

Identification and quantification of preservative chemicals in common household products

Session 2

By completing the Session 2 pre-laboratory exercise, you should have found detailed information about the use of parabens as chemical (EU) regulations concerning the use of parabens in cosmetic formulations.

The overall aim of the study is to determine whether manufacturers are compliant with these regulations.

In order to achieve this aim, you will need to design and implement an experimental procedure which will allow you to identify and quantify the parabens present in the product that you have decided to investigate.

Several products will be made available to you during the session, but you might choose to use a product that you regularly use yourself. (Shampoo is a good example).

Using the information obtained from the Session 2 pre-laboratory exercise, discuss the aims of the experiment and suggest some methods that should enable you to achieve these aims. You will have **20 minutes** to do this.

When designing your method, you should consider the following:

- The experimental procedure: it should be simple, rapid and must address the aim of the session.
- Some/all of the glassware and solvents available to you (A list of the equipment/glassware available to you is provided)
- The analytical procedure template provided.
- The collation of relevant data. You will need to record all relevant results and observations in order to evaluate the success of the procedure.

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List of available equipment for Session 2 (various sizes)

Glassware

Beakers
Measuring cylinders
Volumetric flasks
Pipettes
Separating funnels
Funnels
Glass vials
Pasteur pipettes

Solvents, Chemicals

Hexane
Dichloromethane
Methanol
Ethyl Acetate
Acetic acid
Acetonitrile
MTBSTFA-TBDMSCL (derivatising reagent for $-\text{CO}_2\text{H}$)

General laboratory equipment

Rotary evaporator
Fume cupboard
Evaporating unit
Analytical balance

Analytical equipment/consumables

Silica
GC system equipped either with a Flame Ionisation Detector or a Mass Spectrometer

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Procedure

Step 1 - Product

Weigh an aliquot of the product you want to analyse (e.g. shampoo)



Step 2 - Standards

Determine the nature of any standards to be used



Step 3 - Extraction

Determine if you need to extract parabens from your product prior to analysis



Step 4 - Purification

Determine if you need to purify your extract prior to analysis



Step 5 - Analysis

Determine which equipment you will use for the analysis of your product/extract

Points to take into consideration

- How much product is necessary ?
- Which equipment / glassware will I need to use ?
- How accurately should I weigh my product ?

- Do I need any paraben standards ?
- Do I need an Internal Standard?
- What quantities of standards will I need ?

- Is an extraction step required ?
- What extraction step might be useful ?
- Which equipment / glassware will I need to use?

- Do I need to purify my extract?
- Which purification technique can I use?
- Which equipment / glassware will I need to use?

- What equipment / instrumentation is available for use ?

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