

Synthesis of Mesoporous AITS-1 using Carbon Template and Catalytic Beckmann Rearrangement Reaction

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A series of mesoporous aluminium titanium alicite-1(AITS-1) was prepared through the microwave synthesis by varying the amounts of nanosized carbon template. The N₂ adsorption and desorption analyses of the obtained materials showed the presence of both mesoporosity and microporosity. The acid sites of mesoporous AITS-1 materials depending on the types of pores were investigated with conventional AITS-1 zeolites by in-situ FT/IR spectroscopy for the adsorption of pyridine. The increases in mesoporosity of materials were found as the carbon contents increased in both microwave and hydrothermal synthesis. The dependency of Lewis and Brønsted acidity on carbon contents were more evident in the case of microwave synthesis due to the role of carbon as microwave absorption sites. The MFI structured AITS-1 zeolite performed well for the vapor phase Beckmann rearrangement of cyclohexanone oxime into caprolactam.