

# BIOSPECTRA

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

Effective Date:	04-Feb-2025	04-Feb-2028	: Date of Next Review
Prepared By:	Taylor Yurick	BSI-COA-0091 v.4.2	: Supersedes
QA/QC Approval:	Jessica DeMaio	Hannah Kuchmas	: Management Approval
Reason for Revision:	See Revision History in MasterControl.		

## CERTIFICATE OF ANALYSIS

### TRIS

### BIO EXCIPIENT GRADE / TRIS-3251

### LOT: TRIS-S01-1225-0233

 $\text{NH}_2\text{C}(\text{CH}_2\text{OH})_3$  \* F.W. 121.14 g/mol \* CAS# 77-86-1

Manufacturing Date: 12/27/25      Expiration Date: 12/31/28  
 Manufacturing Site: 1474 Rockdale Lane, Stroudsburg, PA 18360  
 Packaging Site: 100 Majestic Way, Bangor PA, 18013  
 Meets or Exceeds USP Specifications

ANALYSIS	SPECIFICATION	TEST RESULT
Absorbance (1M)	260nm	≤ 0.06 a.u.
	280nm	≤ 0.06 a.u.
	430nm	≤ 0.01 a.u.
Absorbance (10%)	260nm	≤ 0.03 a.u.
	280nm	≤ 0.02 a.u.
Absorbance (40%)	280nm	≤ 0.02 a.u.
	430nm	≤ 0.004 a.u.
APHA Color, 20% Solution	290nm	≤ 0.2 a.u.
Appearance and Color	≤ 20 APHA	< 20 APHA
Appearance of Solution (EP)	White/Crystals	Passes Test
Assay (Dried Basis) (USP/EP/ChP/JPC)	Passes Test	Passes Test
Assay (Ultrapure, Dried Basis)	99.0 – 100.5%	99.9%
Chloride (ChP/EP)	≥ 99.9%	100.0 %
Clarity and Color of Solution (ChP/JPC)	≤ 100 ppm	< 100 ppm
Endotoxins	Passes Test	Passes Test
Enzymes	≤ 2.5 EU/g	< 1.2 EU/g
	DNase	None Detected
	Protease	None Detected
	RNase	None Detected
Heavy Metals (as Pb) (ChP/JPC)	None Detected	None Detected
Identification IR (USP-A/ChP-3/EP-C)	None Detected	None Detected
Identification A (JPC)	≤ 1 ppm	< 0.30ppm
Identification B (USP/ChP-1)	Passes Test	Passes Test
Identification B (JPC)	Passes Test	Passes Test
Identification C (USP)	Passes Test	Passes Test
Identification D (EP/ChP-2)	Passes Test	Passes Test
Insoluble Matter	Passes Test	Passes Test
	≤ 0.005%	< 0.001%

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ANALYSIS		SPECIFICATION	TEST RESULT
Karl Fischer Water		≤ 1.0%	0.1%
Loss on Drying (USP/ChP/EP/JPC)		≤ 0.3%	0.1%
Melting Range (USP/ChP/IDB-EP/JPC)		168 – 172°C	171 - 172 °C
Methanol		≤ 3000 ppm	< 150 ppm
TAMC		≤ 100 CFU/g	< 10 CFU/g
TYMC		≤ 100 CFU/g	< 10 CFU/g
Bile tolerant Gram Neg. Bacteria		Absence in 1g	Absence in 1g
Microbial Content	<i>Escherichia coli</i>	Absence in 1g	Absence in 1g
	<i>Pseudomonas aeruginosa</i>	Absence in 1g	Absence in 1g
	<i>Staphylococcus aureus</i>	Absence in 1g	Absence in 1g
	<i>Candida albicans</i>	Absence in 1g	Absence in 1g
	<i>Salmonella sp</i>	Absence in 10g	Absence in 10g
pH (5%) (USP/IDA-EP/ChP)		10.0 – 11.5	10.9
pH (1 in 100) (JPC)		10.3 – 10.7	10.6
Related Substances (ChP/EP)		≤ 0.1%	< 0.03%
Residue on Ignition/Sulfated Ash (USP/ChP/EP/JPC)		≤ 0.05%	0.02%
Arsenic (As)		≤ 1.6 ppm	< 0.45ppm
Calcium (Ca)		≤ 1 ppm	< 0.60ppm
Copper (Cu)		≤ 1 ppm	< 0.15 ppm
Iron (Fe)		≤ 1 ppm	< 0.30 ppm
Trace Metals	Lead (Pb)	≤ 1 ppm	< 0.30 ppm
	Magnesium (Mg)	≤ 5 ppm	< 0.60 ppm
	Manganese (Mn)	≤ 1 ppm	< 0.60 ppm
	Nickel (Ni)	≤ 15 ppm	< 0.75 ppm
	Zinc (Zn)	≤ 1 ppm	< 0.60 ppm

COUNTRY OF ORIGIN: U.S.A.

TEST METHOD REFERENCE: DCN: BSI-ATM-0007

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.

OVI 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: Anil Mehall Date: 2/24/26 Job Title: QA Tech III

Reviewed by: John Bough Date: 2/24/26 Job Title: QA Supervisor