



Amino Acid Mixtures

For Identification and Quantification

Amino acids play critical roles in biological functions as both building blocks of peptides/proteins and intermediates of various metabolic pathways (e.g., citric acid cycle, urea cycle). These compounds are also reported to influence the pathogenesis and propagation of metabolic disorders/disease. Other areas of research investigate amino acids in biomarker and drug-discovery studies.

To aid research development and application, Cambridge Isotope Laboratories, Inc. (CIL) has formulated various mixtures of stable isotope-labeled amino acids. These include mixes of canonical and branched-chain amino acids (MSK-CAA and NSK-BCAA), a mix of rare or unnatural non-canonical amino acids (MSK-NCAA), and mixes of amino acids/derivatives (e.g., NSK-A, NSK-AA3). All mixes are well characterized for use in quality control and qualification/quantification studies using targeted or untargeted LC-MS methodologies.

MSK Mixes

MSK-CAA Stable isotope-labeled canonical amino acid mix composition. Reconstituting with 1 mL solvent results in concentrations of 2.5 mM (exception L-cystine: 1.25 mM).

Compound	Abbrev.	Label and Enrichment
Glycine	Gly	$^{13}\text{C}_2$, 99%; ^{15}N , 99%
L-Alanine	Ala	$^{13}\text{C}_3$, 99%; ^{15}N , 99%
L-Arginine-HCl	Arg	$^{13}\text{C}_6$, 99%; $^{15}\text{N}_4$, 99%
L-Asparagine-H ₂ O*	Asn	$^{13}\text{C}_4$, 99%; $^{15}\text{N}_2$, 99%
L-Aspartic Acid	Asp	$^{13}\text{C}_4$, 99%; ^{15}N , 99%
L-Cystine	Cys-Cys	$^{13}\text{C}_6$, 99%; $^{15}\text{N}_2$, 99%
L-Glutamic Acid	Glu	$^{13}\text{C}_5$, 99%; ^{15}N , 99%
L-Glutamine*	Gln	$^{13}\text{C}_5$, 99%; $^{15}\text{N}_2$, 99%
L-Histidine-HCl-H ₂ O	His	$^{13}\text{C}_6$, 97-99%; $^{15}\text{N}_3$, 97-99%
L-Isoleucine	Iso	$^{13}\text{C}_6$, 99%; ^{15}N , 99%
L-Leucine	Leu	$^{13}\text{C}_6$, 99%; ^{15}N , 99%
L-Lysine-2HCl	Lys	$^{13}\text{C}_6$, 99%; $^{15}\text{N}_2$, 99%
L-Methionine	Met	$^{13}\text{C}_5$, 99%; ^{15}N , 99%
L-Phenylalanine	Phe	$^{13}\text{C}_9$, 99%; ^{15}N , 99%
L-Proline	Pro	$^{13}\text{C}_5$, 99%; ^{15}N , 99%
L-Serine	Ser	$^{13}\text{C}_3$, 99%; ^{15}N , 99%
L-Threonine	Thr	$^{13}\text{C}_4$, 97-99%; ^{15}N , 97-99%
L-Tryptophan*	Trp	$^{13}\text{C}_{11}$, 99%; $^{15}\text{N}_2$, 99%
L-Tyrosine	Tyr	$^{13}\text{C}_9$, 99%; ^{15}N , 99%
L-Valine	Val	$^{13}\text{C}_5$, 99%; ^{15}N , 99%

*Compounds absent in MSK-A2-1.2. This amino acid mix comprises 17 compounds and is supplied as a 1.2 mL solution (in 0.1 M HCl).



Unlabeled mixes may be available. Please inquire.

Catalog No.	Description
MSK-A2	Metabolomics Amino Acid Mix
MSK-CAA	Canonical Amino Acid Mix
MSK-NCAA	Non-canonical Amino Acid Mix
NEW! MSK-CNCAA	Canonical/Non-canonical Amino Acid Mix Sets
NEW! NSK-AA3	3-Plex Amino Acid Mix
NEW! NSK-AA3-10X	3-Plex Amino Acid Mix (10X)
NSK-A	Amino Acid Standard Mix Set A
NSK-A1	Amino Acid Standard Mix Set A1
NEW! NSK-BCAA	Branched-chain Amino Acid Standard Mix

MSK-NCAA Stable isotope-labeled non-canonical amino acid mix composition. Reconstituting with 1 mL solvent results in concentrations of 2.5 mM.

Compound	Abbrev.	Label and Enrichment
β -Alanine	β -Ala	$^{13}\text{C}_3$, 98%; ^{15}N , 96-99%
L-Azidohomoalanine-HCl	hAHA	1,2,3,4- $^{13}\text{C}_4$, 99%; 2,4- $^{15}\text{N}_2$, 98%
L-Citrulline	Cit	1,2,3,4,5- $^{13}\text{C}_5$, 98%
L-Dihydroxyphenylalanine	DOPA	1- ^{13}C , ring- $^{13}\text{C}_6$, 99%
L-Homoarginine-HCl	Harg	$^{13}\text{C}_7$, 98%; $^{15}\text{N}_4$, 98%
L-Ornithine-HCl	Orn	$^{13}\text{C}_5$, 98%
Sarcosine-HCl	Sar	$^{13}\text{C}_3$, 99%; ^{15}N , 98%

Example References

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NSK Mixes

NSK-A Stable isotope-labeled amino acid mix composition.

Reconstituting with 1 mL solvent results in concentrations of 500 µM (exception glycine: 2500 µM).

Compound	Abbrev.	Label and Enrichment
L-Alanine	Ala	2,3,3,3-D ₄ , 98%
L-Arginine-HCl	Arg	5- ¹³ C, 99%; 4,4,5,5-D ₄ , 95%
L-Aspartic acid	Asp	2,3,3-D ₃ , 98%
L-Citrulline	Cit	5,5-D ₂ , 98%
DL-Glutamic acid	Glu	2,4,4-D ₃ , 98%
Glycine	Gly	2- ¹³ C, 99%; ¹⁵ N, 98%
L-Leucine	Leu	5,5,5-D ₃ , 99%
L-Methionine	Met	methyl-D ₃ , 98%
L-Ornithine-HCl*	Orn	5,5-D ₂ , 98%
L-Phenylalanine	Phe	ring- ¹³ C ₆ , 99%
L-Tyrosine	Tyr	ring- ¹³ C ₆ , 99%
L-Valine	Val	D ₈ , 98%

*NSK-A1 contains Orn 3,3,4,4,5,5-D₆, 98% instead. The remaining components and concentrations are identical.

NSK-A Example References

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NSK-AA3 Stable isotope-labeled 3-plex amino acid mix composition. Reconstituting with 1 mL solvent results in concentrations of 500 µM (exception guanidinoacetic acid: 50 µM).

Compound	Abbrev.	Label and Enrichment
Creatine	Cre	N-Methyl-D ₃ ; glycine-2,2-D ₂ , 99%
Guanidinoacetic acid	GAA	1,2- ¹³ C ₂ , 97-99%; 3- ¹⁵ N, 97-99% (CP 97%)
L-Proline	Pro	D ₇ , 97-98%

NEW!

NSK-BCAA Stable isotope-labeled branched-chain amino acid mix composition. Reconstituting with 1 mL solvent results in concentrations of 400 µM.

Compound	Abbrev.	Label and Enrichment
L-Allo-isoleucine	Alle	¹³ C ₆ , 97-99%; ¹⁵ N, 97-99%
L-Isoleucine	Ile	D ₁₀ , 98%
L-Leucine	Le	5,5,5-D ₃ , 99%
L-Valine	Val	¹³ C ₅ , 99%; ¹⁵ N, 99%

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