



Ultrathin Zeolite Production Method

IP Status: Issued US Patent; **Application #:** 12/741,178

Zeolite Materials for Molecular Sieve and Gas Separation

A method has been developed to swell ultrathin zeolites without loss in crystal structure, leading to improved catalytic activity. The precursor to the zeolite consists of stacked layers which can be exfoliated to produce catalytically active materials, useful for hydrocarbon cracking and ultrathin inorganic molecular sieve coatings for high temperature gas separation membranes, for example removing carbon dioxide from pre-combustion gas mixtures.

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Zeolite Production Maintains Structural Integrity after Swelling

Current methods of swelling cause a loss in crystal structure of the zeolite, limiting the use of the material in applications. The described method allows the preparation of ultrathin (~1 nm) layers with controllable and ordered pore structures. The materials keep their structural integrity upon repeated swellings (such as washing with water). The method produces zeolites with precisely defined pore structures suitable for high temperature and high pressure applications.

BENEFITS OF CRYSTALLINE NANO-LAYERED ZEOLITE:

- Method keeps the crystal structure in tact on swelling, maintaining catalytic activity.
- Useful for hydrocarbon cracking and ultrathin inorganic molecular sieve coatings for high temperature gas separation membranes, for example removing carbon dioxide from pre-combustion gas mixtures.
- Ultrathin particle morphology, yet extremely wide and structurally intact layers.

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