

## PRODUCT DATA SHEET

### rac-beta-Tocopherol

**Catalog number:** 1071

**Common Name:** 5,8-Dimethyltocol

**Source:** synthetic

**Solubility:** chloroform, ethanol, hexane, methanol

**CAS No:** 148-03-8

**Molecular Formula:** C<sub>28</sub>H<sub>48</sub>O<sub>2</sub>

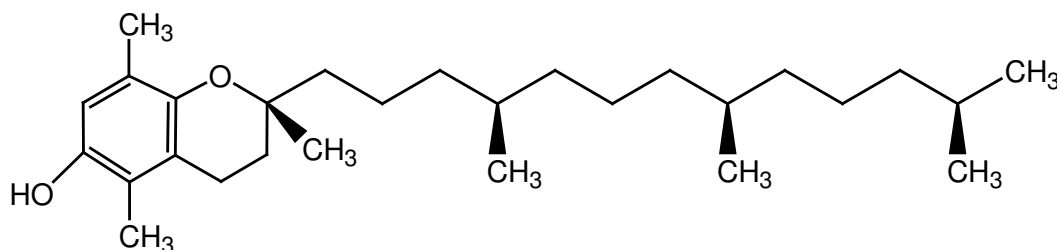
**Molecular Weight:** 417

**Storage:** -20°C

**Purity:** TLC >95%, GC >98%

**TLC System:** chloroform/methanol  
(97:3 by vol.)

**Appearance:** liquid



### **Application notes:**

*beta*-tocopherol is one of the forms of vitamin E, which is well known for its antioxidant activity.<sup>1,2</sup> *beta*-tocopherol, due to its having only one methyl group *ortho* to the phenolic hydroxyl group, has slightly less antioxidant activity *in vivo* than *alpha*-tocopherol which has two *ortho*-methyl groups. Vitamin E inhibits lipid oxidation by donating its phenolic hydrogen to lipid free radicals.<sup>3</sup> Antioxidant activity *in vivo* is normally *alpha*>*beta*>*delta*>*gamma* but the antioxidant potency may depend on various chemical and physical situations.<sup>4</sup> The *ortho*-methyl substitution of the chromanol head plays a vital role in the antioxidant activity of tocopherols while the phytyl 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:**

1. Afaf Kamal-Eldin and Lars-Ake Appelqvist The chemistry and antioxidant properties of tocopherols and tocotrienols, *Lipids*, July; 31 (7): 671-701, 1996
2. G. W. Burton, and M. G. Traber Vitamin E: Antioxidant Activity, Biokinetics, and Bioavailability, *Annual Review of Nutrition*, July Vol. 10: 357-382, 1990
3. G. W. Burton and K. Ingold Autoxidation of biological molecules. 1. Antioxidant activity of vitamin E and related chain-breaking phenolic antioxidants *in vitro*, *U. J. Am. Chem. Soc.*, 103, 6472-6477, 1981
4. Anchalee Sirikhachornkit, Jai W. Shin, Irene Baroli, and Krishna K. Niyogi Replacement of *alpha*-tocopherol by *beta*-tocopherol enhances resistance to photo-oxidative stress in a xanthophyll-deficient strain of *Chlamydomonas reinhardtii*, *Eukaryotic Cell*, doi:10.1128, 2009

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