

**CRYSTALLIZATION OF *m*-CHLORONITROBENZENE  
IN THE PRESENCE OF ADSORBENTS**



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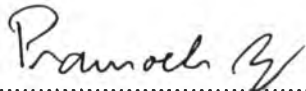
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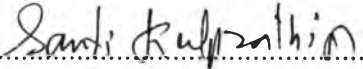
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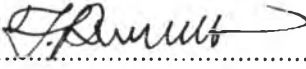
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## ABSTRACT

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Sasikarn Yairit: Crystallization of *m*-Chloronitrobenzene in the Presence of Adsorbents

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Chloronitrobenzenes or CNBs, isomeric substances, consisting of *o*-, *m*- and *p*-CNB, are used as an important starting material in chemical production. This work explored the possibility of enhancing the CNBs separation through the combination of crystallization and adsorption. Effects of feed composition on the crystallization of *m*- and *p*-CNB were studied with 61 (below the eutectic composition) and 65 wt% (above the eutectic composition) *m*-CNB in the feed. In the experiments, the liquid mixture was cooled to its crystallization temperature, and the precipitate composition was determined by a gas chromatograph. The result showed that the precipitates from the feed without a zeolite were rich in *p*-CNB and *m*-CNB with the 61 wt% *m*-CNB and 65 wt% *m*-CNB in the feeds, respectively. On the contrary, the precipitates from the feed with FAU zeolites were rich in *p*-CNB for both below and above the eutectic composition. The effect of the number of FAU zeolites on the precipitate composition was then investigated. The results revealed that the precipitates from the lower number of the zeolites had higher *p*-CNB purity than those from the higher number of zeolite.

## บทคัดย่อ

ศศิกานต์ ไชยฤทธิ์ : การตกผลึกของเมทา-คลอโรไนโตรเบนซีนในสถานะที่มีสารดูดซับ (Crystallization of *m*-Chloronitrobenzene in the Presence of Adsorbents) อ. ที่ปรึกษา : รศ. ดร. ปราโมช รังสรรค์วิจิตร และ ดร. สันติ กุลประทีปปัญญา 65 หน้า

งานวิจัยนี้ได้ประยุกต์ใช้หลักการของกระบวนการตกผลึกและการดูดซับ เพื่อแยกคลอโรไนโตรเบนซีนซึ่งเป็นสารอนุพันธ์ที่มีจุดเดือดใกล้เคียงกัน การทดลองใช้สารผสมคลอโรไนโตรเบนซีนที่มีสัดส่วนของเมทา-คลอโรไนโตรเบนซีน ที่ 61 และ 65 เปอร์เซ็นต์โดยน้ำหนักของสารผสม จากนั้นลดอุณหภูมิของระบบจนถึงอุณหภูมิตกผลึกของสารผสม และวิเคราะห์หาองค์ประกอบของผลึกโดยเทคนิคก๊าซโครมาโตกราฟี จากผลการวิจัยพบว่า สารที่เกิดขึ้นมีลักษณะเป็นผลึกใสมีองค์ประกอบใกล้เคียงกับพารา- และ เมทา-คลอโรไนโตรเบนซีนบริสุทธิ์ สำหรับการตกผลึกของสารผสมที่มีสัดส่วนเมทา-คลอโรไนโตรเบนซีนที่ 61 และ 65 เปอร์เซ็นต์ ตามลำดับในทางกลับกัน เมื่อมีการประยุกต์ใช้ซีโอไลต์ในกระบวนการตกผลึก ผลึกที่เกิดขึ้นมีองค์ประกอบของพารา-คลอโรไนโตรเบนซีนในสารผสมทั้งที่มีสัดส่วนเมทา-คลอโรไนโตรเบนซีนที่ 61 และ 65 เปอร์เซ็นต์ นอกจากนี้ จำนวนของซีโอไลต์ยังส่งผลกระทบต่อองค์ประกอบของผลึกคลอโรไนโตรเบนซีน โดยผลึกที่เกิดขึ้นจากระบบที่มีจำนวนของซีโอไลต์น้อยกว่า ผลึกจะมีองค์ประกอบของพารา-คลอโรไนโตรเบนซีนมากกว่าจากระบบที่มีจำนวนของซีโอไลต์มากกว่า

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## TABLE OF CONTENTS

	<b>PAGE</b>
Title Page	i
Abstract (in English)	iii
Abstract (in Thai)	iv
Acknowledgements	v
Table of Contents	vi
List of Tables	ix
List of Figures	xi
<b>CHAPTER</b>	
<b>I INTRODUCTION</b>	<b>1</b>
<b>II LITERATURE REVIEW</b>	<b>3</b>
2.1 Chloronitrobenzenes	3
2.2 Crystallization	5
2.2.1 Solution Crystallization	5
2.2.2 Melt Crystallization	6
2.3 Phase Equilibrium	7
2.3.1 Phase Rule	7
2.3.2 Solid-Liquid Phase Diagram	9
2.4 Precipitation	12
2.4.1 Agglomeration	12
2.5 Product quality	13
2.5.1 Purity	14
2.5.2 Crystal Size Distributions	14
2.6 Adsorption	15
2.7 Zeolite	16
2.8 Chloronitrobenzene Separation Process	20

<b>CHAPTER</b>	<b>PAGE</b>	
<b>III</b>	<b>EXPERIMENTAL</b>	23
	3.1 Materials	23
	3.1.1 Chemicals and Solvent	23
	3.1.2 Adsorbents	23
	3.2 Equipment	23
	3.3 Methodology	24
	3.3.1 Effects of Feed Composition on <i>m</i> - and <i>p</i> -CNB Crystallization	24
	3.3.2 Effects of FAU zeolites on <i>m</i> - and <i>p</i> -CNB Crystallization	24
	3.3.2 Influences of Seeds on the Crystallization	26
<b>IV</b>	<b>RESULTS AND DISCUSSION</b>	27
	4.1 Effect of Feed Composition on <i>m</i> - and <i>p</i> -CNB Crystallization	27
	4.2 Effect of FAU Zeolite on the <i>m</i> - and <i>p</i> -CNB Crystallization	29
	4.2.1 Effect of FAU Zeolites on the CNB Feed Solution Compositions	29
	4.2.2 Effect of the Number of Zeolites on the CNB Precipitate Compositions and Crystallization Temperature	30
	4.2.3 Effect of FAU Zeolites on the CNB Precipitate Compositions	40
	4.3 Influences of Seeds on the Crystallization	52
<b>V</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	56
	<b>REFERENCES</b>	58

<b>CHAPTER</b>	<b>PAGE</b>
<b>APPENDICES</b>	<b>61</b>
<b>Appendix A</b> <i>m</i> -CNB/ <i>p</i> -CNB Ratio of the Precipitates without and with 5 and 10 grains of Zeolites in the Feed at 61 and 65 wt% <i>m</i> -CNB	<b>61</b>
<b>Appendix B</b> <i>m</i> -/ <i>p</i> -CNB Ratio of the Precipitates with 61 wt% and 65 wt% <i>m</i> -CNB in the Feed and 2 Grains of Each Type of Zeolites	<b>63</b>
<b>Appendix C</b> <i>m</i> -CNB/ <i>p</i> -CNB Ratio of the Precipitates with <i>m</i> -CNB Seed, <i>p</i> -CNB Seed, and <i>m</i> - and <i>p</i> -CNB Seeds in the Feed at 61 and 65 wt% <i>m</i> -CNB	<b>64</b>
<b>CURRICULUM VITAE</b>	<b>65</b>



## LIST OF TABLES

TABLE	PAGE	
2.1	Physical properties of chloronitrobenzene Isomers	3
2.2	Differences between melt and solution crystallization	7
4.1	Compositions of <i>m</i> - and <i>p</i> -CNB in the feeds and precipitates, and crystallization temperature	27
4.2	<i>m</i> - and <i>p</i> -CNB composition in the feed with 61 wt% of <i>m</i> -CNB before and after adding 5 grains of zeolites at 30°C	29
4.3	<i>m</i> - and <i>p</i> -CNB composition in the feed with 61 wt% of <i>m</i> -CNB before and after adding 10 grains of zeolites at 30°C	30
4.4	Composition of <i>m</i> - and <i>p</i> -CNB in the precipitates located near and far from zeolites (Run#1) with 61 wt% of <i>m</i> -CNB in the feed and 5 grains of zeolites	32
4.5	Composition of <i>m</i> - and <i>p</i> -CNB in the precipitates located near and far from zeolites (Run#2) with 61 wt% of <i>m</i> -CNB in the feed and 5 grains of zeolites	33
4.6	Composition of <i>m</i> - and <i>p</i> -CNB in the precipitates located near and far from zeolites (Run#1) with 61 wt% of <i>m</i> -CNB in the feed and 10 grains of zeolites	34
4.7	Composition of <i>m</i> - and <i>p</i> -CNB in the precipitates located near and far from zeolites (Run#2) with 61 wt% of <i>m</i> -CNB in the feed and 10 grains of zeolites	35
4.8	Crystallization temperatures at 61 wt% of <i>m</i> -CNB in the feed with 5 and 10 grains of zeolites	38
4.9	<i>m</i> - and <i>p</i> -CNB compositions of all precipitates collected from 61 wt% <i>m</i> -CNB in the feed with 5 and 10 grains of zeolites	40
4.10	Composition of <i>m</i> - and <i>p</i> -CNB in the precipitates located near and far from zeolites (Run#1) with 65 wt% <i>m</i> -CNB in the feed and 5 grains of zeolites	42

TABLE	PAGE
4.11 Composition of <i>m</i> - and <i>p</i> -CNB in the precipitates located near and far from zeolites (Run#2) with 65 wt% <i>m</i> -CNB in the feed and 5 grains of zeolites	43
A1 <i>m</i> -CNB/ <i>p</i> -CNB ratio of the precipitates without and with 5 and 10 grains of zeolites in the feed at 61 wt% <i>m</i> -CNB	60
A2 <i>m</i> -CNB/ <i>p</i> -CNB ratio of the precipitates without and with 5 grains of zeolites in the feed at 65 wt% <i>m</i> -CNB	60
A3 <i>m</i> -CNB/ <i>p</i> -CNB ratio of all precipitates without and with the 5 grains of zeolites in the feed at 61 and 65 wt% <i>m</i> -CNB	61
B1 <i>m</i> -/ <i>p</i> -CNB ratio of the precipitates with 61 wt% <i>m</i> -CNB in the feed and 2 grains of each type of zeolites	62
B2 <i>m</i> -/ <i>p</i> -CNB ratio of the precipitates with 65 wt% <i>m</i> -CNB in the feed and 2 grains of each type of zeolites	62
C1 <i>m</i> -CNB/ <i>p</i> -CNB ratio of the precipitates with <i>m</i> -CNB seed, <i>p</i> -CNB seed and <i>m</i> -CNB and <i>p</i> -CNB seeds in the feed at 61 wt% <i>m</i> -CNB and 65 wt% <i>m</i> -CNB	63

## LIST OF FIGURES

FIGURE	PAGE
2.1 Chloronitrobenzene isomers	3
2.2 Nitration of chlorobenzene	4
2.3 Phase diagram for the simple eutectic system naphthalene-benzene	9
2.4 Some binary solid-liquid phase diagrams encountered in melt crystallization	12
2.5 Fujasite X cage and the cation exchange sites I-III.	18
3.1 Crystallization unit	24
3.2 Locations where precipitates were collected for studying effect of the number of FAU zeolites on the crystallization	25
3.3 Types and locations of seed crystals in the crystallizer	26
4.1 Binary phase diagram of <i>m</i> - and <i>p</i> -CNB	28
4.2 Locations where precipitates were collected for <i>m</i> - and <i>p</i> -CNB composition analysis	31
4.3 Comparison of <i>m</i> -/ <i>p</i> -CNB ratio of the precipitates with 61 wt% of <i>m</i> -CNB in the feed and 5 grains of zeolites	37
4.4 Comparison of <i>m</i> -/ <i>p</i> -CNB ratio of the precipitates with 61 wt% of <i>m</i> -CNB in the feed and 10 grains of zeolites	38
4.5 Effect of the number of zeolite on <i>m</i> -/ <i>p</i> -CNB ratio of the precipitates at 61 wt% <i>m</i> -CNB in the feed	41
4.6 Comparison of <i>m</i> -/ <i>p</i> -CNB ratio of the precipitates with 65 wt% <i>m</i> -CNB in the feed and 5 grains of zeolites	44
4.7 Comparison of <i>m</i> -/ <i>p</i> -CNB ratio of the precipitates with 61 and 65 wt% <i>m</i> -CNB in the feed and 5 grains of zeolites	45
4.8 Experimental set up to study effects of two grains of each zeolites in 61 and 65 wt% of <i>m</i> -CNB in the feed	46
4.9 Comparison of <i>m</i> -/ <i>p</i> -CNB ratio of the precipitates with 61 wt% and 65 wt% <i>m</i> -CNB in the feed and two grains of each zeolites	47

<b>FIGURE</b>		<b>PAGE</b>
4.10	Solubility-supersolubility diagram	48
4.11	Interfacial tension at the boundaries between three phases	50
4.12	Nucleation on a foreign particle for different wetting angles	51
4.13	Effects of the seeds on the <i>m-/p</i> -CNB ratio of the precipitates at 61 wt% and 65 wt% <i>m</i> -CNB in the feed	53
4.14	Typical phenomenon of nucleation in bulk and surface of seeds	55