



## Certificate of Analysis

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

Part.-No. : 5061-3334

Production date : 05 Feb 2015

Lot.-No. : BCBP5514V (99416)

Expiration date : 05 Feb 2017

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 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

<b>Description</b>	<b>Lot Analysis</b>	<b>Specifications</b>
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, 05.02.2015

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



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