



BIS-TRIS PROPANE SIGMA
Sigma Prod. No. B9410

Product Information

CAS NUMBER: 64431-96-5

STRUCTURE: $(\text{HO-CH}_2)_3\text{C-NH-(CH}_2)_3\text{-NH-C(CH}_2\text{-OH)}_3$

SYNONYMS: 1,3-bis(tris(hydroxymethyl)methylamino)propane

PHYSICAL DESCRIPTION:

Appearance: White crystalline powder

Molecular formula: $\text{C}_{11}\text{H}_{26}\text{N}_2\text{O}_6$

Molecular Weight: 282.3

$\text{pK}_{a1} = 6.8$ at 25°C

$\text{pK}_{a2} = 9.0$ at 25°C

$\Delta\text{pK}/\Delta\text{T} = -0.031$

STABILITY / STORAGE AS SUPPLIED:

This product is stable at room temperature for years. It should be re-evaluated for continued suitability in user application every three to five years.

SOLUBILITY / SOLUTION STABILITY:

Bis-Tris propane is soluble in water; 15 g in 35 mL water (approximately 1.5 M) gives a clear colorless solution. The pH of a 1 M solution is between 10 and 12 at room temperature.

Solutions are expected to be stable to autoclaving. Stock solutions stored at $2\text{-}8^\circ\text{C}$ should be stable for months.

GENERAL REMARKS:

Bis-Tris Propane is a buffer with an unusually wide buffering range, from approximately pH 6 to 9.5, due to its two pK_a values being close in value. A solution is usually titrated to the pH desired using hydrochloric acid.

Because of the wide buffering range, particularly down to pH 6-7, this buffer has been used to enhance the stability or activity of restriction enzymes, compared to Tris buffer (which is a poor buffer below pH 7.5 and has a comparatively large change in pK_a with temperature²). See the restriction enzymes in the Molecular Biology section of the Sigma Catalog.

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GENERAL REMARKS: (continued)

Sigma also offers Bis-Tris Propane, B6755, which is not subjected to as rigorous quality control criteria, and B0405, a product tested for suitability in molecular biology applications.

For general references on buffers, choices, and applications, please see suggested references below.

CITED REFERENCES:

1. Sigma quality control.
2. Stoll, V.S. and Blanchard, J.S., "*GUIDE TO PROTEIN PURIFICATION*" - *METHODS IN ENZYMOLOGY*, 182, p. 29 (1990).

REFERENCES:

ENZYME ASSAYS: A PRACTICAL APPROACH, eds. Eisenthal and Danson (IRL Press, 1992) Chapter 11, p. 317. Excellent discussion of buffer chemistry in clear terms.

DATA FOR BIOCHEMICAL RESEARCH, 3rd Ed., eds. Dawson, Elliott, et al. (Oxford Press, 1986). Contains pK tables for common buffers, recipes for mixing buffers.

MOLECULAR CLONING: A LABORATORY MANUAL, 2nd Ed., eds. Sambrook et al. (Cold Spring Harbor Press, 1989). Appendices contain recipes for many commonly used buffer formulations, particularly in molecular biology applications.

"*GUIDE TO PROTEIN PURIFICATION*" - *METHODS IN ENZYMOLOGY*, 182, pp. 24-38 (1990). Review article about buffers and their properties, particularly in protein isolation applications.

College-level general chemistry books may contain a chapter on acid-base chemistry, addressing the properties and preparation of buffer solutions.