

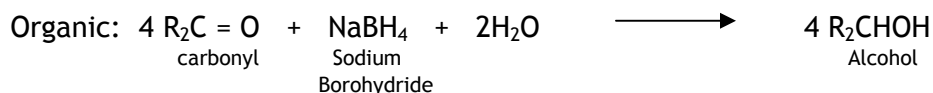
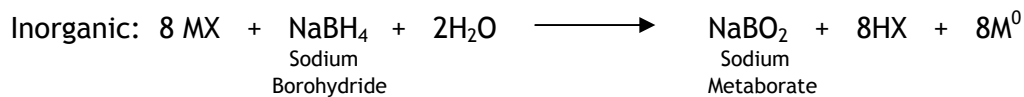
## Product Information Bulletin

### BoroSpec<sup>®</sup> Sodium Borohydride Granules

**BoroSpec Granules** are a customized 98% pure solid formulation of sodium borohydride (NaBH<sub>4</sub>) that contains no anti-caking agents or other impurities. The product has proven selective, effective and cost efficient as a reducing agent in the synthesis of many fine chemical intermediates used in the manufacture of several pharmaceutical and agricultural products. **BoroSpec Granules** are also effective in the preparation and recovery of metal catalyst such as nickel, platinum and cobalt.

#### Applications

**BoroSpec Granules** are soluble in water and exhibit selective reducing capabilities in both organic and inorganic chemical systems. Under ideal reaction conditions, one mole (37.8g) of NaBH<sub>4</sub> will reduce four moles of an aldehyde or ketone to the corresponding alcohol, or provide 8 electrons for reduction of metal ions. The following reactions define the typical reduction of inorganic and organic compounds with NaBH<sub>4</sub> solution where M = Metal and X = Anion:



Thus 37.8 lbs. of NaBH<sub>4</sub> will theoretically reduce 176 lbs. of acetaldehyde to ethanol or 235 lbs. of nickel ion to free nickel metal. Typically under actual reaction conditions, the use level of **BoroSpec Granules** will be greater than the stoichiometric level due to losses from side reactions such as hydrolysis. Theoretical levels of NaBH<sub>4</sub> should only be used as a guideline. Precise **BoroSpec Granules** requirements may vary depending on the actual reduction conditions. Temperature, pH, reaction time, and possible side reactions with other species present, can affect the efficiency of the reaction. Therefore the optimum use level needs to be derived experimentally for each specific application.

#### Physical Properties

Molecular Weight	37.83
Specific Gravity, 25 deg C	1.074
Bulk Density	31 - 34

Particle Size (mesh)	-10 to +20
Form	White crystalline solid
Melting Point	Decomposes above 400 deg C without melting
Purity	98% Min.

## Solubility Data

<u>Solvent</u>	<u>g / 100g solvent @ 25 °C</u>
Water	55.0
Liquid Ammonia	104.0
Ethanol (reacts slowly)	4.0
Dimethylacetamide	14.0
Isopropylamine	6.0
Triglyme	8.0

## Storage and Handling

**BoroSpec Granules** are extremely stable, undergoing minimal decomposition during long term storage in dry air or sealed conditions. The product should be stored and handled following standard procedures for other flammable hygroscopic materials. Protective rubber gloves, clothing and safety goggles should always be worn when handling **BoroSpec** products. Contact with acids or acidic materials and extreme dilution should be prevented, as hydrogen gas may be released. Ventilate spill areas and flush with large quantities of water, per Material Safety Data Sheet instructions.

## Shipping Information

**BoroSpec Granules** are available for shipment in 10 kg PE bags shipped in 50 kg open-head steel drums. Other packaging is also available to meet specific customer requirements.

## Technical Assistance

Customer technical support and assistance for all aspects of usage including lab tests, plant evaluations, product handling & storage, and product safety are provided by Montgomery Chemicals.

*Contact Montgomery Chemicals for complete product information, including suggested safety, handling, and storage procedures, transportation designations, and Material Safety Data Sheets. The material contained herein is believed to be accurate; however no warranty or guarantee is made as to accuracy or completeness. Nothing contained herein is to be construed as permission to infringe on any patent or license. Determination as to suitability of this product for a particular application is solely the responsibility of the user.*

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