

ALADDIN SCIENTIFIC CORPORATION

14078 Meridian Parkway, Riverside, CA. 92518

## Certificate of Analysis

Date of Testing: 2023-07-19 11:03:08  
 Date of Next Testing: 2027-07-18 11:03:08  
 Product Name: **D-(+)-Malic acid**  
 CAS Number: 636-61-3  
 Specifications & Purity:  $\geq 99\%$   
 Lot #: G2310689  
 SKU #: **M109342**  
 Version: **0**  
 Analysis #: **241512**  
 Storage Temperature: Protected from light, Room temperature

| Parameter                                                         | Limit Values                                  | Result                                        |
|-------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Specific Rotation $[\alpha]_{20/D(c=8.5 \text{ in H}_2\text{O})}$ | 1.6-2.6 (°)                                   | 1.75600 °                                     |
| Sulfate Ash                                                       | 0-0.1 (%)                                     | 0.03000 %                                     |
| Water by Karl Fischer                                             | 0-0.5 (%)                                     | 0.30000 %                                     |
| Purity(Neutralization titration)                                  | 98.5-101.5 (%)                                | 99.78000 %                                    |
| Melting point                                                     | 99-105 (°C)                                   | 104.26000 °C                                  |
| Appearance (M109342)                                              | White to Off-White Solid, Powder, or Crystals | White to Off-White Solid, Powder, or Crystals |
| Infrared spectrum                                                 | Conforms to Structure                         | Conforms to Structure                         |



John Su  
QA & QC Manager