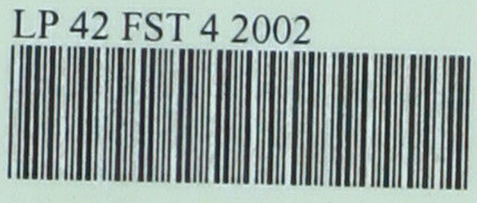
2002

UNIVERSITY PUTRA MALAYSIA
FACULTY OF SCIENCE AND TECHNOLOGY

ONG BENG HUAT

ASSOCIATION BEHAVIOUR OF MIXED ANIONIC-NONIONIC SURFACTANT/ALCOHOL/WATER SYSTEM



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ASSOCIATION BEHAVIOUR OF MIXED ANIONIC-NONIONIC SURFACTANT/ALCOHOL/WATER SYSTEM

BY

ONG BENG HUAT

Thesis submitted in partial fulfillment of the requirement
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ABSTRACT

Studies on a mixed anionic-nonionic surfactant system of sodium dodecyl sulphate (SDS) and polyoxyethylene (20) sorbitan monolaurate (TWEEN 20)/ pentanol/ water system were carried out at room temperature (27 ± 1°C). Method employed for determination of CMC is surface tension. The experimental CMC for SDS was found to be 6.03 x 10^{-3} mole/L and CMC for TWEEN 20 was 7.76 x 10^{-5} mole/L. Results indicated that the composition of 0.4 mole fraction of SDS exhibit a stable and the largest micelle area. Results also indicated that the mixture behaved slightly nonideally and its superior properties are due to its synergistic interaction amongst the mixed which gave a molecular interaction parameter value, β of -6.875. It is observed that the mole fraction of SDS in the solution is lower than their corresponding mole fraction in the mixed micelle. The x values at variable mole fraction of SDS are all smaller than 0.5. It is concluded that the nonionic surfactant (TWEEN 20) is geometrically preferably to anionic surfactant (SDS) for the formation of micelle in both of the system.

ABSTRAK

Kajian terhadap sistem surfaktan sodium dodecyl sulphate (SDS) dan polyoxyethylene (20) sorbitan monolaurate (TWEEN 20)/ pentanol/ air telah dilakukan pada suhu bilik (27 ± 1°C). Kaedah tegangan permukaan digunakan bagi penentuan CMC (critical micelle concentration). Nilai CMC bagi surfaktant SDS yang didapati secara eksperimen ialah 6.03 x 10^{-3} mol/L dan juga CMC bagi surfaktant Tween 20 ialah 7.76 x 10^{-5} mol/L . Keputusan menunjukkan bahawa komposisi 0.4 pecahan mol SDS adalah paling stabil dan mempunyai kawasan misel yang terbesar. Keputusan juga menunjukkan bahawa campuran tersebut menunjukkan sifat tidak unggul (sinergi) yang ketara. Nilai parameter interaksi molekul, β didapati kurang daripada -6.875. Ini dapat dilihat daripada kemolaran SDS dalam larutan adalah lebih rendah daripada kemolaran dalam campuran misel. Nilai bagi kemolaran SDS masing-masing adalah kurang daripada 0.5. Ini dapat disimpulkan bahawa sistem surfaktan (Tween 20) lebih digalakkan kepada sistem surfaktan (SDS) secara geometrinya untuk membentuk misel dalam kedua-dua sistem.