Low-Cost, Scalable Boron Nitride-Based Sorbents with Balanced Capacity-Kinetics-Thermodynamics for Hydrogen Storage in Fossil Fuel Power Plants

- DE-FE0032010

Prime: C-Crete Technologies

PI: Dr. Rouzbeh Shahsavari

Sub: Trimeric Corporation

Location: Stafford, TX

Objectives

- Phase I: full synthesis control over sorbent and its pore-structure, and to fabricate a small module followed by optimization and various structural, chemical and thermal property characterizations.

- Phase II: evaluate the performance of H2 energy storage both at the material and system levels followed by development of conceptual process flow diagram, and unit module and performance models for integration to fossil fuel power plants.

Relevance and Outcomes/Impact

- Feasibility of a new class of scalable, low-cost sorbents with an unprecedented balance of capacity-kinetics-thermodynamics for H2 storage and integration to fossil fuel power plants.

- First step toward on-grid H2 power storage.

DOE: $250,000
Non-DOE: $62,500
Total: $312,500
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Background
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Preliminary Results
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Preliminary Results
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A representative preliminary integration of our technology (red) in an IGCC power plant.

- Hydrogen Purification and Pre-Processing
- C-crete Hydrogen Storage Adsorbent
- Hydrogen Post-Processing (e.g., fan/blower)
- To Fuel Production/Fuel Cell/Other Use
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Thank you