# MIXED MICELLES OF SURFACE ACTIVE COPPER(II) AMINE COMPLEXES WITH SOME COMMON SURFACTANTS

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# Abstract

Micellar and kinetic properties of mixed surfactants composed of a copper surfactant , $Cu(C_{12}tmed)(acac)Cl$ 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 Cu($C_{12}$tmed)(acac)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 pengautooksidaan 3,5-di-*tert*-butylcatechol (3,5-DTBC) , manakala misel campuran lain mempunyai kadar sederhana dalam pengautooksidaan 3,5-DTBC dan hidrolisis *p*-nitrophenyl diphenyl phosphate (PNPDPP) .

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