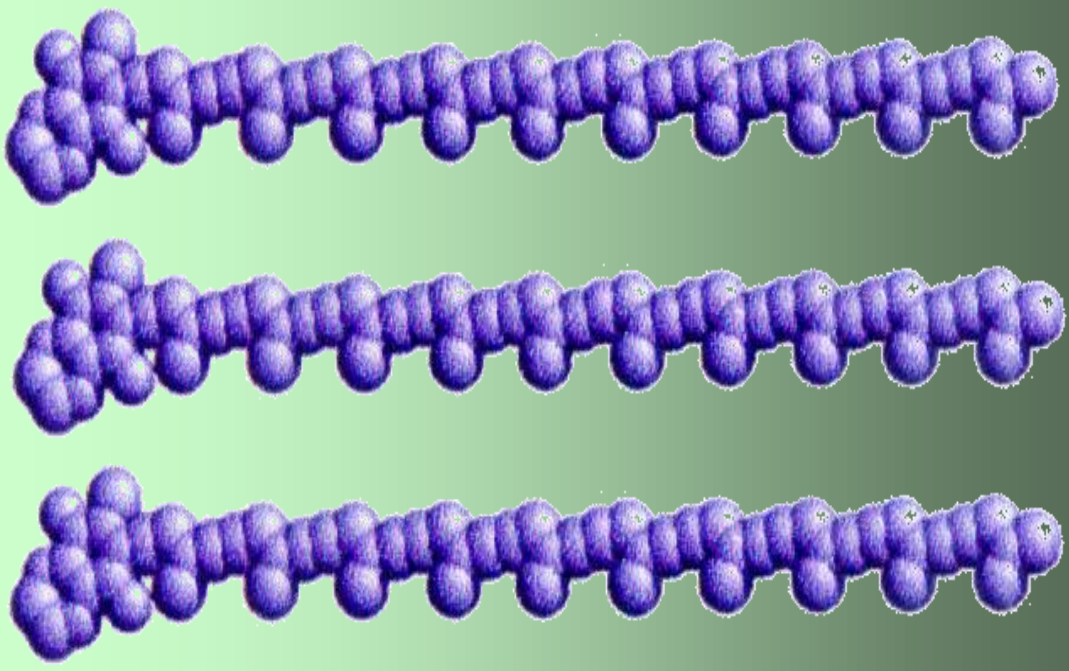
BIO - COENZYME Q10



COENZYME Q: THE UBIQUITOUS QUINONE

CAMPO RESEARCH PTE LTD

Level 30, 6 Battery Road, Singapore 049909

Tel: (65) 63833203 / 202 / 63833631 Direct Fax (65) 63833632 / 63834034

Email: sales@campo-research.com Website: http///www.campo-research.com

CAMPO® Multi-Purpose Cosmetic Base Chemicals & Active Ingredients

CAMPO® Novel Functional Active Cosmetic Ingredient & Raw Materials

Bio-Coenzyme Q10:
Product Information Coenzyme Q: The Ubiquitous Quinone

A.S. Gissen

Introduction

Part 1

Coenzyme Q (CoQ), also known as ubiquinone, is a naturally-occurring substance classified as a fat-soluble quinone with characteristics that are common to vitamins. Its chemical structure is similar to that of vitamin K, and it is found naturally in the tissues of animals and plants. Coenzyme Q is one of the substances in the chain of reactions which produces energy in the metabolism of food. Because of the necessity of CoQ for energy production, almost every cell of a living organism contains CoQ. The CoQ content varies in different organs, being highest in those that produce large amounts of energy. In humans, CoQ is found in relatively high amounts in the heart, liver, kidney, and pancreas.(1) CoQ helps drive the mitochondrial energy production vital to all body functions. The functioning of all organs depends on each cell having adequate levels of CoQ to provide life-sustaining energy.

Structure and Function

Coenzyme Q was first discovered in 1957 by Dr. Frederick Crane and his associates at the Enzyme Institute of the University of Wisconsin, when it was isolated from beef heart and shown to be essential in the process of bioenergetics.(2) A year later, Dr. Karl Folkers and his coworkers at Merck & Co., Inc., had succeeded in establishing its structure. The structure of the Coenzyme Q molecule is that of a quinone with an isoprenoid side-chain, the number of isoprene units in the side chain varies with each species of animal or plant. Humans contain Coenzyme Q10, which has 10 isoprene units.

Coenzyme Q is one of a family of brightly colored substances (quinones) that are widely distributed in nature because they are essential for generating energy in living things that use oxygen. The name ubiquinone was derived from the ubiquitous nature of these quinones. Coenzyme Q is a true coenzyme. A coenzyme is a substance that is necessary for, or enhances, the function of an enzyme. Bioenergy enzymes are necessary for a cell to generate energy from its food substances. The cell then uses this energy for its life processes. Coenzyme Q is an essential coenzyme for several of these bioenergy enzymes.

In cells, the process of generating energy takes place within the mitochondria, which are the energy-producing structures. In the mitochondria, molecules of coenzyme Q continually shuttle between bioenergy enzymes, transporting protons and electrons from one bioenergy enzyme to another. Cells in the body must continuously generate energy to support their function, and this process depends on each cell having adequate amounts of CoQ with which to generate this energy.

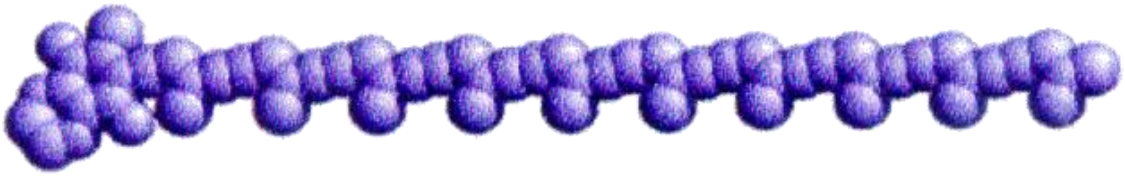
With such a fundamental role in energy production, it would be expected that deficiencies of CoQ would be detrimental to the bodies ability to function properly. Since CoQ is indispensably involved in the complex mechanism of respiration, including ATP formation, it is evident that a significant deficiency of CoQ in cellular respiration may have some detrimental effect upon the life processes dependent on energy, including mechanical, electrical, transport work, and biosynthesis. This deficiency could be reflected by one or more disease states, depending on the location and degree of the cellular deficiency of CoQ. Therefore, it is not surprising that CoQ deficiency has been linked to such diverse conditions as heart disease, heart failure, hypertension, muscular dystrophy, cancer, physical performance and athletics, diabetes, obesity, periodontal disease, aging, immune function, cellular antioxidant protection, and brain function.

Occurence and Distribution

CoQ10 in the human body is thought to be provided not only by its biosynthesis in the body, but also from dietary intake of CoQ from food.(3) However, it is not clear how much exogenous CoQ contributes to maintain the body stores of CoQ10. Since CoQ is found in many foods, and is biosynthesized within the human body, the question of whether a dietary source of CoQ is essential has been considered. CoQ is found in almost all foodstuffs, albeit in small quantities. Wheat germ and rice bran are fair sources of CoQ, as is soy and some other beans. Vegetables are fairly low in CoQ, although spinach and broccoli are good sources. The major sources of CoQ in the human diet, however, are meats, fish, and vegetable oils. Soybean, sesame, and rapeseed oils are high in CoQ10, while corn oil is high in CoQ9. The average person consumes approximately 5 milligrams a day of CoQ, a level insufficient to obtain sufficient CoQ for their needs. The remainder of the CoQ10 needed by the body is synthesized in the cells, especially within the liver.

The production of CoQ10 in the body is a complex process. At least 15 different reactions are necessary (each catalyzed by an enzyme), as well as a number of cofactor substances including vitamins B3, B5, B6, B12, C, and folate.(4) In spite of its complex manufacture, most CoQ10 is made within the body. There is good evidence, however, that dietary CoQ contributes significantly to the endogenous body-pool of CoQ10. This has been shown in patients receiving total parenteral nutrition (TPN) that contains no CoQ. In these patients, who are dependent totally on endogenous CoQ10 synthesis, CoQ10 levels dropped by almost 50% within 1 week on a diet free of CoQ.(5) These levels remained depressed for the 12 weeks of the study. This represents good evidence that dietary sources are indeed a significant contributor to the body pool of CoQ10.

Co-Enzyme Q10 and The Skin



Human Bio-Coenzyme Q10 with isoprenoid side chain consist of 10 isoprene units
Currently, CoenzymeQ10 is used for most of the Skin-Whitening cosmetics as it has been reported that the most of these whitening actives are involved in :

"Total and complete inhibition of the amino acid Tyrosine and its formation

An important point should be noted here on Bio-CoEnzyme Q10 - an Essential Biomolecule that is present in all mammalian tissues; and any lackings in the levels of CoEnzyme Q10 presence and manufacture is related with myriads of physiological dysfunctions like the enhanced Aging processes. The formation of CoEnzymes Q10's quinone ring is synthesized from the Amino Acids Tyrosine and Phenylalanine(map 0130)
Total and complete inhibition of the amino acid Tyrosine and its formation as experienced with most of the presently available Skin Whitening Agents can be implicated in skin Aging and other complications. "
(Balasubramaniam M PhD 1995)

In cosmetic cremes and lotions, Bio-CoenzymeQ10 is an revolutionary anti-aging ingredient that restructures and stimulates the aging skin cells, and acts as a powerful anti-oxidant which tones and smoothen. The Bio-CoEnzyme Q10 maintains skin's energy andnaturally repairs cellular oxygen (radical oxygen) damage as an anti-oxidant.

CAMPO RESEARCH Pte Ltd
TECHNICAL SPECIFICATION

PRODUCT Name (Campo Research) **Other Trade Names (Campo Research)** **Existing CTFA/INCI Name** **Chinese Translation** **CAMPO PRODUCT #** **HS Code:** **CTFA Monograph ID:** CAS# CAS# EU EINECS Number and Name EINECS# EU EINECS Number and Name EINECS# EU European Commission–Health & Consumer Cosmetics–Cosing	***CAMPO BIO-CO-ENZYMES Q-10*** UBIQUINONE Q10; COUPLED WITH ENZYMES *CAMPO BIO-CO-ENZYMES Q-10* *UBIQUINONE* 泛醌 (UBIQUINONE) **98-2915 (WAX)** 1302.19.0000 10169 - UBIQUINONE 303-98-0 / 60684-33-5 – Ubiquinone 303-98-0 / 1339-63-5 / 60684-33-5 (EU) – Ubiquinone 206-147-9(1) – Ubiquinone 206-147-9 / 215-668-0 (EU) – Ubiquinone Ubiquinone http://ec.europa.eu/consumers/cosmetics/cosing/index.cfm?fuseaction=search.details_v2&id=38807 Ubiquinone – 206-147-9 / 215-668-0 (EU)
BATCH/LOT	**See COA Batch Lot**
SPECIES	-
PARTS USED	-
RAW MATERIAL - ORIGIN	Japan
CONCENTRATION	-
COMMENTS	A Quality Management System, compliant to the International Standard ISO 9001,was used to manufacture and test this material ***Please take note that all specifications are liable to changes without prior notice.**

Specification Parameter Analysis	**Specification Range**	**Results**	**Methods**
Physical Form	Waxy hardened granules	Conforms	Visual
Color	Yellow amber waxy hardened granules	Conforms	Visual
Odor	Characteristic	Conforms	Olfactory
Aroma	Neutral	Conform	Olfactory
Microbial: E.Coli Salmonella	 Negative Negative	-	-
Specific Gravity (20°C)	0.688 - 0.695	See COA	USP XXIX/Paar,DMA35
Refractive Index (20°C)	-	-	USP XXIX/DGF IV C (52)
pH(20deg.C.) (100% Concentrate)	N/A	-	USP XXIX/DGF H III (92)
Water solubility	6-9%	Conforms	
Assay: Ubiquinone	NLT 99.5%	-	-
Co-Q9 (Ubiquinone Homolog & Enzymes)	NMT 0.2%	-	-
Saponification Value BS684 (4 hours)	15.00 - 24.00	See COA	
Acid Value BS684	0.000 - 2.00	See COA	
Iodine Value	4.000 - 8.0000	See COA	
Moisture	NMT 0.2%	-	-
Ash	0.000 - 0.250	See COA	G02301

Arsenic	NMT 2 PPM	-	-
Dry Residue (160deg.C/2hrs)	50.0 - 55.0	See COA	Mettler 16J
Preservation	None	Conforms	-
Pesticide Content	None	Conforms	Pflanzaniaschuttal 1989
Total Germs	<10 CFU/ml - non-pathogenic	Conforms	USP XXIX/Ph.Eur.2.6.12(97)
Total Yeast/Mold	Nil	Conforms	USP XXIX/Ph.Eur.2.6.12(97)
Heavy Metals(Total)As,Pb,Hg	NMT 20ppm	Conforms	USP XXIX/Ph.Eur.2.6.12(97)

CAMPO RESEARCH Pte. Ltd, SINGAPORE
CAMPO RESEARCH USA, INC SAN DEIGO CA 92111, & Manhattan, New York City, USA
CAMPO RESEARCH s.r.o., Brno, Czech Republic
CAMPO RESEARCH Pvt. Ltd, CHENNAI , INDIA
CAMPO RESEARCH CANADA LTD, TORONTO, CANADA

MATERIAL SAFETY & CONSUMER SAFETY TESTING LABS.
DIV. OF JTC KAMPOYAKI SINGAPORE
EMERGENCY MATERIAL SAFETY / ACCIDENTAL RELEASE CENTER Contact:
Emergency Tel.no: +(65)-63833202/63833631(24hours) /63228551/63228503
Emergency Fax No: +(65)-63833632(24hours),63824680, 63228558
EMAIL: msds911@campo-research.com

Campo Bio-Co-Enzymes Q-10 ©. **© US. Library-of Congress 1989-2017 ©**