

Shanghai Aladdin Biochemical Technology Co., LTD  
809 Chuhua Branch Road, Fengxian District, Shanghai 201400, China

## Certificate of Analysis

Date of Testing: 2023-02-02 10:53:33  
Date of Next Testing: 2027-02-01 10:53:33  
Product Name: **L-Lactic Acid**  
CAS Number: 79-33-4  
Specifications & Purity: High purity grade, 90%  
Lot #: A2330208  
SKU #: **L107596**  
Analysis: **168497**

| Parameter                                                           | Limit Values                     | Result                           |
|---------------------------------------------------------------------|----------------------------------|----------------------------------|
| Chloride                                                            | 0-0.001 (%)                      | 0.00010 %                        |
| Lead(Pb)                                                            | 0-0.5 (ppm)                      | 0.36000 ppm                      |
| Sulfate(SO42-)                                                      | 0-0.001 (%)                      | 0.00020 %                        |
| Calcium(Ca)                                                         | 0-0.0001 (%)                     | 0.00000 %                        |
| Color test (APHA)                                                   | 0-10 (APHA)                      | 6.00000 APHA                     |
| Ignition Residue                                                    | 0-0.01 (%)                       | 0.00300 %                        |
| Cyanide                                                             | 0-0.0001 (%)                     | 0.00000 %                        |
| Mercury                                                             | 0-1 (ppm)                        | 0.20000 ppm                      |
| (As)Arsenic                                                         | 0-0.0001 (%)                     | 0.00010 %                        |
| Methanol(CH3OH)                                                     | 0-0.05 (%)                       | 0.03000 %                        |
| Iron(Fe)                                                            | 0-0.0001 (%)                     | 0.00006 %                        |
| Heavy metals                                                        | 0-0.0005 (%)                     | 0.00020 %                        |
| Purity (T)                                                          | 89.5-90.5 (%)                    | 90.30000 %                       |
| Density (20°C)                                                      | 1.2-1.22 (g/ml)                  | 1.21300 g/ml                     |
| Specific Rotation [α] <sub>20</sub> /D(c=2.5 in 1.5mol/L NaOH sol.) | -15--10 (°)                      | -12.30000 °                      |
| Appearance (L107596)                                                | Colorless to light yellow liquid | Colorless to light yellow liquid |
| Citric acid, oxalic acid, tartaric acid, and phosphoric acid        | is not muddy                     | is not muddy                     |
| Easy carbon compounds                                               | does not change to dark gray     | does not change to dark gray     |
| Identification (Acidic aqueous solution)                            | lactate positive reaction        | lactate positive reaction        |
| Infrared spectrum                                                   | Conforms to Structure            | Conforms to Structure            |
| Reducing sugars                                                     | No red precipitate               | No red precipitate               |
| The ether insolubles                                                | by EP                            | by EP                            |
| Volatile fatty acids                                                | passes test                      | Passes test                      |

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A handwritten signature in black ink that reads "John Su". The script is fluid and cursive.

John Su  
QA & QC Manager