

Mineral Pigments with Natural Surface Treatment

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Introduction

Pigments and fillers are essential parts of color cosmetic formulations, providing color and structure, and improving the feel during application. However, they are hydrophilic and are prone to agglomeration. Use of uncoated pigments or fillers commonly result in poor feel, difficulty to formulate and instability of formulations. Many types of treatments have been developed and are very popular. In recent years, a new trend has emerged in the personal care industry : the use of natural ingredients. "Natural" is a concept usually associated with "safe", "healthy" and "environmentally friendly". Cosmetic formulations using natural ingredients have become very popular recently and are taking market share at a fast speed. However, the common surface treatments are still mostly synthetic.

During the course of this work, we have compared the change in physicochemical and sensory properties of pigments and fillers treated with different natural compounds. In particular, Jojoba Ester treatment has been found efficient and stable.

Jojoba Esters

Jojoba Wax is extracted from *Simmondsia chinensis* seeds. This wax contains extremely long straight chain (C36-C46) acids and alcohols, which makes it similar to and therefore compatible with sebum. It is commonly used as an emollient, a protective, or softening agent.

Jojoba esters are derived from the wax and are very resistant to oxidation



We have treated pigments (Titanium Dioxide and Iron Oxides) and powders (sericite) with different natural and synthetic compounds, to compare their properties :

- Jojoba Esters (JE) : 2%
- Carnauba Wax (CW) : 4%
- Isostearic Acid (ISA) : 2%
- Lauroyl Lysine (LL) : 5%
- Lecithin (CL) : 3%
- Hydrogenated Lecithin (PC) : 1%
- Isopropyltitanium trisostearate (ITT) : 2%
- Magnesium Myristate (MM) : 2%
- Methicone (MS) : 2%

Acknowledgement

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1. Hydrophobicity

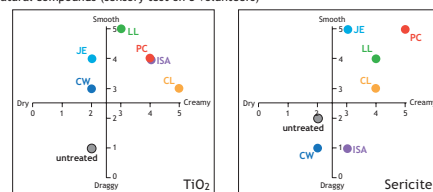
Fig.1 - Flotation test in water.



Flotation on water with 6 yellow iron oxide pigments treated with natural compounds have been compared. Jojoba ester treatment clearly makes pigments highly hydrophobic.

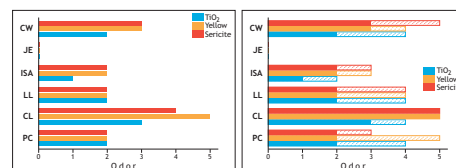
2. Sensory evaluation

Fig. 2 - comparison of feel of titanium dioxide (left) and sericite (right), treated with natural compounds (sensory test on 3 volunteers)



Surface treatment with natural compounds renders TiO₂ and Sericite smoother and creamier. Jojoba treatment seems to add smoothness but not as much creaminess as other compounds, such as lecithins.

Fig. 3 - comparison of odor of titanium dioxide (blue), yellow (yellow) and Sericite (red), treated with natural compounds (sensory test on 3 volunteers). After 6 hours at 90° C, the odor of the same samples were evaluated again (right).



The Jojoba treatment appears to be odorless, as compared with the other natural treatments. Furthermore, it remains stable at high temperature, with no increase in odor, contrary to the other treatments.

3. Skin application

Fig.4 - Application on forearm.



The above picture illustrates the difference in skin application for two loose powder formulas, one having all pigments and powders untreated, the second having pigments and powders treated with jojoba esters. The treatment improves the application and skin adhesion.

Natural Treated Mineral Powder with SPF (KPW-007A)

Percent	Name	INCI Name	Supplier
73.40	GMS-NJE3	Mica (And) Jojoba Esters	Kobo Products
15.00	TTO-NJE8	Titanium Dioxide (And) Alumina (And) Jojoba Esters	Kobo Products
5.00	RBTD-671-NJE2	Titanium Dioxide (And) Jojoba Esters	Kobo Products
5.00	BYO-NJE3	Iron Oxides (C.I. 77492) (And) Jojoba Esters	Kobo Products
1.00	BRO-NJE2	Iron Oxides (C.I. 77491) (And) Jojoba Esters	Kobo Products
0.60	BBO-NJE2	Iron Oxides (C.I. 77499) (And) Jojoba Esters	Kobo Products

Description

A Natural Treated Mineral Powder that shows better color development, adhesion to skin, even application and better feel than control formula KPW-007B. Good adhesion and even laydown should help SPF value.

4. Binding ability

Fig.5 - Drop test



We have submitted two pressed powder formulas to a drop test (3 drops at 12 inches). The surface treatment significantly improves the impact resistance.

Mineral Eye Shadow (KEY-014A)

Percent	Name	INCI Name	Supplier
70.80	GMS-NJE3	Mica (And) Jojoba Esters	Kobo Products
10.00	BRO-NJE2	Iron Oxides (C.I. 77491) (And) Jojoba Esters	Kobo Products
5.00	BORONITE® 1501	Boron Nitride	ESK / Kobo
2.50	ZINC MYRISTATE	Zinc Myristate	Kobo Products
2.00	RBTD-671-NJE2	Titanium Dioxide (And) Jojoba Esters	Kobo Products
2.00	BYO-NJE3	Iron Oxides (C.I. 77492) (And) Jojoba Esters	Kobo Products
0.50	BBO-NJE2	Iron Oxides (C.I. 77499) (And) Jojoba Esters	Kobo Products
0.10	Propyl Paraben NF	Propylparaben	Int. Sourcing
0.10	Methyl Paraben NF	Methylparaben	Int. Sourcing
7.00	PE-48	Pentaerythrityl Tetraoctanoate	Alzo Int.

Description

Velvety feeling eyeshadow with good application, skin adherence, and wear due to NJE Natural Jojoba Ester Treatment.

5. Comparison with common non-natural treatments

We have compared the skin application of a loose powder formula with pigments and powders treated with jojoba esters (NJE), isopropyltitanium trisostearate (ITT), magnesium myristate (MM) and methicone (MS). The natural treatment, jojoba ester, clearly gives better adhesion and improvement in feel as conventional treatments with synthetic material.



Conclusions

- Use of natural ingredients and minerals are rapidly increasing.
- Jojoba ester treatment has been found to outperform other natural coatings. It gives good hydrophobicity, enhances feel and skin adhesion.
- It is stable enough to avoid odor, even at high temperatures.
- On application its performance is as good as common, synthetic treatments.

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