

**ADMICELLAR POLYMERIZATION IN A CONTINUOUS
STIRRED TANK REACTOR: EFFECTS OF NONIONIC SURFACTANT**



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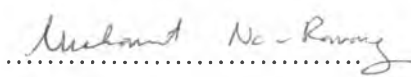
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ABSTRACT

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In order to reduce the production cost of the modified silica, mixed surfactants of cationic and nonionic surfactants, cetyltrimethyl ammonium bromide (CTAB) and Triton X-100, were employed in the admicellar polymerization to replace the use of CTAB alone. In this study, the effect of the molar ratio of CTAB to Triton X-100 and the adsorption structure of surfactants, monolayer and bilayer, were investigated on the admicellar polymerization compared with the polymerization using only CTAB in terms of the compatibility between rubber and silica. The results indicated that the improvement in the overall properties of rubber compound was achieved with 3:1 and 1:3 CTAB/Triton X-100 molar ratios when compared to the case with only CTAB. Interestingly, the modified silica with the monolayer adsorption structure of the mixed surfactants at all molar ratios gave better overall properties of rubber compound than those with the bilayer structure.

บทคัดย่อ

ประพนธ์ อิ่มสวัสดิ์กุล : วิธีแอดไมเซลล์ลาร์พอลิเมอไรเซชันในเครื่องปฏิกรณ์แบบต่อเนื่อง: ผลกระทบของสารลดแรงตึงผิวแบบไม่มีขั้ว (Admicellar Polymerization in a Continuous Stirred Tank Reactor: Effect of Nonionic Surfactant) อ. ที่ปรึกษา: ผศ. ดร. ปราโมช รังสรรค์วิจิตร รศ. ดร. สุเมธ ชวเดช ดร.นุชนาถ ณ ระนอง และ รศ. ดร. จอห์น เฮช โอ เฮเวอร์ 65 หน้า ISBN 974-96-5139-1

เพื่อลดค่าใช้จ่ายในการผลิตโมดิฟายด์ซิลิกา โดยกระบวนการแอดไมเซลล์ลาร์พอลิเมอไรเซชัน ได้ใช้การผสมการผสมสารลดแรงตึงผิวแบบมีขั้วบวก (เซททริวไคโรเมททริวแอมโมเนียมโบรไมด์, ซีแทบ) และแบบไม่มีขั้ว (ไทรทอนเอ็กซ์ 100) แทนการใช้สารลดแรงตึงผิวแบบมีขั้วบวกอย่างเดียว ในการทดลองนี้เป็นการเปรียบเทียบผลของอัตราส่วนโดยโมลซีแทบต่อไทรทอนเอ็กซ์ 100 ต่อโครงสร้างในการดูดซับของสารลดแรงตึงผิวแบบชั้นเดี่ยวและแบบสองชั้นต่อกระบวนการแอดไมเซลล์ลาร์พอลิเมอไรเซชันรวมทั้งสมบัติทางกายภาพของยางผสมโมดิฟายด์ซิลิกาที่ได้ โดยมีกระบวนการแอดไมเซลล์ลาร์พอลิเมอไรเซชันที่ใช้ซีแทบเพียงอย่างเดียว เป็นฐานในการเปรียบเทียบด้วย ผลการทดลองพบว่ายางมีคุณสมบัติทางกลศาสตร์ดีขึ้น เมื่ออัตราส่วนผสมโดยโมลของซีแทบและไทรทอนเอ็กซ์ 100 เท่ากับ 3:1 และ 1:3 นอกจากนั้น โครงสร้างการดูดซับแบบชั้นเดี่ยวของการผสมสารลดแรงตึงผิวทั้งสองในหลายๆ อัตราส่วนโดยโมลให้ผลด้านคุณสมบัติทางกลศาสตร์ของยางดีกว่าโครงสร้างการดูดซับแบบสองชั้น

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