



Chemical Hydride Slurry for Hydrogen Production and Storage

Hydrogen and Fuel Cell Summit Transportation Applications and Challenges

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Vehicle Specifications by Automobile Companies

- Driven by customer demand
 - Passenger and trunk space
 - 300 to 400 miles range between fill-up
 - Fill tank in 3 to 5 minutes
 - Self-serve simple filling
 - Cost per mile
- Result in challenging technical specifications
- Issues
 - Infrastructure
 - Energy density of system (Fuel cell, storage, support equip)
- Focus of Safe Hydrogen
 - Magnesium hydride slurry for safe hydrogen storage
 - Infrastructure solution
 - Safe storage, cost effective, energy dense

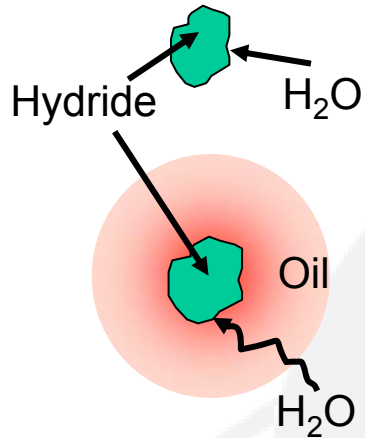


HYDROGEN STORAGE CHALLENGES

| AVAILABLE STORAGE TECHNOLOGIES AND THEIR KEY ISSUES | | | | | | | | |
|---|----------------|------------------|----------------|-------------|-----------------|-----------------------|--------------|---------------------|
| | storage safety | storage capacity | storage weight | Heat issues | Material safety | generation complexity | storage cost | infrastructure cost |
| compressed liquid | red | red | | | | | red | red |
| solid hydride | | | black | | | | red | red |
| comp hydride | | | | | purple | purple | | |
| slurry hydride | excellent | highest | some | none | none | some | very low | minimal |

CONCEPT

Demonstrated in past project with LiH slurry



- Use light metal hydride
- Protected by oil
- Suspended by dispersants
- Stable and pumpable slurry





FEATURES AND BENEFITS OF A CROSS-CUTTING TECHNOLOGY

- React slurry with water - generate 99.999% pure hydrogen
- Only store and transport slurry - hydrogen generated only when needed and immediately consumed
- Slurry can be stored, transported and pumped with the existing fossil fuel infrastructure
- Recycle of byproduct by any energy source - use economies of scale to reduce cost
- Market benefits: safe, low-flammability fuel, use of existing infrastructure, cost competitive

