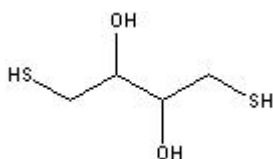


TECHNICAL INFORMATION

Catalog Number: 100597, 194821, 856126

DL-Dithiothreitol

Structure:



Molecular Formula: C₄H₁₀O₂S₂

Molecular Weight: 154.25

CAS # : 27565-41-9

Synonyms: 1,4-Dithiothreitol; DTT; 1,4-Dithio-DL-threitol; Cleland Reagent racemic; (±)-threo-1,4-Dimercapto-2,3-butanediol

Source: *Synthetic.*

Solubility: Soluble in water (50 mg/ml - clear and colorless solution); soluble in ethanol, acetone, ethylate, chloroform and ether. Solutions oxidize relatively slowly in air.¹ It is recommended to make solutions fresh daily.

Half Life: Recorded half-life (hours) of DTT solutions at various pH and temperatures have been recorded.⁸

Conditions (all in 0.1 M KPO ₄ 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 with addition of 0.1 mM Cu ⁺⁺	0.6
pH 8.5 @ 20°C with addition of 1.0 mM EDTA	4

pH (0.1 M in H₂O, 25°C): 4.0 to 6.0

Redox Potential: -0.33 volts at pH 7

Description: Clelands reagent; Protective agent for sulfhydryl groups (-SH). Quantitatively reduces disulfides (-S-S- to -SH). In this reaction the DTT is oxidized to the cyclic disulfide which ensures the reduction of other disulfides in solution. Disulfide reduction occurs quickly at pH 8.

Useful for stabilizing sulfhydryl containing enzymes. Effective in sample buffers for reducing protein disulfide bonds prior to SDS-PAGE. DTT can also be used for reducing the disulfide bridge of the cross-linker N,N'-bis(acryloyl)cystamine to break apart the matrix of a polyacrylamide gel. Typically, a seven fold lower concentration of DTT (100 mM) is needed than is used for 2-mercaptoethanol (5% v/v, 700 mM).

Availability:

Catalog Number	Description	Size
100597	DL-Dithiothreitol	250 mg 1 g 5 g 10 g 25 g 50 g 100 g
194821	DL-Dithiothreitol, Molecular Biology Reagent	250 mg 1 g 5 g 10 g 25 g 50 g
856126	DL-Dithiothreitol, Electrophoresis Grade	5 g

References:

- Merck Index, **12th Ed.**, No. 3441.
- Cleland, W.W., "Dithiothreitol, A new protective reagent for SH Groups." *Biochem.*, **v. 3**, 480 (1964).
- Ruegg, U.T., Rudinger, J., *Meths. Enzymol.*, **v. 47**, 111 (1977).
- Sears, D.W., et al., *Biochemistry*, **v. 16**, 2031 (1977).
- Bacarese-Hamilton, A., et al., *Ann. N.Y. Acad. Sci.*, **v. 448**, 571 (1985).
- Jabusch, J.R., *Anal. Biochem.*, **v. 91**, 532 (1978).
- MacDonald, R.J., "Isolation of RNA using guanidinium salts. Inclusion of a reductant enhances denaturation by breaking intramolecular protein disulfide bonds." *Meths. Enzymol.*, **v. 152**, 219 (1987).
- *Biochemical Education*, **v.11**, 70 (1983). *Biochemical Education*, **v.11**, 70 (1983).