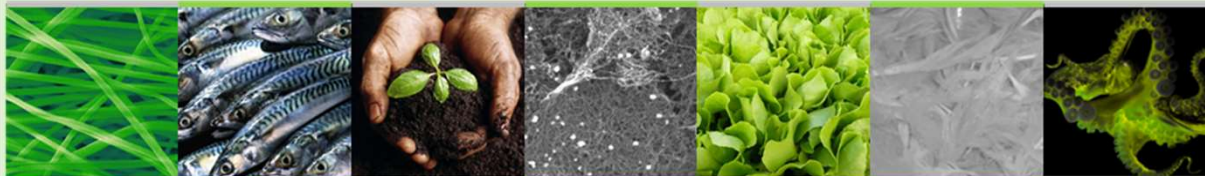


A METHODOLOGY FOR PEROXIDES EVALUATION IN COSMETIC CREAMS: A GREENER APPROACH

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OBJECTIVE

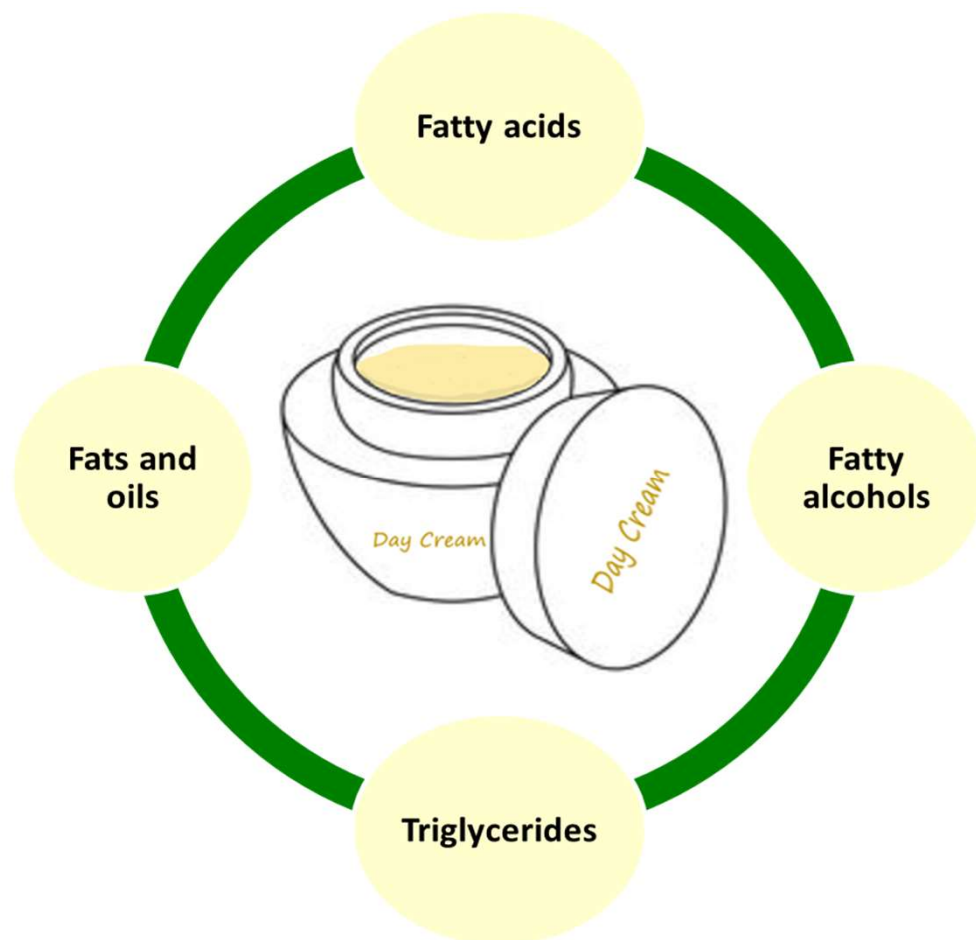
1. Evaluate alternatives for the quantification of the Peroxide Value (PV) in cosmetic creams

- Iodometric method
- International Dairy Federation (IDF) method

2. Evaluation of possible substitute solvent, less harmful than chloroform, used for extracting lipids from the creams.



INTRODUCTION



70% of the raw materials in cosmetics

Lipids

- Plant oils, fatty acids and alcohols, among others)

Derivatives of lipids

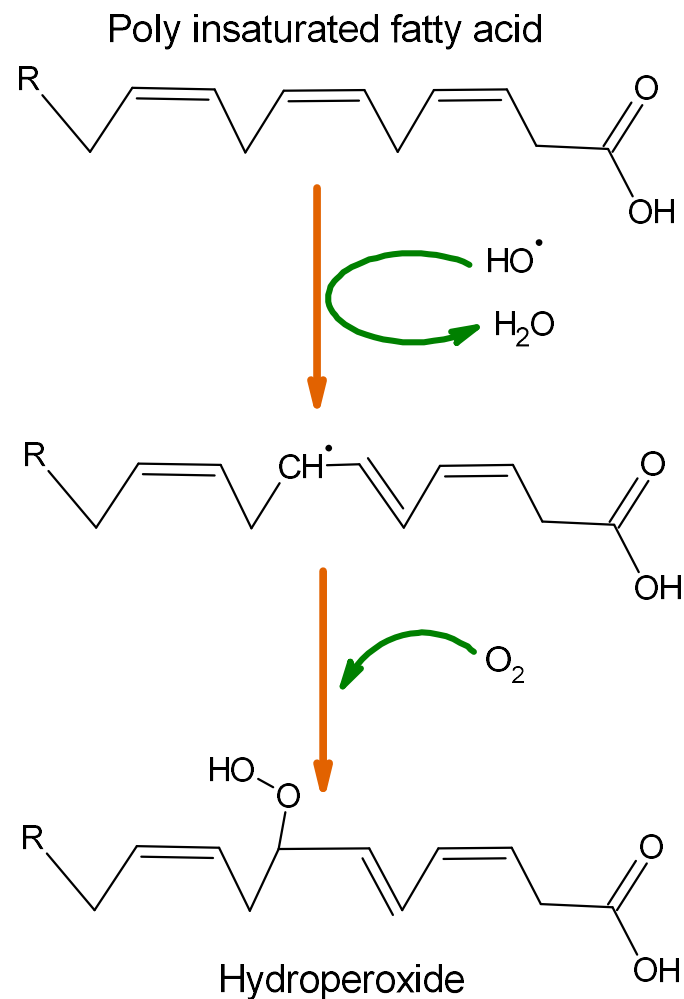
- Emollients, emulsifiers



INTRODUCTION

High-fat content products suffers lipid oxidation causing:

- Formation of hydroperoxides
- Changes in odor
- Deterioration processes that affect product quality and safety





SAMPLE PREPARATION

Cream



Chloroform

Hexane

Isooctane

Isopropanol



Cream solution

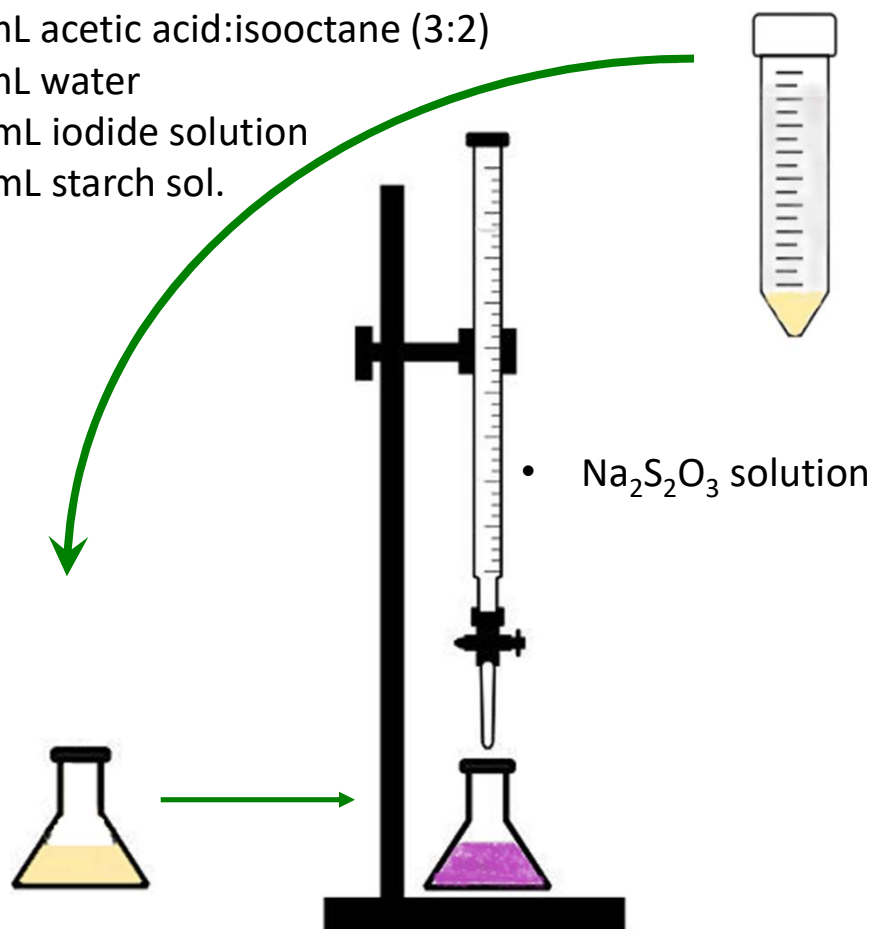


Hexane and Isooctane did not dissolve the sample
Chloroform and isopropanol dissolve the sample

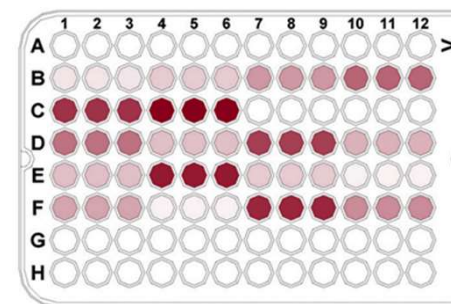
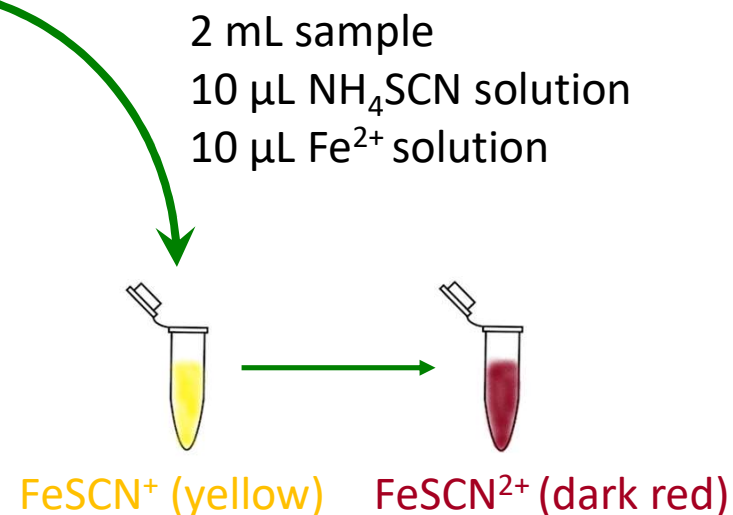
Less toxic isopropanol was chosen to prepare the samples

PEROXIDE VALUE (PV) DETERMINATION

- 5 mL sample
- 25 mL acetic acid:isooctane (3:2)
- 15 mL water
- 0.5 mL iodide solution
- 0.5 mL starch sol.



Iodometric (wet titration) method



IDF method



RESULTS

Table 1. PV values in different creams in mEqO₂/Kg

Samples	Iodometric method	Modified IDF method
Cream 1	9.07 ± 0.91	9.66 ± 0.04
Cream 2	8.60 ± 0.87	6.79 ± 0.27
Cream 3	13.3 ± 1.2	13.3 ± 1.7
Cream 4	11.4 ± 1.1	10.4 ± 0.1



METHOD COMPARISON

Iodometric method

- Time consuming
- Low sample throughput
- Per titration produces at least 50 mL of residues
- Use of organic solvents
- Titration of 50 samples in 18 h

Modified IDF method

- Fast
- High sample throughput
- Produces less than 2.5 mL per sample
- No organic solvents
- With microplates 50 samples in 4 h.



CONCLUSION

Iodometric method has disadvantages in meeting an increasing demand for rapid, clean, and cost-effective PV measurements.

To dissolve the samples and extract the fats, less toxic solvents were used instead of chloroform.

There are alternative and greener analytical methods capable of replacing the standard titration procedure currently in use for determining PV in creams.

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