

BIOSPECTRA

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

Effective Date:	12-Feb-2025	12-Feb-2028	: Date of Next Review
Prepared By:	Taylor Yurick	BSI-COA-0218 v.4.4	: Supersedes
QA/QC Approval:	Jaron Hughes	Carissa Albert	: Management Approval
Reason for Revision:	See Revision History in MasterControl		

CERTIFICATE OF ANALYSIS

CYSTEAMINE HCl (2-MEA)

BIO EXCIPIENT GRADE / CSMH-3250

LOT: CSMH-N02-0525-0019

 $\text{C}_2\text{H}_7\text{N}_1\text{S} \cdot \text{HCl}$ ^ F.W. 113.61 g/mol. ^ CAS# 156-57-0

Manufacturing Date: 2/19/25 Retest Date: 2/28/27

Manufacturing Site: 100 Majestic Way, Bangor PA, 18013

Packaging Site: 100 Majestic Way, Bangor PA, 18013

ANALYSIS	SPECIFICATION	TEST RESULT
Appearance and Color	White or colorless crystals or powder, may contain lumps	White or colorless crystals or powder, may contain lumps
Appearance of Solution	Colorless, clear solution	Colorless, clear solution
Argentometric Titration	30.6 - 31.8%	31.0%
Assay (HPLC Weight %)	98.0 – 102.0%	98.5%
Bioburden	≤ 100 CFU/g	< 100 CFU/g
Endotoxin	≤ 50 EU/g	< 33 EU/g
HPLC Minor Component 1 (Area %)	Cystamine $\leq 2.0\%$	0.82%
Heavy Metals	≤ 20 mg/kg (ppm)	< 20 mg/kg (ppm)
Identification (IR)	Conforms to reference standard	Conforms to reference standard
Loss on Drying	$\leq 1.0\%$	0.1%
Trace Metal Analysis (ICP)	Aluminum (Al)	< 0.80 ppm
	Arsenic (As)	< 0.03 ppm
	Barium (Ba)	< 1.4 ppm
	Bismuth (Bi)	< 0.40 ppm
	Calcium (Ca)	< 1.5 ppm
	Cadmium (Cd)	< 0.004 ppm
	Cobalt (Co)	< 0.01 ppm
	Chromium (Cr)	< 0.10 ppm
	Copper (Cu)	< 0.05 ppm
	Iron (Fe)	< 0.40 ppm

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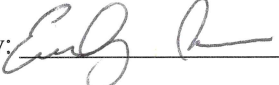
ANALYSIS	SPECIFICATION	TEST RESULT
Mercury (Hg)	≤ 1 ppm	< 0.018 ppm
Potassium (K)	≤ 50 ppm	< 4.0 ppm
Lithium (Li)	≤ 5 ppm	< 0.50 ppm
Magnesium (Mg)	≤ 5 ppm	< 0.40 ppm
Manganese (Mn)	≤ 1 ppm	< 0.05 ppm
Molybdenum (Mo)	≤ 5 ppm	< 0.10 ppm
Trace Metal Analysis (ICP)	Sodium (Na)	32 ppm
	Nickel (Ni)	< 0.04 ppm
	Lead (Pb)	< 0.01 ppm
	Antimony (Sb)	< 0.18 ppm
	Selenium (Se)	< 0.10 ppm
	Strontium (Sr)	< 0.40 ppm
	Vanadium (V)	< 0.02 ppm
	Zinc (Zn)	< 0.40 ppm
Purity (HPLC Area %)	$\geq 98.0\%$	99.2%
	$\geq 92.0\%$	99.2%
Purity (Cysteamine (HPLC))	$\leq 8.0\%$ related substances	0.82%
	Ethanol	< 2410 ppm
Residual Solvents	Isopropyl Alcohol (IPA)	< 2640 ppm
	Tert-Butylmethyl Ether	< 2540 ppm
Solubility	Clear and colorless	Clear and colorless

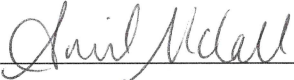
COUNTRY OF ORIGIN: U.S.A.

MANUFACTURING SUITE: Process Suite N02

TEST METHOD REFERENCE: DCN: BSI-ATM-0055

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.

Prepared by:  Date: 5/7/25 Job Title: QA Tech I

Reviewed by:  Date: 5/7/25 Job Title: QA Tech III