Development of new deodorant powder by surface treatment with magnesium hydroxide

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1. Introduction

In recent years, many people have an interest in odor control. Because especially taking care of individual's own odor is gathering remarkable attention, demands for deodorant products have been increasing. Conventionally, zinc oxide and diatomaceous earth have been formulated into them. However, these deodorant powders have some problems such as stimulation to the skin and rough touch feeling. In this study, we developed new surface treatment with magnesium hydroxide for the deodorant powders and investigated their deodorant effects against these causative compounds of body malodors. The magnesium hydroxide treatment could impart a deodorant effect to various cosmetic powders. In particular, microcrystalline cellulose treated with magnesium hydroxide did not irritate the skin and showed a good deodorant effect in a cosmetic product.

2. Materials and methods

2.1. Surface treatment procedure

Microcrystalline cellulose, sericite and diatomite were dispersed in $MgCl_2$ aq. Magnesium hydroxide was deposited on the powders by adjusting the pH of the slurry to be alkaline. After washing, drying and pulverizing steps, $Mg(OH)_2$-treated powders were obtained.

2.2. Deodorant effect of $Mg(OH)_2$-treated powder

Deodorant effect of $Mg(OH)_2$-treated powder for isovaleric acid and diacetyl was evaluated with Headspace-gas chromatography/mass spectrometry. Isovaleric acid is known for a causative agent of foot malodor. Diacetyl has recently been identified as a middle-aged oily odor and has attracted attention as a new substance of human body odor.

2.3. Deodorant effect of $Mg(OH)_2$-treated microcrystalline cellulose in formulation (in vivo)

A roll-on of a natural deodorant gel containing 5% of $Mg(OH)_2$-treated microcrystalline cellulose was applied on armpit. The unpleasant odor was assessed by olfactory scoring from 0 (no odor) to 5 (very strong odor) on treated and non-treated armpits.

3. Results

3.1. Deodorant effect of $Mg(OH)_2$-treated powder

$Mg(OH)_2$ treatment gave deodorizing effect against isovaleric acid and diacetyl to these cosmetic powders (Fig. 1 and 2). It was also found that treating with $Mg(OH)_2$ enhanced the deodorant effect of diatomaceous earth and zinc oxide.

3.2. Deodororant effect of $Mg(OH)_2$-treated microcrystalline cellulose in formulation (in vivo)

A natural deodorant gel formulated $Mg(OH)_2$-treated microcrystalline cellulose suppressed axillary odor 24 hours after application(Fig 3).

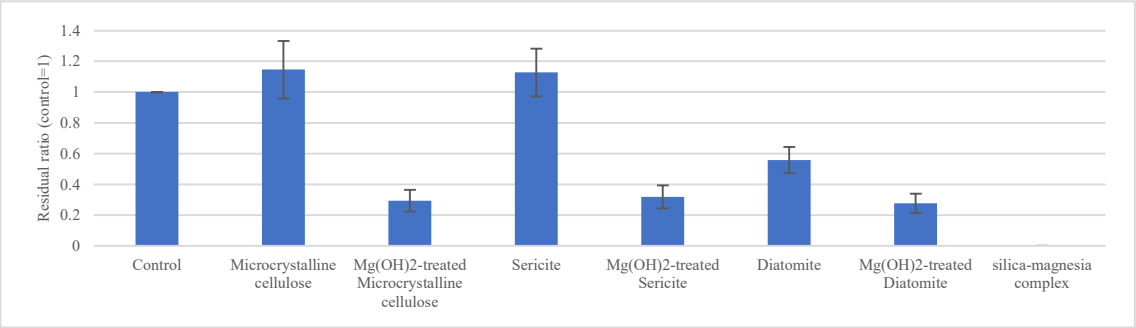

Figure 1. Residual ratio of isovaleric acid

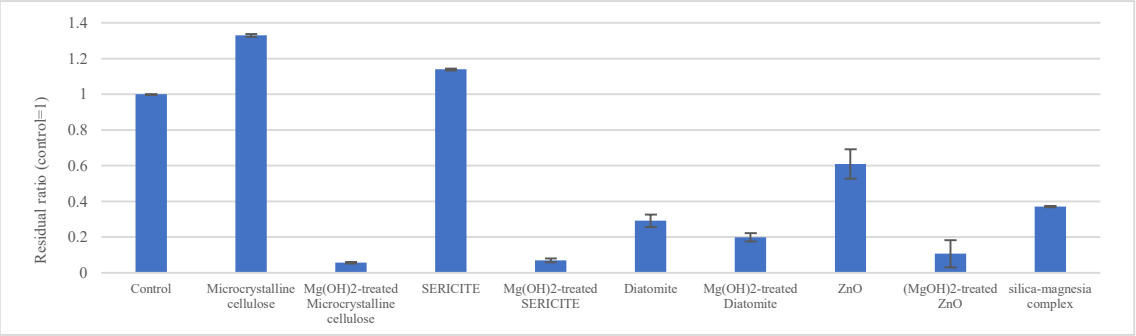

Figure 2. Residual ratio of diacetyl

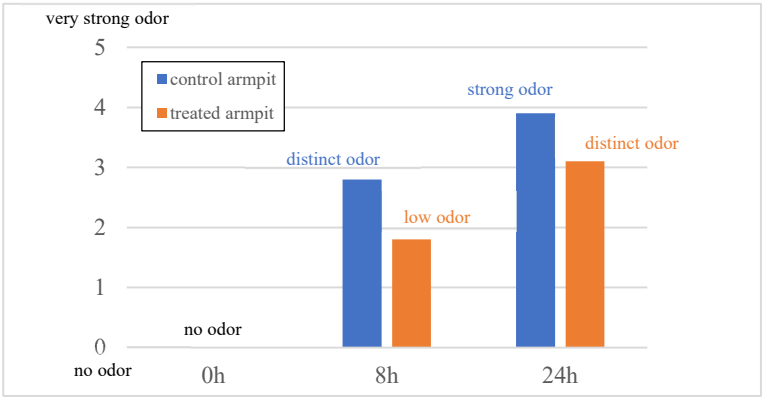

Figure 3. result of sniff test

4. Discussion and Conclusion

The new deodorant powders were developed by the technology of surface treatment with magnesium hydroxide. Since the technology can provide deodorant effect to various cosmetic powders, it can contribute to the development of various new deodorant products.