شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات لم ترد بالاصل

STUDIES ON SOME SURFACE ACTIVE AGENTS AS DEMULSIFIERS FOR OIL WATER EMULSIONS

A THESIS

IN PARTIAL FULFILLMENT FOR THE REQUIREMENT OF

M.SC. DEGREE IN CHEMISTRY

PRESENTED

BY

MANAR EL-SAYED ABDEL-RAOUF

B.Sc in Chemistry

Faculty of Science, Ain Shams University (1992)

TO

DEPARTMENT OF CHEMISTRY

FACULTY OF SCIENCE

AIN SHAMS UNIVERSITY

EGYPT

1995

بسم الله الرحمن الرحيم

"رب أوزعنى أن أشكر نعمتك التى أنعمت على
وعلى والدى وأن أعمل صالحاً ترضاه وأدخلنى
برحمتك فى عبادك الصالحين"

النمل - ١٩

كلية العلوم

STUDIES ON SOME SURFACE ACTIVE AGENTS AS DEMULSIFIERS FOR OIL WATER EMULSIONS

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DEDICATION

To my parents
and
my husband

NOTES

This thesis is submitted in partial fulfillment of the requirements of the M.Sc. degree, Faculty of Science, Ain Shams University. In addition to the work carried out in this thesis, the candidate: Manar El-Sayed Abdel-Raouf, has attended and passed successfully, during the academic year 1992-1993, post graduate studies in the following topics (delivered to the organic chemistry section):

1: Polymer chemistry
2: Pericyclic reaction chemistry
3: Spectroscopy
4: Photochemistry
5: Heterocyclic chemistry
6: Natural products
7: Organic reactions
8. Free radical reactions
9: Organometallic compounds
10: Reaction mechanisms
11: Instrumental organic analysis
12: Aromaticity
13: English

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CURRICULUM VITAE

Manar El-Sayed Abdel-Raouf was born on July 7, 1970, in Cairo, Egypt. She attended The seventh Secondary School (Saudi Arabia). After graduating at 1987, she was enrolled at the Faculty of Science, Ain Shams University and got the B.Sc. Degree with grade "Very Good" in May 1991, and now she is working in the Department of Petroleum Applications, Egyptian Petroleum Research Institute.

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AIM OF WORK

The water co-produced with the crude oil is exist in the crude oil reservoir in the aquifer layer which lies beneath the crude oil zone or introduced by injection into the reservoir beneath the crude oil zone as a second stage recovery to maintain the reservoir operating pressure and fluid flow profile. This water is mixed with the crude oil at the well head chokes and valves where there is significant mixing, turbulence and pressure drop. The produced water-in-crude oil emulsion is then stabilized by the variety of surfactants indigenous to the crude oil. The presence of this emulsified water with crude oil yields a variety of problems. Accordingly, it is desirable to remove this emulsified water from the crude oil.

This work pertains to prepare some block copolymers and investigate their capability in breaking water-in-oil emulsions. A further objective for the present investigation is to study the surface properties of the prepared compounds and peruse the influence of different factors on the efficiency of these block copolymers as demulsfiers.

ABSTRACT

Present investigation deals with synthesis and characterization of some surfactants to be used for breaking water-in-oil emulsions. In this respect two different series of demulsifiers were prepared. The first series comprises ethylene oxide - propylene oxide block copolymers having different hydrophil - lipophil balance obtained by varying the ratios of ethylene oxide to propylene oxide and varying the chain length of the polyethylene glycol. The second series was ethoxylated bisphenol-A. A new spectroscopic method for determining the distribution of the demulsifier in both oil and aqueous phases was introduced. The effect of the structure on the demulsification performance was investigated. Several other factors affecting the demulsification capability were also investigated such as the demulsifier molecular weight, type of solvent, pH of the emulsion, salinity and temperature .

List of abbreviations and symbols

Word	Abbreviation
Absolute temperature	T
Average film thickness	h_a
Boltzmann constant	k
Collision effectiveness	ξ
Chemical potential of component i	μ_i
Chemical potential of component i in the interfacial phase	$\mu_i^{(\sigma)}$
Critical wavelength	λ_c
Diffusion coefficient	D
Density	ρ
Density difference	$\Delta\rho$
Energy barrier to coalescence	E
External phase of volume	$V^{(E)}$
External pressure	P
Force	F
Gravitational constant	G
Hamaker constant	A_{11}
interfacial tension	γ
Interfacial viscosity	μ_s
Number of particles	n
Radius of action	R_a
Radius of the particle	r
Surfactant concentration at interface	Γ