

BIOSPECTRA

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

Effective Date:	10-Apr-2020	10-Apr-2023	: Date of Next Review
Prepared By:	Kyle Snyder	16-000062 v.4.1	: Supersedes
QA/QC Approval:	Carissa McCollian	Hannah Bernier	: Management Approval
Reason for Revision:	See Revision History in ensur.		

CERTIFICATE OF ANALYSIS

TRIS HCl

BIO EXCIPIENT GRADE / TH3220-K010

LOT: TH3220-122-0520

 $\text{NH}_2\text{C}(\text{CH}_2\text{OH})_3 \cdot \text{HCl}$ F.W. 157.60 g/mol. CAS# 1185-53-1

Manufacturing Date: 4/24/2020 Retest Date: 4/30/2022

Manufacturing Site: 1474 Rockdale Lane, Stroudsburg, PA 18360

Packaging Date: 5/13/2020 Packaging Site: 100 Majestic Way, Bangor PA, 18013

ANALYSIS	SPECIFICATION	TEST RESULT	
Absorbance (1M)	280 nm 0.06 a.u. max.	0.01 a.u.	
Appearance and Color	White / Crystals	White / Crystals	
Assay	99.5% min.	99.7%	
Enzymes	DNase	None Detected	
	RNase	None Detected	
	Protease	None Detected	
Heavy Metals	2 ppm max.	< 2 ppm	
Identification (IR)	Passes Test	Passes Test	
Insoluble Matter	0.001% max.	<0.001%	
Karl Fischer	0.5% max.	0.3%	
Melting Range	150 – 153 °C	151-153°C	
pH (0.5M)	4.0 – 5.0	4.4 @ 24.4°C	
pK _a	8.0 – 8.4	8.2	
Residue on Ignition	0.1% max.	<0.1%	
Solubility 35%	Passes Test	Passes Test	
Trace Metals	Arsenic (As)	1 ppm max.	< 1 ppm
	Calcium (Ca)	1 ppm max.	< 1 ppm
	Copper (Cu)	1 ppm max.	< 1 ppm
	Iron (Fe)	1 ppm max.	< 1 ppm
	Lead (Pb)	1 ppm max.	< 1 ppm
	Magnesium (Mg)	1 ppm max.	< 1 ppm

COUNTRY OF ORIGIN: U.S.A.

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TEST METHOD REFERENCE: DCN: 16-000042

INTENDED USE: Material represented by this Certificate of Analysis is suitable for use as an excipient. It is manufactured in accordance with the ICH Q7 Good Manufacturing Practice Guide. The material represented by this Certificate of Analysis is not suitable to be used as an Active Pharmaceutical Ingredient, Drug Product or Household Item.

RESIDUAL SOLVENTS: 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: C. [Signature] Date: 6/4/20 Job Title: QA Supervisor

Reviewed by: Wing [Signature] Date: 06/04/20 Job Title: QA Manager