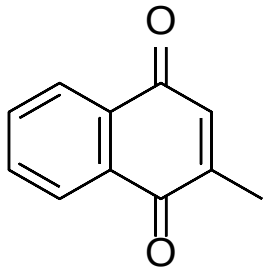
Product data sheet

MedKoo Cat#: 318184 Name: Menadione CAS: 58-27-5 Chemical Formula: $C_{11}H_8O_2$ Exact Mass: 172.0524 Molecular Weight: 172.183	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:

Menadione is a dietary nutrient essential for the normal biosynthesis of factors that are required for blood clotting. Menadione is a synthetic chemical compound sometimes used as a nutritional supplement because of its vitamin K activity. It is an analog of 1,4-naphthoquinone with a methyl group in the 2-position. It has also been shown to inhibit cell growth. Vitamin K3 is a synthetic form of vitamin K that acts as a precursor to vitamin K2. It is capable of both redox cycling and arylating nucleophilic substrates by Michael addition and has been used as a model bifunctional quinone to study cellular stress induction.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMF	30.0	174.23
DMF:PBS (pH 7.2) (1:1)	0.5	2.90
DMSO	34.67	201.34
Ethanol	22.0	127.77
Water	0.1	0.58

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	5.81 mL	29.04 mL	58.08 mL
5 mM	1.16 mL	5.81 mL	11.62 mL
10 mM	0.58 mL	2.90 mL	5.81 mL
50 mM	0.12 mL	0.58 mL	1.16 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Pinilla I, Izaguirre LB, Gonzalvo FJ, Piazuelo E, Garcia-Gonzalez MA, Sanchez-Cano AI, Sopeña F. In vitro vitamin K3 effect on conjunctival fibroblast migration and proliferation. ScientificWorldJournal. 2014 Jan 8;2014:916713. doi: 10.1155/2014/916713. PMID: 24523654; PMCID: PMC3910386.

2. Scott GK, Atsriku C, Kaminker P, Held J, Gibson B, Baldwin MA, Benz CC. Vitamin K3 (menadione)-induced oncosis associated with keratin 8 phosphorylation and histone H3 arylation. Mol Pharmacol. 2005 Sep;68(3):606-15. doi: 10.1124/mol.105.013474. Epub 2005 Jun 6. PMID: 15939799.

In vivo study

Product data sheet

1. Bona AB, Calcagno DQ, Ribeiro HF, Muniz JAPC, Pinto GR, Rocha CAM, Lacreta Junior ACC, de Assumpção PP, Herranz JAR, Burbano RR. Menadione reduces CDC25B expression and promotes tumor shrinkage in gastric cancer. Therap Adv Gastroenterol. 2020 Jan 11;13:1756284819895435. doi: 10.1177/1756284819895435. PMID: 35392297; PMCID: PMC8981514.
2. Kapadia GJ, Soares IAO, Rao GS, Badoco FR, Furtado RA, Correa MB, Tavares DC, Cunha WR, Magalhães LG. Antiparasitic activity of menadione (vitamin K3) against Schistosoma mansoni in BABL/c mice. Acta Trop. 2017 Mar;167:163-173. doi: 10.1016/j.actatropica.2016.12.001. Epub 2016 Dec 23. PMID: 28017859.

7. Bioactivity

Biological target:

Menadione, a naphthoquinone, can be converted to active vitamin K2 in vivo.

In vitro activity

Conjunctival fibroblasts were incubated for 24 hours. An artificial wound was made and the cells were incubated with fresh medium plus doses of vitamin K3 to be tested. Fibroblast mitogenic activity was statistically decreased in all vitamin K groups; statistical differences were found among vitamin K3 1 mg/mL and higher doses too. Vitamin K3 is able to inhibit fibroblast proliferation.

Reference: ScientificWorldJournal. 2014 Jan 8;2014:916713. https://pubmed.ncbi.nlm.nih.gov/24523654/

In vivo activity

In the second animal model, until day 300, CDC25B mRNA and protein expression levels were slightly lower in primates of the MNU (N-Methyl-N-nitrosourea) + MD (menadione) group compared to animals of the MNU group. However, at day 960 both expression levels were around 40% lower in the animals treated with MD (Figure 4). The animal of MNU group that was treated with MD after tumor development presented a considerable decrease in CDC25B mRNA and protein expression levels at the time of surgical tumor extraction when compared to day 990 and to the nontreated animal (Figure 4).

Reference: Therap Adv Gastroenterol. 2020 Jan 11;13:1756284819895435. https://pubmed.ncbi.nlm.nih.gov/35392297/

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.