

Preparation and characterization of nano sized ZSM-5 with various factors

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ZSM-5 zeolite has been drawn attention in the fields of catalyst, membrane and sensor as functional materials. We have been studying the synthesis of nano sized ZSM-5 particles using hydrothermal treatment, and developed various kinds of Si source (TEOS, LUDOX AS-40, Cab-O-Sil), Al source (-SO₄, -NO₃), Temperature, amount of H₂O and so on. And then membrane was prepared with gel composition as same as upper.

Characteristics of synthesized particles and membranes are as follows. (1) Particle size is controlled in the range of about 70 to 200nm by changing the condition of amount H₂O, temperature, Si/Al ratio and hydrothermal treatment. (2) ZSM-5 particles have sphere and polyhedral crystal like shape. (3) The synthesis is applied to various kinds of complex membranes. (4) Thickness and morphology of membrane are expected to control by time and precursor concentration.

We report detailed synthetic methods and the characteristics such as particle shape using SEM and analysis of crystal structure using XRD, FT-IR, BET surface area.