

**SULPHUR BENTONITE AS AN EFFECTIVE  
LIQUID SULPHUR DERIVATIVE**



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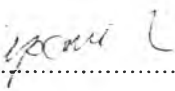

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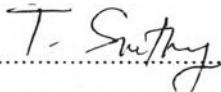
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## ABSTRACT

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Supakit Nuntawat: Sulphur Bentonite as an Effective Derivative.

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Elemental sulphur fertilizer is one of the most effective outlets of liquid sulphur based on the largest percentage of liquid sulphur requirement. The elemental sulphur is oxidized to sulphate form under typical conditions, before being taken up by the plant. Sulphur bentonite mixtures were prepared by blending molten sulphur and bentonite in various forms. The main purpose of this work is to formulate a novel sulphur bentonite by using liquid sulphur produced from a local refinery plant mixed with bentonite and porous clay heterostructure bentonite (PCH) in various ratios for controlling sulphur release. The pelletizing process was successfully produced sulphur bentonite with bentonite contents of 10, 20, and 30 wt%. In the case of sulphur-PCH, the formulas were successfully synthesized only for contents of PCH in the range of 7 to 12 wt%. All sulphur bentonite fertilizers were tested with the plantation of soybean. The height, weight, yields, and symptoms of the soybean were observed whilst controlling the amount of water, light, and basal fertilizer.

## บทคัดย่อ

ศุภกิจ นันทวาสน์ : การผลิตปุ๋ยซัลเฟอร์เบนโทไนด์จากซัลเฟอร์เหลว (Sulphur Bentonite as an Effective Sulphur Derivative) อ.ที่ปรึกษา: ผศ.ดร.อาภาณี เหลืองนฤมิตชัย, ผศ.ดร.หทัยกานต์ มนัสปิยะ และ รศ.ดร.รัตนวรรณ มกรพันธุ์ 84 หน้า

ปุ๋ยธาตุกำมะถันเป็นหนึ่งในผลิตภัณฑ์ทางเลือกที่มีประสิทธิภาพสูงผลิตจากกำมะถันเหลว ซึ่งมีปริมาณมาก ก่อนที่พืชจะนำกำมะถันไปใช้ประโยชน์ ธาตุกำมะถันจะต้องถูกออกซิไดซ์ให้อยู่ในรูปของสารละลายซัลเฟตก่อน ในงานวิจัยนี้ได้ผลิตปุ๋ยซัลเฟอร์เบนโทไนด์ซึ่งทำได้โดยการผสมกำมะถันเหลวเข้ากับเบนโทไนด์ในรูปต่างๆ วัตถุประสงค์ของงานวิจัยนี้คือการผลิตสูตรปุ๋ยซัลเฟอร์เบนโทไนด์โดยวิธีการใหม่ โดยใช้กำมะถันเหลวที่ผลิตจากโรงกลั่นน้ำมันในประเทศไทย มาผสมกับเบนโทไนด์ ออคาโนเคลย์ และเบนโทไนด์ที่มีความพรุนสูงในอัตราส่วนต่างๆ เพื่อควบคุมการปลดปล่อยกำมะถัน ในงานวิจัยนี้ประสบความสำเร็จในการผลิตปุ๋ย โดยมีปริมาณ เบนโทไนด์ร้อยละ 10, 20, และ 30 ในขณะที่เบนโทไนด์ที่มีความพรุนสูงสามารถนำมาผสมได้ได้ในปริมาณร้อยละ 7 ถึง 12 ในท้ายที่สุดปุ๋ยซัลเฟอร์เบนโทไนด์ได้ถูกนำไปทดสอบประสิทธิภาพ โดยการนำไปใช้ในการปลูกถั่วเหลือง โดยจะทำการศึกษาถึงผลผลิต ความสูง น้ำหนัก ปริมาณกำมะถันที่พืชนำไปใช้และลักษณะอาการของถั่วเหลือง

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## TABLE OF CONTENTS

	<b>PAGE</b>
Title Page	i
Abstract (in English)	iii
Abstract (in Thai)	iv
Acknowledgement	v
Table of contents	vi
List of Tables	x
List of Figures	xi
Abbreviations	xiii
 <b>CHAPTER</b>	
<b>I INTRODUCTION</b>	<b>1</b>
 <b>II THEORETICAL BACKGROUND AND LITERATURE REVIEW</b>	 <b>3</b>
 <b>III EXPERIMENTAL</b>	
3.1 Materials	
3.1.1 Clay Minerals	13
3.1.2 Surfactants	13
3.1.3 Silica Sources	13
3.1.4 Solvents	13
3.1.5 Chemicals	13
3.1.6 Liquid Sulphur	13
3.2 Equipment	
3.2.1 X-ray Diffractometer	14
3.2.2 Surface Area Analyzer	14
3.2.3 Fourier Transform Infrared Spectroscopy	14
3.2.4 Thermogravimetric Analysis	14

<b>CHAPTER</b>	<b>PAGE</b>
3.2.5 Scanning Electron Microscope	15
3.2.6 CHNS Analyzer	15
3.2.7 UV/Vis Spectrophotometer	15
3.3 Methodology	
3.3.1 Purification and Adjustment of Bentonite	15
3.3.2 Synthesis of Organoclay	15
3.3.3 Synthesis of Porous Clay Heterostructure	16
3.3.4 Preparation of Sulphur Bentonite Fertilizers	16
3.3.5 Determination of Sulphur Content in Sulphur Bentonite Fertilizer	16
3.3.6 Dispersion of Sulphur Bentonite Prill in Water	17
3.3.7 Purification and pH Adjustment of Soil	17
3.3.8 Oxidation of Sulphur Fertilizers	17
3.3.9 Soybean Plantation	18
3.3.10 Sulphur Uptake of Soybean	18
<b>IV MODIFICATION OF ORGANOCLAY AND POROUS CLAY HETEROSTRUCTURES</b>	
4.1 Abstract	19
4.2 Introduction	19
4.3 Experimental	
4.3.1 Minerals	21
4.3.2 Purification and pH Adjustment of Bentonite	21
4.3.3 Synthesis of Organomodified Bentonite	22
4.3.4 Synthesis of Porous Clay Heterostructures	22
4.3.5 Characterization	23
4.4 Results and Discussion	
4.4.1 FTIR Results	24
4.4.2 XRD Results	26

<b>CHAPTER</b>	<b>PAGE</b>
4.4.3 N <sub>2</sub> Adsorption-Desorption Results	26
4.4.4 SEM Results	28
4.5 Conclusions	29
4.6 Acknowledgement	30
4.7 References	30
<b>V SYNTHESIS OF SULPHUR BENTONITE FERTILIZER</b>	
5.1 Abstract	31
5.2 Introduction	31
5.3 Experimental	
5.3.1 Materials	32
5.3.2 Preparation of Sulphur Bentonite Fertilizer	32
5.3.3 Characterization	32
5.4 Results and Discussion	
5.4.1 Formulation of Sulphur Bentonite Prills	34
5.4.2 Prill Structure	36
5.5 Conclusions	41
5.6 Acknowledgement	41
5.7 References	41
<b>VI THE EFFICIENCY OF SULPHUR BENTONITE FERTILIZER</b>	
6.1 Abstract	43
6.2 Introduction	43
6.3 Experimental	
6.3.1 Materials	44
6.3.2 Sulphur Content	45
6.3.3 Dispersion in Water	45



<b>CHAPTER</b>	<b>PAGE</b>
6.3.4 Purification and pH Adjustment of Sand	46
6.3.5 Oxidation of Sulphur Fertilizers	46
6.3.6 Soybean Plantation	47
6.3.7 Sulphur Uptake of Soybean	49
6.4 Results and Discussion	
6.4.1 Sulphur Content Results	50
6.4.2 Rate of Dispersion in Water	51
6.4.3 Oxidation of Sulphur Fertilizers	53
6.4.4 Results of Soil Planted Soybean Plantation	53
6.4.5 Sulphur Uptake Results	55
6.5 Conclusions	56
6.6 Acknowledgements	56
6.7 References	557
<b>VII CONCLUSION AND RECOMMENDATIONS</b>	<b>56</b>
<b>REFERENCES</b>	<b>58</b>
<b>APPENDICES</b>	
<b>Appendix A</b> Introduction of Sulphur	62
<b>Appendix B</b> Specification of Bentonite	72
<b>Appendix C</b> The Prepared Sulphur Bentonite Fertilizers	73
<b>Appendix D</b> Soil Planted Soybean Plantation	76
<b>Appendix E</b> Water Planted Soybean Plantation	81
<b>CURRICULUM VITAE</b>	<b>84</b>

**LIST OF TABLES**

<b>TABLE</b>		<b>PAGE</b>
4.1	Basal spacing of bentonite, organoclay and PCH	26
4.2	Porosity characteristics of bentonite, organoclay and PCH	27
5.1	Formulation of sulphur bentonite prill	35
6.1	The soybean planted treatment	48
6.2	Sulphur content of sulphur bentonite fertilizers	51
6.3	The water soluble sulphate in sulphur incubated soils	53

## LIST OF FIGURES

FIGURE	PAGE
2.1 Effect of bentonite content on the rate of dispersion of prills in water	5
2.2 Sulphur particle size distribution after dispersion in water	5
2.3 Structure of montmorillonite	8
2.4 The schematic diagrams of the possible interlayer structure of each quaternary alkylammonium derivative	9
2.5 TEM of saponite heterostructure image	10
2.6 Schematic representation of porous clay hetero structure (PCH) formation	11
4.1 Diagram of purification of bentonite	21
4.2 Diagram of preparation of organomodified bentonite	22
4.3 Diagram of synthesis of PCH	23
4.4 FTIR spectra of bentonite, organoclay, PCH	24
4.5 XRD patterns of bentonite, organoclay, PCH	25
4.6 N <sub>2</sub> adsorption-desorption isotherms of organoclay, bentonite, PCH	27
4.7 SEM images of bentonite, organo clay, PCH	28
5.1 Preparation of sulphur bentonite fertilizer	33
5.2 Mixing Chamber perforated with hole diameter of 2 mm	33
5.3 Mixing chamber with temperature controller set and forming sulphur bentonite prills on stainless steel plate	34
5.4 Sulphur bentonite prill, 30 % wt of bentonite content	36
5.5 SEM images of sulphur bentonite	37
5.6 EDX density map of sulphur bentonite prill	37
5.7 SEM image of sulphur-PCH	39
5.8 EDX density map of sulphur-PCH prill	40
6.1 Dispersability test of sulphur bentonite in water	45

<b>FIGURE</b>		<b>PAGE</b>
6.2	Oxidation test of sulphur fertilizers	46
6.3	Diagram of soybean plantation	48
6.4	Diagram of separation of soybean into seeds, root, leaves, and stem	50
6.5	Effect of bentonite content on the rate of dispersion of prill in water	52
6.6	Dispersion of sulphur bentonite in water	52
6.7	The observation of soybean plantation	52
6.8	Effect of sulphur fertilizers on the growing rate of soybean	54
6.9	Effect of sulphur fertilizers on the dried weight of soybean	55
6.10	Effect of sulphur fertilizers on the sulphur uptake of soybean	56

**ABBREVIATIONS**

PCH	Porous clay heterostructure
CTAB	Cetyltrimethylammonium bromide
S <sup>0</sup>	Sulphur
BS <sup>0</sup>	Sulphur bentonite
OS <sup>0</sup>	Sulphur-organoclay