



# B Vitamins



The B vitamins are a class of water-soluble organic compounds that are involved in a wide range of biochemical reactions within living organisms. The B complex includes eight chemically distinct compounds: vitamins B<sub>1</sub> (thiamine), B<sub>2</sub> (riboflavin), B<sub>3</sub> (niacin), B<sub>5</sub> (pantothenic acid), B<sub>6</sub> (pyridoxine), B<sub>7</sub> (biotin), B<sub>9</sub> (folate), and B<sub>12</sub> (cobalamin).

**Cambridge Isotope Laboratories, Inc. is pleased to offer a variety of stable isotope-labeled and unlabeled B vitamins and their derivatives.** The standards are available in their deuterated and/or <sup>13</sup>C/<sup>15</sup>N-labeled form in variable unit sizes for research use applications. While the deuterated standards may be preferred due to current methods and lower costs, <sup>13</sup>C and/or <sup>15</sup>N standards are more desirable in practice due, for example, to isotopic stability and chromatographic alignment (to its unlabeled analogue). Please see our technical note “Benefits of <sup>13</sup>C vs. D Standards in Clinical Mass Spectrometry Measurements” for a detailed overview of <sup>13</sup>C (and <sup>15</sup>N) vs. D standards in MS-based measurements.

## Vitamin B<sub>1</sub> – Thiamine and Its Derivatives

Catalog No.	Description
CLM-7667	Vitamin B <sub>1</sub> hydrochloride (thiamine hydrochloride) (4,5,4-methyl- <sup>13</sup> C <sub>3</sub> , 99%) CP 97%
DLM-8741	Vitamin B <sub>1</sub> pyrophosphate chloride (pyrimidyl-methyl-D <sub>3</sub> , 98%)

## Vitamin B<sub>2</sub> – Riboflavin and Its Derivatives

Catalog No.	Description
CNLM-8851	Vitamin B <sub>2</sub> (riboflavin) ( <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 98%) CP 97%
CNLM-10744	Vitamin B <sub>2</sub> phosphate (riboflavin phosphate) ( <sup>13</sup> C <sub>4</sub> , 99%; <sup>15</sup> N <sub>2</sub> , 98%) CP 90%

## Vitamin B<sub>3</sub> – Niacin and Its Derivatives

Catalog No.	Description
CLM-9925	Vitamin B <sub>3</sub> (nicotinamide) ( <sup>13</sup> C <sub>6</sub> , 99%)
DLM-6883	Vitamin B <sub>3</sub> (nicotinamide) (D <sub>4</sub> , 98%)
CNLM-9757	Vitamin B <sub>3</sub> (nicotinamide) (2,6,carbonyl- <sup>13</sup> C <sub>3</sub> , 99%; ring-1- <sup>15</sup> N, 98%)
CLM-9954	Vitamin B <sub>3</sub> (nicotinic acid) ( <sup>13</sup> C <sub>6</sub> , 99%)
DLM-4578	Vitamin B <sub>3</sub> (nicotinic acid) (D <sub>4</sub> , 98%)
CNLM-9512	Vitamin B <sub>3</sub> (nicotinic acid) (2,6,carboxyl- <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 98%) CP 97%

## Vitamin B<sub>5</sub> – Pantothenic Acid

Catalog No.	Description
CNLM-7694	Vitamin B <sub>5</sub> , calcium salt-H <sub>2</sub> O (calcium panthothenate-H <sub>2</sub> O) (β-alanyl- <sup>13</sup> C <sub>3</sub> , 99%; <sup>15</sup> N, 98%)

Continued ►

Vitamin B<sub>6</sub> – Pyridoxal 5'-Phosphate and Its Derivatives

Catalog No.	Description
DLM-9069	Vitamin B <sub>6</sub> (pyridoxal) (methyl-D <sub>3</sub> , 98%)
DLM-9119	Vitamin B <sub>6</sub> (pyridoxamine-2HCl) (methyl-D <sub>3</sub> , 98%)
CLM-7563	Vitamin B <sub>6</sub> (pyridoxine-HCl) (4,5-bis(hydroxymethyl)- <sup>13</sup> C <sub>4</sub> , 99%)
DLM-8754	Vitamin B <sub>6</sub> (pyridoxine-HCl) (5-hydroxymethyl-D <sub>2</sub> , 98%)
DLM-9121	Vitamin B <sub>6</sub> (pyridoxine-HCl) (methyl-D <sub>3</sub> , 98%) CP 96%
DLM-9793	Vitamin B <sub>6</sub> phosphate (pyridoxal phosphate) (methyl-D <sub>3</sub> , 97%) (mix of 5-,3-isomers) CP 97%

Vitamin B<sub>7</sub> – Biotin

Catalog No.	Description
DLM-8806	Vitamin B <sub>7</sub> (biotin) (ring-6,6-D <sub>2</sub> , 98%) CP 97%
DLM-9751	Vitamin B <sub>7</sub> (biotin) (3',3',4',4'-D <sub>4</sub> , 98%) CP 95%

Vitamin B<sub>9</sub> – Folate and Its Derivatives

Catalog No.	Description
CLM-9548	5-Methyltetrahydrofolic acid (glutamic acid- <sup>13</sup> C <sub>5</sub> , 99%) CP 95%
CLM-7321-N	5-Methyltetrahydrofolic acid, calcium salt (glutamic acid- <sup>13</sup> C <sub>5</sub> , 98%) CP 95%
CLM-7861	Vitamin B <sub>9</sub> (folic acid) (glutamic acid- <sup>13</sup> C <sub>5</sub> , 95%) contains ~10% H <sub>2</sub> O
CLM-7861-N	Vitamin B <sub>9</sub> (folic acid) (glutamic acid- <sup>13</sup> C <sub>5</sub> , 99%) CP 95%

Vitamin B<sub>12</sub> – Cobalamin

Catalog No.	Description
CLM-9770-E	Vitamin B <sub>12</sub> (cyanocobalamin) ( <sup>13</sup> C <sub>7</sub> , 99%) CP 95%

Unlabeled standards  
may be available;  
please inquire.

## Example References

Huang, J.; Cui, L.; Natarajan, M.; et al. **2022**. The ratio of nicotinic acid to nicotinamide as a microbial biomarker for assessing cell therapy product sterility. *Mol Ther Methods Clin Dev*, 25, 410-424.

Marshall, J.; Zhang, H.; Khazaei, H.; et al. **2021**. Targeted quantification of B vitamins using ultra-performance liquid chromatography-selected reaction monitoring mass spectrometry in faba bean seeds. *J Food Compos Anal*, 5, 103687-103697.

Zhang, H.; De Silva, D.; Dissanayaka, D.; et al. **2021**. Validated B vitamin quantification from lentils by selected reaction monitoring mass spectrometry. *Food Chem*, 359, 129810-129818.

Shetty, S.A.; Young, M.F.; Taneja, S.; et al. **2020**. Quantification of B-vitamins from different fresh milk samples using ultra-high performance liquid chromatography mass spectrometry/selected reaction monitoring methods. *J Chromatogr A*, 1609, 460452-460487.

McClure S. **2020**. Simultaneous determination of total vitamins B1, B2, B3, and B6 in infant formula and related nutritionals by enzymatic digestion and LC-MS/MS – A multi-laboratory testing study final action: AOAC Method 2015.14. *J AOAC Int*, 103(4), 1060-1072.

Gill, B.D.; Saldo, S.; Wood, J.E.; et al. **2018**. A rapid method for the determination of biotin and folic acid in liquid milk, milk powders, infant formula, and milk-based nutritional products by liquid chromatography-tandem mass spectrometry. *J AOAC Int*, 101(5), 1578-1583.

Paalme, T.; Vilbaste, A.; Kewai, K.; et al. **2017**. Assessment of bioavailable B vitamin content in food using *in vitro* digestibility assay and LC-MS SIDA. *Anal Bioanal Chem*, 409(27), 6475-6484.

