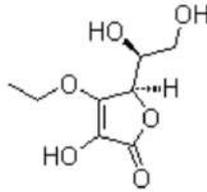


## 3-O-ethyl Ascorbic Acid



### DESCRIPTION

3-O-ethyl ascorbic acid is a new generation of Vitamin C derivative that provides superb whitening effects, also serves as a potent anti-aging active that boosts collagen synthesis and protects skin from DNA damage. It exhibits strong inhibition effect on melanogenesis, reduces dark spots and age spots, fights photoaging by interfering with inflammatory cytokines, such as IL-6, and reverse ROS production to achieve free radical scavenging purpose. 3-O-ethyl ascorbic acid is effectively a newer form of Vitamin C that offers a better overall performance. It is water soluble with excellent heat and photostability profile. Best of all, it is highly stable and easy to formulate.

### PRODUCT CHARACTERISTICS

- Anti-Oxidation
  - Anti-photoageing (Reduce IL-6)
  - Inhibit Tyrosinase and Trp-2 Activities (whitening)
  - Even Out Skin Tone
  - Stimulate Collagen Synthesis
  - Reduce Dark Spots (depigmenting)
  - Protect DNA
  - Scavenge Free Radicals
- Anti-aging

### REGULATION

INCI name: 3-O-Ethyl Ascorbic Acid

Restrictions:

Japan:	Regulated maxi: 2%(Cosmetic)
South Korea:	Regulated maxi: 2% KFDA No: 2001-15
Taiwan:	Regulated 1-2 %

### SPECIFICATIONS / CONDITIONS OF USE

Appearance	: white to off-white crystalline powder
Melting point (°C)	: 111.0-116.0
Water Content	: ≤ 1.0%
pH (3% water solution)	: 4.0-5.5
Heavy metals	: ≤ 20ppm
Arsenic	: ≤ 2ppm
Ash	: ≤0.1%
Assay (HPLC)	: ≥ 98.5%
Free Vc (HPLC)	: ≤10ppm
Total plate count	: ≤500cfu/g

### DOSAGE

**% utilization** 0.5 - 2%

**Formulation Guide** 3-O-ethyl ascorbic acid is much stable at a pH range between 5-6.5. It is recommended that dissolve 1g 3-O-ethyl ascorbic acid in 1g citric acid buffer (pH 5.5) and then add to water phase.

*Citric Acid buffer (pH5.5)	
	%w/w
Citric acid	1.0
Trisodium citrate	15.0
Water	85.00

**Storage Conditions** Protect from contacting with light, heat and moisture.

Store in tightly closed container at 25°C. It is best to use the entire contents of the pack after opening.

**Table 1 Stability and antioxidative of 3-O-ethyl ascorbic acid, ascorbic acid and Magnesium ascorbyl phosphate**

	Thermal Stability	Antioxidative Activity [The scavenging activity of 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical]	
	Retaining rate( 6 weeks at 60°C in aq. solution)	Radical-scavenging activity (IC <sub>50</sub> value )	DPPH radical scavenging amount
3-O-ethyl ascorbic acid	95.5%	10.35µg	2.29 g·g <sup>-1</sup>
Magnesium ascorbyl phosphate	70.6%	163.44µg	0.15 g·g <sup>-1</sup>
Ascorbic Acid	<0.01%	8.42µg	2.82g·g <sup>-1</sup>

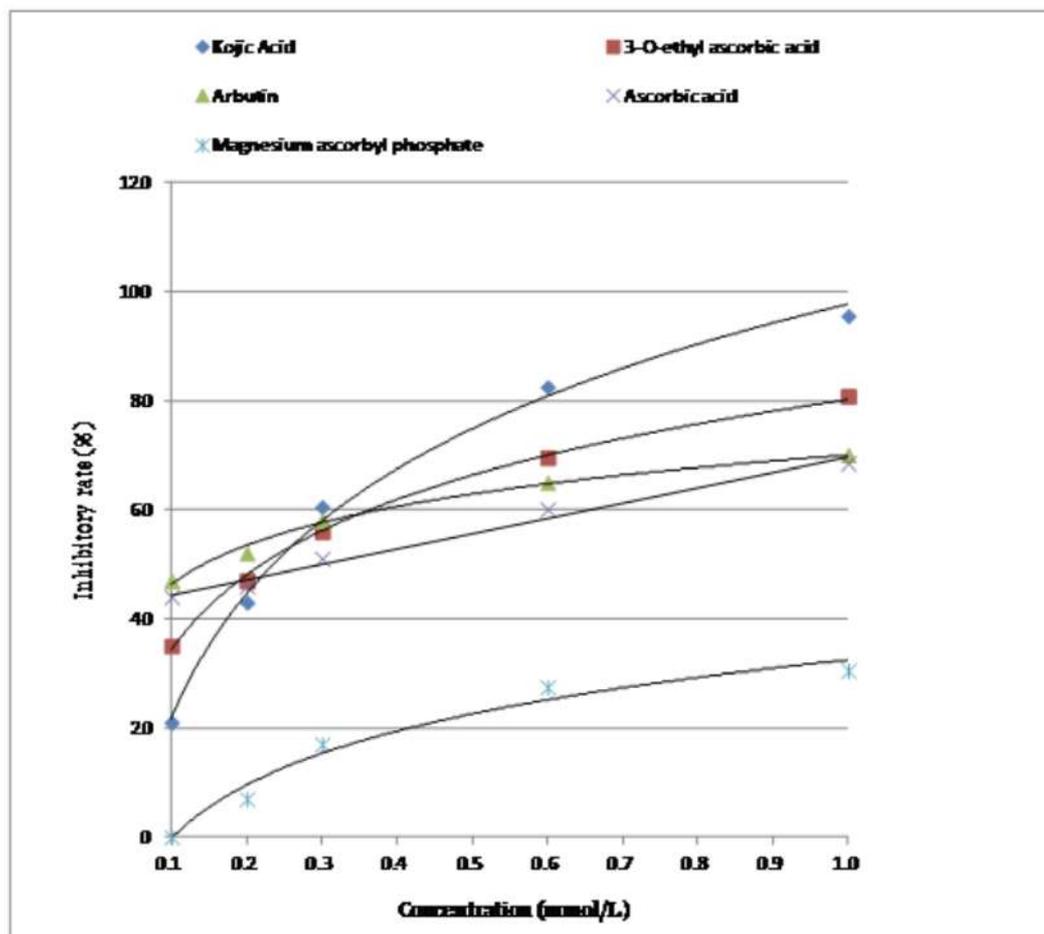


Fig 1. Plots of concentration vs. inhibitory activity against tyrosinase-catalyzed oxidation of L-tyrosine.

The inhibitory rate of 3-O-ethyl ascorbic acid on tyrosinase activity in oxidizing L-tyrosine into melanin achieves 80.0%, which is lower than that of kojic acid (inhibitory rate 95.5%), but higher than ascorbic acid (inhibitory rate 68.5%)

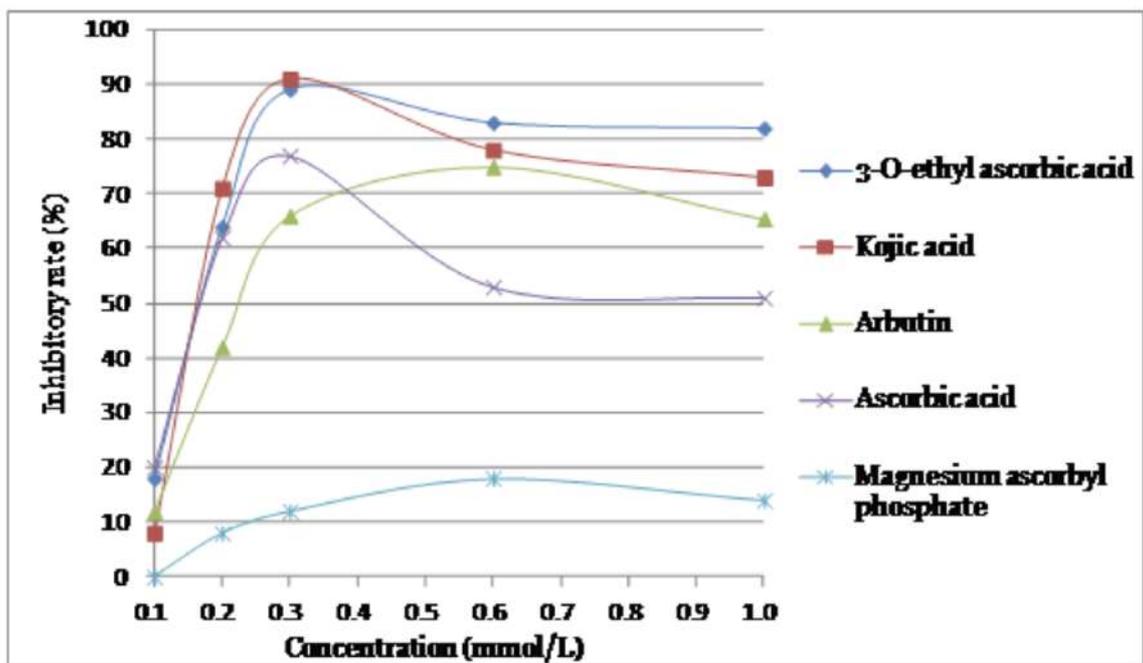


Fig. 2 Plots of concentration vs. inhibitory activity against tyrosinase - catalyzed oxidation of L-dopa. Activity of 3-O-ethyl ascorbic acid against capacity of tyrosinase to oxidize L-dopa forming melanin achieves 89.1%. The inhibitor concentration causing 50% loss of activity ( $IC_{50}$  value) is 0.15mmol/L