

Identification and quantification of preservative chemicals in common household products

Session 2 Post-laboratory Exercise

By the end of Session 2, you should have analysed your standards and extract using HPLC and obtained chromatograms for each of these.

Analysis of HPLC chromatograms

Using the chromatograms obtained during Session 2, complete Tables 1 and 2. Use the retention times (Table 1) and the information provided in Session 1 to identify each paraben standard.

Table 1: Standards

Group	(Paraben) Peak no. (concentration)	Retention time	Peak area
	1 ($1 \mu\text{g mL}^{-1}$)		
	2 ($1 \mu\text{g mL}^{-1}$)		
	3 ($1 \mu\text{g mL}^{-1}$)		
	4 ($1 \mu\text{g mL}^{-1}$)		
	1 ($5 \mu\text{g mL}^{-1}$)		
	2 ($5 \mu\text{g mL}^{-1}$)		
	3 ($5 \mu\text{g mL}^{-1}$)		
	4 ($5 \mu\text{g mL}^{-1}$)		
	1 ($10 \mu\text{g mL}^{-1}$)		
	2 ($10 \mu\text{g mL}^{-1}$)		
	3 ($10 \mu\text{g mL}^{-1}$)		
	4 ($10 \mu\text{g mL}^{-1}$)		

Table 2: Product

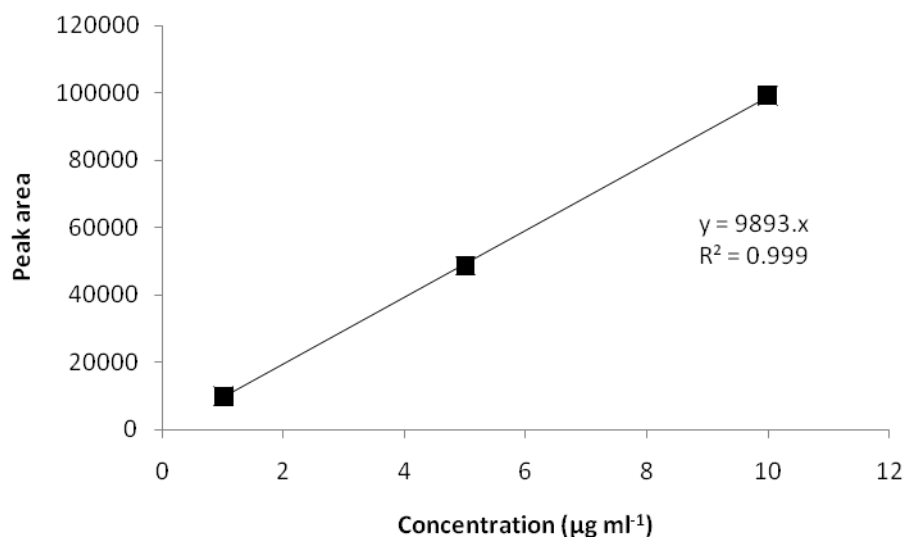
Group	Product identification	Paraben	Retention time	Peak area
		A		
		B		
		C		

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For each standard, plot your data (Table 1) to show the relationship between peak area and paraben concentration (this should be linear). For each standard, determine the line-of-best-fit and the correlation coefficient (r^2).

Example

Standard	concentration	Peak area
Methyl paraben	1 $\mu\text{g mL}^{-1}$	9860
Methyl paraben	5 $\mu\text{g mL}^{-1}$	48750
Methyl paraben	10 $\mu\text{g mL}^{-1}$	99300

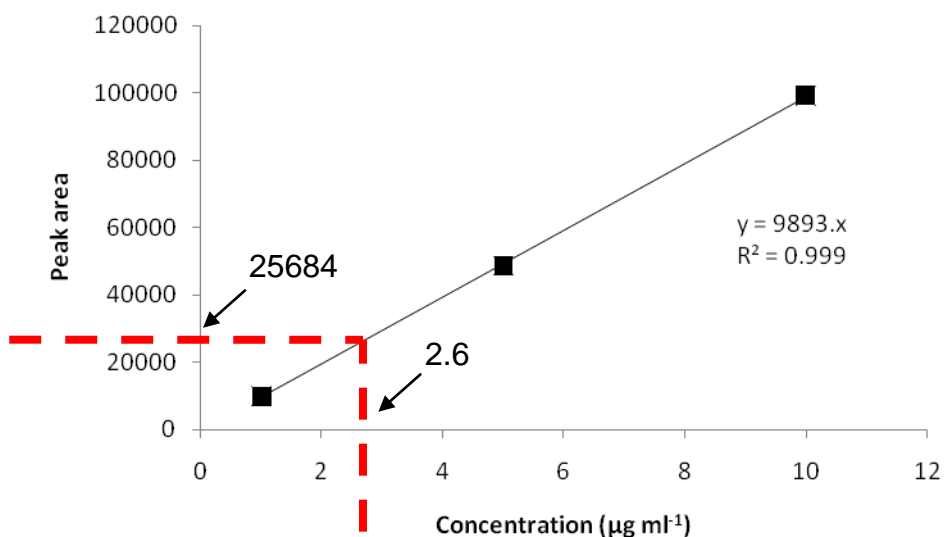


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Identify the parabens present in your extract and calculate their concentrations using the calibration plots.

Example

Product identification	Chemical	Retention time	Peak area	concentration
<i>Methyl paraben</i>	A	X min	25684	$2.6 \mu\text{g mL}^{-1}$



You should now be in a position to assess whether the product you have decided to investigate complies with the 76/768/EEC council directive relating to the use of preservatives in cosmetic products.

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Session 3 Post Laboratory Exercise – Final Report

During this investigation, you have been able to design and carry out some experiments that have enabled you to determine the paraben composition of a common household product. You should therefore be in a position to assess whether the product you have decided to investigate complies with the 76/768/EEC council directive relating to the use of preservatives in cosmetic products.

Using all the information obtained from your laboratory work, together with that found through the pre- and post-laboratory exercises, write a 4-page word-processed report using the report template provided.

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