PRODUCT DATA SHEET

**rac-alpha-Tocopherol**

**Catalog No:** 1072  
**Common Name:** 5,7,8,-Trimethyltocol  
**Source:** synthetic  
**Solubility:** chloroform, ethanol, hexane, methanol  
**CAS No:** 10191-41-0

**Molecular Formula:** C_{29}H_{50}O_{2}  
**Molecular Weight:** 431  
**Storage:** -20°C  
**Purity:** TLC > 95%; GC > 98%; HPLC >98%; identity confirmed by MS  
**TLC System:** chloroform/methanol (97:3)  
**Appearance:** liquid

**Application Notes:**
Alpha-tocopherol is one of the eight forms of vitamin E and contains three methyl groups attached to the chromonal ring. Of all the forms of vitamin E, alpha-tocopherol is preferentially retained by the liver in animals and undergoes slower catabolism in cells. It has been found that alpha-tocopherol inhibits the activity of protein kinase C, an enzyme involved in cell proliferation and differentiation in smooth muscle cells, platelets, and monocytes. Other functions of alpha-tocopherol include gene regulation, up-regulation of mRNA or protein synthesis, and preventing the uptake of the harmful 7-hydroxycholesterol into cells. Although the antioxidant activity of alpha-tocopherol in vitro has long been established it appears that this may not be one of its primary functions in vivo. Vitamin E is involved in immune function, cell signaling, regulation of gene expression, and other metabolic processes. Vitamin E also inhibits lipid oxidation by donating its phenolic hydrogen to lipid free radicals. Antioxidant activity in vivo is normally alpha-beta-delta-gamma but the antioxidant potency may depend on various chemical and physical situations. The ortho-methyl substitution of the chroman head plays a vital role in the antioxidant activity of tocopherols while the phytol tail is very important for proper positioning in the biomembranes. The antioxidant properties of vitamin E may delay memory loss in Down’s syndrome patients due to their protection from harmful oxidation caused by excess activity of superoxide dismutase. Vitamin E is only naturally produced in plants, algae, and some cyanobacteria and is therefore an important dietary nutrient for humans and animals.

**Selected References:**
2. A. Azzi “Molecular mechanism of α-tocopherol action” Free Radical Biology and Medicine, Vol. 43:1 pp. 16-21, 2007  

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