Effect of neutral salts on the excited state proton transfer in the fluorescent probe anchored to the uncharged micelles.

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Streszczenie

We study the salt effect on the excited state proton transfer (ESPT) in the fluorescent probe of 2-hydroxynaphthalene (dodecylo)-6-sulphonamide (NSDA) anchored on the nonionic Brij35 micelles. The results of spectrofluorimetric, electrophoretic and equilibrium dialysis measurements, allowed us to explain the variations in the ESPT rate constants in the presence of different neutral salts (NaCl, KCl, KSCN, NH_4SCN) as resulting from anion accumulation at the particle surface. Similarly to electric double layer in the charged micelles, an ionic layer system is also formed around the nonionic micelles. The dimensions of anionic and cationic layers as well as those of the whole ionic envelope around the nonionic particles are estimated. Furthermore, the electric potential generated within the ionic layer system and acting on the proton dissociating from the probe is determined and interpreted. Different impact of Cl^- and SCN^- ions on photophysical parameters of the targeted system have been explained through a synergy effect between hydrophobicity and polarizability of anions adsorbing on the nonionic micelle surface.Taking into account the existing analogy between micelles and living cells, we can assume that these results will contribute to a better understanding of salt effect in such important biological phenomena as the cell adhesion to surfaces, thermal denaturation of proteins and the aggregation of erythrocytes.

Słowa kluczowe

fluorescence, 2-Naphthol derivative bound to micelles, Excited state proton transfer, Nonionic micelles, Salt impact on micelles

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