

ALADDIN SCIENTIFIC CORPORATION

14078 Meridian Parkway, Riverside, CA. 92518

## Certificate of Analysis

Date of Testing: 2023-09-14 09:00:15  
 Date of Next Testing: 2027-09-13 09:00:15  
 Product Name: **1,4-Piperazinediethanesulfonic acid(PIPES)**  
 CAS Number: 5625-37-6  
 Specifications & Purity:  $\geq 99.5\%$   
 Lot #: I2311619  
 SKU #: **P105093**  
 Version: **1**  
 Analysis #: **276051**  
 Storage Temperature: Room temperature

| Parameter                                      | Limit Values          | Result                |
|------------------------------------------------|-----------------------|-----------------------|
| Molybdenum(Mo)                                 | 0-0.0005 (%)          | 0.00020 %             |
| Potassium(K)                                   | 0-0.005 (%)           | 0.00000 %             |
| Bismuth(Bi)                                    | 0-0.0005 (%)          | 0.00000 %             |
| Calcium(Ca)                                    | 0-0.005 (%)           | 0.00000 %             |
| Aluminum(Al)                                   | 0-0.005 (%)           | 0.00020 %             |
| Purity                                         | 99.5-100 (%)          | 99.64000 %            |
| Lithium(Li)                                    | 0-0.0005 (%)          | 0.00002 %             |
| Nickel(Ni)                                     | 0-0.0005 (%)          | 0.00000 %             |
| Ignition Residue(Ash)(SO <sub>4</sub> , 900°C) | 0-0.5 (%)             | 0.00000 %             |
| loss on drying, 110 °C                         | 0-0.5 (%)             | 0.11000 %             |
| Iron(Fe)                                       | 0-0.0005 (%)          | 0.00000 %             |
| Magnesium(Mg)                                  | 0-0.0005 (%)          | 0.00005 %             |
| Chromium(Cr)                                   | 0-0.0005 (%)          | 0.00000 %             |
| Lead(Pb)                                       | 0-0.0005 (%)          | 0.00000 %             |
| Appearance (P105093)                           | White powder          | White powder          |
| Infrared spectrum                              | Conforms to Structure | Conforms to Structure |
| Proton NMR spectrum                            | Conforms to Structure | Conforms to Structure |
| Solubility in 1 M NaOH , Colorless,Clear,0.5 M | pass                  | Pass                  |



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

John Su  
QA & QC Manager