BIOSPECTRA

100 Majestic Way, Bangor, PA 18013 / www.biospectra.us

Effective Date:	15-Apr-2020	15-Apr-2023	: Date of Next Review
Prepared By:	Kyle Snyder	16-001154 v.2.0	: Supersedes
QA/QC Approval:	Carissa McCollian	Hannah Bernier	: Management Approval
Reason for Revision:	See Revision History in ensur.		

CERTIFICATE OF ANALYSIS

TRIS HCl

BIO PHARMA GRADE / TH4220-K050

LOT: TH4220-012-1020

$NH_2C(CH_2OH)_3 \cdot HCl$ ▲ F.W. 157.60 g/mol. ▲ CAS# 1185-53-1

Manufacturing Date: 05/08/20 Retest Date: 05/31/22

Manufacturing Site: 1474 Rockdale Lane, Stroudsburg, PA 18360

Packaging Date: 10/14/20 Packaging Site: 100 Majestic Way, Bangor PA, 18013

ANALYSIS		SPECIFICATION	TEST RESULT
Absorbance (1M)	280 nm	0.06 a.u. max.	<0.06 a.u.
Appearance and Color		White / Crystals	White / Crystals
Assay, Dried		99.5% min.	99.8%
Enzymes	DNase	None Detected	None Detected
	Protease	None Detected	None Detected
	RNase	None Detected	None Detected
Heavy Metals		2 ppm max.	< 2 ppm
Identification (IR)		Passes Test	Passes Test
Insoluble Matter		0.001% max.	<0.001%
LOD at 105 °C		0.5% max.	0.1%
Melting Range		150 – 153°C	151 - 152 °C
pH (0.5M)		4.0 – 5.0	4.2 @ 23.5°C
pK_a		8.0 – 8.4	8.1
Residue on Ignition		0.1% max.	<0.1%
Solubility (1M)		Passes Test	Passes Test
Trace Elements	Arsenic (As)	5 ppm max.	< 5 ppm
	Calcium (Ca)	5 ppm max.	< 5 ppm
	Copper (Cu)	5 ppm max.	< 5 ppm
	Iron (Fe)	5 ppm max.	< 5 ppm
	Lead (Pb)	5 ppm max.	< 5 ppm
	Magnesium (Mg)	5 ppm max.	< 5 ppm

COUNTRY OF ORIGIN: U.S.A.

TEST METHOD REFERENCE: DCN: 16-000042

INTENDED USE: Material represented by this Certificate of Analysis is suitable for use as a GMP process chemical. It is manufactured in accordance with the IPEC-PQG Joint Good Manufacturing Practice Guide. The material represented by this Certificate of Analysis is not suitable to be used as an Active Pharmaceutical Ingredient, Drug, Drug Product or Household Item.

RESIDUAL SOLVENT STATEMENT: Based on the manufacturing process and the controlled handling, storage and analysis of this product, this product complies with the requirements and specifications listed in the current USP method <467> Tables 1, 2, 3, or 4.

Prepared by: _____ Date: 10/21/20 Job Title: QA Document Specialist

Reviewed by: _____ Date: 10/21/20 Job Title: QA Supervisor