

BIOSPECTRA

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

Effective Date:	17-Aug-2020	17-Aug-2023	: Date of Next Review
Prepared By:	Amy Hosein	18-002600 v.5.0	: Supersedes
QA/QC Approval:	Carissa McCollian	Amy Yenko	: Management Approval
Reason for Revision:	See Revision History in ensur.		

CERTIFICATE OF ANALYSIS

TREHALOSE, DIHYDRATE

BIO EXCIPIENT GRADE / TE3250 – K005

LOT: TE3250-019-0820

 $C_{12}H_{22}O_{11} \cdot 2H_2O$ ^ F.W. 378.33 g/mol. ^ CAS# 6138-23-4

Manufacturing Date: 2/9/19 Retest Date: 5/31/21

Manufacturing Site: 100 Majestic Way, Bangor PA, 18013

Packaging Date: 8/18/20 Packaging Site: 100 Majestic Way, Bangor PA, 18013

Meets or Exceeds EP/BP, JP and NF Specifications

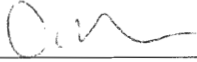
ANALYSIS	SPECIFICATION	TEST RESULT
Appearance and Color	White to Off-White Crystalline Powder	White to Off-White Crystalline Powder
Appearance of Solution (EP)	Clear, Colorless	Clear, Colorless
Assay % w/w	98.0% - 101.0%	99.5%
	(NF) $\leq 0.0125\%$	$\leq 0.0125\%$
Chloride	(EP) $\leq 0.0125\%$	$\leq 0.0125\%$
	(JP) $< 0.018\%$	$< 0.018\%$
Color and Clarity of Solution	A720 ≤ 0.050	0.002
	A420 – A720 ≤ 0.100	0.016
Dextrin, Soluble Starch, Sulfite	Passes Test	Passes Test
Endotoxins	≤ 2.4 EU/g	< 1.2 EU/g
Heavy Metals (as Pb)	≤ 5 ppm	≤ 5 ppm
Identification A	Conforms to Standard	Conforms to standard
Identification B	Passes Test	Passes Test
Identification C	Passes Test	Passes Test
Identification 1	(JP) Passes Test	Passes Test
Identification 2	(JP) Passes Test	Passes Test
Identification 3	(JP) Passes Test	Passes Test

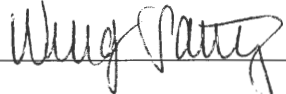
ANALYSIS	SPECIFICATION	TEST RESULT
Maltotriose (Impurity B)	≤ 0.5%	≤ 0.5%
Total Impurities with RRT < 1.0	≤ 0.5%	≤ 0.5%
Total Impurities with RRT > 1.0	≤ 0.5%	≤ 0.5%
Impurities		
Glucose (Impurity A)	≤ 0.5%	≤ 0.5%
Any Other Impurities	≤ 0.2%	≤ 0.2%
Sum of Glucose, Maltotriose, and Other Impurities	≤ 1.0%	≤ 1.0%
Microbial Content		
<i>Escherichia coli</i>	Absent	Absent
<i>Salmonella species</i>	Absent	Absent
TAMC	≤ 100 CFU/g	≤ 10 CFU/g
TYMC	≤ 100 CFU/g	≤ 10 CFU/g
Nitrogen Content	≤ 0.005%	≤ 0.005 %
pH @ 25°C	4.5 – 6.5	5.7
Residual Ethanol	≤ 5000 ppm	≤ 5000 ppm
Residual Isopropyl Alcohol	≤ 5000 ppm	≤ 5000 ppm
Residual Methanol	≤ 3000 ppm	≤ 3000 ppm
Residue on Ignition	≤ 0.1%	≤ 0.1%
Soluble Starch	Passes Test	Passes Test
Specific Rotation @ 20°C	+197° to +201°	+198°
	(NF) ≤ 0.0200%	≤ 0.0200%
Sulfate	(EP) ≤ 0.0200%	≤ 0.0200%
	(JP) ≤ 0.024%	≤ 0.024%
Water (Karl Fischer)	9.0% to 11.0%	9.3%

COUNTRY OF ORIGIN: U.S.A.

TEST METHOD REFERENCE: DCN: 18-002375

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: 8/20/20 Job Title: QA Supervisor

Reviewed by:  Date: 08/20/20 Job Title: QA Manager