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Product Information

TES

Cell Culture Tested

Product Number **T 5691**

Store at Room Temperature

Product Description

Molecular Formula: $C_6H_{15}NO_6S$

Molecular Weight: 229.3

CAS Number: 7365-44-8

pK_a : 7.4 (25 °C)¹

Synonyms: N-[tris(hydroxymethyl)methyl]-2-aminoethanesulfonic acid, 2-[(2-hydroxy-1,1-bis(hydroxymethyl)ethyl)amino]ethanesulfonic acid

This product is cell culture tested and is designated as Biotechnology Performance Certified. It has been tested for endotoxin levels and analyzed for the absence of nucleases and proteases.

TES is a zwitterionic buffer that is used in biochemistry and molecular biology research. It is one of the Good buffers developed in the 1960's to provide buffers in the pH range of 6.15 - 8.35 for wide applicability to biochemical studies. The pioneering publication by Good and co-workers describes the synthesis of TES and its physical properties.¹ The useful pH range of TES buffer at 37 °C is pH 6.5 - 7.9.

The effect of buffer identity on the kinetics of the restriction enzyme *EcoRV* has been studied in various buffers, including TES.² TES buffer has been utilized in a study of the interactions of proteoglycans with type I collagen.³ An investigation of the interactions of phospholipid vesicles with poly(L-lysine) in TES buffer has been reported.⁴ A study of intracellular pH recovery in NH_4Cl -induced acidosis in anoxic isolated turtle heart has utilized TES buffer.⁵

The kinetics of the reaction of a (*E*)-1-methyl-4-[2-(methylsulfonyl)-1-ethenyl]pyridinium iodide with glutathione in TES buffer has been studied.⁶ A protocol has described the use of TES buffer to resolve naphthalene-2,3-dicarboxaldehyde (NDA)-derivatized substance P (CBI-SP) and five lysine-containing metabolites by micellar electrokinetic chromatography.⁷

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in water (500 mg/ml), yielding a clear, colorless solution.

Storage/Stability

Solutions of this product should be stable at 2-8 °C for at least six months. Sterile filtration through 0.2 μm filters is generally recommended for stock solutions. However, autoclavability has been checked on 0.5 M TES solutions at pH 6.7, 7.45, and 8.5, and at 0.05 M at pH 7.4. The pH was identical between autoclaved and non-autoclaved samples, and the solutions remained colorless.

References

1. Good, N. E., et al, Hydrogen ion buffers for biological research. *Biochemistry*, **5**(2), 467-477 (1966).
2. Wenner, J. R., and Bloomfield, V. A., Buffer effects on *EcoRV* kinetics as measured by fluorescent staining and digital imaging of plasmid cleavage. *Anal. Biochem.*, **268**(2), 201-212 (1999)

3. Pogany, G., et al., The *in vitro* interaction of proteoglycans with type I collagen is modulated by phosphate. Arch. Biochem. Biophys., **313(1)**, 102-111 (1994).
4. Fukushima, K., et al., Conformational study of poly(L-lysine) interacting with acidic phospholipid vesicles. Biophys. Chem., **34(1)**, 83-90 (1989).
5. Shi, H., et al., Mechanisms of pHi recovery from NH₄Cl-induced acidosis in anoxic isolated turtle heart: a ³¹P-NMR study. Am. J. Physiol., **272 (1 Pt 2)**, R6-15 (1997).
6. Holler, M., et al., (*E*)-1-Alkyl-4-[2-(alkylsulfonyl)-1-ethenyl]pyridinium salts: Reaction with thiol groups giving rise to chromophoric (*E*)-1-Alkyl-4-[2-(alkylsulfanyl)-1-ethenyl]pyridinium salts. Chemistry, **6(11)**, 2053-2062 (2000).
7. Freed, A. L., and Lunte, S. M., Separation of naphthalene-2,3-dicarboxaldehyde-derivatized-substance P and its metabolites by micellar electrokinetic chromatography. Electrophoresis, **21(10)**, 1992-1996 (2000).

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