



||||| Antioxidants

drstraetmans
intelligence behind beauty



NATURAL PROTECTION OF SKIN AND COSMETIC PRODUCTS

Oxidative processes are all around us. As the metabolism of every living organism depends on conversions of chemicals with a high energetic content, and oxidation is involved in every cell, it does not wonder that nature has learnt to cope with oxidative systems and exploit them for energy production. On the other hand, our life expectancy is growing and the intensity of solar radiation is increasing. Thus, the oxidative stress for our skin is much higher than years ago and we are approaching a natural limit of our skin's resistance against the influence of sunlight, oxygen and other unavoidable oxidative burden. The results of changes in the skin's integrity, triggered by harmful oxidative reactions, is commonly known as premature aging of the skin. Therefore we have to protect our skin against oxidative reactions to avoid premature skin aging.

As nature offers perfect antioxidants, developed in many millions of years, it doesn't appear useful to invent new compounds. We have to identify the right compounds and blend them to obtain the best possible effect for different applications. And as described above we have identified exactly two different systems that need protection with different requirements due to their nature.

Cosmetic formulations are nowadays increasingly complex formulations with sometimes expensive and often sensitive raw materials. There are growing numbers of active concepts in modern cosmetic products, many of them from natural origin. And all these products have one thing in common: they are not living systems and lack restorable antioxidant systems. Therefore they are subject to quick deterioration if not protected. In cosmetic compositions it has been found that the natural mixture of α , β , γ - and δ -tocopherols like **dermofeel**[®] Toco 70 is more active against deterioration than the single species. The natural blend of Tocopherol guarantees a strong and long lasting effect for product protection. For natural cosmetics **dermofeel**[®] Toco 70 non-GMO with organic sunflower oil as solvent is the right choice.

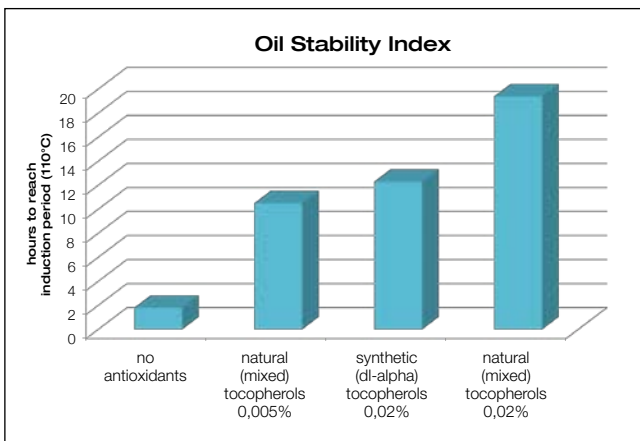


Fig. 1: The antioxidative capacity of natural (D-) Tocopherols is higher than that of the synthetic (DL-) mixture of α -Tocopherol.

Natural restoration of tocopherol happens by reduction with ascorbic acid to re-establish the tocopherol's antioxidative capacity in living cells. This cycle can be mimicked and thus additional synergistic activity can be achieved by addition of **dermofeel**[®] ascorbyl palmitate. This component will make the tocopherols available for a longer time.

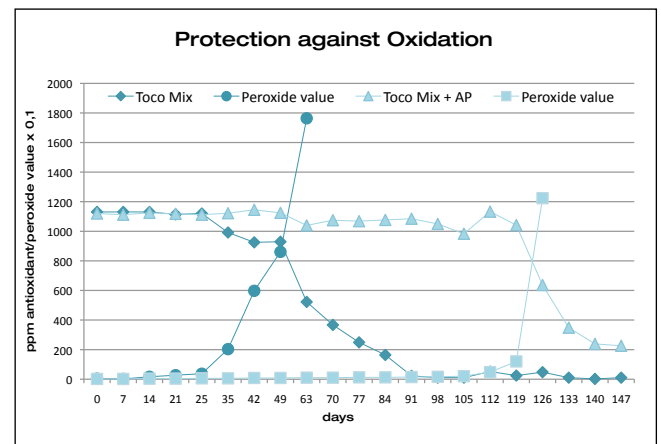


Fig. 2: The restoration of the antioxidative capacity by added Ascorbyl Palmitate (AP) prolongs the time of protection against oxidative deterioration. Without Ascorbyl Palmitate the Tocopherol mixture is significantly oxidised and the peroxide value of the formulation increases significantly after 6 weeks (dark blue lines). With added Ascorbyl Palmitate the same process is delayed and starts after 18 weeks (light blue lines).

Slowing down oxidation is also achieved by addition of a chelating agent. It is well known that certain heavy metal ions (e.g. iron, copper) act as catalysts for oxidative reactions. Therefore by adding a chelator like **dermofeel**[®] PA-3 (INCI: Sodium Phytate) and inactivating the metal ions by complexation the oxidation will slow down and thus be a first line protection against oxidation. Sodium Phytate is one of the strongest natural chelating agents, exceeding the complexing power of EDTA for many metal ions. Sodium Phytate can be used over a broad pH range (3-10), is derived from 100% natural sources and is fully biodegradable.

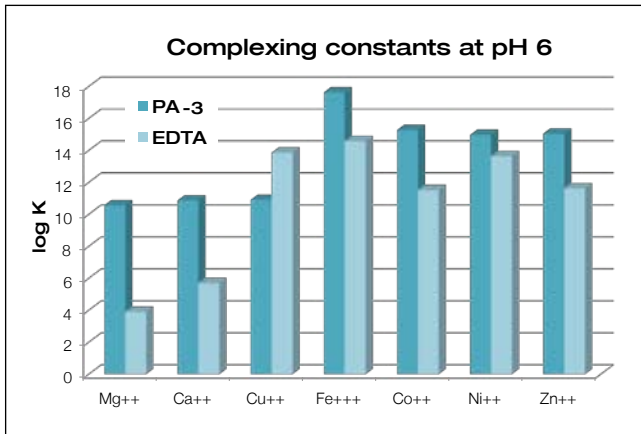


Fig. 3: Comparison of complexing constants between Sodium Phytate and EDTA, showing superior levels of complexation of Sodium Phytate.

The protection of human skin in the sense of anti-aging concepts follows other concepts. It has been shown that here it is the pure D- α -Tocopherol that shows the highest activity of the naturally occurring tocopherols. Furthermore,

commercially available synthetic D,L-Tocopherol is not as effective as the natural pure D-Tocopherol. That's why our recommendation for an effective anti-aging concept will point at **dermofeel**[®] E 67 non-GMO. This is pure D- α -Tocopherol sourced from certified non-GMO plants. Another elegant way to protect the skin is the use of Tocopheryl Acetate – **dermofeel**[®] E 74 A non-GMO. This material is stable in the cosmetic formulation and unfolds its antioxidative properties only when it is applied on the skin. There, with the help of enzymes present in our skin, fresh α -Tocopherol is generated from the precursor and will protect the skin. The possibilities for anti-aging concepts are completed with our green tea extracts. The **dermofeel**[®] Phenon group of products with its high content of polyphenols delivers well known antioxidative protection to the skin.

And, naturally, to complete our picture of natural antioxidants we offer the relevant products in non-GMO quality. Our complete range of antioxidants is in full accordance with natural cosmetic standards, produced using 100% renewable resources, fully biologically degradable and ECOCERT registered.

| Our Antioxidants | INCI | Function |
|--|--------------------------|-----------------------------------|
| dermofeel [®] Toco 70 | Tocopherol | Antioxidant |
| dermofeel [®] Toco 70 non-GMO | Tocopherol | Antioxidant |
| dermofeel [®] E 67 non-GMO | Tocopherol | Anti-aging active |
| dermofeel [®] E 74 A non-GMO | Tocopheryl Acetate | Anti-aging active |
| dermofeel [®] Ascorbyl Palmitate | Ascorbyl Palmitate | Co-antioxidant |
| dermofeel [®] Phenon 90 M | Camelia Sinensis Extract | Anti-aging complex from green tea |
| dermofeel [®] Phenon 30 R | Camelia Sinensis Extract | Anti-aging complex from green tea |
| dermofeel [®] EGCG | Epigallocatechin Gallate | Anti-aging agent from green tea |
| dermofeel [®] PA | Phytic Acid | Chelating agent |
| dermofeel [®] PA-3 | Sodium Phytate | Chelating Agent |

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