

HECTORITE, A NATURAL CLAY: FROM FORMULATION AND INSTRUMENTAL TESTS TO IN VIVO OIL AND SWEAT CONTROL EFFICIENT COSMETIC PRODUCTS

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Hectorite is a specific natural clay of smectite-type, with a strong exfoliation ability that, in aqueous media, leads to the formation of gels which present some interesting features for cosmetic products. Indeed, after application of hectorite gels onto the skin, the dry films can absorb sebum; they show long lasting mattifying efficacy in *in vitro* and *in vivo* instrumental tests. However, formulating hectorite, especially in presence of some particular ingredients (such as salts), remains a highly challenging task. This is the case for magnesium containing compounds (ex. MgO, Mg(OH)₂) known for their anti-bacterial and anti-odor efficacy.

Electrostatic interactions occur between negatively charged hectorite sheets and positively charged MgO particles when introduced in aqueous media. This leads to the formation of a network of interconnected particles and gives a kind of "attractive" gel. The gel contraction phenomenon leads to the syneresis. The resulting gels tend also to thicken and compact over time.

To overcome the formulation challenge and provide stable, safe and efficient cosmetic products for tests we investigated both the interactions between hectorite and magnesium salts and the influence of other raw materials commonly used in cosmetics. The modification of hectorite/MgO interactions may be an answer to this challenge. This can be done either by screening/distancing the charges of the hectorite and MgO particles (by use of glycols, polymers, etc.) or/and by delaying the hectorite/MgO interactions.

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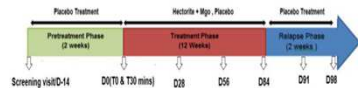
Performance evaluation methods for skin care products Instrumental In Vivo Study of Mattifying Efficacy

28 women with oily skin or combination skin on face

Mini-Areas protocol: 2 on forehead and 2 on cheeks

Light-Cam: Contrast Gloss: In grey levels, calculated for each area

Clinical study



156 subjects were included on mild (grade 2) to moderate acne (grade 3) severity without nodules on IGA scale from 0 to 4, according to the investigator with an oily skin type measured by sebum casual level on forehead >120 µg/cm².

Consumer study

30 women with mixed or oily skin used the investigated product (3% of hectorite + 0.9% of MgO + 3.7% of crystallized fatty compounds + 0.1% of polymer in water) instead of their own in the morning for 7 days.

Performance evaluation method for deo products

Learning-Use-Deprivation (LUD) - Pure Monadic Home use test

426 women, regular users of deodorant in stick or roll on, natural - seekers having a profile of « eco-friendly. Each woman tries 1 product (5% of hectorite + 2% of MgO + 20% propylene glycol in jar or 3% of hectorite + 2% of MgO + 20% propylene glycol + 3.5% crystallized fatty compounds in tube) during 2 weeks, and the usage period is divided in 3 steps.



At the 1st, the 3rd and the 5th application → Online interviews for Application assessment of the tested product.

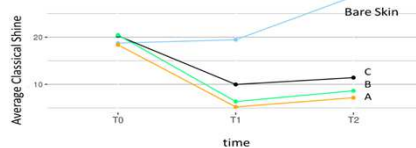
After 2 weeks of usage → Face to face interviews for Evaluation of the tested product.

1 week after stopping the product (deprivation) → Online interviews to Measure how much people miss the product.

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Instrumental In Vivo Study of Mattifying Efficacy

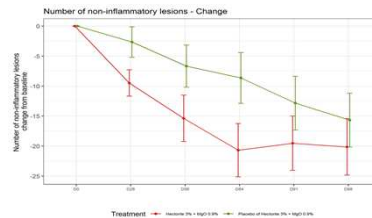
Skin shine evolution under hammam conditions



A: aqueous gel containing 5% of hectorite + 0.9% of MgO + 5% propylene glycol + polymer A
B: aqueous gel containing 5% of hectorite + 0.9% of MgO + polymer B
C: tech ref = aqueous gel containing 1% of ammonium polyacryloyldimethyl taurate + 2% of silica silylate

Clinical acne study

Comparison of Inflammatory lesions between 3% of hectorite + 0.9% of MgO and Placebo adjusted for baseline at D0



Consumer study

The formula leaves the long-lasting matte finish and the blurring effect. Consumers are impressed by the oil control provided by the product as well as its duration and find their pores to be less visible, making for an even complexion which lasts throughout the day. Over time they notice that the formula also tackles other deeper skin imperfections such as blemishes, spots, pores, and skin redness on top of superficial shine and oiliness.

LUD Test

Both tested products* are at parity on Global satisfaction & liking, versus Market Reference

"Effect against the odors" 36 vs 32%

"Efficacy against odor all day long" 21 vs 17%

...are superior on Deodorant & Humidity dimensions

"Protect against odor & perspiration" 71 vs 60%

"Anti-perspirant efficacy" 46 vs 33%

"Avoids feelings of underarm wetness during the day" 95 vs 87%

"Effective against underarm wetness" 93 vs 89%

...are superior on Care dimension

"Makes the skin under my arms softer to the touch" 77 vs 66%

"Takes care of the skin under your arms" (tendency)

"Gradually improves the quality of the skin under your arms in usage" (tendency)

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Modern consumers expect from cosmetics ever more benefits such as naturalness and new sensorial experience without any trade-off in performance. Cosmetics dedicated to oily skin should ensure long lasting oil and sweat control while long lasting wetness and odor protection are expected from deodorants.

In vivo efficacy of formulations based on hectorite/MgO association has been evidenced through different tests vs market products. Efficacy was also perceived by consumers when comparing tested product versus market references, highlighting that the hectorite/MgO association has high potential for cosmetic applications.