

Gallosilicate Zeolite Synthesis through Charge Density Mismatch Approach

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The gallosilicate version of UZM-12 (framework type ERI) and offretite (OFF) structure have been synthesized through a charge density mismatch (CDM) approach. The presence of Ga in the tetrahedral framework position of these gallosilicates is evidenced by a combination of powder XRD, IR, and ^{71}Ga and ^{29}Si MAS NMR. The structure-directing ability of Ga is considerably different from that of Al under the same synthesis condition with an intermediate-silica composition. In particular, the ^{29}Si MAS NMR results clearly show the existence of two distinct tetrahedral sites in both gallosilicate UZM-12 and offretite zeolites. The methanol-to-olefin performances of a series of UZM-12 zeolites with alumino- and gallosilicate compositions are also presented.