

Catalytic Generation

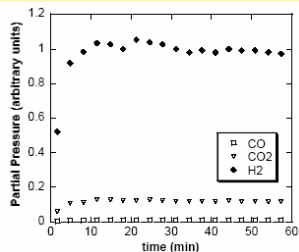
Program: Enhanced Selectivity of Steam Reforming Catalysts

Sponsor: U.S. Army

Accomplishments:

- 1) Steam-reforming catalysts prepared using co-precipitation to minimize coking, sintering and CO formation
- 2) Developed methanol steam-reforming reactor CuO/ZnO/Al₂O₃ catalyst

PI: S Suib

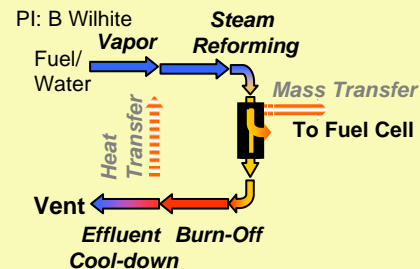


Program: Creation of Scalable, Cartridge-Based Microreactor Reformers

Sponsor: ONR

Goal:

Develop a reformer that integrates several elements within one design and has controllable heat and mass transfer



PI: B Wilhite

Gas Analysis Technology

Program: Reformer Gas Analysis

Sponsor: Precision Combustion, Inc.

Accomplishments:

Developed inline tool to measure H₂ concentration in process gas streams

PI: X Huang

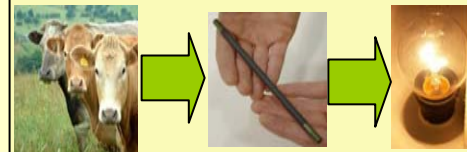
Program: Environmental Analysis of Manure Digester Biogas powered Fuel Cells

Sponsor: EPA

Accomplishments:

Design, fabrication and operation of SOFC cells running on methane-rich fuel

PI: N Sammes, J Pusz



Biological Generation

HYDROGEN GENERATION

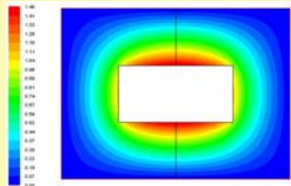
Program: Ammonia Borane Pyrolysis Chemistry

Sponsor: Ensign Bickford & U.S. Army

Accomplishments:

- 1) Characterized thermal decomposition of ammonia borane to produce high density H₂ source
- 2) Created thermal models of the reactor to better understand the reaction process

PI: T Molter, U Pasaogullari, B Wilhite, S Suib



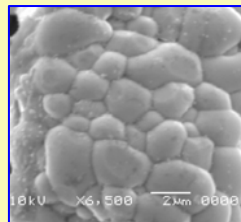
Program: Mixed Conducting Ceramic Membranes for Hydrogen Separation

Sponsor: CeraMem Inc.

Accomplishments:

- 1) Sol-gel Pechini methods used to synthesize Strontium, Barium Cerates and Zirconates
- 2) Samples tested for: morphology, microstructure, stability and electrical conductivity

PI: A Smirnova



Program: Electrochemical Hydrogen Separator

Sponsor: FuelCell Energy & CT Clean Energy Fund

Accomplishments:

- 1) Separated 1200 Liters/Hr of H₂ from process gas
- 2) > 6000 hours of reliable operation.

PI: T Molter



Separation Technology

Chemical Generation