

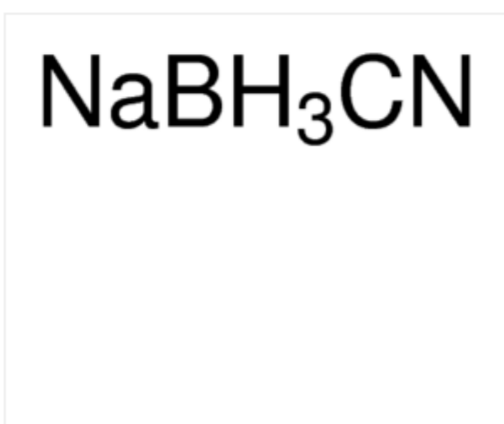
71435 Sigma-Aldrich

Sodium cyanoborohydride

purum, ≥95.0% (RT)

Synonym: **Sodium cyanotrihydridoborate**

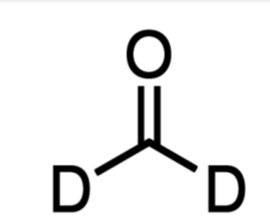
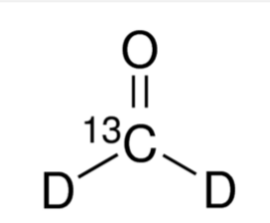
CAS Number [25895-60-7](#) | Linear Formula [NaBH₃CN](#) | Molecular Weight [62.84](#) | Beilstein/REAXYS Number [4152656](#) | EC Number [247-317-2](#) | MDL number [MFCD00003516](#)
 PubChem Substance ID [329763275](#)


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Product Recommendations

<p>NaBH₃CN</p> <p>156159 Sigma-Aldrich Sodium cyanoborohydride reagent grade, 95%</p>	<p>NaBH₃CN</p> <p>42077 SAFC Sodium cyanoborohydride PharmaGrade, Manufactured under appropriate controls fo...</p>	<p>Na⁺ H₃B≡N</p> <p>818053 Sigma-Aldrich Sodium cyanoborohydride</p>	<p></p> <p>492620 Sigma-Aldrich Formaldehyde-d₂ solution ~20 wt. % in D₂O, 98 atom % D</p>	<p></p> <p>596388 Sigma-Aldrich Formaldehyde-¹³C, d₂ solution 20 wt. % in D₂O, ≥99 atom % ¹³C, ≥98 atom % D</p>
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Properties

Related Categories	Borohydrides, Chemical Synthesis, Reduction, Synthetic Reagents
grade	purum
assay	≥95.0% (RT)
mp	>242 °C (dec.) (lit.)
solubility	THF: soluble(lit.) alcohol: soluble(lit.) hydrocarbons: insoluble(lit.) water: soluble(lit.)
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Description

General description

Sodium cyanoborohydride is a versatile reducing agent stable in aqueous solution at pH 7.2.^[2] It is a weaker reducing agent as compared to NaBH₄. It effectively reduces Schiff bases.^[1] NaCNBH₄ participates in the reductive methylation for the efficient and selective conversion of the ε-amino groups of lysyl residues in proteins to the mono- and dimethyl derivatives.^[1] Review on sodium cyanoborohydride has been reported.^{[4][5]} It participates in selective reductions with NaCNBH₃, modified with zinc chloride,^[6] with zinc iodide.^[7]

Application


Sodium cyanoborohydride may be used in the following studies:

- As reducing agent for the *in vitro* radiolabeling of proteins by reductive alkylation.^[2]
- Reduction of aldehydes and ketones.^[8]
- Selective deoxygenation of aldehydes and ketones.^[9]
- Preparation of colloidal gold particles of varying sizes.^[3]

Other Notes

Review^{[4][5]}; selective reductions with NaCNBH₃, modified with zinc chloride^[6]; with zinc iodide^[7]

Safety Information

Symbol	 GHS05, GHS06, GHS09 GHS02,
Signal word	Danger
Hazard statements	H228-H300 +H310 + H330-H314-H410
Precautionary statements	P210-P260-P264-P273-P280-P284
Supplemental Hazard Statements	Contact with acids liberates very toxic gas.
Personal Protective Equipment	Eyeshields, Faceshields, full-face particle respirator type N100 (US), Gloves, respirator cartridge type N100 (US), type P1 (EN143) respirator filter, type P3 (EN 143) respirator cartridges
RIDADR	UN 3179 6.1(4.1) / PGII
WGK Germany	3

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[Labeling of proteins by reductive methylation using sodium cyanoborohydride.](#)
 N Jentoft and D G Dearborn
 The Journal of biological chemistry, 254(11), undefined (1979-6-10)

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[Radiolabeling of proteins by reductive alkylation with \[¹⁴C\]formaldehyde and sodium cyanoborohydride.](#)
 D Dottavio-Martin and J M Ravel
 Analytical biochemistry, 87(2), undefined (1978-7-1)

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[Preparation of colloidal gold particles of various sizes using sodium borohydride and sodium cyanoborohydride.](#)
 R G DiScipio
 Analytical biochemistry, 236(1), undefined (1996-4-5)
 C.F. Lane Synthesis , 135-135, (1975)
 R.O. Hutchins Organic preparations and procedures international 11, 201-201, (1979)
 S. Kim et al. The Journal of Organic Chemistry 50, 1927-1927, (1985)
 C.K. Lau et al. The Journal of Organic Chemistry 51, 3038-3038, (1986)
 Sodium cyanoborohydride-a highly selective reducing agent for organic functional groups. Clinton F. Synthesis 3, 135-146, (1975)
 Selective deoxygenation of ketones and aldehydes including hindered systems with sodium cyanoborohydride. Hutchins RO, et al. Journal of the American Chemical Society 95(11), 3662-3668, (1973)

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[Triplex protein quantification based on stable isotope labeling by peptide dimethylation applied to cell and tissue lysates.](#)
 Paul J Boersema et. al
 Proteomics, 8(22), undefined (2008-10-14)
 Stable isotope labeling is at present one of the most powerful methods in quantitative proteomics. Stable isotope labeling has been performed at both the protein as well as the peptide level using either metabolic or chemical labeling. Here, we prese...[Read More](#)

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[AGE-modified basement membrane cooperates with Endo180 to promote epithelial cell invasiveness and decrease prostate cancer survival.](#)
 Mercedes Rodriguez-Teja et. al
 The Journal of pathology, 235(4), undefined (2014-11-20)
 Biomechanical strain imposed by age-related thickening of the basal lamina and augmented tissue stiffness in the prostate gland coincides with increased cancer risk. Here we hypothesized that the structural alterations in the basal lamina associated ...[Read More](#)

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[Stereochemical configuration of 4-hydroxy-2-nonenal-cysteine adducts and their stereoselective formation in a redox-regulated protein.](#)
 Chika Wakita et. al
 The Journal of biological chemistry, 284(42), undefined (2009-8-21)
 4-Hydroxy-2-nonenal (HNE), a major racemic product of lipid peroxidation, preferentially reacts with cysteine residues to form a stable HNE-cysteine Michael addition adduct possessing three chiral centers. Here, to gain more insight into sulphydryl m...[Read More](#)

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[A study of the performance characteristics of immunoaffinity solid phase microextraction probes for extraction of a range of benzodiazepines.](#)
 Heather L Lord et. al
 Journal of pharmaceutical and biomedical analysis, 44(2), undefined (2007-2-23)
 Immunoaffinity solid phase microextraction (SPME) probes have been developed with antibodies specific for the benzodiazepine class of drugs, covalently immobilized to glass rods. This involved both purification of the polyclonal antibodies to isolate...[Read More](#)

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[Resveratrol and its metabolites bind to PPARs.](#)
 E Calleri et. al
 Chembiochem : a European journal of chemical biology, 15(8), undefined (2014-5-7)
 Resveratrol, a modulator of several signaling proteins, can exert off-target effects involving the peroxisome proliferator-activated receptor (PPAR) transcription factors. However, evidence for the direct interaction between this polyphenol and PPARs...[Read More](#)

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[PEGylation of magnetic poly\(glycidyl methacrylate\) microparticles for microfluidic bioassays.](#)

Jana Kucerova et. al

Materials science & engineering, C, Materials for biological applications, 40, undefined (2014-5-27)

In this study, magnetic poly(glycidyl methacrylate) microparticles containing carboxyl groups (PGMA-COOH) were coated using highly hydrophilic polymer poly(ethylene glycol) (PEG). PEG was used to reduce nonspecific interactions with proteins and cell...[Read More](#)
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