Natural Make-up Film Formation Using properties of Treated Powders and HLB Values of Binding Agents.

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1. Introduction

We studied not only the surface properties of treated powders but also the effect of pigments on dispersion with oil binders using a HLB value between them. The degree of the dispersion of pigment effects the quality, stability and homegeneous coloration of make-up properties. Recently, the use of treated pigments as a body powder is increasing. Therefore, the study on binding agents interacted with treated pigments is absolutely required. First, we examind the characteristic properties for the surface of some kinds of treated pigments. The degrees of the dispersion of pigments are evaluted as the change of a HLB value, shown by L*, a*, b* and C*(Chroma) confirmed by light microscope and scanning Electron Microscopy. On the basis of our data, we could make the natural make-up products with the better qualilty and the more homogeneous film. Our result suggest that the better make-up products could be obtained by staudying the sufrace properties of various treated powders and enhancing the degree of dispersion through by HLB values of binding agents.

2. Experiment

1. The experiment of suitability between coating powder and Binder

The standard content is 50% of Sericite SL including pigments and 50% of oil binder. Correctly speaking 45.3% of Sericite SL, 4.7% of Iron oxide, 40% of Liquid paraffin, and 10% of Crodalan SWL were treated with Three roll mill three times. To observe the change of value according to HLB of oil binder, it was made possible for the contents mentioned above to be liquid paraffin (To 100) by applying 10% of non-ion surfactant (Arlacel 83, Tween 20) respectively. In addition to identify the change according to coating materials, the same experiments were made with Sericite SS and Synthetic Mica FNK-100 except Sencite SL.

Sample material: the contents provided by KS pearl were used without any prior treatment

Particle size on average - 10~15 μm

Coating contents - 3%

Evaluation of suitability

The suitability was observed after keeping the produced contents in the incubator with the temparature of 43°C for 2 days.

2. The experiment to identify dispersibility

The experiment was done as follows, to identify the dispersibility according to the value of HLB of coating powder and binder. The contents were applied differently with 82.9% of powder and 4.7% of iron oxide and as a binder, 10% of liquid paraffin and 3% of Tween 20(HLB 16.7), 3% Arlacel 83(HLB 3.7) and 3% of Tween 20/Arlacel 83(HLB 10) were respectively dispersed with Homogenizer (NIHONSEIKI KAISHA Co LTD) for powder dispersion. And the value of L*, a*, b* was measured with colorimeter (MINOLTA Co. Ltd. CR-200) by pressing after Jripening the dispersed powder for one day. Furthermore, for the identification of dispersion, Scanning Electron Microscopy (SEM JSM-6400, JEOL Co.) was used and EDS (TFC 1100E) was used for the identification of powder

measuring SEM: prior treatment of sample material - ultrasonic dispersion with alcohol as a solvent

coating -200Å GOLD coating

3. The Result and discussion

1. The result of suitability

As a result of checking suitability, it was shown as follows.

power	binder	I	II	III	IV
Sericite SL		X	X	Δ	Δ
Sericite SS		X	Δ	θ	O
Synthetic Mica FNK-100		X	X	Δ	O

(Table 1)

I. Liquid Paraffin 40%, Crodalan SWL 10% - standard

II. Liquid Paraffin 30%, Crodalan SWL 10%, Arlacel 83 10%

III. Liquid Paraffin 30%, Crodalan SWL 10%, Tween 20 10%

IV. Liquid Paraffin 30%, Crodalan SWL 10%, CGsmol 168AR 10%

* evaluation of the result -, X completely divided

θ bad

O good

Δ very good

It was revealed that most standard products which use only liquid paraffin and Crodalan SWL as a binder were all seperated regardless of the coating elements, showing bad suitability.

However, Sericite SL coated with Lecithin of amino acid series which was intended to increase cutaneous affinity seemed to be very stable (figure I) at III and IV which introduced the hydrophilic binder. And in the same way, Sericite SS coated with silicon to bolster waterresisting qualities appeared to be stable at II and IV. Synthetic Mica FNK 100 showed to be stable at III and IV, similar to Sericite SL. Based on the result above, it is shown that it is possible to increase the stability of products when using non-ion surfactant active agent as a binder.

It should be noted that Cosmol 168AR (NISSHINOIL MILLS, LTD) contributed to overall stability, which results from the fact that Cosmol 168AR has a high degree of solution (over 100%) toward liquid paraffin, thus making powder homogeneous to liquid paraffin.

2. The identification of dispersibility

The result of measuring the pressed products by colorimeter is shown in Table 2~4. As it turned out, each powder didn't have any noticeable influence on the value of L* which determines luminosity, while it had some influence on the value of a* and b* which determines Chroma. In the analysis of the numbers shown in table 2~4 in general, Sericite SL treated with Lecithin had the highest value of C* with Tween 20 (HLB 16.7) which has very strong tendency toward hydrophlic, On the other hand, in case of Sericite SS which WAS treated with silicon, it had the highest value of C* with Arlacel 83 (HLB 3.7) which shows strong tendence toward hydrophobic, contrary to Sericite SL. In addition, Synthtic Mica FNK-100 had similar value of C* with Tween 20* and Tween 20/ Arlacel 83 (the range of HLB; 16.7 - 10), while showing more tendency than hydrophobic.

Based on the result of experirnent, when choosing oil binder according to the qualitv of coating in powder, it seems to produce the goods with good color and usefulness if non-ion surfactant binder, polarity and the degree of solution are considered. Furthermore, the reason there is no big variation in numbers is that a certain amount of iron oxide was introduced to identify the coating dispersion of iron oxide as well as the dispersion of the coating powder through SEM, thus making little change in overall colors. However, it was impossible to identify the dispersion of iron oxide in products, while it was only possible to identify the dispersion of Sericite and it became clear that the dispersed plate through EDS (figure 2) was Sericite which were consisted of SiO_2, Al_2O_3. and K_20.

Color / HLB value	L*	a*	b*	C*
Tween 20	55.39	7.31	27.61	28.56
Tween20/ Arlacel83	56.49	6.65	24.39	25.28
Arlacel 83	55.71	7.01	24.06	25.06

Chroma of Sericite SL (Table 2)

Chroma (C*)= $\sqrt{(a^*)^2+\sqrt{(b^*)^2}}$

Color / HLB value	L*	a*	b*	C*
Tween 20	57.26	7.68	28.13	29.16
Tween20/Arlacel83	56.13	7.78	28.09	29.16
Arlacel 83	56.91	8.89	29.86	31.96

Chroma of Sericite SS (Table 3)

Color / HLB value	L*	a*	b*	C*
Tween 20	53.16	11.52	16.73	20.40
Tween20/Arlacel83	52.89	11.64	16.94	20.55
Arlacel 83	53.12	10.39	15..19	18.40

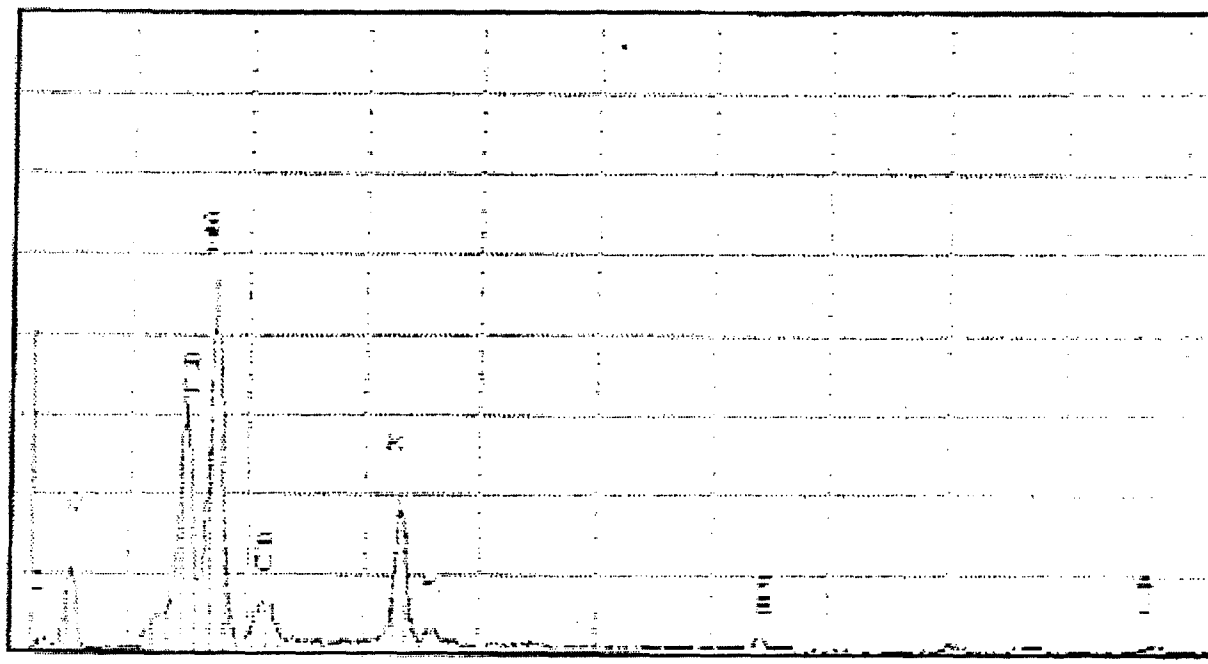
Chroma of Synthetic Mica FNK-100 (Table 4)

(figure 1)

I : Liquid paraffin40%, Crodalan SWL10%-Standard

II: Liquid paraffin30%, Crodalan SWL10%, Tween20 10%

III: Liquid paraffin30%, Crodalan SWL10%, Cosmol 168AR 10%



(figure 2)

EDS Analysis of Sericite

(figure 3)

SEM photo of Synthetic Mica FNK 100
Liquid Paraffin 30%, Crodalan SWL 10%, Tween20 10%

(figure 4)

SEM photo of Synthetic Mica FNK-100
Liquid paraffin 30%, Crodalan SWL 10%, Arlacel83 10%

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