

**THE ADSORPTION OF THE SURFACTANT ON PAPER FIBER
RELATED TO PAPER RECYCLING**

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For the Degree of Master of Science
The Petroleum and Petrochemical College, Chulalongkorn University
In Academic Partnership with
The University of Michigan, The University of Oklahoma,
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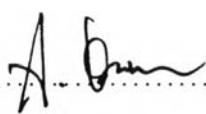
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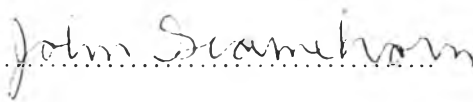
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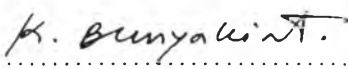
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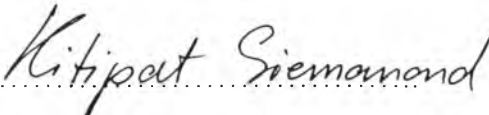
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บทคัดย่อ

สุวีณา โสมะบุตร : การดูดซับของสารลดแรงตึงผิวบนเส้นใยกระดาษในกระบวนการนำกระดาษกลับมาใช้ใหม่ (Adsorption of surfactant on paper fiber related to paper recycling) อ. ที่ปรึกษา : ศ. จอห์น เอฟ สกemasอร์น, รศ. กัญจนา บุญเกียรติ และ ดร. กิตติพัฒน์ สีมานนท์ 58 pp ISBN 974-334-157-9

ในกระบวนการนำกระดาษกลับมาใช้ใหม่ โดยทั่วไปมักจะใช้สารลดแรงตึงผิวเพื่อช่วยในการดึงหมึกพิมพ์ออกจากเส้นใยกระดาษ การทดลองมุ่งศึกษาถึงการทำปฏิกิริยาของสารลดแรงตึงผิว (โซเดียมโดเดซิลซัลเฟต หรือ เอสดีเอส) บนพื้นผิวเส้นใยกระดาษ โดยมีตัวแปรของกรด-เบส และความเข้มข้นของเกลือแคลเซียม ต่อการดูดซับของเอสดีเอส พร้อมกับวัดค่าความต่างศักย์อิเล็กโตรโคโนติกของสารแขวนลอยที่เอสดีเอสดูดซับบนพื้นผิวเส้นใยกระดาษ ผลการทดลองแสดงว่า เกลือแคลเซียมมีการดูดซับบนพื้นผิวเส้นใยกระดาษโดยการแลกเปลี่ยนประจุ และยังพบว่าเกลือแคลเซียมไม่มีผลในการเพิ่มการดูดซับของเอสดีเอส บนพื้นผิวเส้นใยกระดาษ ส่วนเอสดีเอสจะดูดซับบนพื้นผิวเส้นใยกระดาษได้ดีในสถานะของกรด-เบสที่ต่ำ และยังพบอีกว่าความเป็นกรด-เบสทำให้เห็นความแตกต่างของการดูดซับของเอสดี-เอสอย่างชัดเจน โดยเฉพาะอย่างยิ่งในช่วงที่ความเข้มข้นของเอสดีเอสในระบบยังไม่ถึงจุดซีเอ็มซี ซึ่งเป็นความเข้มข้นแรกที่สารลดแรงตึงผิวเกิดการรวมตัว

ABSTRACT

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KEYWORD: Anionic Surfactant/ Flotation Deinking/ Paper fiber/ Recycling/
Counterion/ pH

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Flotation deinking is a common method used to remove ink from paper in paper recycling processes. The mechanism of flotation was predicted by studying the interaction of an anionic surfactant (sodium dodecyl sulfate (SDS) or sulfate) with paper fiber. The effect of calcium concentration was also studied. The pH values used in this study were 7 and 9. Experimental data from adsorption isotherms indicated that calcium ions adsorbed on negatively charged sites of the paper fiber by an ion exchange mechanism. The SDS adsorption isotherm was found to be the S-shaped. The addition of calcium did not have much effect on the adsorption of SDS. On the other hand, changing the pH had a considerable effect on the adsorption of SDS. The experimental results also revealed that the adsorption of SDS was better at low pH value. The differences in adsorption of SDS were clearly observed at concentrations before approaching the CMC.

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TABLE OF CONTENTS

	PAGE
Title Page	i
Abstract (in English)	iii
Abstract (in Thai)	iv
Acknowledgements	v
Table of Contents	vi
List of Tables	ix
List of Figures	xii
CHAPTER	
I	
INTRODUCTION	1
II	
LITERATURE SURVEY	2
2.1 Nature of Paper Fiber	2
2.1.1 Source of Paper Fiber	2
2.1.1.1 Wood	2
2.1.1.2 Non-Wood	3
2.1.2 Chemical Composition of Wood	3
2.1.2.1 Cellulose	3
2.1.2.2 Hemicellulose	3
2.1.2.3 Lignin	3
2.1.2.4 Extractive	3
2.1.3 Composition of Paper Fiber	4
2.1.3.1 Fibrous Materials	4
2.1.3.2 Non Fibrous Materials	4
2.2 Characteristic Features of Surfactants	5
2.2.1 General Structure of Surfactants	6

CHAPTER	PAGE
2.2.1.1 Anionic	6
2.2.1.2 Cationic	6
2.2.1.3 Zwitterionic	6
2.2.1.4 Nonionic	6
2.3 Role of Surfactant on Flotation Deinking	7
2.4 Adsorption Isotherm of Surfactant	7
2.5 Roles of Calcium Ions in Flotation Deinking	8
2.6 Effect of pH in Flotation Deinking	9
2.7 The Double Layer	10
2.8 Zeta Potential	11
III EXPERIMENTAL	13
3.1 Materials	13
3.2 Method	14
3.2.1 Adsorption Isotherm Experiment	14
3.2.2 Zeta Potential Experiment	14
IV RESULTS AND DISCUSSION	16
4.1 Effect of Calcium Ions on the Adsorption of SDS on the Paper Fiber	16
4.2 Effect of pH on the Adsorption of SDS and Calcium Ions on Paper Fiber	24
4.3 Effect of SDS and Calcium Ions to the Zeta Potential of Paper Fiber	30
4.4 Effect of pH to the Zeta Potential of Paper Fiber	32
V CONCLUSIONS AND RECOMMENDATIONS	36

CHAPTER	PAGE
5.1 Conclusions	36
5.2 Recommendations	37
REFERENCES	38
APPENDICES	40
CURRICULUM VITAE	58

LIST OF TABLES

TABLE	PAGE
A-1 Data of SDS adsorption with no calcium at pH 7.	40
A-2 Data of SDS adsorption with no calcium at pH 9.	41
A-3 Data of SDS adsorption with initial calcium concentration 100 μM at pH 7.	42
A-4 Data of SDS adsorption with initial calcium concentration 100 μM at pH 9.	43
A-5 Data of SDS adsorption with initial calcium concentration 1,000 μM at pH 7.	44
A-6 Data of SDS adsorption with initial calcium concentration 1,000 μM at pH 9.	44
B-1 Data of calcium adsorption with initial calcium concentration 100 μM and varying SDS concentration at pH 7.	45
B-2 Data of calcium adsorption with initial calcium concentration 100 μM and varying SDS concentration at pH 9.	46
B-3 Data of calcium adsorption with initial calcium concentration 1,000 μM and varying SDS concentration at pH 7.	47
B-4 Data of calcium adsorption with initial calcium concentration 1,000 μM and varying SDS concentration at pH 9.	47
B-5 Data of calcium adsorption with no SDS at pH 7.	48
B-6 Data of calcium adsorption with no SDS at pH 9.	49
B-7 Data of calcium adsorption with initial SDS concentration 500 μM at pH 7.	50
B-8 Data of calcium adsorption with initial SDS concentration 500 μM at pH 9.	50

TABLE	PAGE
B-9 Data of calcium adsorption with initial SDS concentration 1,000 μM at pH 7.	51
B-10 Data of calcium adsorption with initial SDS concentration 1,000 μM at pH 9.	51
C-1 Data of zeta potential of paper fiber with varying SDS concentration and no calcium at pH 7.	52
C-2 Data of zeta potential of paper fiber with varying SDS concentration and no calcium at pH 9.	52
C-3 Data of zeta potential of paper fiber with varying SDS concentration and initial calcium concentration 100 μM at pH 7.	53
C-4 Data of zeta potential of paper fiber with varying SDS concentration and initial calcium concentration 100 μM at pH 9.	53
C-5 Data of zeta potential of paper fiber with varying SDS concentration and initial calcium concentration 1,000 μM at pH 7.	54
C-6 Data of zeta potential of paper fiber with varying SDS concentration and initial calcium concentration 1,000 μM at pH 9.	54
C-7 Data of zeta potential of paper fiber with no SDS and varying calcium concentration at pH 7.	55
C-8 Data of zeta potential of paper fiber with no SDS and varying calcium concentration at pH 9.	55
C-9 Data of zeta potential of paper fiber with initial SDS concentration 500 μM and varying calcium concentration at pH 7.	56

TABLE	PAGE
C-10 Data of zeta potential of paper fiber with initial SDS concentration 500 μM and varying calcium concentration at pH 9.	56
C-11 Data of zeta potential of paper fiber with initial SDS concentration 1,000 μM and varying calcium concentration at pH 7.	57
C-12 Data of zeta potential of paper fiber with initial SDS concentration 1,000 μM and varying calcium concentration at pH 9.	57

LIST OF FIGURES

FIGURE	PAGE
2.1 S-shaped adsorption isotherm for an anionic surfactant on a strong charge site substrate.	8
2.2 Visualization of the Double Layer.	11
2.3 Relationship between zeta potential and surface potential.	12
3.1 Schematic of SDS.	13
4.1 Adsorption isotherm of calcium on paper fiber with no SDS at pH 7 at 30 ⁰ C; varying initial calcium concentration.	17
4.2 Adsorption isotherm of calcium on paper fiber with no SDS at pH 9 at 30 ⁰ C; varying initial calcium concentration.	17
4.3 Adsorption isotherm of SDS on paper fiber with no calcium at pH 7 at 30 ⁰ C; varying initial SDS concentration.	18
4.4 Adsorption isotherm of SDS on paper fiber with no calcium at pH 9 at 30 ⁰ C; varying initial SDS concentration.	18
4.5 Adsorption isotherms of SDS and calcium on paper fiber at pH 7 at 30 ⁰ C; (■) varying initial SDS concentration, (◆) varying initial calcium concentration.	20
4.6 Adsorption isotherms of SDS with varying initial calcium concentration at pH 7 at 30 ⁰ C; (▲) varying initial SDS concentration, (◆) varying initial SDS concentration and constant initial calcium concentration 100 μM, (■) varying initial SDS concentration and constant initial calcium concentration 1,000 μM.	21
4.7 Adsorption isotherms of SDS with varying initial calcium concentration at pH 9 at 30 ⁰ C; (▲) varying initial SDS concentration, (◆) varying initial SDS concentration and	

FIGURE	PAGE
constant initial calcium concentration 100 μM , (■) varying initial SDS concentration and constant initial calcium concentration 1,000 μM .	22
4.8 Adsorption isotherms of calcium and SDS with varying initial calcium concentration at pH 7 at 30 ⁰ C; (◆) varying initial SDS concentration and constant initial calcium concentration 100 μM , (■) varying initial SDS concentration and constant initial calcium concentration 1,000 μM .	23
4.9 Adsorption isotherms of calcium and SDS with varying initial calcium concentration at pH 9 at 30 ⁰ C; (◆) varying initial SDS concentration and constant initial calcium concentration 100 μM , (■) varying initial SDS concentration and constant initial calcium concentration 1,000 μM .	24
4.10 Adsorption isotherms of SDS with no calcium and varying pH at 30 ⁰ C ; (▲) varying initial SDS concentration at pH 7, (◆) varying initial SDS concentration at pH 9.	25
4.11 Adsorption isotherms of calcium with no SDS and varying pH at 30 ⁰ C; (▲) varying initial calcium concentration at pH 7, (◆) varying initial calcium concentration at pH 9.	26
4.12 Adsorption isotherms of SDS with initial calcium concentration 100 μM and varying pH at 30 ⁰ C; (▲) varying initial SDS concentration and constant calcium concentration 100 μM at pH 7, (◆) varying initial SDS concentration and constant calcium concentration 100 μM at pH 9.	27
4.13 Adsorption isotherms of SDS with initial calcium concentration 1,000 μM and varying pH at 30 ⁰ C; (▲) varying initial SDS concentration and constant calcium concentration	

FIGURE	PAGE
1,000 μM at pH 7, (\blacklozenge) varying initial SDS concentration and constant calcium concentration 1,000 μM at pH 9.	28
4.14 Adsorption isotherms of calcium and SDS with initial calcium concentration 100 μM and varying pH at 30 ⁰ C; (\blacklozenge) varying initial SDS concentration and constant calcium concentration 100 μM at pH 7, (\blacksquare) varying initial SDS concentration and constant calcium concentration 100 μM at pH 9.	29
4.15 Adsorption isotherms of calcium and SDS with initial calcium concentration 1,000 μM and varying pH at 30 ⁰ C; (\blacklozenge) varying initial SDS concentration and constant calcium concentration 1,000 μM at pH 7, (\blacksquare) varying initial SDS concentration and constant calcium concentration 1,000 μM at pH 9.	30
4.16 Zeta potential of paper fiber as a function of equilibrium SDS concentration with no calcium at pH 7 at 30 ⁰ C; (\blacklozenge) varying initial SDS concentration.	31
4.17 The schematic of the SDS adsorption on paper fiber.	31
4.18 Zeta potential of paper fiber as a function of equilibrium SDS concentration with varying initial calcium concentration at pH 7 at 30 ⁰ C; (\blacktriangle) varying initial SDS concentration, (\blacklozenge) varying initial SDS concentration and constant calcium concentration 100 μM , (\blacksquare) varying initial SDS concentration and constant calcium concentration 1,000 μM .	32
4.19 Adsorption isotherms of SDS and zeta potential of paper fiber with no calcium and varying pH at 30 ⁰ C; (\blacklozenge , \blacksquare) adsorption value of varying initial SDS concentration at pH 7 and 9 respectively, (\blacklozenge -, \blacksquare -) zeta potential value of varying initial	

FIGURE	PAGE
SDS concentration at pH 7 and 9 respectively.	33
4.20 Adsorption isotherms of SDS and zeta potential of paper fiber with initial calcium concentration 100 μM and varying pH at 30 $^{\circ}\text{C}$; (\blacklozenge , \blacksquare) adsorption value of varying initial SDS concentration at pH 7 and 9 respectively, (\blacklozenge —, \blacksquare —) zeta potential value of varying initial SDS concentration at pH 7 and 9 respectively.	34
4.21 Adsorption isotherms of SDS and zeta potential of paper fiber with initial calcium concentration 1,000 μM and varying pH at 30 $^{\circ}\text{C}$; (\blacklozenge , \blacksquare) adsorption value of varying initial SDS concentration at pH 7 and 9 respectively, (\blacklozenge —, \blacksquare —) zeta potential value of varying initial SDS concentration at pH 7 and 9 respectively.	35