Two-Step Microwave Synthesis of Mesoporous ZSM-5 with CTAB and Benzylation of Alkylaromatics with Benzylalcohol

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There have been strong needs for the formation of mesoporous materials in a commercial viable ways, even bunch of approaches have been proposed. Still, direct synthesis without lossing acid sites, uniform mesopore size and controllability of mesoporosity, and using low cost porogen or templates have been laid as challenges. Also, post-synthesis methods have confronted with problems on unstable structure, changing silica to alumina ratios was hard to control uniform mesoporosity, etc.. In this study mesoporous ZSM-5 was directly synthesized with CTAB in a two-stage microwave synthesis. At first, ZSM5 nucleus was prepared from precursor gels with nano seed below 30 min microwave irradiation . And at the second stage, these preformed nanoparticles was mixed with CTAB as a mesoporogen. After 24hours aging, the mixture was crystallized under microwave for 3 hrs. As this result, mesoporosity could be controlled as unique structure and morphology. And the form mesoporous ZSM-5 were ion-exchanged into meso H-ZSM5. Then, benzylation of aromatics using benzylalcohol was investigated as an acid catalyzed reaction for illustrating a role of mesoporosity.