

# # 4072431823 : MAJOR CHEMICAL TECHNOLOGY  
KEY WORD: DESULFURIZATION/METHANOL

SUPUNNEE RATANAKANTADILOK : COAL DESULFURIZATION WITH METHANOL-WATER AND POTASSIUM HYDROXIDE. THESIS ADVISOR : PROF. PATTARAPAN PRASSASSARAKICH, Ph.D. THESIS CO-ADVISOR : ASST. PROF. SOMKAIT NGAMPRASERTSIT, Ph.D. 104 pp. ISBN 974-332-752-5.

Methanol-water and methanol-KOH are polar solvents that have high solubility for polar organic molecules such as coal due to the hydrogen bonding and dipole attractive forces. KOH can break C-S bonding in coal, which enables greater penetration of methanol. The removal of sulfur from coal by methanol-water and methanol-KOH was investigated. The effects of methanol concentration, KOH concentration, reaction time, temperature and coal particle size on sulfur removal were studied. The optimum condition for desulfurization with methanol-KOH was at 0.025 KOH g/g coal, 150°C, reaction time of 90 min and coal particle size of 500 micron- 1 mm. The total sulfur reduction was 58.17%. The pyritic sulfur reduction and organic sulfur reduction were 51.29% and 39.52 %, respectively.

The kinetics of desulfurization by pyritic sulfur reaction was investigated. The rate of pyritic sulfur reaction was found to be well represented by a continuous reaction model: it was second order with respect to pyritic sulfur. The rate constant is expressed as follows:

$$k_p = 5.120 \exp ( -31.94 \times 10^3 / RT )$$

where energy of activation is  $31.94 \times 10^3$  kJ/ kmol.

ภาควิชา.....  
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