

ACB Bio-Chelate 5 PF



let your outer beauty mirror
your inner health

proper nutrition,
vitamins + minerals
enhance barrier function,
increase cellular health,
decrease stress related factors,
soothe

BACKGROUND

Outer beauty is a reflection of inner health. Proper nutrition is the key to promoting and maintaining healthy skin, scalp, and hair; therefore, priming the skin and hair with adequate minerals is an excellent means to deeply nourishing both. ACB Bio-Chelate 5 PF consists of five fermented, essential minerals: zinc, iron, silicon, copper and magnesium. Through fermentation, these minerals are transformed into a bio-active material that is easily recognized by our skin, scalp and hair. To clarify, the fermented minerals that make up ACB Bio-Chelate 5 PF become a powerhouse of benefits, efficaciously enhancing barrier function, increasing growth factor expression, decreasing stress related factors, increasing cellular energy production and acting as an anti-inflammatory.

Both vitamins and minerals are used for their positive nutritional value; they play a key role in the body's overall health and well-being. Unlike vitamins however, minerals cannot be synthesized within the human body. Without minerals, vitamins cannot easily assimilate with our bodies and many enzymatic reactions cannot take place without a mineral acting as a co-factor. Yet, how do minerals work in personal care products? When applied topically, minerals provide strength and vitality to the skin and hair.

SCIENCE

Minerals may be divided into two categories: major elements and micronutrients. The major elements typically consist of calcium, phosphorous, silicon, magnesium, sodium, potassium, chloride, and sulfur. The micronutrients consist of iron, copper, iodine, manganese, zinc, fluorine, cobalt, chromium, molybdenum, and selenium. By chelating vitamins and minerals, the beneficial aspects of both can be fully capitalized on without residual, damaging effects.

Code Number: 20339PF

INCI Name: Water & Saccharomyces/ Zinc Ferment & Saccharomyces/Copper Ferment & Saccharomyces/Magnesium Ferment & Saccharomyces/Iron Ferment & Saccharomyces/Silicon Ferment

INCI Status: Conforms

REACH Status: Conforms

CAS Number: 7732-18-5 & 8013-01-2 & 8013-01-2 & 8013-01-2 & 8013-01-2 & 8013-01-2

EINCS Number: 231-791-2 & 232-387-9 & 232-387-9 & 232-387-9 & 232-387-9 & 232-387-9

Origin: Mineral

Processing:

- GMO Free
- No Ethoxylation
- No Irradiation
- No Sulphonation

Additives:

- Preservatives: None
- Antioxidants: None
- Other additives: None

Solvents Used: N/A

Appearance: Light Green/ Amber Hazy Liquid

Soluble/ Miscible: Water

Ecological Information:

100% Biodegradability

Microbial Count:

< 100opg, No Pathogens

Suggested Use Levels: 0.5 – 5.0%

Suggested Applications: Skin & Hair Care, Conditioning, Nourishing

Benefits of ACB Bio-Chelate 5 PF:

- Enhances Barrier Function
- Provides Anti-inflammatory Effects
- Increases Growth Factor Expression
- Decreases Stress Related Factors
- Increases Cellular Energy Production

ACB Bio-Chelate 5 PF

The five essential minerals used in ACB Bio-Chelate 5 PF work as co-factors in many enzymatic reactions such as protein synthesis and cellular reproduction. Through fermentation, we enhance the reaction the minerals have with the skin, resulting in healthier skin when applied topically.

BENEFITS

The fermented minerals that make up ACB Bio-Chelate 5 PF work immediate to efficaciously enhancing barrier function, increasing growth factor expression, decreasing stress related factors, increasing cellular energy production and acting as an anti-inflammatory.

When incorporating ACB Bio-Chelate 5 PF into hair care products, not only is the scalp deeply nourished, but the hair cuticle is simultaneously primed with nutrients responsible for smoothing the strands for a perfect finish!

EFFICACY DATA

To determine the ability of ACB Bio-Chelate 5PF to smooth the cuticle of the hair as well as its capability to penetrate into the hair shaft. Energy Dispersive Analysis of X-rays as well as Scanning Electron Microscopy were used to evaluate the results of the studies. According to the results, ACB Bio-Chelate 5 PF is capable of significantly smoothing the hair cuticle for healthier and shiner looking hair while simultaneously nourishing it as it is capable of enhancing the delivery of minerals into the shaft.

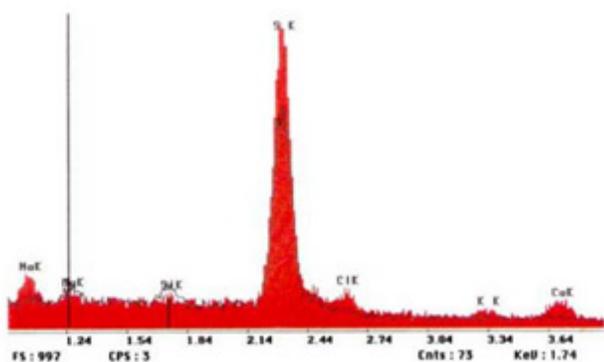


Figure 1: Elemental Composition by EDAX analysis of mineral in the hair

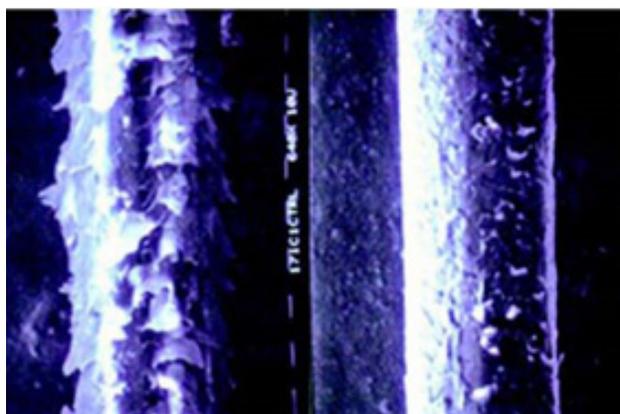


Figure 2: Scan Electron Microscopy of hair shaft following application of ACB Bio-Chelate 5 PF

EDAX studies confirmed penetration of magnesium and silicon. The EDAX scan (Figure 1) shows the untreated controls in red and the ACB Bio-Chelate 5 PF treated samples as a black superimposed line. European blonde hair tresses were damaged by a 2x-bleach/wave process followed by a 30-50% elongation of the individual hair fibers in order to stimulate excessive chemical and physical damage. Three fibers were cut into equal halves to produce six hair strands. Three hair strands functioned as the test materials, while the remaining three functioned as controls. The three damaged test fibers were treated with 100% ACB Bio-Chelate 5 PF and allowed to dry. Analysis of the treated fibers by SEM (Figure 2) demonstrated a smoothing of the hair cuticle, without a surface buildup of the treatment product.

An in-vivo study was conducted over a period of four weeks to evaluate the effect on skin density of ACB Bio-Chelate 5 PF. 10 M/F subjects between the ages of 23-45 participated in the study. Data gathered from the high resolution ultrasound imaging yielded results that indicate that this material is capable of significantly improving skin density compared to the control.

As evidenced in a 4 week efficacy study of ACB Bio-Chelate 5 PF on skin, skin density was improved by 11.02% after 24 hours and by 13.54% after 4 weeks when compared to the untreated control. When compared to the base cream ACB Bio-Chelate 5 PF improved skin density by 14.48% after 24 hours and after 4 weeks ACB Bio-Chelate 5 PF improved density by 13.69%. Results indicate that ACB Bio-Chelate 5 PF is capable of improving skin density when compared to both the untreated control as well as the base lotion. ACB Bio-Chelate 5 PF has a positive effect on skin's density when used at recommended use levels.

ACB Bio-Chelate 5 PF

Comparative Analysis of Skin Density

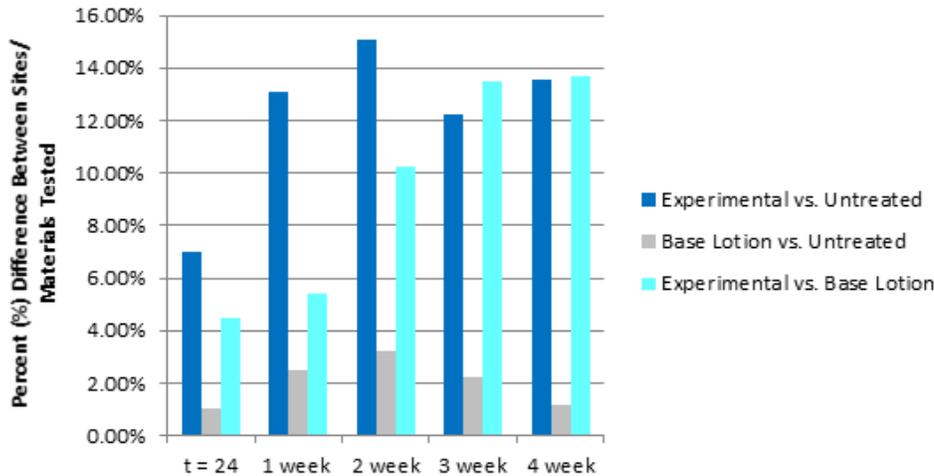


Figure 3. Percent difference in skin density recordings between test materials

To learn about the biological activity of topically applied minerals, we employed a DNA microarray with 21,629 different DNA fragments. In this study, a solution of iron, copper, zinc, magnesium, and silicon chelates was applied to a MatTek tissue model consisting of both keratinocytes and fibroblasts. These models have been shown to have similar gene expression to normal human skin. Given then established biological activity of the five minerals and the associated yeast extract, it is no surprise that 1,155 genes were altered by more than the 30% limit chosen for this study. 591 were down-regulated and 564 were up-regulated by a 24 hour exposure to a 5.0% solution of bio-chelated minerals. To analyze the data, the results were first run through the internet software program DAVID. DAVID is an acronym for Database for Annotation, Visualization, and Integrated Discovery. The software identified five KEGG pathways as being particularly affected. KEGG, an acronym for Kyoto Encyclopedia of Genes and Genomes, is a database collection of diagrams representing molecular interaction networks.

The genes found to be up-regulated in the KEGG pathways indicate a positive impact on skin's protective properties. The down-regulation of so many neuroactive receptors and the MAPK pathway is a strong indication of the minerals' anti-inflammatory properties. A noteworthy subset of regulated genes can be grouped under the heading of generalized stress responses. Combined with the neuroactive receptor and MAPK categories, the skin's response to stress is surely influenced by the topically applied mineral blend.

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