

Abstract

Micellar and kinetic properties of mixed surfactants composed of a copper surfactant, $\text{Cu}(\text{C}_{12}\text{tmed})(\text{acac})\text{Cl}$ and three common surfactants, i.e., sodium dodecyl sulfate (SDS), cetyltrimethylammonium bromide (CTAB) and octaethylene glycol monododecyl ether (C_{12}E_8) were studied.

Formation of mixed micelles and mixed monolayers were measured by surface tensiometric method. The data obtained were treated with models developed from Regular Solution approach and Gibbs-Duhem approach. It was found that there is strong attractive interaction between cationic copper surfactant and anionic SDS, while there is almost ideal mixing between copper surfactant with CTAB and C_{12}E_8 .

The ESR and UV-visible spectra of the three mixed surfactant systems were measured and the structural implications of the mixed micelles are discussed.

In the kinetic studies, copper surfactant - C_{12}E_8 mixed micelles appear to be the excellent catalyst for the autooxidation of 3,5-di-*tert*-butylcatechol (3,5-DTBC), while other mixed micelles have modest rate effects on the autooxidation of 3,5-di-*tert*-butylcatechol and the hydrolysis of *p*-nitrophenyl diphenyl phosphate (PNPDPP).

Abstrak

Sifat misel dan kinetik bagi micelle campuran mengandungi satu zat aktif permukaan kuprum $\text{Cu}(\text{C}_{12}\text{med})(\text{acac})\text{Cl}$ dengan tiga zat aktif permukaan biasa, iaitu, sodium dodecyl sulfate (SDS), cetyltrimethylammonium bromide (CTAB) dan octaethylene glycol monododecyl ether (C_{12}E_8) telah dikaji.

Pembentukan misel campuran dengan monolapisan campuran telah diukur dengan kaedah ketegangan permukaan. Data yang didapati diproses dengan model daripada pendekatan Regular Solution dan Gibbs-Duhem. Adalah didapati terdapat interaksi tarikan kuat di antara kationik zat aktif permukaan kuprum dengan anionik SDS, manakala campuran ideal di antara zat aktif permukaan kuprum dengan CTAB dan C_{12}E_8 .

Spektra ESR dan UV-visible bagi ketiga-tiga zat aktif permukaan campuran telah diukur dan implikasi struktur bagi misel campuran telah dibincangkan.

Dalam kajian kinetik, misel campuran terdiri dari zat aktif permukaan kuprum - C_{12}E_8 merupakan mangkin yang terbaik dalam pengautooksidasi 3,5-di-*tert*-butylcatechol (3,5-DTBC), manakala misel campuran lain mempunyai kadar sederhana dalam pengautooksidasi 3,5-DTBC dan hidrolisis *p*-nitrophenyl diphenyl phosphate (PNPDPP).