

**ACID-BASE INTERACTION BETWEEN C₈ AROMATICS
AND X AND Y ZEOLITES**



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ABSTRACT

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In this work, C_8 aromatics adsorption in liquid phase on X and Y zeolites was investigated. To study effects of acid-base interaction between the aromatics and the zeolites, a series of both zeolites with different exchanged cations, Cs , Rb , K , Na and Li , was used as adsorbents. p -Xylene, having the weakest basicity of the aromatics, was expected to have increased selectivity with decreasing zeolite acidity. However, the results showed that the acid-base interaction could not be used to explain the adsorption behavior for all cations studied. The effects of cation size and zeolite type must also be taken into account. Here, KY had high p -xylene selectivity, which could be obtained from either the dynamic adsorption or equilibrium adsorption experiments. Moreover, p -xylene selectivity was hardly changed by the components' concentrations in the feed.

บทคัดย่อ

รัตติยา สุนทรพันธ์: อันตรกิริยาระหว่างสารอะโรมาติกคาร์บอน 8 อะตอม และ ซีโอไลต์เอ็กซ์และวาย (Acid-Base Interaction between C₈ aromatics and X and Y Zeolites) อ. ที่ปรึกษา: ดร. สันติ กุลประทีปปัญญา ผศ.ดร. ปราโมช รังสรรค์วิจิตร ดร. ปมทอง มาลากุล ณ อยุธยา, 59 หน้า, ISBN 974-03-1567-4

งานวิจัยนี้ศึกษาถึงการดูดซับของสารอะโรมาติกคาร์บอน 8 อะตอมในสถานะของเหลวบนซีโอไลต์เอ็กซ์และวายโดยเน้นในเรื่องอันตรกิริยาระหว่างเบส ตัวดูดซับที่ใช้คือซีโอไลต์เอ็กซ์และวายซึ่งผ่านกระบวนการแลกเปลี่ยนกับโลหะประจุบวกหมู่หนึ่งได้แก่ ซีเซียม, รูบิเดียม, โพแทสเซียม, โซเดียม และ ลิเทียม ตามทฤษฎีคาดว่าค่าซีเล็กติวิตีของพาราไซลีนซึ่งเป็นสารประกอบที่มีความเป็นด่างอ่อนที่สุดจะเพิ่มขึ้นเมื่อค่าความเป็นกรดของซีโอไลต์ที่เป็นตัวดูดซับลดลง อย่างไรก็ตามผลการทดลองพบว่าอันตรกิริยาระหว่างเบสเพียงอย่างเดียวไม่สามารถอธิบายพฤติกรรมการดูดซับของสารประกอบอะโรมาติกคาร์บอน 8 อะตอมบนซีโอไลต์ทั้งหมดที่ศึกษาได้ จำเป็นจะต้องคำนึงถึงผลกระทบจากขนาดของโลหะประจุบวกและชนิดของซีโอไลต์ด้วย งานวิจัยพบว่าโพแทสเซียมวายให้ค่าซีเล็กติวิตีของพาราไซลีนสูงที่สุด นอกจากนี้จากการทดลองการดูดซับทั้งแบบพลศาสตร์และแบบสมดุลซึ่งให้ผลใกล้เคียงกันพบว่าค่าซีเล็กติวิตีของพาราไซลีนไม่ขึ้นอยู่กับค่าความเข้มข้นของสารประกอบในสารละลายตั้งต้น

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