

Coenzyme Q10



Coenzyme Q10 (CoQ10), also known as ubiquinone, is a vitamin-like substance acting similar to Vitamin E. CoQ10 is critical to the production of energy in every cell of the body. It aids in circulation, stimulates the immune system, increases tissue oxygenation, and has vital anti-aging effects. CoQ10 has exceptional antioxidant properties. Studies have shown that it can effectively counteract free radical damage and provide significant protection against UVA-induced depletion of cell membrane. This function helps to prevent damage to collagen and elastin production process and help you avoid wrinkles.

CoQ10 improves both the rate and efficiency of energy production in the cells, including the skin and at the same time protects mitochondria from free radicals. CoQ10 is sometimes called a “bio-marker of ageing” because its level correlates so well with ageing.

In most people over thirty, levels of CoQ10 in the skin is below optimum, resulting in a lesser ability to produce collagen, elastin and other important skin molecules. CoQ10-depleted skin may also be more prone to the damage by free radicals, which are particularly abundant with exposure of the skin to the elements. Thus, CoQ10 may boost skin repair and regeneration. Furthermore, CoQ10 is a small molecule that can relatively easily penetrate into skin cells

Methods of manufacturing CoQ10

There are several different ways to manufacture CoQ10:

- **Extraction from Natural Resources:** Since CoQ10 occurs at very low concentrations in natural resources and is extremely difficult to purify, industrial manufacture of natural CoQ10 is not a practical option and would lead to exorbitant prices.
- **Chemical Synthesis from a Natural Derivative:** CoQ10 can be synthesized by using solanesol, an extracted from plant material from the Eggplant family, which is converted to a nine-isoprenoid compound (decaprenol) and reacted with hydroquinone to produce CoQ10.
- **Microorganism Method:** Microorganisms such as yeast or bacteria can be stimulated to produce repeated mutations, thereby enhancing their capacity to synthesize CoQ10.

Use in Cosmetics

Since CoQ10 has a deep orange color, skin creams and lotions become usually slightly yellowish or orange if there is a biologically significant amount of CoQ10 in the product. Thus, the color of a product gives you a hint whether the product contains significant amounts of CoQ10 or not.

CoQ10 comes either in powder form or, more sophisticated, encapsulated in liposomes (usually phospholipid nano-emulsion loaded with 10% vitamin E). CoQ10 packed in liposomes is much more stable, maintains its activity, and enhances skin penetration significantly. As a consequence, liposome-encapsulation largely reduces the amount of Q10 required for effectiveness as compared to non-encapsulated pure CoQ10 in powder form.

Features of CoQ10

Synonyms:

ubiquinone, ubiquinone

Structure:

Vitamin-like structure

Occurrence:

CoQ is found in all human cells in various intracellular organs as peroxisomes, vesicles, lysosomes, and mitochondria.

Function:

- Antioxidant in both mitochondria and lipid cell membranes neutralizing free radicals and preventing oxidative injury to DNA in cells
- Essential in vitamin E generation
- Effective anti-aging properties

Appearance:

Yellow to orange powder or liquid

Manufacture: either chemically synthesized from a natural derivative or biosynthetically by recombinant technology.

Use in Cosmetics: preferentially incorporated into liposomes since CoQ10 is functionally protected and much better absorbed by the skin

Typical Use Level in Cosmetics: 2-6% (if CoQ10 is packed in liposomes)

Applications: anti-aging & anti-wrinkle products, pre/after sun lotions, hydrating / rejuvenating & moisturizing skin care products, eye wrinkle treatment.

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