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## **Fast determination of bronopol in cosmetic products by vortex-assisted emulsification extraction combined with liquid chromatography**

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Bronopol (2-bromo-2-nitropropane-1,3-diol) is an effective preservative employed in cosmetic formulations. However, under specific conditions, bronopol can decompose releasing low levels of formaldehyde and nitrites. These last compounds can react with any secondary amines or amides to produce significant levels of carcinogenic nitrosamines. The production of nitrosamines in cosmetic products has to be avoided. For this reason, although the use of bronopol is authorized in the current European Regulation, the maximum allowed concentration of bronopol in cosmetic products is 0.1%. Nevertheless, there is still no official method of analysis for the determination of this compound. The aim of this work is to propose a fast and simple analytical method to determine bronopol in cosmetic products. The proposed method is based on a vortex-assisted emulsification extraction, as one-step solution extraction process to prepare cosmetic samples, followed by liquid chromatography with spectrophotometric detection at 250 nm. The best results were achieved by using a C18 column at the following optimized conditions: Temperature, 40°C; Flow rate, 0.5 mL min<sup>-1</sup>; mobile phase, ethanol and a 1% acetic acid aqueous solution were used to perform the separation by elution gradient. Satisfactory results were obtained for the analysis of 19 cosmetic samples including creams, shampoos and bath gels, with good recoveries and repeatability. Limits of detection and quantification were at the low Bg mL<sup>-1</sup> levels. These good analytical features, as well as its environmentally-friendly characteristics, make the presented method suitable for the determination of bronopol in cosmetic products.

### **Biography**

Alberto Chisvert has completed BSc from Faculty of Chemistry, University of Valencia, in 1999; PhD from Department of Analytical Chemistry, University of Valencia, in 2003. He is Associate Professor of the Department of Analytical Chemistry of University of Valencia. At present, he has published more than 60 articles in reputed journals, and more than 10 book chapters. Moreover, he is the Co-Editor of the book *Analysis of Cosmetic Products* (Elsevier, 2007). He is Editorial Board Member of *Advances in Analytical Chemistry*, *American Journal of Analytical Chemistry*, *Chromatography Research International*, *International Journal of Analytical Chemistry* and *Journal of Trace Analysis in Food and Drugs*, and is a regular Reviewer of more than 27 journals. His research areas are focused on both liquid and gas chromatography coupled to mass-spectrometry, liquid- and solid-phase micro-extraction, in bio-analysis and cosmetic, pharmaceutical and environmental analysis.

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