

### The Control of Mesoporous Silica Structure between MCM-48 and MCM-41 by Kinetically Controlled Reaction

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The pore structure of 3-dimensional MCM-48 is expected to have superior molecular diffusion and pore plugging than that of 1-dimensional MCM-41. In spite of this advantage, the study of mesoporous molecular sieve property was given more importance to MCM-41, because MCM-48 is difficultly synthesized than MCM-41.

We developed a new method to synthesize mesoporous MCM-48 and MCM-41 easily at room temperature by controlling the drying after the filtration of reaction mixture and composition of reaction mixture. We used tetraethyl orthosilicate as silica source, cetyltrimethylammonium bromide as a structure directing agent, ethanol as an additive for micell-phase change and ammonia as a catalyst for polymerization of silica source. The structure of mesoporous materials were investigated by XRD and SEM. The structure of mesoporous silica was mostly formed during the drying process. As the degree of silica polymerization increased, the structure of mesoporous silica changed from MCM-48 to MCM-41.