BIOSPECTRA

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

Effective Date:	05-Nov-2021		: Date of Next Review
Initiated By:	Bertsch, Amy M	N/A	: Supersedes
Reason for Print:	Placement on Website		

Approval:

Approvers

Date	Time	Group	Name
04-Nov-2021	11:59:02 AM	EDITOR	Rehrig, Krista M
04-Nov-2021	02:27:28 PM	QUALITY	Gibbons, Emily E
05-Nov-2021	10:10:58 AM	MANAGEMENT	Yencho, Amy M

DEGRADATION AND IMPURITY PROFILE REPORT: MES, MONOHYDRATE 2021

Printed On:	10-Nov-2021 12:25:17 PM	Ledergerber, Alissa L	: Printed By
Print Expiration:	This document expires on the Date of Next Review listed in the header of this document or upon next revision.		
Notice:	The Information contained herein is the property of BioSpectra and is Confidential.		

TABLE OF CONTENTS

1. PURPOSE AND SCOPE: 3
2. RESPONSIBILITIES: 3
3. REFERENCES: 3
4. PROCEDURE: 4

1. PURPOSE AND SCOPE:

1.1. The impurity profiling of MES, Monohydrate was intended to identify and possibly quantify impurities found in the MES, Monohydrate product manufactured and purified at the BioSpectra Bangor, PA facility.

1.1.1. The profiling results and data allow BioSpectra to further understand the purity and characteristics of MES, Monohydrate.

1.1.2. The four stages of MES that were tested were Raw Material, Mother Liquor, Wet Crystals, and Finished Goods.

1.1.2.1. The stages analyzed for each test were dictated by each analysis required.

1.1.3. The tests that were used to determine the presence of impurities and degradation products were as follows:

1.1.3.1. Assay

1.1.3.1.1. Raw Material, Mother Liquor, Wet Crystal, Finished Goods.

1.1.3.2. Identification (IR)

1.1.3.2.1. Raw Material, Mother Liquor, Wet Crystal, Finished Goods.

1.1.3.3. pH of a 0.5M Solution

1.1.3.3.1. All four stages.

1.1.3.4. Residual Solvents

1.1.3.4.1. Finished Goods only.

1.1.3.5. Elemental Impurities with the addition of Iron and Sodium

1.1.3.5.1. All four stages.

1.2. All results were recorded in the appropriate laboratory documentation. The results are detailed in section 4 of this report. This report includes all relevant data as well as references to the initial documented results. This report discusses any impurities found in the product and includes a specification for any limits on the impurities found, when applicable.

2. RESPONSIBILITIES:

2.1. The Quality Control Management is responsible for control, implementation, training and maintenance of this report.

2.2. The QC Analysts were responsible for performing the testing stated in the corresponding Protocol and recording all results in the appropriate laboratory documentation.

2.3. The QC Compliance team, or qualified designee, was responsible for completing the degradation and impurity testing report.

3. REFERENCES:

3.1. USP <467> Residual Solvents

3.2. MES Monohydrate Testing Methods

3.3. Mes Monohydrate Bio Excipient Grade Validation Protocol 2021

3.4. Degradation and Impurity Profile Protocol: Mes, Monohydrate

3.5. MES, Monohydrate Elemental Impurity Profile 2021

4. PROCEDURE:

4.1. ASSAY :

4.1.1. Refer to the Degradation and Impurity Profile Protocol: Mes, Monohydrate for testing methods and requirements. The results of the Assay testing are detailed in the table below.

TABLE 1: ASSAY

Lot Number	Stage of Material	Specification	Assay (%)
1120047121	Raw Material	95.0% min	99.9%
1120035073	Raw Material	95.0% min	100.3%
ME3200-232-0221-PV ML Build	Mother Liquor	Report	25.84%
ME3200-232-0221-PV WC Top	Wet Crystal	Monitor	98.54%
ME3200-232-0221-PV WC Bottom	Wet Crystal	Monitor	98.54%
ME3200-232-0221-PV Drum 1	Finished Good	99.0% min	100.0%

4.2. IDENTITY (IR) :

4.2.1. Refer to the Degradation and Impurity Profile Protocol: Mes, Monohydrate for testing methods and requirements. The results of the Identity (IR) testing are detailed in the table below.

TABLE 2: IDENTITY (IR)

Lot Number	Stage of Material	Specification	IR Correlation
1120047121	Raw Material	≥ 0.95	0.983107
1120035073	Raw Material	≥ 0.95	0.986696
ME3200-232-0221-PV ML Build	Mother Liquor	Monitor	0.99751
ME3200-232-0221-PV WC Top	Wet Crystal	Report	0.96516
ME3200-232-0221-PV WC Bottom	Wet Crystal	Report	0.98975
ME3200-232-0221-PV Drum 1	Finished Good	≥ 0.95	0.997355

4.3. pH of a 0.5M SOLUTION :

4.3.1. Refer to the Degradation and Impurity Profile Protocol: Mes, Monohydrate for testing methods and requirements. The results of the pH of a 0.5M Solution testing are detailed in the table below.

TABLE 3: PH (0.1M SOLUTION)

Lot Number	Stage of Material	Specification	pH of a 0.5M Solution
1120047121	Raw Material	2.5 – 4.5 @ 25°C	2.9 @ 25°C

Printed On:	10-Nov-2021 12:25:17 PM	Ledergerber, Alissa L	: Printed By
Print Expiration:	This document expires on the Date of Next Review listed in the header of this document or upon next revision.		
Notice:	The Information contained herein is the property of BioSpectra and is Confidential.		

1120035073	Raw Material	2.5 – 4.5 @ 25°C	3.0 @ 25°C
ME3200-232-0221-PV ML Build	Mother Liquor	Report	3.389 @ 25.53°C
ME3200-232-0221-PV WC Top	Wet Crystal	Report	3.247 @ 25.18°C
ME3200-232-0221-PV WC Bottom	Wet Crystal	Report	3.241 @ 25.14°C
ME3200-232-0221-PV Drum 1	Finished Good	2.5 – 4.5 @ 25 ±2°C	3.3 @ 26.0°C

4.4. **RESIDUAL SOLVENTS USP<467><1467>:**

4.4.1. Refer to the Degradation and Impurity Profile Protocol: Mes, Monohydrate for testing methods and requirements. The results of the Residual Solvents testing are detailed in the table below.

TABLE 4: RESIDUAL SOLVENTS

Lot Number	Stage of Material	Specification	Residual Solvents Results
ME3200-232-0221-PV Drum 1	Finished Good	Complies with USP <467><1467>	Complies with USP <467><1467>

4.5. **ELEMENTAL IMPURITIES with additional Fe, and Na analysis :**

4.5.1. Refer to the Degradation and Impurity Profile Protocol: Mes, Monohydrate for testing methods and requirements. The results of the Elemental Impurities with additional Fe, and Na analysis testing are detailed in the table below.

TABLE 5: ELEMENTAL IMPURITIES

Lot Number	Stage of Material	Specification	Results
1120047121	Raw Material	Monitor	Refer to DCN: 21-001722 for Mes, Monohydrate Elemental Impurity w/Iron and [1]Sodium Profile 2021 FG Meets Criteria for As, Cu, Fe, and Pb ≤2ppm
1120035073	Raw Material	Monitor	
ME3200-232-0221-PV ML Build	Mother Liquor	Monitor	
ME3200-232-0221-PV WC Top	Wet Crystal	Monitor	
ME3200-232-0221-PV WC Bottom	Wet Crystal	Monitor	
ME3200-232-0221-PV Drum 1	Finished Good	As, Cu, Fe, Pb: 2 ppm max	
		EI: Complies with USP <231><232>	

[1]Sodium is a Monitor specification.

5. CONCLUSION:

5.1.1. All samples met the specifications for the required analyses as dictated in the Degradation and Impurity Profile Protocol: MES, Monohydrate 2021.

5.1.2. It can be concluded that there are no additional identifiable impurities present in the MES material at any stage of the process at this time.

Printed On:	10-Nov-2021 12:25:17 PM	Ledergerber, Alissa L	: Printed By
Print Expiration:	This document expires on the Date of Next Review listed in the header of this document or upon next revision.		
Notice:	The Information contained herein is the property of BioSpectra and is Confidential.		