

# SolarToco<sup>TM</sup> Natural Tocopherol

Vita-Solar Biotechnology manufactures and markets a line of plant sterol products under the brand name SolarToco<sup>TM</sup>. Our products are derived from all-natural plant sources and are formulated for use in food, beverages, and dietary supplements.

Tocopherol, is one of the most important phytonutrients in edible oil. It is also widely recognized that d- $\alpha$ -tocopherol (Nature Vitamin E) is the most active form of Vitamin E in human body. As a powerful antioxidant, it protects the body from unstable molecules known as free radicals. It is used for the prevention of ailments related to the cellular aging process, such as breast cancer, prostate cancer, skin cancer, coronary illness, etc.

## Product Description

Vitamin E is the collective term for a family of chemical substances that are structurally and, in some cases, biologically related to the best known member of this family, alpha-tocopherol. Vitamin E is a fat-soluble vitamin and an essential nutrient for humans. However, in contrast with the other vitamins present in human nutrition, its exact biochemical role remains unknown.

Vitamin E deficiency occurs as a result of rare genetic abnormalities affecting the alpha-tocopherol transfer protein (alpha-TTP), as a result of various malabsorption syndromes and as a result of protein-energy malnutrition. Alpha-TTP is a protein found in the liver, heart, cerebellum and retina. Alpha-TTP selectively recognizes alpha-tocopherol and is believed to mediate the secretion of alpha-tocopherol taken up by the liver cells into the circulation. It may also function in delivering alpha-tocopherol to the cerebellum and retina.

The vitamin E family of molecules can be divided into two groups, the tocopherols and the tocotrienols. Vitamin E occurs naturally in eight different forms: four tocopherols, alpha-, beta-, gamma- and delta-tocopherol and four tocotrienols, alpha- beta gamma- and delta-tocotrienol. All of these forms consist of a substituted hydroxylated ring system (the chromanol ring or head group) with a long phytol side chain or tail. The phytol tail is bonded to the chromanol ring at the 2 position of the ring. It is the hydroxyl group of the chromanol ring that confers antioxidant activity to vitamin E.

## I .Mixed Tocopherols

Mixed Tocopherols Concentrate is a reddish-brown to pale yellow, clear oily liquid, suspension with smaller crystalline is permitted, with special taste and

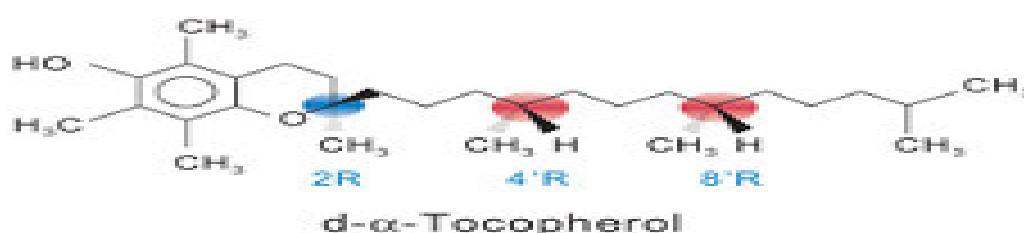
smell. Used as antioxidant and nutrient in foods, Typical doses for supplementation of low alpha mixed tocopherol are around 200mg/daily, determined as d-gamma-tocopherol.

## II. D-alpha tocopherol

d-alpha-tocopherol is available as a stand-alone supplement and in the form of mixed tocopherols. d-alpha-tocopherol is unesterified and thus much more susceptible to oxidation. It should be stored in a tightly closed, opaque bottle and in a cool, dry place. Typical doses for supplementation range from 100 to 400 milligrams daily. d-alpha-tocopherol is also available for cosmetic application as an antioxidant and moisturizer. Some are hypersensitive to topical d-alpha-tocopherol and may develop dermatitis from its use. To convert from International Units (IU) of d-alpha-tocopherol to milligrams, multiply by 0.67. To convert from milligrams of d-alpha-tocopherol to IU, multiply by 1.49.

**CAS No.:** 59-02-9

### Chemical Structure



**Chemical Formula:** C<sub>29</sub>H<sub>50</sub>O<sub>2</sub>    **Molecular Weight:** 430.71

## III. D-alpha tocopheryl acetate

d-Alpha-tocopheryl acetate is available as a stand-alone supplement and in multivitamin preparations. Since the acetate group protects the hydroxyl group of the chromanol ring against oxidation, it is a more stable form than d-alpha-tocopherol, the free or unesterified form.

Typical doses for supplementation range from 100 to 400 milligrams daily (as d-alpha-tocopherol). To convert from International Units (IU) of d-alpha-tocopheryl acetate to milligrams of d-alpha-tocopherol, multiply by 0.67. To convert milligrams of d-alpha-tocopheryl acetate to d-alpha-tocopherol, multiply by 0.91.

## IV. D-alpha tocopheryl succinate

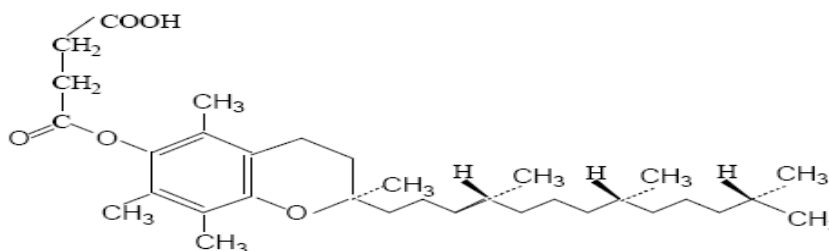
d-Alpha-tocopheryl succinate is available as a stand-alone supplement and in combination vitamin preparations. Since the succinate group protects the

hydroxyl group of the chromanol ring against oxidation, it is a more stable form than d-alpha-tocopherol, the free or unesterified form.

Typical doses for supplementation range from 100 to 400 milligrams daily (as d-alpha-tocopherol). To convert from International Units (IU) of d-alpha-tocopheryl succinate to milligrams of d-alpha-tocopherol, multiply by 0.67. To convert milligrams of d-alpha-tocopheryl succinate to d-alpha-tocopherol, multiply by 0.81.

**CAS No.:**4345-03-3

### Chemical Structure



**Chemical Formula:** C<sub>33</sub>H<sub>54</sub>O<sub>5</sub>      **Molecular Weight:** 530.79

### Advantages:

- GMO-free and based on non-allergenic ingredients (EC/13/2000)
- High Biological Activity
- Kosher & Halal Certified
- FCC IV & USP26

### Dosage and Administration

- ◆ The new RDA for natural alpha-tocopherol for both men and women is 15 mg/day. ~30mg/day. To convert from milligrams to International Units (IU), the conversion factor is 1.49. Therefore, 15 milligrams of alpha-tocopherol is equal to 22.4 IU. The UL for vitamin E is 1,000 milligrams or 1,490 IU/day expressed as alpha-tocopherol
- ◆ Recommended doses for supplementation range from 100 to 400 milligrams daily with a cap of 1000 milligrams/day for d-alpha-tocopherol in the form of d-alpha-tocopheryl acetate or succinate
- ◆ The average intake of alpha-tocopherol derived from various dietary surveys ranges from about 7.5 to 10.3 milligrams daily for men and 5.4 to 7.3 milligrams daily for women.

## Different SolarToco™ product forms

Product Code and Name	Application	Benefits
<b>Mixed Tocopherol Oil</b>	Food/feed antioxidant	Fat & oil soluble
<b>Mixed Tocopherol Powder</b>	Used for the solid and beverage food	Dispersible in water
<b>D-alpha tocopherol acetate powder CWD &amp;DC</b>	For use in tablets and hard capsules	Dispersible in water
<b>D-alpha tocopherol Oil</b>	Nutritional supplement	In edible oil
<b>D-alpha tocopheryl acetate oil</b>	For fortification of margarine ,oil and fat, nutrition products and baby foods, also used for softgel	Fat & oil soluble
<b>D-alpha tocopheryl succinate</b>	An off-white powder used in aqueous applications	Dispersible in water

### Usage:

#### In food/pharmacy industry

-As a natural antioxidant inside cells, it supplies oxygen to blood, thus alleviating fatigue; aids in bringing nourishment to cells.

-As an antioxidant and nutrition fortifier, it has rich nutrition and high security, and is prone to be absorbed by human body.

#### In cosmetics industry

- Improve microcirculation of the skin
- Protect against UV irradiations
- Maintain natural moisture of skin

#### In feed and poultry feed industry

- As dietary supplements and as antioxidant in food technology
- As a feed supplement improving animal procreation functions and fecundity