Nanostructured molecular sieve membranes

Our membrane research program is focused on the synthesis of microporous and mesoporous silica-based molecular sieve films that can find application as permselective or support layers in membrane composites aiming gas, vapor and liquid separations. Examples of current research include development of microporous aminosilicate membranes for enhanced CO2/air separation, organic-templated silica membranes that can mimic the separation function of zeolite membranes, and nanostructured palladium/mesoporous silica composites for enhanced H2 separation. In the area of mesoporous films, work is underway to develop silica-based surfactant-templated layers on coarse-pore ceramic or metallic substrates, in order to facilitate deposition of a zeolite- or palladium-based gas separation membrane for H2 purification.