

Natural Resins for high mechanical resistant Cosmetic films

Angéline Roudot ¹, Lyubov Lukyanova ¹, Victoria Waltz ¹, Nathalie Guillier ¹, Odile Aubrun ¹, Ludovic Mineau ¹,
Vanessa Olszewski ¹, Julien Portal ¹, Jérôme Bonnard ¹, Aude Benard ¹, Claire Prudhon ², Sandrine Fernandes ²,
Christophe Mauduit ³, Alexis Dubuis ³

¹ L'Oréal Recherche et Innovation, Recherche Avancée,

² L'Oréal Recherche et Innovation, Lips Application Domain,

³ L'Oréal Recherche et Innovation, Analysis Department, France

angelina.roudot@loreal.com

All Day wear is a key expectation for make-up consumers, with only petrochemical solutions available today on the market, especially silicone-based ingredients like MQ resin and/or silicone film-formers. These materials bring to the formula deposit the required adhesion, cohesion, and chemical resistance (towards water, sebum, or olive oil), thus leading to the desired long lastingness.

In the context of a growing need for sustainability, it is crucial to build new Wear Performance Engines with bio-based ingredients for innovative natural makeup products offering long-lasting and comfort throughout the day.

In this study, we explored Natural Resins known for their protection, healing, and adhesion functions in Nature [1] [2] [3] [4], as well as their association with polysaccharides to create new hybrid materials for wear in Make-Up. We characterized the solubility, thermal behavior and mechanical properties of the different systems using Hansen Solubility Parameters measurements, DSC, DMA, rheology, fragmentation and friction tests.

We studied a large set of natural resins alone, such as Candelilla resin, Protium Heptaphyllum resin and Glyceryl Rosinate. Candelilla resin was then associated with Ethylcellulose in different ratio and solubilized in Ethanol/Isododecane mixes. The best associations were formulated with Red-7 pigments to build simplex liquid lipsticks.

A wide range of mechanical behaviors was obtained from highly cohesive and no adhesive deposits to no cohesive and highly adhesive deposits by varying Ethylcellulose/Candelilla Resin ratio from 100/0 to 0/100 (Figure 1). Friction resistance could also be tuned from mid to highly resistant. Optimum ratio of 50/50 was defined to get the right balance between adhesion and cohesion. The best associations were competitive with petrochemical references in terms of global wear results as demonstrated in vitro and in vivo in simplex liquid lipsticks formulas [5][6].

Keywords:

Natural resins, polysaccharides, mechanical resistance, cosmetic films, lipsticks

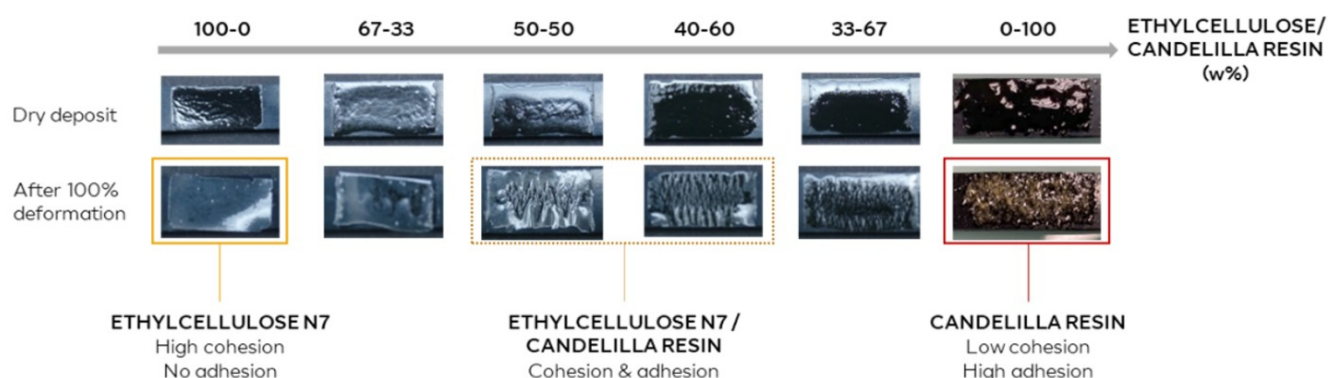


Figure 1 - Adhesion and cohesion balance of Ethylcellulose and Candelilla Resin mixes assessed by fragmentation after 100% deformation on an elastomeric substrate

References:

- [1] M. Sherriff, R. W. Knibbs, P. G. Langley. Journal of Applied Polymer Science vol. 17, pp. 3423-3438. 1973
- [2] D. Voigt, E. Gorb, S. Gorb. Journal of Experimental Biology, 212 (19), pp. 3184-3191. 2009
- [3] B. R. T. Simoneit, P.M. Medeiros, E. Wollenweber. Z. Naturforsch, 63 c, pp. 625-630. 2008
- [4] J. H. Langenheim. American Scientist, vol. 78 (1), pp. 16-24. 1990
- [5] WO2023118430A1: Cosmetic composition comprising a Natural Resin
- [6] WO2024008769A1: Cosmetic composition comprising a Natural Resin