological activities [3, 4]. A number of benzimidazole derivatives are known to possess versatile pharmacological activities, such as antibacterial, antifungal, antihelmintic, antiallergic, antineoplastic, local analgesic, antihistaminic, vasodilative, hypotensive and spasmylic activities [5, 6]. Benzimidazole and some related heterocyclic compounds had considerable antimicrobial activity against standard strains; Enterococcus faecalis, staphylococcus aureus, Escherichia coli and Pseudomonas aeruginosa and yeast Candida albicans and Candida tropicalis [7].

The most intense and the most useful fluorescence is found in compounds containing aromatic functional groups with low-energy π → π* transition levels. Compounds containing aliphatic and alicyclic carbonyl structures or highly conjugated double–bond structures may also exhibit fluorescence, but the number of these is small compared with the number in the aromatic systems. Substitution on the benzene ring causes shifts in wavelength of absorption frequently affects the fluorescence efficiency.

In this study, the substituent effect on fluorescence properties of some bis-dibenimidazole derivatives have been studied at room temperature in a series of solvents with different polarities and proton-donating abilities. For this purpose, emission spectra of these compounds in dioxane, methanol, ethanol, chloroform, N,N-dimethyl sulphoxide, N,N-dimethyl formamide, acetonitrile, hexane, toluene and water were measured by changing excitation wavelengths and then fluorescence intensities at excitation (λex) and emission wavelengths (λem) were determined in these solvents and the substituent effects were discussed and compared with each other.

References


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