



## Certificate of Analysis

Description : Amino Acid Standard (0.1 nmol/ $\mu$ l) 10/pk

Part.-No. : 5061-3332

Production date : 05 Nov 2013

Lot.-No. : BCBM1575V (99414)

Expiration date : 05 Nov 2015

No.	Component	Molecular Weight	Final Concentration (mg/ml)
01	L-Alanine	89.10	0.00891
02	L-Arginine	174.20	0.01742
03	L-Aspartic Acid	133.11	0.01331
04	L-Cystine	240.30	0.02403
05	L-Glutamic Acid	147.13	0.01471
06	Glycine	75.07	0.00751
07	L-Histidine Hydrochloride Monohydrate	209.63	0.02096
08	L-Isoleucine	131.18	0.01312
09	L-Leucine	131.18	0.01312
10	L-Lysine Hydrochloride	182.65	0.01827
11	L-Methionine	149.21	0.01492
12	L-Phenylalanine	165.19	0.01652
13	L-Proline	115.13	0.01151
14	L-Serine	105.09	0.01051
15	L-Threonine	119.12	0.01191
16	L-Tyrosine	181.19	0.01812
17	L-Valine	117.15	0.01172

### 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
Indes 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, 05.11.2013

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



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