

Technical Data Sheet (TDS)

1. Product Overview

Product Name: Menadione **CAS Number:** 58-27-5 **Molecular Formula:** C₁₁H₈ O₂ **Molecular Weight:** 172.18 g/mol

Product Characteristics: Also known as vitamin K3, a synthetic naphthoquinone derivative with vitamin K activity. It is a yellow to orange crystalline powder, odorless or with a slight characteristic odor, soluble in ethanol, ether and chloroform, slightly soluble in water. It is a fat-soluble vitamin with high biological activity, which is an essential substance for the synthesis of blood coagulation factors in the liver, and has the functions of promoting blood coagulation and preventing bleeding. It is widely used in pharmaceutical, feed and fine chemical industries, and is the core raw material for vitamin K supplement preparations and feed nutritional fortifiers.

2. Technical Specifications

Appearance: Yellow to orange crystalline powder
Assay (HPLC): ≥ 98.0%
Melting Point: 105-107 °C
Loss on Drying (105 °C): ≤ 0.5%
Residue on Ignition (800±25 °C): ≤ 0.1%
Heavy Metals (Pb): ≤ 5 ppm
Arsenic (As): ≤ 1 ppm
Iron (Fe): ≤ 10 ppm
Sulfated Ash: ≤ 0.1%
Related Substances (Total): ≤ 1.0%
Related Substances (Single): ≤ 0.3%
Solubility: Soluble in ethanol/ether/chloroform/acetone; slightly soluble in water (≈0.04 g/100 mL, 25 °C)
Storage Stability: 24 months at room temperature (sealed, dark); 36 months at 2-8 °C (sealed, dark)
Photosensitivity: Sensitive to light, easy to decompose under direct sunlight

3. Product Advantages

- High Biological Activity:** Strong vitamin K activity, directly participating in the synthesis of liver blood coagulation factors II, VII, IX and X, with efficient blood coagulation and hemostatic effects.
- High Purity & Low Impurity:** Strict control of related substances and heavy metals, assay ≥98.0%, meeting USP/EP/BP pharmaceutical grade and feed grade international standards.
- Good Stability:** Stable under sealed and dark storage conditions, low loss on drying, no easy oxidation and decomposition, and good batch-to-batch consistency.
- Easy Formulation:** Soluble in common organic solvents, easy to prepare into oral, injectable pharmaceutical preparations and feed additives, with good processability.
- Cost-Effective:** Synthetic raw material with mature production process, stable supply and high cost performance, suitable for large-scale application.

4. Application Fields

- Pharmaceutical Industry:** Core raw material for vitamin K supplement pharmaceutical preparations (tablets, capsules, injections); hemostatic drug for the treatment of bleeding caused by vitamin K deficiency, hypoprothrombinemia and liver disease.
- Feed Industry:** Nutritional fortifier for livestock, poultry and aquatic feed; prevents vitamin K deficiency in animals, improves blood coagulation function, reduces bleeding rate, and improves animal growth performance and survival rate.
- Fine Chemical Industry:** Intermediate for the synthesis of vitamin K derivatives and naphthoquinone series fine chemicals; raw material for biochemical research and detection reagents.

5. Usage Methods



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- **Pharmaceutical Formulation:** Dissolve in ethanol, propylene glycol or vegetable oil according to formulation requirements to prepare oral tablets/capsules or injectable formulations; adult daily recommended dosage 1-10 mg (calculated as pure menadione), adjust the dosage according to clinical needs.
- **Feed Additive:** Mix evenly with feed raw materials after dissolving in a small amount of organic solvent or carrier adsorption; recommended addition amount: livestock and poultry 0.5-2.0 mg/kg feed, aquatic products 1.0-3.0 mg/kg feed.**Note:** Avoid direct sunlight and high temperature processing (>80°C) to prevent decomposition and activity loss; seal immediately after use; the product is photosensitive, and the formulated preparation should be added with light stabilizer if necessary; strictly follow the dosage requirements, and avoid excessive use.

6. Packaging & Storage

Packaging Specifications:

- 100 g/bottle (brown glass bottle with rubber stopper and aluminum seal)
- 500 g/bottle (brown glass bottle with rubber stopper and aluminum seal)
- 1 kg/drum (sealed tin can with inner plastic bag, dark protection)
- 25 kg/drum (sealed HDPE drum with inner aluminum foil bag, dark protection)

Storage Conditions:

- Store in a cool, dry, well-ventilated warehouse, temperature $\leq 25^{\circ}\text{C}$, relative humidity $\leq 60\%$;
- Keep the container tightly sealed, avoid direct sunlight, strong light and high temperature, use brown glass or dark packaging materials;
- Store separately from strong oxidizing agents, strong acids, strong alkalis and reducing agents; store in a dedicated locked area for pharmaceutical/feed raw materials.

Shelf Life: 24 months (unopened, room temperature, dark storage); 36 months (unopened, 2-8°C, dark storage); 3 months after opening (sealed, dark storage at room temperature).**Transportation:** Non-hazardous goods, transported by ordinary dry means; use dark and sealed packaging, avoid direct sunlight, high temperature and rain during transportation; prevent packaging damage and powder leakage.

7. Safety & Protection

The product is low-toxic, and personal protective equipment should be worn during handling to avoid direct contact and dust inhalation. Wear nitrile rubber gloves, chemical splash goggles and N95 dust mask for all handling operations; in case of skin contact, rinse the affected area with plenty of soap and water for at least 5 minutes; in case of eye contact, rinse eyes thoroughly with running water for 10-15 minutes and consult a doctor if necessary; do not ingest, and if accidentally swallowed, rinse mouth with water and seek medical advice immediately.

8. Quality Assurance

The product is produced in accordance with ISO 9001 quality management system, pharmaceutical GMP and feed additive production standards; the production process is fully traceable, and strict quality control is carried out from raw material procurement to finished product delivery; each batch of products is fully tested by an independent QA laboratory and accompanied by a Certificate of Analysis to ensure compliance with international and national standards; professional technical support is provided for product application, including formulation optimization, solubility guidance and dosage adjustment advice.