

## Vitamin K1

## Chemical Properties

CAS No. : 84-80-0

Formula: C<sub>31</sub>H<sub>46</sub>O<sub>2</sub>

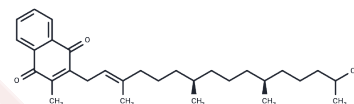
Molecular Weight: 450.70

Keep away from direct sunlight, Keep away from moisture

Storage:

Powder: -20°C for 3 years | In solvent: -80°C for 1 year

Actual storage temperature shall be subject to the COA.



## Biological Description

Description	Vitamin K1 (Phylloquinone) a fat-soluble, naturally occurring vitamin with antihemorrhagic and prothrombogenic activity.
Targets(IC50)	Endogenous Metabolite
In vitro	Phylloquinone, also known as vitamin K1, is a vital compound produced solely by plants, green algae, and some cyanobacteria. It functions importantly in photosynthesis as an electron carrier in photosystem I and aids in forming protein disulfide bonds. Beyond its plant-based roles, phylloquinone is crucial for blood coagulation, bone, and vascular health in humans and other vertebrates, with green leafy vegetables and vegetable oil being its primary dietary sources[1]. Therapeutically, vitamin K1 exhibits a notable antiproliferative effect and induces apoptosis in specific cancer cell lines such as Caco-2, HT-29, and SW480, likely through the MAPK pathway, while also significantly reducing polyamine biosynthesis[2].
In vivo	Subjects who augmented their dietary vitamin K intake during the follow-up exhibited a 51% lower risk of developing diabetes compared to those who reduced or maintained their phylloquinone (vitamin K) consumption [3]. Furthermore, vitamin K supplementation countered bone deterioration in mice on a high-fat diet by modulating osteoblast and osteoclast activities, thereby preventing bone loss [4]. Additionally, topical application of vitamin K1 on skin has been effective in reducing pigmentation and resolving bruising, demonstrating significant improvement in wound healing, epithelialization time, hydroxyproline content, and tensile strength when compared to the control group [5].
Cell Research	Caco-2, HT-29, and SW480 cells are treated with increasing concentrations of vitamin K1 (10, 50, 100, and 200 μM) for 24 h, 48 h, and 72 h. MTT is added to each dish and incubated for 2 h at 37°C. At the end of the incubation period, the medium is removed. The plate is read at 570 nM[2].

## Solubility Information

## A DRUG SCREENING EXPERT

Solubility	Ethanol: 40 mg/mL (88.75 mM), Sonication is recommended. DMSO: 25 mg/mL (55.47 mM), Sonication and heating are recommended. ( $< 1$ mg/ml refers to the product slightly soluble or insoluble)
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### Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	2.2188 mL	11.0939 mL	22.1877 mL
5 mM	0.4438 mL	2.2188 mL	4.4375 mL
10 mM	0.2219 mL	1.1094 mL	2.2188 mL
50 mM	0.0444 mL	0.2219 mL	0.4438 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

### Reference

- Basset GJ, et al. Phylloquinone (Vitamin K1): Occurrence, Biosynthesis and Functions. *Mini Rev Med Chem*. 2016 Jun 22.
- Li Y, Xing Z, Wang S, et al. Disruption of biofilms in periodontal disease through the induction of phase transition by cationic dextrans. *Acta Biomaterialia*. 2023
- Orlando A, et al. Vitamin K1 exerts antiproliferative effects and induces apoptosis in three differently graded human colon cancer cell lines. *Biomed Res Int*. 2015;22015:296721.
- Ibarrola-Jurado N, et al. Dietary phylloquinone intake and risk of type 2 diabetes in elderly subjects at high risk of cardiovascular disease. *Am J Clin Nutr*. 2012 Nov;96(5):1113-8.
- Kim M, et al. Vitamin K1 (phylloquinone) and K2 (menaquinone-4) supplementation improves bone formation in a high-fat diet-induced obese mice. *J Clin Biochem Nutr*. 2013 Sep;53(2):108-13.
- Hemmati AA, et al. Topical vitamin K1 promotes repair of full thickness wound in rat. *Indian J Pharmacol*. 2014 Jul-Aug;46(4):409-12.

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