



Certificate of Analysis

Manganese Chloride Tetrahydrate ACS/USP

Catalog Number: MC1003
Lot Number: 0508801
CAS Number: 13446-34-9
Molecular Formula: $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$
Molecular Weight: 197.91
Storage: 15°C – 30°C, Hygroscopic, keep container tightly closed
Date of Manufacture: September 15, 2016
Retest Date: September 14, 2021

| Test | Specification | Result |
|---|----------------------|----------|
| Appearance | Light pink crystals | Conforms |
| Assay | 98.0 – 101.0% | 99.86% |
| Identification | To meet requirements | Conforms |
| Solubility (10%) | Clear, light pink | Conforms |
| pH (5%) | 3.5 – 6.0 | 4.54 |
| Moisture (LOD) | 36.0 – 38.5% | 36.32% |
| Insoluble Matter | ≤ 0.005% | 0.003% |
| Sulfate | ≤ 0.005% | < 0.005% |
| Calcium | ≤ 0.005% | 0.0008% |
| Magnesium | ≤ 0.005% | 0.0041% |
| Potassium | ≤ 0.01% | 0.0011% |
| Sodium | ≤ 0.05% | 0.0004% |
| Substances Not Precipitated by Ammonium Sulfide | ≤ 0.2% | 0.17% |
| Heavy Metals | ≤ 5ppm | < 5ppm |
| Iron | ≤ 5ppm | < 5ppm |
| Zinc | To meet requirements | Conforms |
| Lead | ≤ 4mg/kg | 2mg/kg |
| Organic Volatile Impurities | To meet requirements | Conforms |

Approved by:

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Date: May 9, 2018



Gojira Fine Chemicals, LLC

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