

การสังเคราะห์ซีไอไลต์เบต้าโดยวิธีการเปลี่ยนของเจลแห้งและสมรรถภาพของตัวเร่งปฏิกิริยา



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BETA ZEOLITE SYNTHESIS BY DRY GEL CONVERSION AND ITS CATALYTIC PERFORMANCE

Miss Siriporn Paisansing

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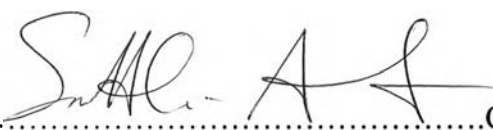
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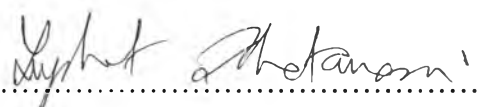
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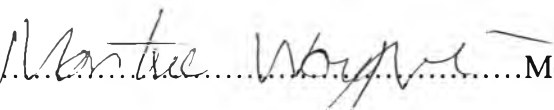
  
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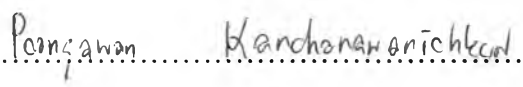
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สังเคราะห์ซีโอไลต์เบต้าที่มีอัตราส่วน  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ตั้งแต่ 30 ถึง 200 โดยวิธีการเปลี่ยน  
ของเจลแห้ง และตกผลึกภายใน 24 ชั่วโมง และทำการวิเคราะห์คุณสมบัติของซีโอไลต์ที่เตรียม  
ขึ้นด้วยเทคนิค XRD, XRF, BET, SEM และ  $^{27}\text{Al}$  MAS NMR และทดสอบด้วยปฏิกิริยาการ  
เปลี่ยนเมทานอล และศึกษาถึงอิทธิพลของปริมาณน้ำ ปริมาณของเจลแห้ง และอัตราส่วน  
 $\text{SiO}_2/\text{Al}_2\text{O}_3$  ที่มีผลต่อการเกิดซีโอไลต์เบต้า จากผลการศึกษาจะพบว่าตัวแปรที่มีผลมากที่สุดใ  
การสังเคราะห์ซีโอไลต์เบต้าโดยวิธีการเปลี่ยนของเจลแห้งคือปริมาณน้ำ และปริมาณของเจลแห้ง  
ที่อยู่ในเครื่องอัดความดันในระหว่างกระบวนการการตกผลึก ซึ่งปริมาณน้ำที่เหมาะสมคือ 10  
มิลลิลิตร และอัตราส่วนของ  $M_{\text{gel}}/M_{\text{water}}$  และอัตราส่วนของ  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ที่เหมาะสมคือ 1.5  
และ 100 ตามลำดับ ผลที่ได้จาก XRD จะแสดงให้เห็นว่าปัจจัยที่เหมาะสมเหล่านี้ทำให้ได้ซี  
โอไลต์เบต้าที่สังเคราะห์โดยวิธีการเปลี่ยนของเจลแห้งมีความเป็นผลึกสูง สำหรับซีโอไลต์เบต้าที่มี  
อัตราส่วนของ  $\text{SiO}_2/\text{Al}_2\text{O}_3$  จาก 30 ถึง 100 พบว่าขนาดของอนุภาค พื้นที่ผิว และความเป็น  
ผลึกของซีโอไลต์เบต้าจะเพิ่มขึ้นเมื่ออัตราส่วนของ  $\text{SiO}_2/\text{Al}_2\text{O}_3$  เพิ่มขึ้น และค่าการเปลี่ยนของ  
เมทานอลของซีโอไลต์เบต้าที่สังเคราะห์โดยวิธีการเปลี่ยนของเจลแห้งจะขึ้นกับความเป็นผลึกของซี  
โอไลต์เบต้า

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SIRIPORN PAISANSING: BETA ZEOLITE SYNTHESIS BY DRY GEL CONVERSION AND ITS CATALYTIC PERFORMANCE. THESIS ADVISOR: SUPHOT PHATANASRI, D.Eng., THESIS CO-ADVISOR: PROF. PIYASAN PRASERTHDAM, Dr.Ing. 82 pp. ISBN 974-17-6631-9

Beta zeolites was synthesized by dry gel conversion with  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ratios of 30-200, and the crystallized products obtained within 24 h. The products obtained were characterized by XRD, XRF, BET, SEM and  $^{27}\text{Al}$  MAS NMR spectrometer and methanol conversion as the catalytic test reaction. The effect of water content in the autoclave, dry gel mass and silica to alumina ratios on the formation of beta zeolite has been investigated. The results suggest that the most critical parameters of the dry gel synthesis of beta zeolite are the water content and dry gel mass in the autoclave during the crystallization process. The optimum the water content was 10 ml, the optimum  $M_{\text{gel}} / M_{\text{water}}$  ratio was 1.5 and the optimum  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ratios was 100. The XRD patterns are shown that highly crystalline beta zeolite by dry gel conversion was obtained with these conditions. For pure beta zeolite was obtained with  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ratio from 30 to 100. The particle size, the BET surface area and the crystallinity of beta zeolites increased with increasing  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ratio. The methanol conversion of beta zeolite synthesized by dry gel conversion depend on the crystallinity of beta zeolites.

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