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Thematic course: Spectral luminescence properties and complexing 5-fluorouracil tautomers with β-cyclodextrine. Report 2.

Complexing 5-fluorouracil tautomers with β-cyclodextrine

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Abstract

The spectra of fluorescence (FL) of 5-fluorouracil (FU) tautomers in neutral water solution (pH 7) were studied depending on the content of β-cyclodextrine (CD). It was found, that FU forms fluorescent supramolecular inclusion complexes of eqimolar composition 1:1 (or 2:2) with CD. Only dominating 2,4-dioxo-tautomer FU (I) takes part in complexing, but minor hydroxy-forms do not form complexes with β-cyclodextrine. An equilibrium constant of complexing I with CD (K = 30 l/mol) as well as a quantum yield of FL of the complex [I•CD] ($\varphi_к = 4\times10^{-4}$) was found. The increase in the quantum yield of FL at complexing (a quantum yield of the vacant I: $\varphi_0 = 1.5\times10^{-4}$) is explained by shielding electron excited FU included into the cavity of β-cyclodextrine against the "quenching" effect of a solution.