

220b Small-Angle X-Ray Scattering and NMR Investigations of Zeolite Nucleation and Growth

Daniel F. Shantz and Henry Cheng

The formation and growth of zeolite ZSM-5 has been intensely studied over the last two decades. Of particular note are the numerous studies of Silicalite-1 formation from clear solutions (1 TEOS: 0.36 TPAOH: 20 H₂O) at low (368 K) temperatures given the (relative) ease with which one can study in situ growth of this particular system. The results presented here will have two primary focuses: 1) showing that this system is unique in that we have not been able to observe the nucleation of any other siliceous zeolite phases under comparable conditions, and 2) showing the sensitivity of the silicalite-1 synthesis from clear solution to the SDA identity, silane source, etc. Finally we will also present results on competitive growth studies that employ solutions containing mixture of TPAOH and other tetraalkylammonium cations.

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