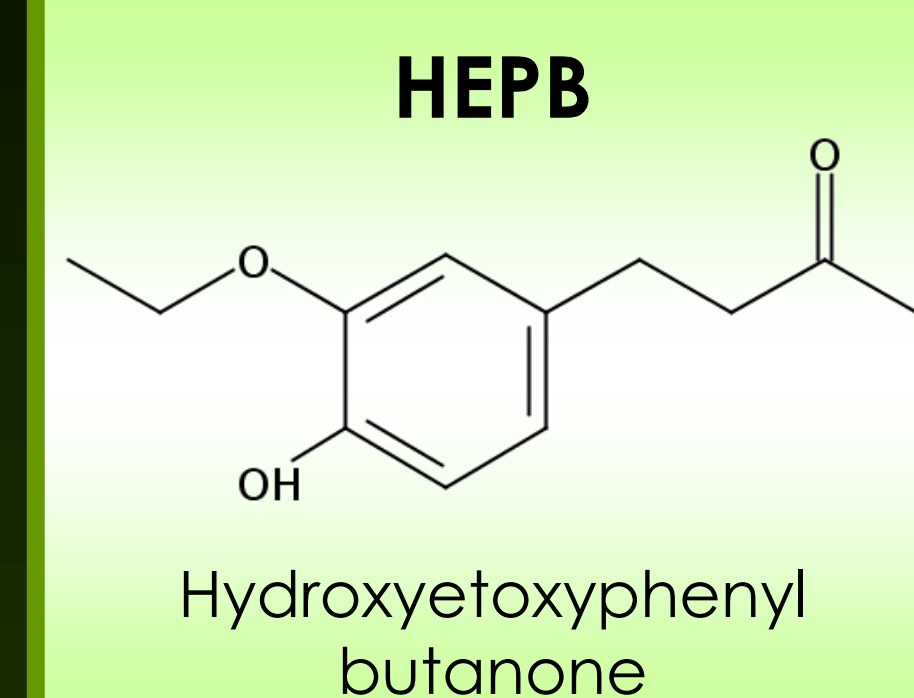


INTRODUCTION

Hydroxyethoxyphenyl butanone (HEPB) is a skin conditioning used as **alternative preservative** in cosmetics

- HEPB is not regulated yet by the current *European Regulation on Cosmetic Products*
- However, according to the *Scientific Committee on Consumer Safety*, only a **maximum concentration of 0.7 %** can be considered safe due to potential toxicity for repeated exposure
- There are no published or official methods to quantify HEPB in cosmetic samples

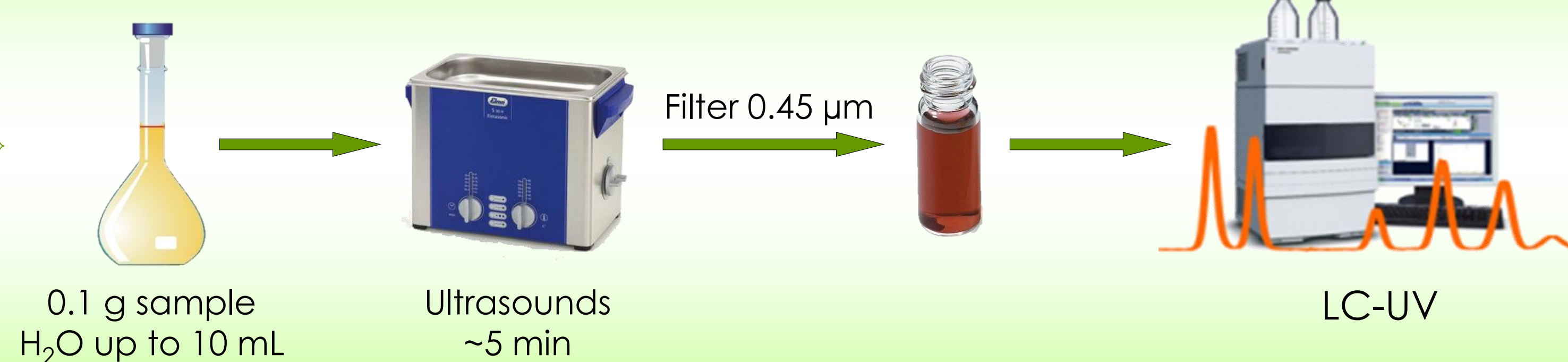


The **aim** of this work is to develop and validate an accurate and fast analytical method to determine HEPB in different types of cosmetic products, with good analytical features and environmentally-friendly characteristics [1]

EXPERIMENTAL

✓ Ultrasound-assisted lixiviation

- Fast and simple procedure
- Only water is used as solvent
- Working range: 1 – 100 $\mu\text{g mL}^{-1}$



LC-UV Conditions

- Injection volume: 20 μL
- Column: LiChrospher® 100 RP-18 (250x4 mm, 5 μm)
- Column temperature: 35 $^{\circ}\text{C}$
- Mobile phase: EtOH : 1 % AcOH solution (23:77)
- Flow rate: 0.8 mL min^{-1}
- Detection wavelength: 279 nm

RESULTS AND DISCUSSION

Analytical features of the proposed method

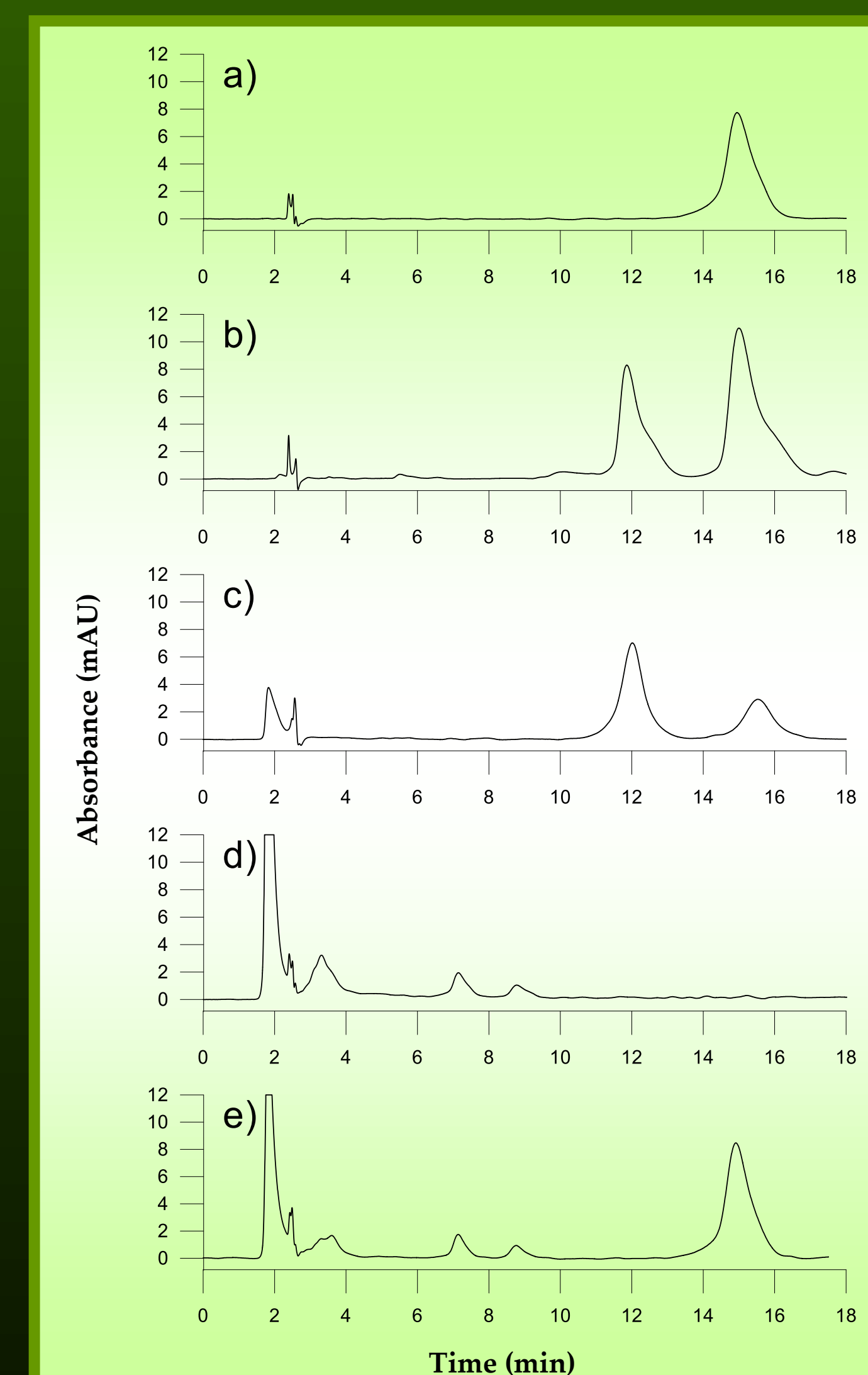
- ✓ High level of **linearity** ($R^2 > 0.9997$) at least to 100 $\mu\text{g mL}^{-1}$
- ✓ **Limit of detection** (3 S/N): 0.3 $\mu\text{g mL}^{-1}$ (30 $\mu\text{g g}^{-1}$ in sample)
Limit of quantification (10 S/N): 0.9 $\mu\text{g mL}^{-1}$ (90 $\mu\text{g g}^{-1}$ in sample)
- ✓ **Intra-day and inter-day repeatability**, expressed as RSD (%):
 - 2.5 and 1.2 % at 5 $\mu\text{g mL}^{-1}$
 - 0.2 and 1.2 % at 25 $\mu\text{g mL}^{-1}$
 - 0.9 and 4.7 % at 50 $\mu\text{g mL}^{-1}$
- ✓ **Relative error** below 5.6 % in the analysis of a laboratory-made cosmetic cream sample
- ✓ Quantitative **recovery values**, 86 – 103 %, in the analysis of spiked samples

PRECISION

ACCURACY

Analysis of commercial cosmetic samples

- ✓ The proposed method was satisfactorily applied to **7 commercial cosmetic samples**
- ✓ **Different types of cosmetics:**
 - 2 liquid hand soaps
 - 2 sunscreens
 - 1 shampoo
 - 1 moisturizing cream
 - 1 make-up
- ✓ HEPB was found in the moisturizing cream (0.083 ± 0.002 % w/w) according to its label.



Cromatograms obtained applying the proposed LC-UV method to: a) standard solution (25 $\mu\text{g mL}^{-1}$), b) laboratory-made cream, c) moisturizing cream, d) sunscreen, e) sunscreen spiked with HEPB (25 $\mu\text{g mL}^{-1}$).

Conclusions



The method is rapid and provides a good analytical performance, allowing the quality control of cosmetic products containing HEPB as alternative preservative agent.

The method is in accordance with the principles of the so-called Green Analytical Chemistry, as it is harmless to the operator and the environment.



Consulta otras comunicaciones presentadas por el GICAPC en la **XXII Reunión de la Sociedad Española de Química Analítica:**

Determination of nitro musks in environmental waters by stir bar sorptive dispersive microextraction followed by thermal desorption-gas chromatography-mass spectrometry. J.L. Benedé, A. Chisvert, A. Salvador. **Flash Communication.** [Ver comunicación.](#)

Stir bar sorptive-dispersive microextraction mediated by a magnetic nanoparticles-metal organic framework composite for the determination of n-nitrosamines in cosmetic products. P. Miralles, I. Van Gemert, A. Chisvert, A. Salvador. **Flash Communication.** [Ver comunicación.](#)

Development of an analytical method for the determination of acrylamide in cosmetic products based on dispersive liquid-liquid microextraction. L. Schettino, J.L. Benedé, A. Chisvert, A. Salvador. **Flash Communication.** [Ver comunicación.](#)

Determination of hydroxylated ingredients with preservative activity in cosmetic products by gas chromatography-mass spectrometry. C. Azorín, J.L. Benedé, A. Chisvert, A. Salvador. [Ver comunicación.](#)

A green analytical method for the determination of hydroxyethoxyphenyl butanone in cosmetic products. P. Miralles, J.L. Benedé, A. Mata-Martín, A. Chisvert, A. Salvador. [Ver comunicación.](#)

Determination of polycyclic aromatic hydrocarbons in cosmetics by stir bar sorptive dispersive microextraction and gas chromatography-mass spectrometry. Váñez-Gomis, J. Grau, J.L. Benedé, A. Chisvert, A. Salvador. [Ver comunicación.](#)

Reversed-phase dispersive liquid-liquid microextraction prior to liquid chromatography-tandem mass spectrometry for the determination of acrylamide in cosmetic products. L. Fernández, J.L. Benedé, A. Chisvert, A. Salvador. [Ver comunicación.](#)

Development of dispersive liquid-solid microextraction: application to the determination of cortisone and cortisol in human saliva. J. Grau, J.L. Benedé, A. Chisvert, A. Salvador. [Ver comunicación.](#)