

**WETTABILITY ON HYDROPHOBIC SURFACES BY ALCOHOL
ETHOXYLATES: INFLUENCE OF ETHYLENE OXIDE GROUP**

Yuttapong Mahasittiwat

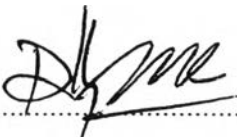
A Thesis Submitted in Partial Fulfilment of the Requirements
for the Degree of Master of Science
The Petroleum and Petrochemical College, Chulalongkorn University
in Academic Partnership with
The University of Michigan, The University of Oklahoma,
Case Western Reserve University and Institut Français du Pétrole

2010


I28375725


Thesis Title: Wettability on Hydrophobic Surfaces by Alcohol Ethoxylates:
Influence of Ethylene Oxide group
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Program: Petrochemical Technology
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Accepted by the Petroleum and Petrochemical College, Chulalongkorn University, in partial fulfilment of the requirements for the Degree of Master of Science.


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บทคัดย่อ

ยุทธพงษ์ มหาสิทธิวัฒน์: ความสามารถในการเปียกบนพื้นผิวไฮโดรโฟบิกชนิดต่างๆ ของสารลดแรงตึงผิวชนิดแอลกอฮอล์อีทอกซิเลท อิทธิพลของหมู่เอทิลีนออกไซด์ (Wettability on Hydrophobic Surfaces by Alcohol Ethoxylates: Influence of Ethylene Oxide Group) อ. ที่ปรึกษา : รศ. ดร. สุเมธ ชวเดช 94 หน้า

การศึกษาคูคัพและการเปียกของสารลดแรงตึงผิวชนิดแอลกอฮอล์อีทอกซิเลท — $C_{12-14}EO_5$, $C_{12-14}EO_7$, $C_{12-14}EO_8$ และ $C_{12-14}EO_9$ ซึ่งเป็นสารลดแรงตึงผิวชนิดไร้ประจุที่ผลิตจากผลิตภัณฑ์จากธรรมชาติ โดยกระบวนการแปรรูปจากน้ำมันธรรมชาติ เช่น น้ำมันปาล์มและน้ำมันมะพร้าว บนพื้นผิวไฮโดรโฟบิกชนิดต่างๆ โดยเปรียบเทียบกับสารลดแรงตึงผิวชนิดไร้ประจุที่ผลิตจำหน่ายเชิงพาณิชย์ คือ โนนิลฟินอลอีทอกซิเลท 9 และสารลดแรงตึงผิวชนิดประจุลบ คือ เมทิลเอสเทอร์ซัลโฟเนต พื้นผิวไฮโดรโฟบิกที่นำมาใช้ในการศึกษาประกอบด้วย โพลีเททราฟลูออโรเอทิลีน โพลีไวนิลคลอไรด์ และ โพลีเมทิล เมทาคริเลต จากการศึกษาพบว่า การคูคัพของสารลดแรงตึงผิวจะเพิ่มขึ้นตามจำนวนหมู่เอทิลีนออกไซด์ที่ลดลงและความไม่มีขั้วของพื้นผิวที่ลดลง โดยพบว่าสารลดแรงตึงผิวทั้งหมดที่ศึกษาสามารถคูคัพระหว่างพื้นผิวของเหลวและอากาศได้ดีกว่าระหว่างพื้นผิวของแข็งและของเหลว โดยความแตกต่างของการคูคัพระหว่างรอยต่อจะเพิ่มขึ้นตามความไม่มีขั้วของพื้นผิวที่เพิ่มขึ้น นอกจากนี้ ความสามารถในการเปียกของพื้นผิวพลาสติกที่ศึกษาพบว่ามีค่าเพิ่มขึ้นตามจำนวนหมู่เอทิลีนออกไซด์ที่ลดลงและความเป็นขั้วของพื้นผิวที่เพิ่มขึ้น คุณสมบัติการคูคัพและการเปียกบนพื้นผิวไฮโดรโฟบิกที่ศึกษาของสารลดแรงตึงผิวชนิดแอลกอฮอล์อีทอกซิเลทมีแนวโน้มดีกว่าหรือเทียบเท่ากับคุณสมบัติของสารลดแรงตึงผิวชนิด โนนิลฟินอลอีทอกซิเลท 9 และเมทิลเอสเทอร์ซัลโฟเนต

ABSTRACT

5171029063: Petrochemical Technology Program

Yuttapong Mahasittiwat: Wettability on Hydrophobic Surfaces by
Alcohol Ethoxylates: Influence of Ethylene Oxide Group

Thesis Advisor: Assoc. Prof. Sumaeth Chavadej

94 pp.

Keywords: Adsorption Isotherm / Alcohol Ethoxylates (AEs) / Contact Angle /
Hydrophobic surface / Wettability

Adsorption and wetting studies of Alcohol Ethoxylates (AEs) — $C_{12-14}EO_5$, $C_{12-14}EO_7$, $C_{12-14}EO_8$, and $C_{12-14}EO_9$, nonionic surfactants produced from natural products (palm oil and coconut oil) on different hydrophobic surfaces, were investigated compared with commercial nonionic surfactant, nonylphenol ethoxylates 9 (NPE-9), and anionic surfactant, methyl ester sulfonate (MES). The three plastics used for this study were poly(tetrafluoroethylene) (PTFE), poly(vinyl chloride) (PVC), and poly(methyl methacrylate) (PMMA). The results showed that surfactant adsorption increased with decreasing ethylene oxide group and decreasing hydrophobicity of surfaces. Furthermore, all the studied surfactants were found to adsorb preferentially at the liquid/vapor interface more than at the solid/liquid interface and the differences increased with increasing hydrophobicity of surface. Besides, the wettability of the studied plastic surfaces was found to increase with decreasing ethylene oxide group and increasing polarity of surfaces. The adsorption and wetting properties on the studied surfaces of almost all the studied AEs were better than those of NPE-9 and MES.

ACKNOWLEDGEMENTS

This work would not have been possible without the assistance of the following individuals.

First of all, I would like to take this opportunity to express my deep gratitude to Assoc. Prof. Sumaeth Chavadej, my thesis advisor, for providing many invaluable recommendation, creative comments, and kindly support throughout course of this research work.

I would like to special thanks to Asst. Prof. Boonyarach Kitiyanan who acted as advisory committee member for giving the valuable comments and recommendation.

Also, I would like to thanks Dr. Veerapat Tuntayakom for being my advisory committee member outside PPC and giving his valuable time to comment and recommendation.

I am grateful for the scholarship and funding of the thesis work provided by the Petroleum and Petrochemical College, and by the National Center of Excellence for Petroleum, Petrochemicals, and Advanced Materials, Thailand.

I am grateful for the partial funding of the thesis work provided by the Postgraduate Education and Research Programs in Petroleum and Petrochemical Technology (PTT Consortium).

I am also grateful for providing the plastics from Thai Plastics and Chemicals Public Co., Ltd, and Diapolyacrylate Co., Ltd., and providing the surfactants from Cognis (Thailand) Co., Ltd. for using in this work.

I would like to express my sincerely gratitude to all faculties and staff of the Petroleum and Petrochemical College for their kind assistance to facilitate all works. Special thanks go to all PPC friends for their friendly assistance and creative suggestions.

Finally, the author would like to express deep appreciation to my parents and my sisters for their endless support, encourage and love throughout the two years study period of my M.S.

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