

**Certificate of Analysis**

Description : Amino Acid Standard (0.25 nmol/μl) 10/pk
Part.-No. : 5061-3331 Production date : 21-Jul 2016
Lot-No. : BCBS5420V (99413) Expiration date. : 21 Jul 2018

No.	Component	Molecular Weight	Final Concentration (mg/ml)
01	L-Alanine	89.10	0.02228
02	L-Arginine	174.20	0.04355
03	L-Aspartic Acid	133.11	0.03328
04	L-Cystine	240.30	0.06008
05	L-Glutamic Acid	147.13	0.03678
06	Glycine	75.07	0.01877
07	L-Histidine Hydrochloride Monohydrate	209.63	0.05241
08	L-Isoleucine	131.18	0.03279
09	L-Leucine	131.18	0.03279
10	L-Lysine Hydrochloride	182.65	0.04566
11	L-Methionine	149.21	0.03730
12	L-Phenylalanine	165.19	0.04130
13	L-Proline	115.13	0.02878
14	L-Serine	105.09	0.02627
15	L-Threonine	119.12	0.02978
16	L-Tyrosine	181.19	0.04530
17	L-Valine	117.15	0.02929

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 is 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, 21.07.2016

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



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