

Battelle Number(s):

15988

Patent(s) Issued

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Available Technologies

Simplified Synthesis of Bulk Ammonia Borane

SUMMARY

Ammonia borane is a stable solid compound that has excellent potential as a hydrogen store for fuel cell and other applications. The ability to efficiently and economically manufacture pure ammonia borane in large quantities is important to keeping production costs manageable and for providing light-weight power options for applications ranging from small power to fuel cell vehicles. Ammonia borane is also used as a starting material for new generation of hydrogen storage materials, e.g., metal amidoboranes.

The synthesis may be done step-wise, isolating the ammonium borohydride and then decomposing with tetrahydrofuran (THF) to provide ammonia borane. Alternatively, a one-pot method may be used whereby THF is added to the ammonia solution, decomposing the ammonium borohydride in situ to afford ammonia borane.

In more simplified terms, this new process provides a more direct method to produce ammonia borane in bulk quantities. Unlike methods currently discussed in the open literature, this process requires a single step providing ammonia borane in greater yields and higher purity. The process avoids the use of toxic diborane making it an environmentally friendly solution.

ADVANTAGES

- * One-pot synthesis method simplifies process and is more economical than existing alternative processes which require additional transfer and handling steps
- * Results in high yield, high purity product requiring less post-process purification
- * Decreased loss of starting materials
- * Environmentally friendly

Patents & Intellectual Property

- » Patent #: 7,897,129

Technology Portfolio(s)

- » Boranes
- » Hydrogen Generation

Potential Industry Applications

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

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