




CERTIFICATE OF ANALYSIS

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|--------------|------------------------------|
| Product | Spermine tetrahydrochloride |
| Grade | Biotech |
| Product Code | SB0902 |
| Formula | $C_{10}H_{26}N_4 \cdot 4HCl$ |
| MW | 348.19 |
| CAS# | 306-67-2 |
| Lot No | O2111460 |
| Retest Date | February 20, 2022 |

| Test Items | Specifications | Results |
|---------------------------------|--|--------------|
| Appearance | white to slightly off-white crystalline powder | White Powder |
| Water Content(K. Fischer) | $\leq 1.0\%$ | 0.2% |
| Argentometric Titration | 98.5-101.5 % | 99.3% |
| pH-Value (1 M in water at 25°C) | 6.0 ± 1.0 | 6.3 |
| FT-IR Spectrum | corresponds to reference spectrum | Corresponds |
| 1H-NMR Spectrum | corresponds to reference spectrum | Corresponds |
| 13C-NMR Spectrum | corresponds to reference spectrum | Corresponds |

Storage: - 20°C

This Signature indicates that the above material has met all quality specifications and has been reviewed by a quality representative.

Signature: 
Title: General Manager
Date: February 25, 2020