

The association of picrate ions with amphiphilic cations in water and aqueous solutions of nonionic surfactant and β -cyclodextrin

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Abstract

The interaction of cetyltrimethylammonium and cetylpyridinium bromides with picrate ions in water and aqueous solutions of the nonionic surfactant Brij 35 is studied by spectrophotometry. Spectral characteristics of the associates of picrate ions with long-chain nitrogen-containing cations depend on the concentration of a cationic surfactant. When β -cyclodextrin is added, these associates decompose owing to the formation of the strong inclusion complexes of the guest-host type with amphiphilic ions of a cationic surfactant or Brij 35 molecules. The conclusion is made that the driving force for the formation of premicellar aggregates involving picrate ions is the interactions between alkyl chains of surfactant cations. It is shown that, in the presence of various surfactants, as β -cyclodextrin concentration increases, first the molecules of nonionic surfactant and then amphiphilic cations bind with the receptor cavity. It is confirmed that there is no interaction between polyethylene glycol and β -cyclodextrin in aqueous solution.
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