ANIONIC SURFACANTS WITH CATIONIC CYCLODEXTRIN COUNTERION

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New surfactants are formed by the association of cationic derivatives of β-cyclodextrins and dodecylsulfate. Cationic β-cyclodextrins grafted with pyridinium groups are able to form inclusion complexes with organic molecules such as surfactants owing to the hydrophobic character of their internal cavity. The cationic cyclodextrin acts both as a counterion to the anionic surfactant and a complexing agent to the hydrophobic chain of dodecylsulfate.

The tensioactive properties of the mono-pyridinium β-cyclodextrin dodecylsulfate surfactant have been investigated together with the properties of the mixed system with sodium dodecylsulfate. The pyridinium β-cyclodextrin counterion increases the cmc with respect to the sodium counterion. Cmc measurements of the mixed systems show the non-ideal behavior of the association with sodium dodecylsulfate. Deviation from ideal behavior has been modeled with the regular solution theory, giving an interaction parameter β of -3.6. The structure of the mixed micelles have been investigated by small-angle neutrons scattering, giving information on the size of mixed micelles and intermicellar electrostatic interactions (adsorption of sodium and pyridinio-cyclodextrin counterions). Such structural information gives insight for the molecular origin of the non-ideal behavior of the mixed system.