

**EFFECT OF IONIC STRENGTH ON ADSOLUBILIZATION OF
TOLUENE AND ACETOPHENONE INTO CTAB ADSORBED
ON PRECIPITATED SILICA**



Ms. Thunyarak Kanjanakhunthakul

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By : Ms. Thunyarak Kanjanakhunthakul
Program : Petrochemical Technology
Thesis Advisors : Dr. Pomthong Malakul
Asst. Prof. John H. O'Haver
Prof. Jeffrey H. Harwell

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K. Bunyakiat
..... College Director
(Assoc. Prof. Kunchana Bunyakiat)

Thesis Committee:

Pomthong Malakul
.....
(Dr. Pomthong Malakul)

John H. O'Haver
.....
(Asst. Prof. John H. O'Haver)

Jeffrey H. Harwell
.....
(Prof. Jeffrey H. Harwell)

Chintana Saiwan
.....
(Assoc. Prof. Chintana Saiwan)

Boonyarach Kitiyanan
.....
(Dr. Boonyarach Kitiyanan)

ABSTRACT

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In this study, the effects of ionic strength on adsorption and adsolubilization were studied using a quaternary ammonium cationic surfactant, cetyltrimethylammonium bromide or CTAB, and precipitated silica as a solid oxide surface. The adsolubilization of the model organic compounds, toluene and acetophenone, was investigated both in single-solute and mixed-solute systems. For both adsorption and adsolubilization, batch experiments were carried out at two different pH values (5 and 8) under various ionic strengths (1, 10 and 100 mM). The results showed that the adsorption of CTAB on the silica surface increased with increasing ionic strength. In the single-solute system, increasing ionic strength had little effect on the adsolubilization of toluene. However, the adsolubilization of acetophenone significantly increased with increasing ionic strength, especially at 100 mM. In the mixed-solute system, the synergetic effect was observed in the adsolubilization of acetophenone in the presence of toluene and the effect was more pronounced with increasing ionic strength. In contrast, the presence of acetophenone had little effect on the adsolubilization of toluene.

บทคัดย่อ

ธีญรักษ์ กาญจนจันทร์กุล : ผลกระทบของความแรงของประจุต่อการแอดโซลูบิไลเซชันของโทลูอิน และอะซิโตฟีโนนในซีเทปที่ดูดซับอยู่บนผิวของซิลิกา (Effect of Ionic strength on Adsolubilization of Toluene and Acetophenone into CTAB Adsorbed on Precipitated Silica) อ. ที่ปรึกษา คร. ปมทอง มาลากุล ณ. อยุธา, ผศ. ดร. จอห์น เซช โอ เฮเวอร์ และ ศ. ดร. เจฟฟรีย์ เซช ฮาร์เวลล์ 69 หน้า ISBN 974-03-1580-1

งานวิจัยเล่มนี้ได้ศึกษาผลกระทบของความแรงของประจุต่อการดูดซับและการแอดโซลูบิไลเซชัน โดยใช้สารลดแรงตึงผิวประจุบวกชนิดควอเตอร์นารีแอมโมเนียม เซติลไตรเมทิลแอมโมเนียมโบรไมด์หรือซีเทปและใช้ผิวหน้าออกไซด์ของแข็งเป็นซิลิกา การศึกษาแอดโซลูบิไลเซชันได้ใช้โทลูอินและอะซิโตฟีโนนเป็นโมเดลของสารอินทรีย์ทำการศึกษาทั้งในระบบสารละลายชนิดเดียวและสารละลายผสม สำหรับการดูดซับและแอดโซลูบิไลเซชัน ได้ทำการทดลองแบบกะในสภาวะความเป็นกรด-ด่าง (พีเอช) ที่ 5 และ 8 และที่ค่าความแรงของประจุต่างๆกัน (1, 10, 100 มิลลิโมลต่อลิตร) ผลการทดลองพบว่าการเพิ่มความแรงของประจุทำให้การดูดซับของซีเทปบนพื้นผิวซิลิกาเพิ่มขึ้นทั้งพีเอช 5 และ 8 สำหรับระบบสารละลายเดียวนั้น การเพิ่มความแรงของประจุมีผลกระทบเพียงเล็กน้อยต่อการแอดโซลูบิไลเซชันของโทลูอิน แต่การแอดโซลูบิไลเซชันของอะซิโตฟีโนนนั้นเพิ่มขึ้นอย่างเห็นได้ชัดเมื่อเพิ่มความแรงของประจุ โดยเฉพาะที่ 100 มิลลิโมลต่อลิตร สำหรับระบบสารละลายผสมนั้น โทลูอินมีผลสนับสนุนต่อการแอดโซลูบิไลเซชันของอะซิโตฟีโนนเมื่อเพิ่มความแรงของประจุ ในทางตรงกันข้าม อะซิโตฟีโนนกลับมีผลกระทบเพียงเล็กน้อยต่อการแอดโซลูบิไลเซชันโทลูอิน

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