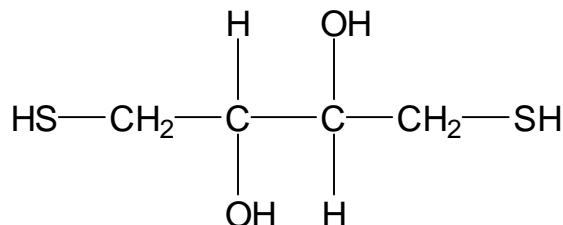


DL-DITHIOTHREITOL
Sigma Prod. Nos. D-0632, D-5545 and D-6052

CAS NUMBER: 27565-41-9
ACRONYM: DTT
SYNONYM: Cleland's Reagent¹

PHYSICAL DESCRIPTION:

Appearance: White Powder
Melting point: 42-43°C
Molecular weight : 154.1
Purity: 99% by titration
Formula: C₄H₁₀O₂S₂



METHOD OF PREPARATION:

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

STABILITY / STORAGE AS SUPPLIED:

Cooler, protected from moisture. Although storage is at 2-8°C, product is shipped at ambient temperature. Summer shipments may result in melted, melted/resolidified or wet-looking material. The product is completely unaffected chemically.

SOLUBILITY / SOLUTION STABILITY:

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 KPO4 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 +0.1mM Cu ⁺⁺	0.6
pH 8.5 @ 20°C +1.0 mM EDTA	4

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USAGE / APPLICATIONS:

Dithiothreitol (DTT) 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 ensure the reduction of other disulfides in solution. The disulfide reduction is complete in minutes at pH 8.

Specific and sensitive assay for disulfide groups is based on determination of resulting monothiols with DTNB (Sigma Prod. No. D-8130).²

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)