CERTIFICATE OF ANALYSIS (COA)

Product Name: Battery-Grade Manganese Sulfate Monohydrate ($MnSO_4 \cdot H_2O$)

CAS No.: 10034-96-5

Chemical Formula: $MnSO_4 \cdot H_2O$

Application: Lithium-Ion Battery Cathodes (NMC / LMO)

Item	Information
Batch / Lot No.	MnSO4-2025-LB
Production Date	2025/9/12
Inspection Date	2025/9/20
Country of Origin	China
Packaging	25 kg bag / 1,000 kg jumbo bag
Appearance	Pale pink crystalline powder

TEST RESULTS

Parameter	Specification	Test Result	Test Method
$MnSO_4 \cdot H_2O$ Purity	≥ 99.5 %	99.7 %	Chemical analysis
Mn Content (as Mn)	≥ 31.8 %	32.1 %	ICP-OES
Water Insolubles	≤ 0.05 %	0.03 %	Gravimetric
Fe (Iron)	≤ ≤ 5 ppm	< 3 ppm	ICP-MS
Cu (Copper)	≤ ≤ 2 ppm	< 1 ppm	ICP-MS
Pb (Lead)	≤ ≤ 1 ppm	< 1 ppm	ICP-MS
Ni (Nickel)	≤ ≤ 3 ppm	< 2 ppm	ICP-MS
Na + K (Total)	≤ ≤ 50 ppm	38 ppm	ICP-MS
Ca + Mg (Total)	≤ ≤ 100 ppm	82 ppm	ICP-MS
pH (5% Solution)	5.0 – 6.5	5.6	pH meter
Particle Size (D50)	10 – 50 μm	~25 μm	Laser diffraction
Bulk Density	0.9 – 1.2 g/cm³	1.05 g/cm³	Standard test

Specifications based on industry-accepted battery-grade $MnSO_4$ requirements.

CONCLUSION

The above batch of **Battery-Grade Manganese Sulfate Monohydrate** has been tested according to internal quality control procedures and meets the specified

criteria for use in **lithium-ion battery cathode production**, including high purity and low impurity levels critical for cathode precursor performance.

Result: ☑ PASS — Product is suitable for lithium battery cathode applications.

Authorized By: _____lipan_____
Date: __2025/10/5_____
Signature & Company Stamp