

# PRODUCT INFORMATION



## Vitamin B<sub>12</sub> (hydrate)

Item No. 18425

CAS Registry No.: 194937-59-2

Formal Name: 5,6-dimethyl-1-(3-O-phosphono- $\alpha$ -D-ribofuranosyl)-1H-benzimidazole monoester with cobinamide cyanide, inner salt, hydrate

Synonym: Cobalamin

MF: C<sub>63</sub>H<sub>88</sub>CoN<sub>14</sub>O<sub>14</sub>P • XH<sub>2</sub>O

FW: 1,355.4

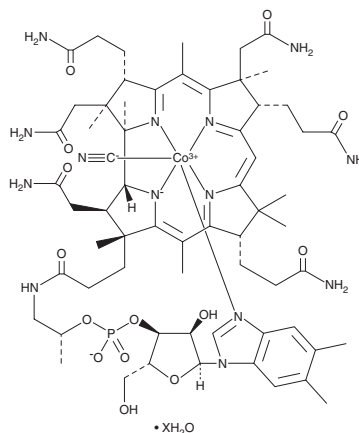
Purity:  $\geq 95\%$

UV/Vis.:  $\lambda_{\text{max}}$ : 208, 278, 360, 548 nm

Supplied as: A crystalline solid

Storage: -20°C

Stability:  $\geq 4$  years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Laboratory Procedures

Vitamin B<sub>12</sub> (hydrate) is supplied as a crystalline solid. A stock solution may be made by dissolving the vitamin B<sub>12</sub> (hydrate) in the solvent of choice, which should be purged with an inert gas. Vitamin B<sub>12</sub> (hydrate) is soluble in organic solvents such as ethanol and DMSO. The solubility of vitamin B<sub>12</sub> (hydrate) in these solvents is approximately 10 and 75 mg/ml, respectively. Vitamin B<sub>12</sub> (hydrate) is also soluble in water at a concentration of 50 mg/ml. We do not recommend storing the aqueous solution for more than one day.

### Description

Vitamin B<sub>12</sub> is a water-soluble vitamin with roles in brain and nervous system functioning and blood formation through regulation of DNA synthesis, cellular metabolism, fatty acid metabolism, and amino acid metabolism.<sup>1</sup> It belongs to the corrinoid group of compounds, which contain a corrin macrocycle, and is produced only by certain bacteria and archaea.<sup>2</sup> Reference to vitamin B<sub>12</sub> usually encompasses a group of cobalt-containing compounds (or cobalamins), which include cyanocobalamin, hydroxocobalamin, 5'-deoxyadenosylcobalamin (AdoB<sub>12</sub>), and methylcobalamin (MeB<sub>12</sub>). These forms serve as cofactors in isomerase-, methyltransferase-, and dehalogenase-catalyzed reactions.<sup>3</sup> For example, methylmalonyl coenzyme A mutase acts on AdoB<sub>12</sub> to convert methylmalonyl-CoA to succinyl-CoA, an important step before entry into the Krebs cycle. Additionally, methionine synthase uses MeB<sub>12</sub> to transfer a methyl group from 5-methyltetrahydrofolate to homocysteine to generate tetrahydrofolate and methionine, which is important for DNA synthesis.<sup>4</sup>

### References

1. Vitamin B<sub>12</sub>, Chapter 9, in Dietary reference intakes for thiamin, riboflavin, niacin, vitamin B<sub>6</sub>, folate, vitamin B<sub>12</sub>, pantothenic acid, biotin, and choline. The National Academies Press, Washington, DC, 306-356 (1998).
2. Moore, S.J., Lawrence, A.D., Biedendieck, R., *et al.* Elucidation of the anaerobic pathway for the corrin component of cobalamin (vitamin B<sub>12</sub>). *Proc. Natl. Acad. Sci. USA* **110**(37), 14906-14911 (2015).
3. Banerjee, R. and Ragsdale, S.W. The many faces of vitamin B<sub>12</sub>: Catalysis by cobalamin-dependent enzymes. *Annu. Rev. Biochem.* **72**, 209-247 (2003).
4. Ragsdale, S.W. Catalysis of methyl group transfers involving tetrahydrofolate and B<sub>12</sub>. *Vitam. Horm.* **79**, 293-324 (2008).

#### WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

#### SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the [complete](#) Safety Data Sheet, which has been sent via email to your institution.

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