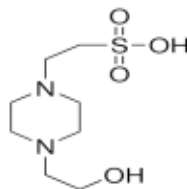


## Certificate of Analysis

Product Name:

HEPES - PharmaGrade, Manufactured under appropriate controls for use as a raw material in pharma or biopharmaceutical production, suitable for cell culture

Product Number: PHG0001  
 Batch Number: SLCH6666  
 Brand: SIGMA  
 CAS Number: 7365-45-9  
 Formula: C<sub>8</sub>H<sub>18</sub>N<sub>2</sub>O<sub>4</sub>S  
 Formula Weight: 238.30 g/mol  
 Quality Release Date: 05 NOV 2020  
 Recommended Retest Date: OCT 2024



Test	Specification	Result
Appearance (Color)	White	White
Appearance (Form)	Powder	Powder
Solubility (Color)	Colorless	Colorless
Solubility (Turbidity)	Clear	Clear
1 M in H <sub>2</sub> O		
Infrared spectrum	Conforms to Structure	Conforms
Water (by Karl Fischer)	≤ 0.5 %	0.0 %
Assay	≥ 99.5 %	100.1 %
(anhydrous basis)		
pH	4.7 - 5.3	4.8
1% in H <sub>2</sub> O		
Residue on ignition (Ash)	≤ 0.1 %	0.0 %
UV Absorbance 260nm	≤ 0.05	0.01
1 M in H <sub>2</sub> O		
UV Absorbance 280nm	≤ 0.04	0.00
1 M in H <sub>2</sub> O		
Aluminum (Al)	≤ 5.0 ppm	< 5.0 ppm
Bismuth (Bi)	≤ 5.0 ppm	< 5.0 ppm
Lead (Pb)	≤ 5.0 ppm	< 5.0 ppm
Barium (Ba)	≤ 5.0 ppm	< 5.0 ppm
Cadmium (Cd)	≤ 5.0 ppm	< 5.0 ppm
Copper (Cu)	≤ 5.0 ppm	< 5.0 ppm
Zinc (Zn)	≤ 5.0 ppm	< 5.0 ppm

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at [Sigma-Aldrich.com](http://Sigma-Aldrich.com). For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.



## Certificate of Analysis

**Product Number:** PHG0001  
**Batch Number:** SLCH6666

Test	Specification	Result
Cobalt (Co)	≤ 5.0 ppm	< 5.0 ppm
Calcium (Ca)	≤ 30.0 ppm	< 30.0 ppm
Chromium (Cr)	≤ 5.0 ppm	< 5.0 ppm
Magnesium (Mg)	≤ 5.0 ppm	< 5.0 ppm
Manganese (Mn)	≤ 5.0 ppm	< 5.0 ppm
Iron (Fe)	≤ 5.0 ppm	< 5.0 ppm
Lithium (Li)	≤ 5.0 ppm	< 5.0 ppm
Molybdenum (Mo)	≤ 5.0 ppm	< 5.0 ppm
Nickel (Ni)	≤ 5.0 ppm	< 5.0 ppm
Arsenic (As)	≤ 3.0 ppm	< 3.0 ppm
Antimony (Sb)	≤ 5.0 ppm	< 5.0 ppm
DNase, Exonuclease Detection	Pass	Pass
NICKase, Endonuclease Detection	Pass	Pass
RNase Detection	Pass	Pass
Protease Detection	Pass	Pass
Endotoxin	≤ 50 EU/g	< 1 EU/g
Total Aerobic Microbial Count	≤ 100 CFU/g	0 CFU/g
Total Yeast and Mold	≤ 100 CFU/g	0 CFU/g
Cytotoxicity	Pass	Pass
TLC	Pass	Pass
(One Spot)		
Methanol	≤ 3000 ppm	< 400 ppm
(Solvent content by GC)		



Brian Dulle, Supervisor  
 Quality Assurance  
 St. Louis, Missouri US

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at [Sigma-Aldrich.com](http://Sigma-Aldrich.com). For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

