

## Certificate of Analysis

Date of Testing: 2024-01-18 09:28:28  
 Date of Next Testing: 2028-01-17 09:28:28  
 Product Name: **Mannitol**  
 CAS Number: 69-65-8  
 Specifications & Purity: Ultrapure, ≥99.0%(HPLC)  
 Lot #: D2007098  
 SKU #: **M108829**  
**Analysis: 315437**

| Parameter  | Limit Values             | Result                   |
|--|--------------------------|--------------------------|
| Sulfate(SO42-)   | 0-200 (ppm)              | 13.60 ppm                |
| Reducing sugars  | 0-0.2 (%)                | 0.11 %                   |
| Calcium(Ca)  | 0-100 (ppm)              | 0.00 ppm                 |
| Phosphorus (P)   | 0-0.01 (%)               | 0.00 %                   |
| Silicon(Si)  | 0-0.02 (%)               | 0.00 %                   |
| Melting point  | 166-170 (°C)             | 168.42000 °C             |
| Chloride (Cl-)   | 0-50 (ppm)               | 0.27 ppm                 |
| Copper(Cu)   | 0-50 (ppm)               | 0.00 ppm                 |
| Sodium(Na)   | 0-200 (ppm)              | 8.90 ppm                 |
| Purity(HPLC)   | 99-100 (%)               | 99.35500 %               |
| Zinc(Zn)   | 0-10 (ppm)               | 0.00 ppm                 |
| Specific Rotation $[\alpha]_{25}^D(c=1 \text{ in } 1\% \text{ acidified Molybdate} \& \text{ H}_2\text{SO}_4)$ | 137-145 (°)              | 141.09 °                 |
| Potassium(K)   | 0-50 (ppm)               | 6.22 ppm                 |
| loss on drying, 105 °C   | 0-0.5 (%)                | 0.32 %                   |
| Iron(Fe)   | 0-50 (ppm)               | 0.00 ppm                 |
| Magnesium(Mg)  | 0-50 (ppm)               | 0.00 ppm                 |
| Lead(Pb)   | 0-50 (ppm)               | 0.00 ppm                 |
| Appearance (M108829)   | White Powder or Crystals | White Powder or Crystals |
| Infrared spectrum  | Conforms to Structure    | Conforms to Structure    |
| Solubility in H2O  | Almost transparency      | almost transparency      |



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A handwritten signature in black ink that reads "John Su".

John Su  
QA & QC Manager