

**EFFECTS OF ADSORBENTS ON THE CRYSTALLIZATION OF
CHLORONITROBENZENES**

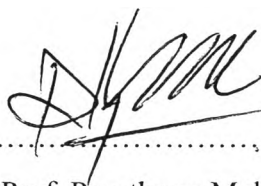
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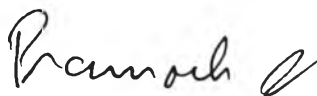
Thesis Title: Effects of Adsorbents on the Crystallization of
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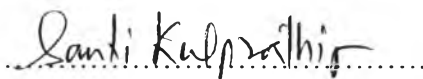


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ABSTRACT

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Jeeranun Neaungjumnong: Effects of Adsorbents on the
Crystallization of Chloronitrobenzenes

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Crystallization of chloronitrobenzenes (CNBs) with the presence of an adsorbent was investigated. Equilibrium binary component adsorption experiments of *m*-CNB and *p*-CNB on NaX, CaX, BaX, NaY, CaY, KY, Al₂O₃, SiO₂, activated carbon and glass beads were performed. The results indicated that selectivity and adsorption of *m*-CNB and *p*-CNB depended on the adsorbent. Effects of feed composition on crystallization of *m*- and *p*-CNB were then studied with below, at, and above the eutectic composition (61.0, 62.9, and 63.5 wt% *m*-CNB in the feed, respectively). In the experiments, the system was cooled by cooling water from 30 °C to crystallization temperature. The crystal composition was then measured by a gas chromatograph. The results conformed to the binary phase diagram of *m*- and *p*-CNB. On the other hand, the crystals from the feed with adsorbents were rich in *p*-CNB for both at and above the eutectic composition, and the crystals near the adsorbents had higher *p*-CNB purity than those far from the adsorbents.

บทคัดย่อ

จีรนนท์ เนื่องจำนงค์: การศึกษาผลกระทบของสารดูดซับที่มีต่อการตกผลึกของคลอโรไนโตรเบนซีน (Effects of Adsorbents on the Crystallization of Chloronitrobenzenes)
อ. ที่ปรึกษา: รศ. ดร. ปราโมช รังสรรค์วิจิตร และ ดร. สันติ กุลประทีปปัญญา 59 หน้า

งานวิจัยชิ้นนี้เป็นการศึกษาการตกผลึกของคลอโรไนโตรเบนซีนโดยที่มีสารดูดซับในระบบ เพื่อแยกคลอโรไนโตรเบนซีนซึ่งเป็นสารอนุพันธ์ที่มีจุดเดือดใกล้เคียงกัน การทดลองแรกเป็นการศึกษาการดูดซับพารา-เมทาคลอโรไนโตรเบนซีนโดยใช้สารดูดซับ นอกจากนี้ใช้สารผสมคลอโรไนโตรเบนซีนที่มีสัดส่วนของเมทาคลอโรไนโตรเบนซีนที่ 62.9 และ 63.5 เปอร์เซ็นต์โดยน้ำหนักของสารผสม จากนั้นลดอุณหภูมิของระบบจนถึงจนถึงอุณหภูมิตกผลึกของสารผสมและวิเคราะห์หาองค์ประกอบของผลึกโดยเทคนิคก๊าซโครมาโตกราฟี จากผลการวิจัยพบว่าสารที่เกิดขึ้นมีลักษณะออสัญฐานมีองค์ประกอบใกล้เคียงกับสารผสมเริ่มต้นและสารที่มีลักษณะผลึกใสมีองค์ประกอบใกล้เคียงกับเมทาคลอโรไนโตรเบนซีนบริสุทธิ์ สำหรับการตกผลึกของสารผสมที่มีสัดส่วนเมทาคลอโรไนโตรเบนซีนที่ 62.9 และ 63.5 เปอร์เซ็นต์ ตามลำดับ ในทางกลับกัน เมื่อมีสารดูดซับในกระบวนการตกผลึก ผลึกที่เกิดขึ้นมีองค์ประกอบของพาราคลอโรไนโตรเบนซีนในสารผสมทั้งที่มีสัดส่วนเมทาคลอโรไนโตรเบนซีนที่ 62.9 และ 63.5 เปอร์เซ็นต์ โดยผลึกที่เกิดขึ้นที่ตำแหน่งใกล้เคียงสารดูดซับจะมีองค์ประกอบของพาราคลอโรไนโตรเบนซีนสูงกว่าผลึกที่ตำแหน่งไกลจากสารดูดซับออกไป

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