



## Product Information

### Sodium cyanoborohydride

Product Number **S 8628**  
Store at Room Temperature

#### Product Description

Molecular Formula:  $\text{BCH}_3\text{NNa}$   
Molecular Weight: 62.84  
CAS Number: 25895-60-7

Sodium cyanoborohydride is a selective reducing agent used for a variety of chemical reductions, including aldehyde, ketones, oximes, enamines, reductive aminations of aldehydes and ketones, and reductive alkylations of amines and hydrazines. The utility of sodium cyanoborohydride as a reducing agent is greatly enhanced by its stability under acid conditions, and its solubility in aprotic solvents. Sodium cyanoborohydride is a milder and more selective reducing agent than sodium borohydride.<sup>1</sup>

Some of the reactions where the selectivity of sodium cyanoborohydride are demonstrated are as follows:

1. Reduction of aldehydes and ketones.  
At pH 3-4, benzaldehyde can be reduced to benzyl alcohol with 87% yield. Under the same conditions cyclohexanone can be reduced to cyclohexanol with 88% yield.<sup>2</sup>
2. Reduction of oximes.  
At pH 4, cyclopentanone oxime can be reduced to the corresponding hydroxylamine with 77% yield with no reduction to the amine.<sup>2</sup>

3. Reductive amination of aldehydes and ketones.  
At pH 6, benzaldehyde and ethylamine in the presence of sodium cyanoborohydride forms the secondary amine N-ethylbenzylamine with 91% yield.<sup>2</sup> The steroid 5- $\alpha$ -androstane-3,17-dione can be selectively aminated at the 3-position using ammonium acetate with 100% yield.<sup>3</sup>
4. Tertiary methylated amines can be synthesized by reaction of an aromatic or aliphatic amine with aqueous formaldehyde and sodium cyanoborohydride in acetonitrile. m-Nitroaniline is alkylated with formaldehyde to m-Nitro-N,N-dimethylaniline with 68% yield.<sup>4</sup>

#### Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

#### Preparation Instructions

Sodium cyanoborohydride is soluble in water (100 mg/ml, with heating), methanol, ethanol, and THF. It is insoluble in nonpolar solvents such as benzene or hexane.

#### References

1. Aldrichimica Acta, Vol. 8, No. 1 (1975).
2. Borch, R.F. and Bernstein, M.D., J. Amer. Chem. Soc., **93**, 2897 (1971).
3. Boutique, M.-H. and Jacquesy, R., Bull. Soc. Chim. Fr., **750**, (1973).
4. Borch, R.F. and Hassid, A.I., J. Org. Chem., **37**, 1673 (1972).

JLH/JRC 11/03

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