

Synthesis of KFI-type zeolite with high crystallinity by interzeolite conversion method

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Zeolite ZK-5 (KFI-type), the first synthetic zeolite, has a 3-dimensional channel system and a small pore (3.9 Å). The first synthesis of ZK-5 with BaCl₂ was reported by Barrer, but extraframework Ba was hardly removed by ion-exchange of NH₄⁺, which is highly unfavorable for catalytic use. In 1991, Verdujin et al. reported that small amount of Sr leads to the formation of ZK-5. This system has been most widely used for synthesis of ZK-5. However, the formation of some impurities and/or amorphous phase remains as a problem. In this work, we synthesized pure ZK-5 without any impurity by interzeolite conversion method (i.e. from zeolite USY to ZK-5). Several characterization techniques such as XRD, N₂ adsorption-desorption, NH₃-TPD, ²⁹Si-NMR and ²⁷Al-NMR were conducted. Selective catalytic reduction of NO_x by NH₃ was performed to verify its potential use as a catalyst.