Author's Accepted Manuscript

www.elsevier.com/locate/talanta

Simultaneous determination of preservatives and synthetic dyes in cosmetics by single-step vortex extraction and clean-up followed by liquid chromatography coupled to tandem mass spectrometry

Eugenia Guerra, Gerardo Alvarez-Rivera, Maria Llompart, Carmen Garcia-Jares

PII: S0039-9140(18)30546-0
DOI: https://doi.org/10.1016/j.talanta.2018.05.054
Reference: TAL18695

To appear in: *Talanta*

Received date: 1 February 2018
Revised date: 14 May 2018
Accepted date: 15 May 2018

Cite this article as: Eugenia Guerra, Gerardo Alvarez-Rivera, Maria Llompart and Carmen Garcia-Jares, Simultaneous determination of preservatives and synthetic dyes in cosmetics by single-step vortex extraction and clean-up followed by liquid chromatography coupled to tandem mass spectrometry, *Talanta,* https://doi.org/10.1016/j.talanta.2018.05.054

Simultaneous determination of preservatives and synthetic dyes in cosmetics by single-step vortex extraction and clean-up followed by liquid chromatography coupled to tandem mass spectrometry

Eugenia Guerra, Gerardo Alvarez-Rivera, Maria Llompart, Carmen Garcia-Jares*

Laboratory of Research and Development of Analytical Solutions (LIDSA), Department of Analytical Chemistry, Nutrition and Food Science, Faculty of Chemistry, Universidade de Santiago de Compostela, E-15782, Santiago de Compostela, Spain.

*Corresponding author. Tel.: 34-881814394. E-mail: carmen.garcia.jares@usc.es

ABSTRACT

A simple methodology based on vortex extraction (VE) followed by liquid chromatography tandem mass spectrometry (LC-MS/MS) has been developed for the simultaneous analysis of 22 regulated preservatives and synthetic dyes in cosmetics. The extraction procedure was performed in an Eppendorf tube allowing both extraction and clean-up in a single step, reducing sample and reagents consumption, and resulting in an effective and quick extraction. The method exhibited good linearity ($R^2 \geq 0.9918$) and intra and inter-day precision (%RSD $\leq$ 13) with LOQs lower than 0.587 μg g^{-1} for preservatives and 3.437 μg g^{-1} for synthetic dyes. Quantitative recoveries were obtained at four concentration levels in the range 2-100 μg g^{-1} in the cosmetic matrices. The method was successfully applied to a broad range of cosmetics, including both leave-on and rinse-off products in which 13 of the target compounds could be quantified at concentrations ranging from 0.39 to 442 μg g^{-1} in the case of dyes, and from 1.89 to 1335 μg g^{-1} for the preservatives. It can be highlighted the presence of parabens in 24 out of the 35 analyzed samples at concentrations higher than 1000 μg g^{-1} in a toothpaste.

Keywords: dyes; preservatives; cosmetics; vortex extraction; LC-MS/MS

1. Introduction