

การผลิตเมทิลเอสเทอร์จากน้ำมันปาล์ม โอเลอินและน้ำมันมะพร้าวโดยการปรับปรุงพื้นผิว
แคลเซียมออกไซด์และแมกนีเซียมออกไซด์ด้วยสารประกอบ
แอมโมเนียมและโพแทสเซียม



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PRODUCTION OF METHYL ESTERS FROM PALM OLEIN AND
COCONUT OIL USING CALCIUM OXIDE AND MAGNESIUM
OXIDE MODIFIED WITH AMMONIUM AND POTASSIUM
COMPOUNDS

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A Thesis Submitted in Partial Fulfillment of the Requirements
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Department of Chemical Engineering

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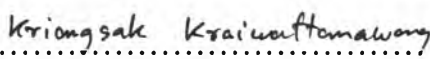

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ภารดี บุญรอง: การผลิตเมทิลเอสเทอร์จากน้ำมันปาล์มโอเลอินและน้ำมันมะพร้าวโดยการปรับปรุงพื้นผิวแคลเซียมออกไซด์และแมกนีเซียมออกไซด์ด้วยสารประกอบแอมโมเนียมและโพแทสเซียม. (PRODUCTION OF METHYL ESTERS FROM PALM OLEIN AND COCONUT OIL USING CALCIUM OXIDE AND MAGNESIUM OXIDE MODIFIED WITH AMMONIUM AND POTASSIUM COMPOUNDS) อ.ที่
 ปรึกษาวิทยานิพนธ์หลัก: อ.ดร. เจ็ดศักดิ์ ไชยคุนา, 105 หน้า.

งานวิจัยนี้เป็นการศึกษาการผลิตเมทิลเอสเทอร์ด้วยปฏิกิริยาทรานส์เอสเทอร์ฟิเคชันของน้ำมันปาล์มโอเลอินและน้ำมันมะพร้าวโดยใช้ตัวเร่งปฏิกิริยาแบบวิวิธพันธุ์ ได้แก่ แคลเซียมออกไซด์ (CaO) แมกนีเซียมออกไซด์ (MgO) และแคลเซียมออกไซด์และแมกนีเซียมออกไซด์ที่ปรับปรุงพื้นผิวด้วยแอมโมเนียมคาร์บอเนต ((NH₄)₂CO₃) และโพแทสเซียมคาร์บอเนต (K₂CO₃) การทดลองทำในถังปฏิกรณ์แบบกะ ทำปฏิกิริยาที่อุณหภูมิ 60 องศาเซลเซียส ที่ความดันบรรยากาศ สัดส่วนโดยโมลของเมทานอลต่อน้ำมันคือ 6 ต่อ 1 ปริมาณของตัวเร่งปฏิกิริยาร้อยละ 5 ของน้ำหนักน้ำมัน เวลาที่ใช้ในการทำปฏิกิริยา 2 ชั่วโมงและใช้เตตระไฮโดรฟูแรน (THF) เป็นตัวทำละลายร่วม

ผลการทดลองแสดงว่า เมื่อใช้ตัวเร่งปฏิกิริยาแคลเซียมออกไซด์และแมกนีเซียมออกไซด์ที่ปรับปรุงพื้นผิวด้วยแอมโมเนียมคาร์บอเนตและโพแทสเซียมคาร์บอเนต ทำให้ปฏิกิริยาทรานส์เอสเทอร์ฟิเคชันของน้ำมันปาล์มโอเลอินและน้ำมันมะพร้าวเกิดได้ดีขึ้นและตัวเร่งปฏิกิริยาแคลเซียมออกไซด์ที่ปรับปรุงพื้นผิวด้วยแอมโมเนียมคาร์บอเนต ให้ปริมาณเมทิลเอสเทอร์จากน้ำมันปาล์มโอเลอินและน้ำมันมะพร้าวสูงสุด

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PARADEE BUNRONG : PRODUCTION OF METHYL ESTERS FROM PALM OLEIN AND COCONUT OIL USING CALCIUM OXIDE AND MAGNESIUM OXIDE MODIFIED WITH AMMONIUM AND POTASSIUM COMPOUNDS. ADVISOR: JIRDSAK TSCHEIKUNA, Ph.D., 105 pp.

Methyl esters production with transesterification reaction of palm olein oil and coconut oil using calcium oxide (CaO), magnesium oxide (MgO), modified CaO and MgO with ammonium carbonate ((NH₄)₂CO₃) and potassium carbonate (K₂CO₃) as heterogeneous catalysts was investigated in this study. The experiments were conducted in a batch reactor, at a temperature of 60°C, an ambient pressure and methanol to oil molar ratio of 6:1. The amount of catalyst used in each experiment was 5% by weight of oil. Tetrahydrofuran was used as co-solvent. Retention time of each experiment was 2 hours.

The results indicate that modified CaO and MgO catalyst with ammonium carbonate and potassium carbonate increased yield of methyl esters of both palm olein oil and coconut oil. CaO catalyst modified with ammonium carbonate exhibits the highest yield of methyl esters of both palm olein oil and coconut oil.

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