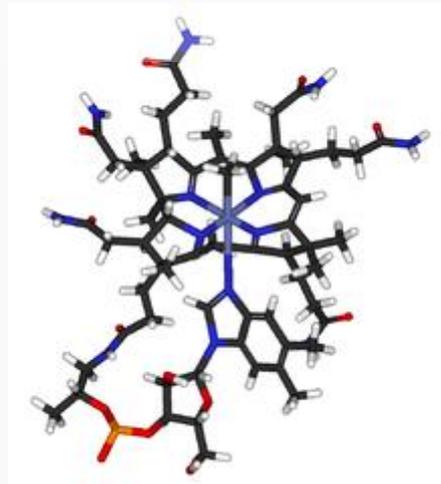


# Methylcobalamin

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## Systematic (IUPAC) name

carbanide; cobalt(3+);

## Clinical data

[AHFS/Drugs.com](http://AHFS/Drugs.com)

[International Drug Names](#)

[Legal status](#)

[OTC \(US\)](#)

<b><u>Routes</u></b>	oral,sublingual,injection.
<b>Identifiers</b>	
<b><u>CAS number</u></b>	<u>13422-55-4</u>
<b><u>ATC code</u></b>	<u>B03BA05</u>
<b><u>PubChem</u></b>	<u>CID 6436232</u>
<b><u>UNII</u></b>	<u>BR1SN1JS2W</u>
<b><u>ChEMBL</u></b>	<u>CHEMBL1697757</u>
<b>Chemical data</b>	
<b><u>Formula</u></b>	<u>C<sub>63</sub>H<sub>91</sub>CoN<sub>13</sub>O<sub>14</sub>P</u>
<b><u>Mol. mass</u></b>	1344.40 g/mol

**Methylcobalamin** (mecobalamin, MeCbl, or MeB<sub>12</sub>) is a cobalamin, a form of vitamin B<sub>12</sub>. It differs from cyanocobalamin in that the cyanide is replaced by a methyl group.<sup>[1]</sup> Methylcobalamin features an octahedral cobalt(III) centre. Methylcobalamin can be obtained as bright red crystals.<sup>[2]</sup> From the perspective of coordination chemistry, methylcobalamin is notable as a rare example of a compound that contains metal-alkyl bonds. Nickel-methyl intermediates have been proposed for the final step of methanogenesis.

Methylcobalamin is equivalent physiologically to vitamin B<sub>12</sub>, and can be used to prevent or treat pathology arising from a lack of vitamin B<sub>12</sub> (vitamin B12 deficiency), such as pernicious anemia.

Methylcobalamin is also used in the treatment of peripheral neuropathy, diabetic neuropathy, and as a preliminary treatment for amyotrophic lateral sclerosis.

## Production

Methylcobalamin can be produced in the laboratory by reducing cyanocobalamin with sodium borohydride in alkaline solution, followed by the addition of methyl iodide.<sup>[2]</sup>

## Functions

This vitamer is one of two active coenzymes used by vitamin B<sub>12</sub>-dependent enzymes and is the specific vitamin B<sub>12</sub> form used by 5-methyltetrahydrofolate-homocysteine methyltransferase (MTR), also known as methionine synthase.<sup>[citation needed]</sup>

Methylcobalamin participates in the Wood-Ljungdahl pathway, which is a pathway by which some organisms utilize carbon dioxide as their source of organic compounds. In this pathway, methylcobalamin provides the methyl group that couples to carbon monoxide (derived from CO<sub>2</sub>) to afford acetyl-CoA. Acetyl-CoA is a derivative of acetic acid that is converted to more complex molecules as required by the organism.<sup>[3]</sup>

Methylcobalamin is produced by some bacteria. It plays an important role in the environment. In the environment, it is responsible for the biomethylation of certain heavy metals. For example, the highly toxic methylmercury is produced by the action of methylcobalamin.<sup>[4]</sup> In this role, methylcobalamin serves as a source of "CH<sub>3</sub><sup>+</sup>".

## See also

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- Cobamamide
- Cyanocobalamin
- Hydroxocobalamin
- Vitamin B12

## References

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1. <sup>▲</sup>L. R. McDowell, *Vitamins in animal and human nutrition*
2. <sup>▲▲</sup>David Dophin, Preparation of the Reduced Forms of Vitamin B<sub>12</sub> and of Some Analogs of the Vitamin B<sub>12</sub> Coenzyme Containing a Cobalt-Carbon Bond. *D.B. McCormick and L.D. Wright, Eds. 1971;Vol. XVIII:34-54.*
3. <sup>▲</sup>Fontecilla-Camps, J. C.; Amara, P.; Cavazza, C.; Nicolet, Y.; Volbeda, A. (2009). "Structure-function relationships of anaerobic gas-processing metalloenzymes". *Nature* **460** (7257): 814–822. doi:10.1038/nature08299. PMID 19675641. [edit](#)
4. <sup>▲</sup>Zenon Schneider, Andrzej Stroiński, *Comprehensive B12: Chemistry, Biochemistry, Nutrition, Ecology, Medicine*

*Formylin™ Inj.*

