On the Formation of Uniform Si-CHA Zeolite Layers

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All-silica CHA zeolites hold promise to separate CO2 from other molecules. However, conventionally synthesized near cubic Si-CHA particles have a wide size distribution (~1-20 μm). The wide size distribution prevents forming a close-packed layer, though the layer is critical in manufacturing zeolite films in secondary growth. In an attempt to overcome this, anisotropic plate-like Si-CHA particles, discovered as the minor product along with the dominant near cubic Si-CHA particles, were adopted to make a uniform Si-CHA layer. Selected area electron diffraction and X-ray diffraction characterizations verified the CHA phase of the plate-like particles. We would like to present a method to deposit the plate-like CHA particles on a porous the α-Al2O3 disc despite lower abundance in a mixture. The uniform CHA layer was observed with a high surface coverage and the uniformity of the plate-like CHA deposits allowed a preferred out-of-plane orientation. In this talk, we will discuss how to achieve the selective deposition of the plate-like Si-CHA particles.