【Technical Data】	YAMAGUCHI MICA CO., LTD.				
Title	Mica composite powder ADMOLITE -Iron oxide-coated mica IM series-				
Category	Cosmetics	By	H. Asano	Date	Apr.30.2024

(Summary)

In order to propose new possibilities for mica, we investigated not only its use as an extender pigment but also its functionality as color ingredients. As a result, we were able to prepare iron oxide-coated mica “ADMOLITE” by precipitation of iron oxide on the mica surface. This ADMOLITE suggests the possibility of new uses for mica.

(Key Wors)

Mica, iron oxide, precipitation, coating, color ingredient

(Introduction)

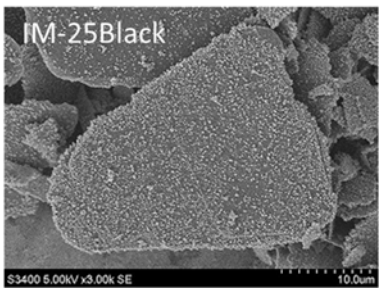
Mica has been used as a typical extender pigment, but we have been thinking that it is necessary to develop new uses for mica. On the other hand, iron oxides are also typical coloring ingredients, but it is necessary to take into consideration manufacturing techniques and regulations due to submicron- and nano-level size. In consideration of the addition of higher value to mica and the ease of handling iron oxide, we will report on new coloring ingredients in which the surface of mica is coated with iron oxide.

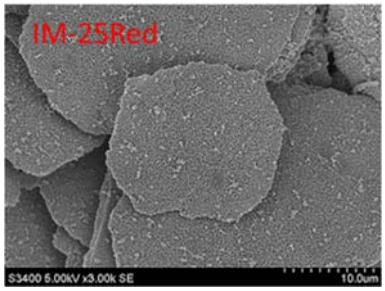
ADMOLITE IM Series

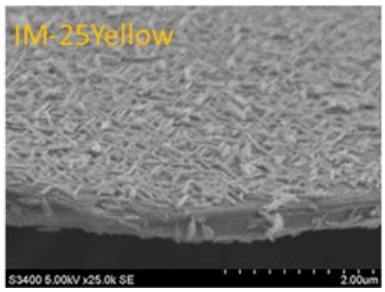
These color ingredients are made by applying our unique wet technology to coat and fix iron oxides on the surface of mica.

As shown in the table and figure below, ADMOLITEs are plate-like, micron-sized powders. We report these characteristics as a colorant resulting from this shape and the fact that it is not submicron in size.

Product Name		IM-25Black	IM-25Red	IM-25Yellow
INCI		MICA / IRON OXIDES		
Avg. Particle Size		24μm		
Heavy Metal	Pb	≦10ppm	≦10ppm	≦10ppm
	As	≦2ppm	≦2ppm	≦2ppm
	Hg	≦1ppm	≦1ppm	≦1ppm
	Cd	≦5ppm	≦5ppm	≦5ppm
	Sb	≦10ppm	≦10ppm	≦10ppm







(Results)

1.Color Properties

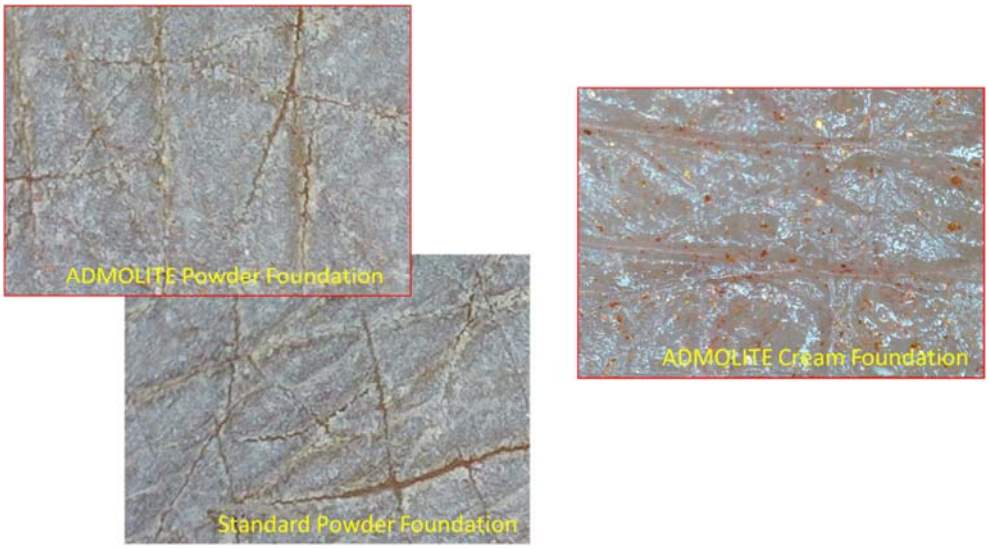
The color tone of each ADMOLITE was evaluated by applying to hemispherical models, comparing to each mixed powder with the same composition of iron oxide and mica.

Left: mixed powder
Right: ADMOLITE

IM-25Black had a deep color with high saturation, IM-25Red had a bluish red color with a slightly yellowish luster, and IM-25Yellow had a bright yellow color with high saturation. In addition, since the coloring material is plate-shaped, the front side is brightly colored, while the surrounding areas appear to be less bright. In actual cosmetics, it is expected that there will be a difference in color tone between the front of the face and the face line, creating a three-dimensional effect.

2.Adhension characteristics to skin

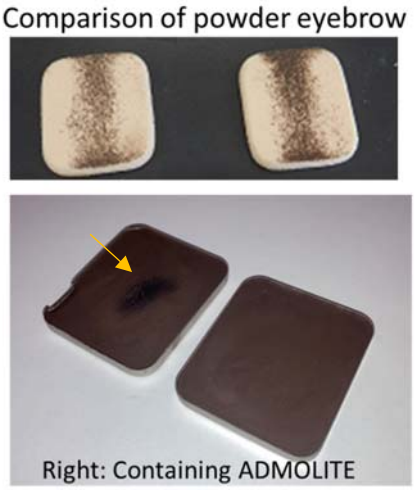
Powder foundations and O/W type cream foundations were prepared and the application of color ingredients was observed with a skin scope.



In the case of powder foundations prepared with general iron oxide, the colorant tends to fall into sulus cutis, but with ADMOLITE, it was observed that the yellow particles were stuck to crista cutis. Similarly, cream foundations with high IM-25Red content showed a large amount of colorant scattered on crista cutis.

3.Contorol of hardness

Eye shadows and powder eyebrows contain a large amount of colorant to enhance coloring-property, and the pressed products tend to be hard. For this reason, the amount of removal decreases and caking tends to occur more easily. In such cases, replacing some of the regular iron oxide with ADMOLITE can increase the amount of removal without reducing coloring-property and prevent caking.



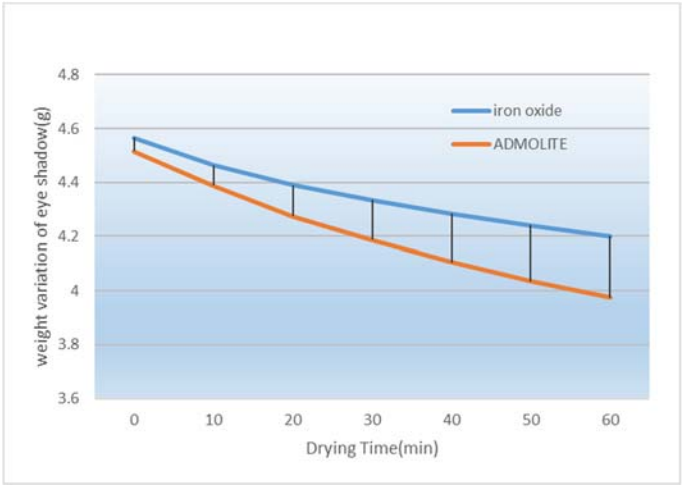
The amount of removal for each prepared powder eyebrow was compared by replacing a weight on the makeup puff and pulling it. Based on the state of the adhesion to the puff, powder eyebrow containing ADMOLITE was shown to be easier to remove. Additionally, caking occurred with the conventional powder eyebrow, but not with powder eyebrow containing ADMOLITE.

4.Dispersion property

General iron oxide is a submicron-sized powder and tends to aggregate. Therefore, it is necessary to perform a preliminary dispersion process using an extender pigment such as talc as a dispersion medium, and a process of dispersing it in water or oil using a powerful mixer. However, ADMOLITE is a colorant made by coating micron-sized mica with iron oxide, so it can be easily dispersed like normal mica. Therefore, ADMOLITE simplifies the dispersion process.

5.Function for molding with wetting condition

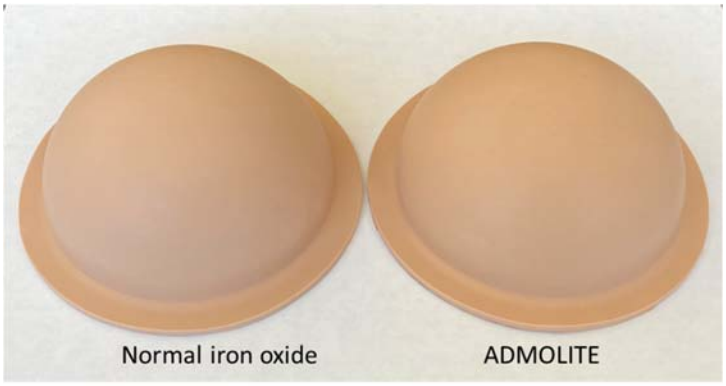
In molding with wetting condition of caked powder cosmetics, replacement of powders with different particle sizes and shapes changes the absorption and drying of solvents or water contained in the slurry. For example, if the iron oxide in an eyeshadow is replaced with ADMOLITE, the drying time can be expected to change. Therefore, we prepared eyeshadow powder mixtures with similar color, and compared the drying times of solvents.

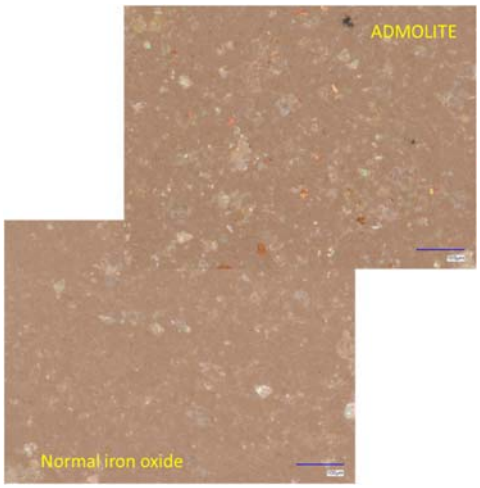


Eyeshadows containing ADMOLITE dried faster, and the drying efficiency tended to increase by about 10 to 40%.

6. Color properties in formulations

In order to confirm the color properties of formulation using ADMOLITE, we prepared water foundations as a simple formulation. ADMOLITE and iron oxide were used in each formulation, and the appearance colors of both water foundations were adjusted to be the same colors. Each applied color was confirmed by applying it to a hemispherical model, and its surface condition was confirmed using a skin scope.





The foundation using ADMOLITE showed higher saturation than that using normal iron oxides. When observing the state of the applied surface, it was difficult to see the colorant with iron oxides, but with ADMOLITE, the micron-sized colorant was clearly visible. These color observations suggest that something similar to Neo-Impressionist pointillism is being reproduced. Pointillism is a painting technique in which small dots of different colors are placed next to each other so that the different colors appear mixed when viewed from a distance. This method allows the colors to appear vivid and bright because the colors do not mix together and become muddy. It can be considered that this pointillism effect also occurs in the foundation using ADMOLITE.

(Conclusion)

The newly developed ADMOLITE IMs are micron-sized colorants with iron oxides coated on the mica surface. As above results, ADMOLITE IMs have the following characteristics;

high coloring (pointillism effect)
adhesion characteristics to skin
control of hardness and drying
good dispersibility