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**PRODUCTION OF GYPSUM PLASTER FROM
MAE MOH FLUE-GAS GYPSUM**

Mr. Wichit Prakaypun

**A Thesis Submitted in Partial Fulfillment of the Requirments
for the Degree of Master of Science in Technology Ceramics**

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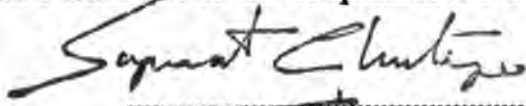
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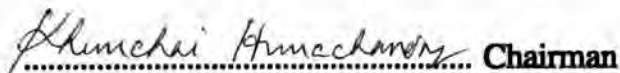
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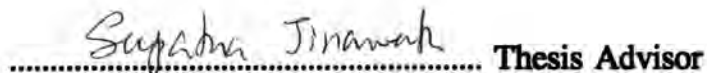


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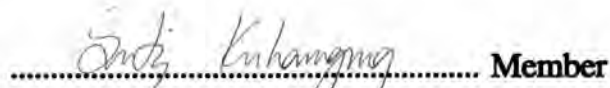
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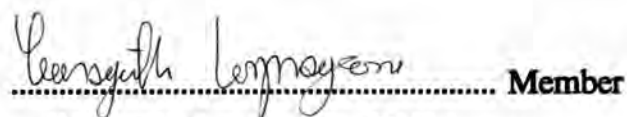
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ยิปซัมฟลูแก๊สเป็นผลพลอยได้จากการติลล์เฟอโรเซชันแก๊สซัลเฟอร์ไดออกไซด์จากสถานีพลังงานแม่เมาะ ได้ถูกนำมาใช้เป็นวัสดุตั้งต้นในการสังเคราะห์เบต้า-เฮมิไฮเดรตและมัลติเฟสพลาสเตอร์ ซึ่งเป็นวัสดุที่จะนำมาขึ้นรูปเป็นผลิตภัณฑ์พลาสเตอร์สำหรับงานก่อสร้างประเภทยิปซัมบอร์ดและฉาบผนัง เบต้า-เฮมิไฮเดรตและมัลติเฟสพลาสเตอร์ถูกเตรียมโดยการเผาแคลไซน์ยิปซัมฟลูแก๊สในเตาไฟฟ้าที่อุณหภูมิ 130°C และที่อุณหภูมิในช่วง $400\text{--}450^{\circ}\text{C}$ ตามลำดับ ทำการศึกษาผลของเวลาที่ใช้ในการเผาแคลไซน์ ขนาดอนุภาคของยิปซัม อุณหภูมิและความชื้นในเตาเผาที่มีต่อเฟสของพลาสเตอร์ที่เตรียมได้รวมทั้งผลของสารเติมแต่งชนิดต่างๆที่มีต่อสมบัติของผลิตภัณฑ์พลาสเตอร์ จากผลการทดลองพบว่าการนำเทคโนโลยีร่วมสมัยมาประยุกต์ใช้กับงานวิจัยสามารถที่จะผลิตขึ้นทดลองที่มีสมบัติเทียบเท่ากับที่ได้จากการใช้ยิปซัมธรรมชาติ โดยยิปซัมบอร์ดที่ผลิตจากมัลติเฟสพลาสเตอร์มีความแข็งแรงดัดสูงสุดเท่ากับ $7.13 \pm 1.04 \text{ N/mm}^2$ และผลิตภัณฑ์จากเบต้า-เฮมิไฮเดรตเท่ากับ $5.89 \pm 1.48 \text{ N/mm}^2$ พลาสเตอร์ฉาบผนังที่ผลิตได้มีค่าความบ่งผิวเท่ากับ $10.26 \pm 0.36 \text{ m}^2/100\text{kg}$. และเวลาในการเซ็ทตัวประมาณ 54.53 ± 0.35 นาที

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WICHIT PRAKAYPUN : PRODUCTION OF GYPSUM PLASTER FROM MAE MOH FLUE-GAS GYPSUM.



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
Flue-gas gypsum, from the desulfurization of SO_2 emitting from the Mae Moh power plant, was used as a starting material for the syntheses of β -hemihydrate and multiphase plasters which were used for the fabrication of building plaster components such as gypsum board and projection plaster. β -hemihydrate and multiphase plaster were prepared by calcining the flue-gas gypsum in an electric furnace at temperatures 130°C and $400\text{--}450^\circ\text{C}$, respectively. The effects of calcining time, particle size of gypsum, temperature and humidity in the furnace upon the phase of plasters obtained and also the effects of various additives on the properties of the products were studied. It was found from the experimental results that with the application of the contemporary gypsum technology, the specimens having equivalent quality to those from the natural gypsum could be successfully obtained. The maximum flexural strength of the gypsum board from multiphase plaster was $7.13\pm 1.04\text{ N/mm}^2$ and that from β -hemihydrate was $5.89\pm 1.48\text{ N/mm}^2$. The surface coverage and the initial setting time of the projection plaster were $10.26\pm 0.36\text{ m}^2/100\text{ kg}$. and $54.53\pm 0.35\text{ min}$.

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