



**THESIS APPROVAL**  
**GRADUATE SCHOOL, KASETSART UNIVERSITY**

Doctor of Engineering (Chemical Engineering)

**DEGREE**

Chemical Engineering

**FIELD**

Chemical Engineering

**DEPARTMENT**

**TITLE:** Novel Synthesis of Nanostructured Materials: SiO<sub>2</sub>-TiO<sub>2</sub>, SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> and  
SUZ-4 Zeolite for Environmental Applications

**NAME:** Miss Patcharin Worathanakul

**THIS THESIS HAS BEEN ACCEPTED BY**

\_\_\_\_\_  
**THESIS ADVISOR**

( Associate Professor Paisan Kongkachuichay, Ph.D. )

\_\_\_\_\_  
**COMMITTEE MEMBER**

( Associate Professor Thumrongrut Mungcharoen, Ph.D. )

\_\_\_\_\_  
**COMMITTEE MEMBER**

( Associate Professor Metta Chareonpanich, D.Eng. )

\_\_\_\_\_  
**DEPARTMENT HEAD**

( Associate Professor Paisan Kongkachuichay, Ph.D. )

**APPROVED BY THE GRADUATE SCHOOL ON** \_\_\_\_\_

\_\_\_\_\_  
**DEAN**

( Associate Professor Vinai Artkongharn, M.A. )