



## Stable Isotope Labeled Amino Acid Mixes

Amino acids play a central role in biochemistry. They are the building blocks of proteins and precursors to the biosynthesis of various secondary metabolites. From being used as food additives (as artificial sweeteners and flavor enhancers) to the synthesis of drugs, biodegradable plastics, and chiral catalysts— amino acids have a wide range of uses. An amino acid analysis generally involves hydrolysis of the peptide bonds in a protein/peptide, followed by the analysis of released amino acids using appropriate analytical methods.

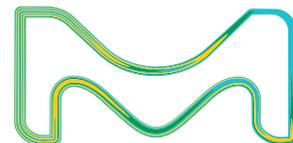
Amino acid analyses (AAA) determine the amino acid composition or protein content in pharmaceutical formulations, biological preparations, biological fluids such as urine, blood or plasma, and protein powder supplements.

Certified reference materials of stable isotope labeled analogues of the corresponding amino acids can be used as internal standards as well as references for isotope dilution mass spectrometry (IDMS). A combination of such a CRM with the natural amino acids allow the measurement and calibration of instrumental biases. This is also applicable for more complex techniques, e.g. isobaric tagging (iTRAQ, aTRAQ™) and can reduce the number of experiments, but still guarantees the traceability to the SI.

We have always strived to provide you with a wide range of high-quality reference materials. Our reference material portfolio offers more than 20,000 products. View [sigmaaldrich.com/standards](http://sigmaaldrich.com/standards) for the complete range. Recently two new certified solution mixtures of labelled amino acids have been added to the portfolio. These mixes are suitable as internal standard or reference for all kinds of mass spectrometric analysis of amino acids by isotope dilution methods and other research applications, e.g. LC-MS, GC-MS, MALDI [1-2].

### Key Features of the mixes:

- TraceCERT<sup>®</sup> certified reference material, traceable to primary material from NIST
- Isotopically Labeled Amino Acid Mix produced by an established workflow following ISO 17034
- qNMR certified components in the mix (following ISO/IEC 17025 accreditation)



- Tested for homogeneity and stability using LC method
- Supplied with a comprehensive certificate including measurement uncertainty

Find a complete list of amino acid reference material on [SigmaAldrich.com/aminoacidstandards](https://www.sigmaaldrich.com/US/en/technical-documents/technical-article/analytical-chemistry/tracecert/tracecert-amino-acids)

The concentration values are nominal, the exact concentrations can be found on the certificate (example certificate is downloadable on the webpage. Note, that while the mix is prepared with L-amino acids, the certification methods are not distinguishing enantiomers, therefore the certified values are reported without specifying the stereochemistry.

### Below are the compositions of the two mixes.

Product Number	96378
Product Name	Stable Isotope Labeled Amino Acid Mix Solution 1
Suffix	certified reference material, TraceCERT®
Solvent	HCl (0.1M)
Concentrations	1250-2500 nmol/mL
Package Size	1 mL

Component	CAS	Nominal Concentration
L-Alanine- <sup>13</sup> C <sub>3</sub> , <sup>15</sup> N	202407-38-3	2.5 mmol/L
L-Arginine- <sup>13</sup> C <sub>6</sub>	55443-58-8	2.5 mmol/L
L-Aspartic acid- <sup>13</sup> C <sub>4</sub>	55443-54-4	2.5 mmol/L
L-Cystine- <sup>13</sup> C <sub>6</sub> , <sup>15</sup> N <sub>2</sub>	1252803-65-8	1.25 mmol/L
L-Glutamic acid- <sup>13</sup> C <sub>5</sub>	55443-55-5	2.5 mmol/L
Glycine- <sup>13</sup> C <sub>2</sub> , <sup>15</sup> N	211057-02-2	2.5 mmol/L
L-Histidine- <sup>13</sup> C <sub>6</sub>	55443-59-9	2.5 mmol/L
L-Isoleucine- <sup>13</sup> C <sub>6</sub> , <sup>15</sup> N	202468-35-7	2.5 mmol/L
L-Leucine- <sup>13</sup> C <sub>6</sub> , <sup>15</sup> N	202406-52-8	2.5 mmol/L
L-Lysine- <sup>13</sup> C <sub>6</sub>	55443-57-7	2.5 mmol/L
L-Methionine- <sup>13</sup> C <sub>5</sub> , <sup>15</sup> N	202468-47-1	2.5 mmol/L
L-Phenyl- <sup>13</sup> C <sub>6</sub> -alanine	180268-82-0	2.5 mmol/L
L-Proline- <sup>13</sup> C <sub>5</sub>	201740-83-2	2.5 mmol/L
L-Serine- <sup>13</sup> C <sub>3</sub> , <sup>15</sup> N	202407-34-9	2.5 mmol/L
L-Threonine- <sup>13</sup> C <sub>4</sub>	55443-53-3	2.5 mmol/L
L-Tyrosine-(phenyl- <sup>13</sup> C <sub>6</sub> )	201595-63-3	2.5 mmol/L
L-Valine- <sup>13</sup> C <sub>5</sub>	55443-52-2	2.5 mmol/L

### Below are the compositions of the two mixes.

Product Number	01428
Product Name	Stable Isotope Labeled Amino Acid Mix Solution 2
Suffix	certified reference material, TraceCERT®
Solvent	HCl (0.1M)
Concentrations	500-2500 nmol/mL
Package Size	1 mL

Component	CAS	Nominal Concentration
L-Alanine- <sup>13</sup> C <sub>3</sub> , <sup>15</sup> N	202407-38-3	0.5 mmol/L
L-Arginine- <sup>13</sup> C <sub>6</sub>	55443-58-8	0.5 mmol/L
L-Aspartic acid- <sup>13</sup> C <sub>4</sub>	55443-54-4	0.5 mmol/L
L-Glutamic acid- <sup>13</sup> C <sub>5</sub>	55443-55-5	0.5 mmol/L
Glycine- <sup>13</sup> C <sub>2</sub> , <sup>15</sup> N	211057-02-2	2.5 mmol/L
L-Leucine- <sup>13</sup> C <sub>6</sub> , <sup>15</sup> N	202406-52-8	0.5 mmol/L
L-Methionine- <sup>13</sup> C <sub>5</sub> , <sup>15</sup> N	202468-47-1	0.5 mmol/L
L-Phenyl- <sup>13</sup> C <sub>6</sub> -alanine	180268-82-0	0.5 mmol/L
L-Proline- <sup>13</sup> C <sub>5</sub>	201740-83-2	0.5 mmol/L
L-Tyrosine-(phenyl- <sup>13</sup> C <sub>6</sub> )	201595-63-3	0.5 mmol/L
L-Valine- <sup>13</sup> C <sub>5</sub>	55443-52-2	0.5 mmol/L

### References

1. Dettmer K., Stevens A.P., Fagerer S.R., Kaspar H., Oefner P.J. (2019) Amino Acid Analysis in Physiological Samples by GC-MS with Propyl Chloroformate Derivatization and iTRAQ-LC-MS/MS. In: Alterman M. (eds) Amino Acid Analysis. Methods in Molecular Biology, vol 2030. Humana, New York, NY. [https://doi.org/10.1007/978-1-4939-9639-1\\_14](https://doi.org/10.1007/978-1-4939-9639-1_14)
2. Michail A. Alterman (ed.), Amino Acid Analysis: Methods and Protocols, Methods in Molecular Biology, vol. 2030, [https://doi.org/10.1007/978-1-4939-9639-1\\_3](https://doi.org/10.1007/978-1-4939-9639-1_3), © Springer Science+Business Media, LLC, part of Springer Nature 2019.

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