

Design of Zeolite Composite Catalysts for Selective Formation of Light Olefin and p-Xylene

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Nanoporous (microporous and mesoporous) materials such as zeolites, mesoporous silica and carbons are indispensable to the establishment of sustainable society. Our group has focused on (1) morphology control of nanoporous materials and (2) design of nanopores and (3) their use as catalysts, separation (adsorption, membrane) and electric devices (EDLC supercapacitors, Fuel cell).

Development of new catalysts with high activity and selectivity is a key technology for the future chemical and petrochemical industry to reduce energy consumption. In the future society, biomass and natural gas including shale gas will play an important role as energy and material sources. In particular, light olefins and benzene, toluene and xylene (BTX) are important petrochemical compounds in chemical industry. We prepared core-shell zeolite composite crystals consisting of an MFI structure by a zeolite over growth. The conversion to olefin and BTX, especially p-xylene from various C1-3 feedstocks on core-shell zeolite composites has been studied.