

# Quantification of preservatives in cosmetic products by HPLC

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## Introduction

Johnson&Johnson is an American multinational medical device, pharmaceutical and cosmetic manufacturer. These products are used by many people, which is why quality is a very important factor.

Before being commercialized, the last step for a cosmetic product is quality control. To make sure that a product complies with norms, physical and chemical analyses are made. For example, the physical ones can be pH measurement or checking the aspect. The chemical analyses are mainly quantitative determination of compounds, like sun filters or preservative mixtures by HPLC (High-Performance Liquid Chromatography) or GC (Gas Chromatography). In this article, four compounds are quantified by HPLC: phenoxyethanol, ethylparaben (PHBE), methylparaben (PHBM) and propylparaben (PHBP). This method has been validated for many formulas and it is used to quantify different products in the same analysis.

## Material and Method

The method uses an external calibration with a 4 level linear regression. The standard and sample solutions were prepared in methanol because parabens are insoluble in water. Two standard solutions were prepared and diluted to obtain the four working standard solutions. Then, the solutions were filtered and injected to obtain the chromatograms (see figure 1).

The operating conditions are:

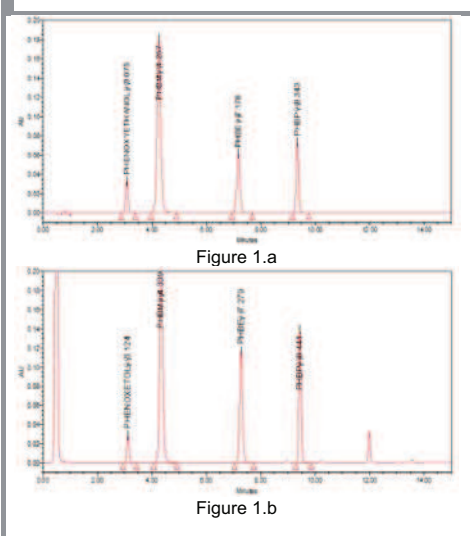
- Column: lichrospher 60 RP select B
- Length: 125 mm
- Internal diameter: 4 mm
- Particle diameter: 5  $\mu$ m
- Detection wavelength: 254 nm
- Flow rate: 1.5mL/min
- Injection volume: 10  $\mu$ L

See table 1 for the gradient elution used, with water (A) and acetonitrile (B).

| Time (min) | %A | %B |
|------------|----|----|
| 0          | 75 | 25 |
| 4          | 75 | 25 |
| 20         | 10 | 90 |
| 35         | 10 | 90 |
| 40         | 75 | 25 |
| 50         | 75 | 25 |

Table 1: Description of the gradient elution.

Figure 1: Typical standard (a) and sample (b) chromatograms.



## Results and discussion

As shown on figure 1, we obtain four peaks, one for each compound. The peak areas of the four standard chromatograms are used to make a calibration curve. Then, this curve is used to quantify the parabens in the sample.

The results have to be within a range of values given in the product specifications. These are produced by the R&D department who collect all the information about the product.

## Conclusion

To conclude, our results show that this routine method is efficient but it would be better if some parameters were changed, such as the column in order to reduce the analytical time.