

BIO SPECTRA

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

Effective Date:	19-Dec-2019	19-Dec-2022	: Date of Next Review
Prepared By:	Carissa McCollan	16-000062 v4.0	: Supersedes
QA/QC Approval:	Hannah Bernier	Amy Yenko	: Management Approval
Reason for Revision:	See Revision History in ensur		

TRIS HCl

CERTIFICATE OF ANALYSIS

BIO EXCIPIENT GRADE / TH3220-K010

LOT: TH3220-105-0120

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

Manufacturing Date: 12/3/2019 Retest Date: 12/31/2021

Packaging Date: 1/10/2020

Manufacturing Site: 1474 Rockdale Lane, Stroudsburg, PA 18360

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.	99.9%
Enzymes		
DNase	None Detected	None Detected
RNase	None Detected	None Detected
Protease	None Detected	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.	0.2%
Melting Range	150 – 153 °C	151-152°C
pH (0.5M)	4.0 – 5.0	4.2 @ 23.1°C
pK _a	8.0 – 8.4	8.2
Residue on Ignition	0.1% max.	<0.1%
Solubility 35%	Passes Test	Passes Test
Trace Elements		
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

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COUNTRY OF ORIGIN: U.S.A.

TEST METHOD REFERENCE: DCN: 16-000042

INTENDED USE: Material represented by this Certificate of Analysis is suitable to be used only as the following: ICH Q7 Compliant cGMP Manufactured Excipient for use in further manufacturing. 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] / QA Supervisor Date: 11/17/20

Reviewed by: H. [Signature] / QA Manager Date: 11/20/20