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# A Novel Temperature Swing Adsorption Process for Natural Gas Purification: Part I, Model Development

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## Highlights

Novel TSA-based gas separation using adsorbent-coated microchannels investigated.

Direct contact heat transfer between transfer fluid and adsorbent layer yields compactness.

Computational models developed to study transfer phenomena.

Parametric studies to determine optimum geometry and materials.

## ABSTRACT

This article investigates a novel TSA-based gas separation cycle that uses a microchannel monolith with a hollow polymer-adsorbent matrix coated along the inner walls of each microchannel. CO<sub>2</sub> is removed

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