

Product Data Sheet

Product Name: Ribitol
Cat. No.: GC15755

Chemical Properties

Cas. No. 488-81-3

Chemical Name pentane-1,2,3,4,5-pentol

SMILES C(C(C(C(CO)O)O)O)O

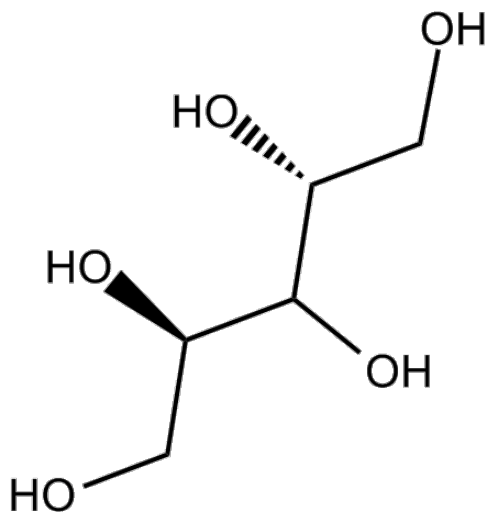
Formula $C_5H_{12}O_5$ M.Wt 152.15

Solubility DMF: 5mg/mL, DMSO: 25mg/mL, PBS (pH 7.2): 5mg/mL
Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Caution: Product has not been fully validated for medical applications. For research use only.

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Kinase experiment:

The high-performance liquid chromatography (HPLC) analyses are carried out using a Fast Acid Column (100×7.8 mm) and a HPX-87H Ion Exclusion Column (300 mm×7.8 mm) in series with 2.5 mM H₂SO₄ in water as the mobile phase at a flow rate of 0.3 mL/min, at 55°C. This method enabled quantification of D-glucose, ethanol, glycerol, D-xylulose, Ribitol, and xylitol. D-ribose, D-ribulose, and D-arabitol coeluted on the Aminex HPX-87H column. The CarboPac MA-1 column of Dionex ICS-3000 is used to analyze representative culture supernatant samples for the presence of arabitol and xylitol. Samples are run at column temperature of 30°C with 480 mM NaOH at flow rate 0.4 mL/min. The CarboPac MA-1 column separated D-arabitol from D-ribose and D-ribulose, but the alkaline conditions degraded D-ribulose interfering with the quantification of D-ribose. Yeast cells are disrupted with glass beads in 100 mM sodium phosphate buffer pH 7.0 containing phenylmethylsulfonyl fluoride and pepstatin A in final concentrations of 0.17 mg/mL and 0.01 mg/mL, respectively. The activity of NAD⁺-dependent Gdh2p is measured in a reaction buffer of 0.5 M triethanol amine pH 7.7 and 2 mM NADH. After addition of the cell lysate, the reaction is started by adding a mixture of α-ketoglutarate (100 mM) and NH₄Cl (200 mM) to a final concentration of 2.4 mM and 4.9 mM, respectively. The GapB activity is measured. Shortly, the reaction mixture is 500 mM triethanol amine pH 7.8, 1 mM ATP, 2 mM MgCl₂, 200 μM NADPH, and 10 μg/mL of phosphoglycerate kinase. 3-phosphoglycerate is added to a final concentration of 5 mM to start the reaction. Activity measurements are performed with a Cobas Mira Plus automated analyzer[2].

References:

- [1]. Praissman JL, et al. The functional O-mannose glycan on α-dystroglycan contains a phospho-Ribitol primed for matriglycan addition. *Elife*. 2016 Apr 29;5. pii: e14473.
- [2]. Toivari MH, et al. Enhancing the flux of D-glucose to the pentose phosphate pathway in *Saccharomyces cerevisiae* for the production of D-ribose and ribitol. *Appl Microbiol Biotechnol*. 2010 Jan;85(3):731-9.

Background

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Ribitol is a crystalline pentose alcohol formed by the reduction of ribose. Enhancing the flux of D-glucose to the pentose phosphate pathway in *Saccharomyces cerevisiae* for the production of D-ribose and ribitol.

Ribitol is a reduced sugar[1]. Phosphoglucose isomerase-deficient (pgi1) strains of *Saccharomyces cerevisiae* are studied for the production of D-ribose and Ribitol from D-glucose via the intermediates of the pentose phosphate pathway. Overexpression of the gene encoding sugar phosphate phosphatase (DOG1) of *S. cerevisiae* is needed for the production of D-ribose and Ribitol. The engineered strains are compared for their ability to produce the PPP-derived 5-carbon compounds Ribitol and D-ribose from D-glucose[2].

References:

[1]. Praissman JL, et al. The functional O-mannose glycan on α -dystroglycan contains a phospho-Ribitol primed for matriglycan addition. *Elife*. 2016 Apr 29;5. pii: e14473.

[2]. Toivari MH, et al. Enhancing the flux of D-glucose to the pentose phosphate pathway in *Saccharomyces cerevisiae* for the production of D-ribose and ribitol. *Appl Microbiol Biotechnol*. 2010 Jan;85(3):731-9.

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