

# PRODUCT DATA SHEET

## *rac-gamma*-Tocopherol

**Catalog number:** 1073

**Common Name:** 7,8-Dimethyltocol

**Source:** synthetic

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

**CAS number:** 7616-22-0

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

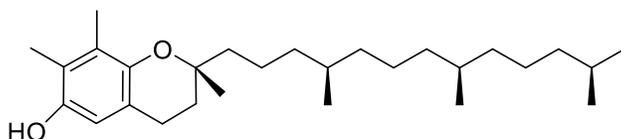
**Molecular Weight:** 417

**Storage:** -20°C

**Purity:** TLC > 95%; GC > 96%; HPLC >96%;  
identity confirmed by MS

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

**Appearance:** liquid



### Application Notes:

*gamma*-Tocopherol is the most prevalent form of vitamin E in many seed oils and is the major form of vitamin E in the U.S. diet. *gamma*-Tocopherol has greater functionability in some processes than other forms of vitamin E such as a greater ability to trap lipophilic electrophiles. In addition, *gamma*-tocopherol has functions unique from other forms of vitamin E, as in its ability to inhibit cyclooxygenase activity and as a natriuretic.<sup>1</sup> It has been suggested that *gamma*-tocopherol may be able to protect against cardiovascular disease and prostate cancer.<sup>2</sup> 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.<sup>3</sup> Antioxidant activity *in vivo* is normally *alpha* > *beta* > *gamma* > *delta* but the antioxidant potency may depend on various chemical and physical situations.<sup>4</sup> The *ortho*-methyl substitution of the chroman 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. Q. Jiang et al. "*gamma*-tocopherol, the major form of vitamin E in the US diet, deserves more attention" *American Journal of Clinical Nutrition*, Vol. 74(6) pp. 714-722, 2001
2. K. Wagner, A. Kamal-Eldin, and I. Elmadfa "*Gamma*-tocopherol--an underestimated vitamin?" *Annals of Nutrition and Metabolism*, Vol. 48(3) pp. 169-188, 2004
3. G. Burton and K. Ingold "Autoxidation of biological molecules. Antioxidant activity of vitamin E and related chain-breaking phenolic antioxidants *in vitro*", *U. J. Am. Chem. Soc.*, Vol. 103 pp. 6472-6477, 1981
4. A. Sirikhachornkit et al. "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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