“STRATIS V. SOTIRCHOS” 2005 Memorial Lectureship

Molecular Sieve Thin Film Technology: Current Status and Research Opportunities

by

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Abstract

The idea to fabricate molecular sieve films goes back to the beginnings of zeolite and membrane science. However, it took decades for this early vision to become a commercial product. In addition to their current use as separation membranes, molecular sieve films have been proposed as hosts enabling guest organization for nanostructures with novel properties including optoelectronic and thermoelectric materials. The indisputable advantage of zeolite films is the subnanometer precision of pore structure architectures dictated by the crystalline nature of these materials. However, the crystallinity also poses enormous challenges when one attempts to prepare thin films and it is well recognized that future developments rely on our ability to develop cost effective and scalable film processing. This talk will focus on recent developments and research opportunities in this emerging area of chemical engineering and materials science including:

Crystal shape control using organic structure directing agents.

Physical and chemical methods for micro- and nano-crystal attachment.

Film growth from pre-organized nanostructures.