

1,4-Dithiothreitol

Cleland's reagent (threo-1,4-dimercapto-2,3-butanediol)

Cat. No. 10 197 777 001 2 g
Cat. No. 10 708 984 001 10 g
Cat. No. 11 583 786 001 25 g

Version 09

Content version: October 2018

Store at +2 to +8°C

1. What this product does

Contents

Crystalline powder

Storage and Stability

The crystalline powder is stable for at least 12 months at +2 to +8°C when stored in a glass container protected from moisture and light.

A solution of DTT in Hepes buffer (pH 7.75) is stable for one week at +2 to +8°C if the container is tightly sealed and the solution is protected from atmospheric oxygen by argon or nitrogen.

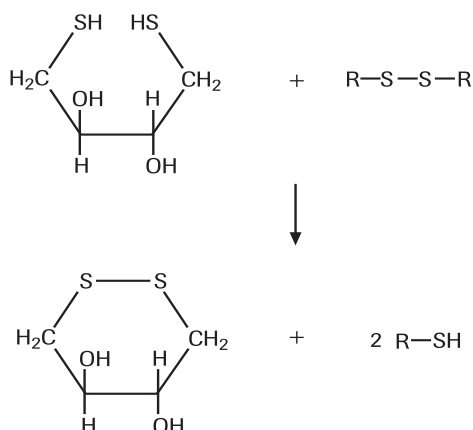
Application

- Isolation and purification of enzymes and proteins
- Measurement of activity of enzymes (reactivation of enzymes) (3, 4)
- Determination of disulfide groups in proteins and enzymes
- Characterization of proteins and enzymes

Product Characteristics

Formular	C ₄ H ₁₀ O ₂ S ₂
Molecular weight	M _r = 154.3
Typical analysis	DTT (with Ellman's reagent) > 97%
Solubility	Gives a clear solution in water (c= 10 mg/ml)

Structure



2. Additional Information on this Product

2.1 Background Information

Dithiothreitol (DTT) is a reducing agent that is primarily used to protect free SH-groups from oxidation during the isolation of proteins or other biochemical procedures. Because of its low redox potential (-0.33 V at pH 7) DTT is able to maintain free SH-groups in the reduced state and to reduce disulfide bridges quantitatively.

DTT is therefore routinely used in all laboratories that work with enzymes or proteins. DTT is extensively used in protein chemistry and in the isolation of enzymes.

DTT is more suitable for the protection of free SH-groups than 2-mercaptoethanol because it forms an intramolecular disulfide bond on oxidation. Generation of this energetically favorable six-membered ring shifts the reaction equilibrium to the side of the oxidized dithiothreitol. As a result, a much smaller excess is needed to protect SH-groups (e.g. in proteins) (1, 2).

Further advantages of DTT are that it:

- produces a clear solution in water,
- is more stable than 2-mercaptoethanol in aqueous solution,
- has a less disagreeable odor,
- has only a slight tendency to oxidize in air.

References

- 1 Cleland, W.W. (1964) *Biochemistry* **3**, 480
- 2 Stevens, R. Stevens, L. & Price, N.C. (1983) *Biochem. Education* **11** (2), 70.
- 3 Stolle, D. & Rick, W. (1976) *J. Clin. Chem. Clin. Biochem.* **14**, 239
- 4 Nealon, A.N. & Henderson, R. (1977) *Clin. Chem.* **23** (5), 816
- 5 Rintamäki, E. *et al.*, (2000) *PNAS* **97**, 11644-11649
- 6 Baillat, D. *et al.*, (2002) *J. Biol. Chem.* **277**, 29386-29398.

3. Supplementary Information

3.1 Changes to Previous Version

- Editorial changes.

3.2 Ordering Information

Electrophoresis reagents

Product	Cat. No	Pack size
Guanidine thiocyanate	11 685 929 001	500 g
Sodium Dodecyl Sulfate (SDS)	11 667 289 001	1 kg

Regulatory Disclaimer

For life science research only. Not for use in diagnostic procedures.

Trademarks

All third party product names and trademarks are the property of their respective owners.

Disclaimer of License

For patent license limitations for individual products please refer to:

[List of biochemical reagent products](#)

Contact and Support

To ask questions, solve problems, suggest enhancements and report new applications, please visit our **Online Technical Support Site**.

To call, write, fax, or email us, visit sigma-aldrich.com, and select your home country. Country-specific contact information will be displayed.



Roche Diagnostics GmbH
Sandhofer Strasse 116
68305 Mannheim
Germany