Agilent Technologies SIGMA-ALDRICH®

Certificate of Analysis

Description : Amino Acid Standard (0.010 nmol/µl) 10/pk

Part.-No. : 5061-3334 Production date : 03-Mar 2017
Lot-No. : BCBT9013 (99416) Expiration date : 03-Mar 2019

No.	Component	Molecular Weight	Final Concentration (mg/ml)
01	**L-Alanine**	89.10	0.00089
02	**L-Arginine**	174.20	0.00174
03	**L-Aspartic Acid**	133.11	0.00133
04	**L-Cystine**	240.30	0.00240
05	**L-Glutamic Acid**	147.13	0.00147
06	**Glycine**	75.07	0.00075
07	**L-Histidine Hydrochloride Monohydrate**	209.63	0.00210
08	**L-Isoleucine**	131.18	0.00131
09	**L-Leucine**	131.18	0.00131
10	**L-Lysine Hydrochloride**	182.65	0.00183
11	**L-Methionine**	149.21	0.00149
12	**L-Phenylalanine**	165.19	0.00165
13	**L-Proline**	115.13	0.00115
14	**L-Serine**	105.09	0.00105
15	**L-Threonine**	119.12	0.00119
16	**L-Tyrosine**	181.19	0.00181
17	**L-Valine**	117.15	0.00117

Purity Determination:
Amino acids by Titration, Loss on drying, Residue on ignition, IR-Spectroscopy, MicroSelect-Test, Trace Metal and Trace Anion Determination
Hydrochloric acid by Titration, MicroSelect-Test, Trace Metal and Trace Anion Determination

Raw materials
All raw materials used to prepare this amino acid standard are of the highest available purity (> 99%) and are routinely analyzed according to the above-mentioned purity-determinations.

Manufacturing
We employ precise measuring techniques in manufacturing this amino acid standard. Mass is determined with electronic balances capable of weighing to 0.0001 g and calibrated by the Swiss Office of Weights and Measures. Volume ist determined in dedicated high-purity borosilicate volumetric flasks capable of measuring a 2000 ml-volume with an accuracy of 0.3%.

Packaging And Storage
The final solution is handled under argon, filled into 1 ml amber ampoules under inert gas (argon) and sealed. 10 finished ampoules are packaged into a set and stored at 4 °C.

Stability
Every individual lot of the product is subjected to reanalysis and the experience allows to set the shelf life to two years, if the product is stored as received at 4 °C. The guaranteed stability is not applicable to ampoules stored after opening, even if resealed.

Analytical Quality Control
The scope of the analytical testing procedures covers identity, purity, homogeneity, accuracy, function test in amino acid analysis and stability of the finished product

Description	Lot Analysis	Specifications
Aspect	clear, colorless liquid	clear, colorless liquid
Density (20/4)	1.000	1.00 ± 0.01 g/ml
Index of Refraction (20/D)	1.334	1.334 ± 0.005
Amino Acid Analysis :	corresponds	corresponds
- Identity	corresponds	corresponds
- Purity	corresponds	corresponds
- Concentration Accuracy	corresponds	± 2.5% relative to primary standard

Buchs, 03.03.2017

Sigma-Aldrich Production GmbH
Industriestrasse 25
CH-9471 Buchs / Switzerland

A. Schneider

Dr. A. Schneider, Analytical Product Manager
Quality Control, Buchs / Switzerland