

Synthesis of Macro-, Meso- and Microporous Composite using Carbon Nanoparticle and its Catalytic Application

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Macro-, meso- and microporous ZSM-5 composite has been prepared with carbon nanoparticle (particle size 12nm) and TPAOH as structure directing agent under two kinds of different synthetic method such as hydrothermal treatment and microwave irradiation. It was characterized with X-ray powder diffraction, BET analysis, NH₃-temperature programmed desorption analysis and scanning electron microscopy. The pore size calculated from the nitrogen adsorption-desorption isotherm is trimodal distribution with macropores, mesopores and mesopores. For its catalytic application, this material has been introduced into methanol dehydration to give dimethyl ether (DME). The results showed relatively low conversion, similar selectivity and low coking deposit in comparison with H-ZSM-5 zeolite.