

BIOSPECTRA

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

Effective Date:	23-Jan-2025	23-Jan-2028	: Date of Next Review
Prepared By:	Amy Yench	Not Applicable	: Supersedes
QA/QC Approval:	Krista Rehrig	Carissa Albert	: Management Approval
Reason for Revision:	See Revision History in MasterControl.		

CERTIFICATE OF ANALYSIS

TRIS HYDROCHLORIDE

BIOTECH, HIGH ASSAY, LBLE, GMP, PREMIUM REAGENT

BIO PHARMA GRADE / THCL-4251

LOT: THCL-S03-0825-0126

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

Manufacturing Date: 08/22/25 Expiration Date: 08/31/28

Manufacturing Site: 1474 Rockdale Lane, Stroudsburg, PA 18360

Packaging Site: 100 Majestic Way, Bangor PA, 18013

ANALYSIS	SPECIFICATION	TEST RESULT
Absorbance (1M)	260 nm	≤ 0.06 a.u.
	280 nm	≤ 0.06 a.u.
	400 nm	≤ 0.01 a.u.
Appearance and Color	White, Crystalline Powder to Needle-Like Crystals	White, Crystalline Powder to Needle-Like Crystals
Assay, Dried Basis	≥ 99.0 %	99.8 %
Bioburden	≤ 100 CFU/g	< 100 CFU/g
Endotoxin	≤ 2.5 EU/g	< 1.9 EU/g
Enzymes	DNase	None Detected
	Protease	None Detected
	RNase	None Detected
Identification, Chloride	Passes Test	Passes Test
Identification, IR	Conforms to Reference Standard	Conforms to Reference Standard
Insoluble Matter	≤ 0.005 %	< 0.001 %
Loss on Drying	≤ 0.5 %	0.1 %
Melting Range	147 – 152 °C	151 - 152 °C
pH (1% solution)	4.0 – 5.0	4.8
pH (0.5M)	3.5 – 5.0	4.2

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ANALYSIS	SPECIFICATION	TEST RESULT
Trace Metals	Arsenic (As)	≤ 5 ppm
	Calcium (Ca)	≤ 1 ppm
	Copper (Cu)	≤ 1 ppm
	Iron (Fe)	≤ 1 ppm
	Lead (Pb)	≤ 1 ppm
	Magnesium (Mg)	≤ 5 ppm
	Manganese (Mn)	≤ 1 ppm
	Zinc (Zn)	≤ 1 ppm
Water, KF		≤ 1.0 %

COUNTRY OF ORIGIN: U.S.A.

TEST METHOD REFERENCE: DCN: BSI-ATM-0002

INTENDED USE: Material represented by this Certificate of Analysis is suitable for use as a 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.

Prepared by: David McCall Date: 12/15/25 Job Title: QA Technician

Reviewed by: Jim Brough Date: 12/15/25 Job Title: QA Supervisor