CO₂ Removal Systems for Advanced Space Exploration
Karen Son, J.A. Weibel, S. V. Garimella

Objective

Improve predictions of the physical properties of porous materials through more accurate physical models, to enable the design of life support systems for deep space exploration missions.

Approach

- Develop reduced-order model of CO₂ flow through a packed bed of sorbent pellets
- Experimentally measure adsorption/desorption rates in packed, sorbent pellet bed
- Determine sources of model inaccuracy by comparing with experiments to then develop better a priori predictions of physical properties

Impact

- Improved predictive modeling tools for adsorption/desorption of CO₂ in packed beds
- Enable simulation-based design and optimization of the next generation of sorbent-based CO₂ removal systems for our journey to Mars

Selected Publications


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