



## CERTIFICATE of ANALYSIS

<b>PRODUCT:</b>	<b>TRIS Ultrapure</b> [Tris(hydroxymethyl) aminomethane; Tromethamine] C <sub>4</sub> H <sub>11</sub> NO <sub>3</sub> , M.W. 121.1, CAS# [77-86-1]	
<b>PRODUCT NUMBER:</b>	T-1178	
<b>LOT NUMBER:</b>	C1001	
	<u>SPECIFICATIONS:</u>	<u>RESULTS:</u>
<b>APPEARANCE:</b>	White crystalline solid	Pass
<b>PURITY (Dried basis by GC):</b>	Min. 99%	99.94%
<b>MOISTURE (KF):</b>	Max. 0.1%	< 0.1%
<b>ASSAY (Dried basis):</b>	99.9 – 100.1%	100%
<b>MELTING POINT:</b>	168.0 – 172.0°C	170.7%
<b>SOLUBILITY (2M in H<sub>2</sub>O):</b>	Clear and colorless	pass
<b>ABSORBANCE:</b> (@280nm, 1M, in H <sub>2</sub> O)	Max. 0.01	0.00
<b>ABSORBANCE:</b> (@290nm, 40% soln in H <sub>2</sub> O)	Max. 0.20	0.02
<b>pH:</b> (1.0M Aqueous solution @ 25°C)	10.5 – 11.5	10.9

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<b>pH:</b> (5% solution in H <sub>2</sub> O @ 25°C)	10.0 – 11.5	10.8
<b>IDENTIFICATION A:</b>	-----	Pass
<b>IDENTIFICATION B:</b>	-----	Pass
<b>IDENTIFICATION C:</b>	-----	Pass
<b>APHA COLOR:</b> (20% Aqueous solution)	Max. 20	< 5
<b>LOSS ON DRYING:</b> (105°C for 3 hrs)	Max. 1.0%	0.00%
<b>RESIDUE ON IGNITION:</b>	Max. 0.05%	0.0%
<b>INSOLUBLE MATTER:</b>	Max. 0.005%	0.000%
<b>UV Abs @260nm:</b> 10% Aqueous solution	Max. 0.03	0.01
<b>UV Abs @280nm:</b> 10% Aqueous solution	Max. 0.02	0.01
<b>UV Abs @430nm:</b> 10% Aqueous solution	Max. 0.004	0.001
<b>HEAVY METALS (as PB):</b>	Max. 5 ppm	< 5 ppm
<b>IRON (Fe):</b>	Max. 1 ppm	< 0.3 ppm
<b>ARSENIC:</b>	Max. 5 ppm	< 1 ppm
<b>COPPER:</b>	Max. 1 ppm	< 1 ppm
<b>LEAD:</b>	Max. 1 ppm	< 1 ppm
<b>MAGNESIUM:</b>	Max. 1 ppm	< 1 ppm

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DNase, RNase, protease:

None detected

Pass

STORAGE & HANDLING:

Store at + 20°C. WARNING: IRRITANT!

CAUTION: For laboratory research & scientific manufacturing use only. Not for human or drug use. The pharmacological and toxicological properties of this product have not been fully investigated. Use caution when handling. Do not use this compound if you are not fully trained or are unaware of the hazards involved.

Verified:

A handwritten signature in blue ink, appearing to be 'J. P. [unclear]', is written over the 'Verified:' text.