

Product Information

DL-Dithiothreitol

Catalog Numbers **D0632**, **D5545**

Storage Temperature 2-8°C

CAS RN 3483-12-3

Synonyms: Clelands's Reagent¹; DTT;
threo-1,4-Dimercapto-2,3-butanediol

Molecular Formula: HSCH₂CH(OH)CH(OH)CH₂SH

Molecular Weight: 154.25

Melting point: 41-44 °C

Product Description

D0632

Assay: ≥99% (titration)

Appearance: white powder

Shelf-life: four years

D5545

SigmaUltra

Assay: >99% (titration)

Appearance: white powder

Shelf-life: four years

DTT is synthetic. A method of preparation has been described in *J. Chem. Soc.* 253 (1949)

Dithiothreitol is an agent for reducing -S-S- to -SH. Redox potential: -0.33 volts at pH 7. DTT acts as a protective agent for -SH groups of other species in solution. In this reaction the DTT is oxidized to the cyclic disulfide, and thereby ensures the reduction of other disulfides in solution. The disulfide reduction is complete in minutes at pH 8.

A specific and sensitive assay for disulfide groups is based on determination of resulting monothiols with 5,5'-Dithiobis(2-nitrobenzoic acid) (DTNB), Catalog Number D8130.²

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

The solubility of dithiothreitol has been tested by Sigma at 50 mg/ml in water, resulting in a clear colorless solution. It has been described as freely soluble in water, ethanol, acetone, ethylate, chloroform and ether. Solutions oxidize relatively slowly in air.³ It is recommended to make solutions fresh daily. Recorded half-life (hours) of DTT solutions at various pH and temperatures are as follows:⁴

Conditions (all in 0.1 M potassium phosphate buffer)	Half life (Hours)
pH 6.5, 20 °C	40
pH 7.5, 20 °C	10
pH 8.5, 20 °C	1.4
pH 8.5, 0 °C	11
pH 8.5, 40 °C	0.2
pH 8.5, 20 °C, +0.1 mM Cu ⁺⁺	0.6
pH 8.5, 20 °C, +0.1 mM EDTA	4

References

1. *Biochemistry* **3**, 480 (1964)
2. *J. Biol. Chem.* **243**, 716 (1968)
3. Merck Index 12 ed. #3441
4. *Biochemical Education* **11**, 70 (1983)

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