SYNTHESIS OF ZSM-5 ZEOLITES FROM RICE HUSK ASH IN THE ABSENCE OF ORGANIC TEMPLATE WITH VARIATION OF HYDROTHERMAL TEMPERATURE

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ABSTRACT

ZSM-5 zeolites were successfully synthesized by hydrothermal method in the absence of organic template, with rice husk ash as silica source. Rice husk ash contained amorphous silica (93.3%) was obtained from controlled burning of rice husk at 600°C for 4 hours. Synthesis ZSM-5 zeolites was conducted by hydrothermal method, at molar composition of 10 Na₂O : 100 SiO₂ : 2 Al₂O₃ : 1800 H₂O, with variation of hydrothermal temperatures i.e. 125, 150, 175 and 200°C. The solids were characterized by X-ray diffraction, infrared spectroscopy and scanning electron microscopy techniques. Analysis result confirmed that single crystalline phase of ZSM-5 was obtained by hydrothermal at 175°C. Hydrothermal crystallization at 200°C produced smaller particle sizes of the ZSM-5 crystals than that of hydrothermal at 175°C.

Keyword: rice husk ash, ZSM-5, hydrothermal temperature, SEM