

การพัฒนาการเคลื่อนบอะตุนานบนโมโนทัศนิตเซรามิก

นางสาว หฤทัย คังอุดมวงษา



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DEVELOPMENT OF ALUMINA COATING ON A CERAMIC MONOLITH



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สถาบันวิทยบริการ

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for the Degree of Master of Engineering in Chemical Engineering

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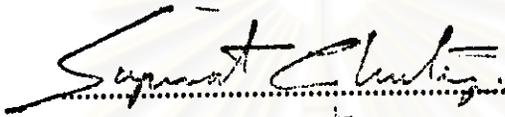
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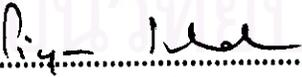
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วัตถุประสงค์ของงานวิจัยนี้ เพื่อหาสภาวะที่เหมาะสมสำหรับการปรับสภาพพื้นผิวเซรามิกโมโนลิทด้วยกรดและการเคลือบอะลูมินาบนพื้นผิวเซรามิกโมโนลิท

พบว่าสภาวะที่เหมาะสมสำหรับการปรับสภาพพื้นผิวของโมโนลิทด้วยกรดโดยแช่โมโนลิทในกรดอะซีติกเข้มข้นร้อยละ 2.5 โดยน้ำหนักเป็นเวลา 2 นาที ได้พบอีกว่าปริมาณอะลูมินาในสเลอรีเข้มข้นร้อยละ 40 โดยน้ำหนักมีความเหมาะสม อุณหภูมิและเวลาที่เหมาะสมสำหรับการเผาโมโนลิทที่เคลือบอะลูมินาแล้วคือ 500 องศาเซลเซียส เป็นเวลา 2 นาที ตามลำดับ การทดสอบการเพิ่มและลดอุณหภูมิอย่างรวดเร็วที่ 600 องศาเซลเซียส พบว่าอะลูมินาที่เคลือบบนโมโนลิทแตกเป็นเกล็ดขนาดเล็ก ส่วนการทดสอบการเพิ่มและลดอุณหภูมิอย่างรวดเร็วที่ 800 องศาเซลเซียส พบว่าอะลูมินาที่เคลือบบนโมโนลิทแตกเป็นเกล็ดขนาดใหญ่และเกล็ดอะลูมินาบางส่วนหลุดออกจากพื้นผิวโมโนลิท เมื่อทดสอบความทนทานต่อการขัดสีของอะลูมินาที่เคลือบบนโมโนลิท พบว่าน้ำหนักของโมโนลิทที่เคลือบด้วยอะลูมินาที่แตกเป็นเกล็ดขนาดเล็กลดลงน้อยกว่าโมโนลิทที่เคลือบด้วยอะลูมินาที่แตกเป็นเกล็ดขนาดใหญ่ กล่าวโดยสรุปคือ ขั้นตอนที่เหมาะสมสำหรับการเคลือบอะลูมินาบนโมโนลิทคือ เคลือบโมโนลิทในอะลูมินาสเลอรีสามครั้ง ครั้งละ 2 นาทีและเผาที่อุณหภูมิ 500 องศาเซลเซียสเป็นเวลา 2 ชั่วโมง

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

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The objective of this study is to find the suitable condition for acid surface treatment of ceramic monolith and for coating alumina washcoat on monolith surface.

It is found that the appropriate condition for acid surface pre-treatment is dipping monolith in 2.5% by weight acetic acid for 2 min. It is also found that the suitable alumina content in washcoat slurry (alumina in 2.5 wt% acetic acid) is 40% by weight. The preferred calcination temperature and holding time in calcination for the washcoated monolith are 500°C and 2 hr., respectively. The thermalshock temperature at 600°C showed small washcoat grainsize, whereas the thermalshock temperature at 800°C showed large washcoat grainsize and some of washcoat grains released from the monolith surface. The results of the abrasive strength of the washcoated monolith showed that the monolith with small washcoat grainsize lost its coated alumina less than the monolith with larger washcoat grainsize. In conclusion, the suitable procedure for preparing the alumina washcoated monolith is dipping the monolith in alumina washcoat slurry for three times, each 2 min., and calcined at 500°C for 2 hr.

ภาควิชา วิศวกรรมเคมี

สาขาวิชา วิศวกรรมเคมี

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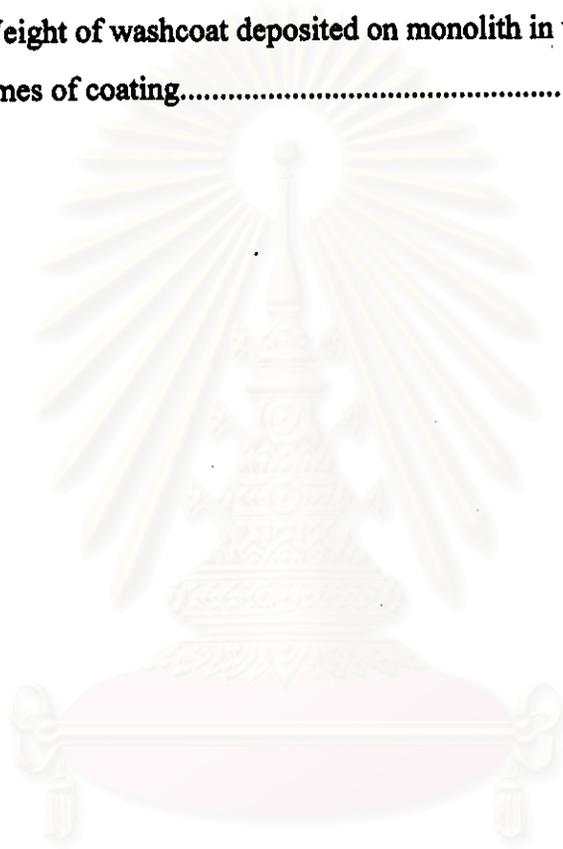
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