



## Evaluation of the efficiency of the preservative system of a cosmetic emulsion after long term storage and consequences of sunlight on dehydroacetic acid degradation

Ségolène de VAUGELADE

EXPERTOX Laboratory, France

### Abstract:

The present work is devoted to the antimicrobial properties of cosmetic emulsion containing DHA as preservatives during 1 years aging stability test and the structural elucidation of by-products issued from the direct UV-visible irradiation of DHA. DHA and its salt (sodium dehydroacetate) are used as preservatives because of their antibacterial and antifungal activities. Dehydroacetic acid is listed in the International Codex Alimentarius Standard as a preservative. At the same time, DHA is used as cosmetics preservative limited at 0.6% in finished products. However, the behavior and the degradation of DHA are poorly studied in literature. Benassi et al. have studied dehydroacetic acid sodium salt Prevent (DHANA) stability in presence of other cosmetic preservatives. In 1995, Liu Hongfang has studied degradation of dehydroacetic acid as a food preservative. Photolysis experiments were performed with a Q-sun test chamber. Analyses were carried out using a gas chromatograph coupled with an ion trap mass spectrometer and by a high performance liquid chromatography coupled with ultrahigh resolution Fourier transform ion cyclotron resonance mass spectrometry (LC-UHRMS). Three photoproducts were detected by LC-MS while one photoproduct was detected by GC-MS. First photoproduct corresponds to an isomer of DHA while PP2-1 and PP2-2, two isomeric compounds, corresponding to MH<sup>+</sup>. Concerning the study of the antimicrobial effect of the emulsion during one year, the efficiency was evaluated by challenge test and quantification of the DHA at different time and different condition of storage. Results express that the decrease of preservative's concentration does not alter the effectiveness of DHA.



### Biography:

Dr DE VAUGELADE Ségolène has completed her graduate of biology engineering in 2014 from E.B.I. and has finished her PhD at the age of 27 years from Ecole Polytechnique. She is responsible of Research and Development service at EXPERTOX (Quality control laboratory of industrial product) in Paris. She has published more than 10 papers in international journals as first author or co-author.

### Publication of speakers:

1. De Vaugelade, Segolene & Taillandier, Celine & Thomas, Claire & Pirnay, Stéphane. (2018). Validation of analytical method for the quantitative determination of preservative acids allowed in Eco label cosmetic products. 4. 10.15406/mojt.2018.04.0011.
2. Charron, C & De Vaugelade, Segolene & Richard, F & Largitte, A & Pirnay, S. (2018). Optimization of the method of the content-containing interaction evaluation for cosmetic products by gas chromatography - mass spectrometry. International Journal of Cosmetic Science. 40. 10.1111/ics.12460.
3. De Vaugelade, Segolene & Nicol, Edith & Vujovic, Svetlana & Bourcier, Sophie & Pirnay, Stéphane & Bouchonnet, Stéphane. (2018). UV-visible phototransformation of dehydroacetic acid - Structural characterization of photoproducts and global ecotoxicity. Rapid Communications in Mass Spectrometry. 32. 10.1002/rcm.8104.

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