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Battelle Number(s):

15911

Patent(s) Issued

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Available Technologies

Controlling Foaming in Hydrogen Release from Boranes

SUMMARY

Ammonia Borane is a compound that has excellent potential as a hydrogen storage material for fuel cell power applications. However, as ammonia borane releases hydrogen during heating, the material expands to 10-100 times the original volume). This expansion complicates processing in fuel cell power applications. This solution controls the amount of foam produced so these compounds can be efficiently used to their fullest chemical potential.

This process involves the use of an additive to ammonia borane, methyl cellulose, which preserves the ammonia borane fuel form factor. In the described formulation methyl cellulose acts as an anti-foaming agent, effectively suppressing and controlling foaming during hydrogen release from solid borane fuel pellets without changing any other properties of the borane or affecting its ability to release hydrogen. Additional formulations using siloxane polymers or sorbitol have also proven to control foaming in appropriately fashioned formulations.

ADVANTAGES

* Cleaner way to produce hydrogen from boranes and borohydrides

* Retention of fuel form factors simplifies and improves process efficiency

* Materials are environmentally friendly

U.S. DEPARTMENT OF ENERGY

Patents & Intellectual Property

- Pub Patent App #: 2009/0302269

Technology Portfolio(s)

- Boranes
- Hydrogen Generation

Potential Industry Applications

- Automotive & Transportation
- Chemicals
- Consumer Products
- Energy & Utilities

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