

ANALYTICAL CHARACTERIZATION OF AN HANDMADE COSMETIC PRODUCT

Antonino Biagio Carbonaro¹, Ivan Pizzileo¹, Valentina Greco¹ and Alessandro Giuffrida¹

¹ Department of Chemical Sciences, University of Catania, Via Andrea Doria 6, 95125, Catania

e-mail:antonino.carbonaro@phd.unict.it

ABSTRACT

According to "Regulation (CE) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 on cosmetic products", cosmetic products, which may include creams, emulsions, lotions etc., should be safe under normal conditions of use.

The aim of the work was to analyze an homemade cosmetic sample from a seizure carried out by the Syracuse Public Prosecutor's Office after several reports of violent allergic reactions after its use. The material was contained in a transparent plastic vial with a screw-on spray cap without information about the composition. The substance had a gelatinous appearance, with an intense red color. After an initial clean-up, mass spectrometry, uv spectroscopy and fluorescence spectroscopy analysis were performed on the various fractions in order to determine the individual components semi-quantitatively.

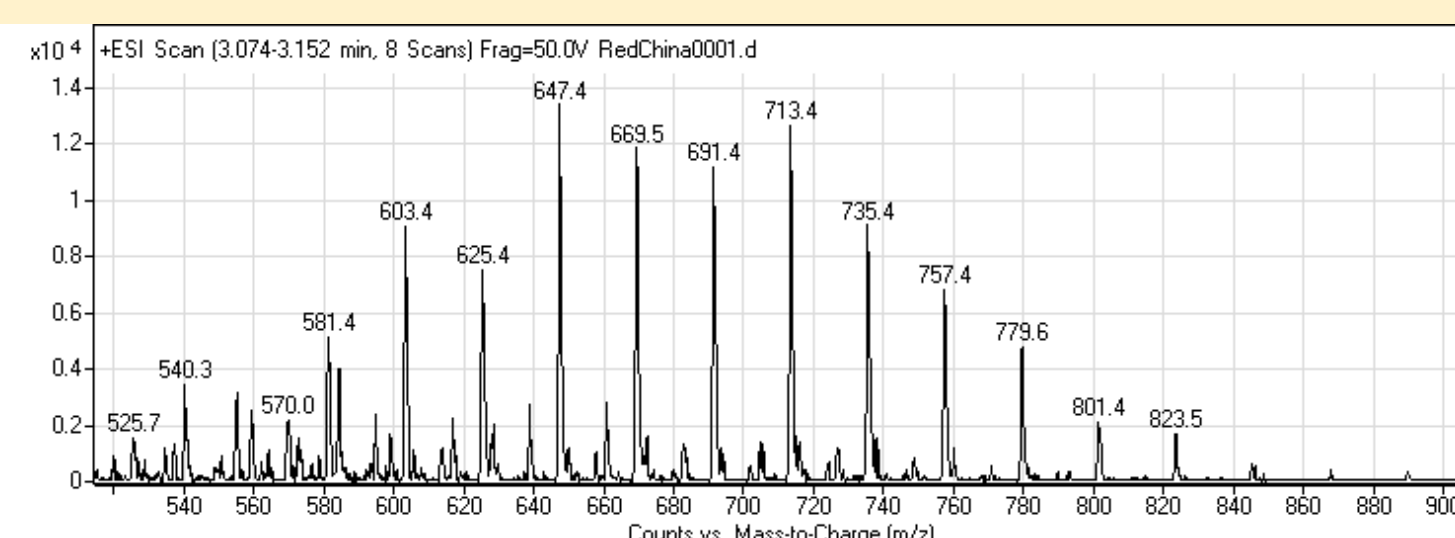
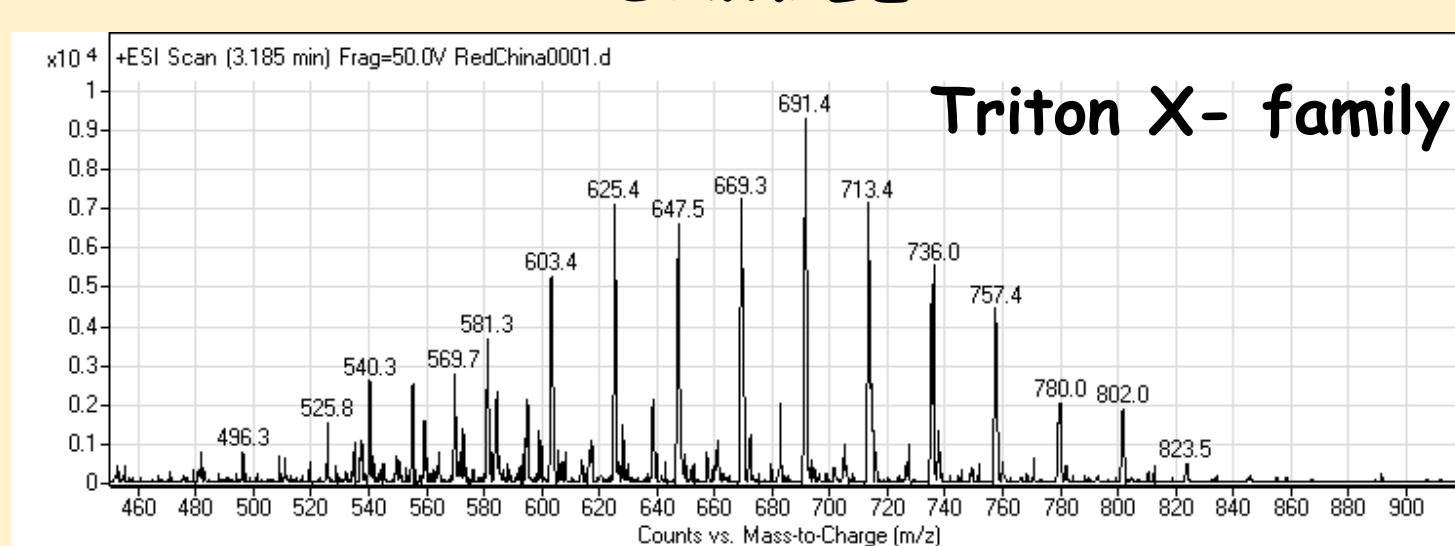
METHODS



1

Raw sample dilution 1:50 v/v

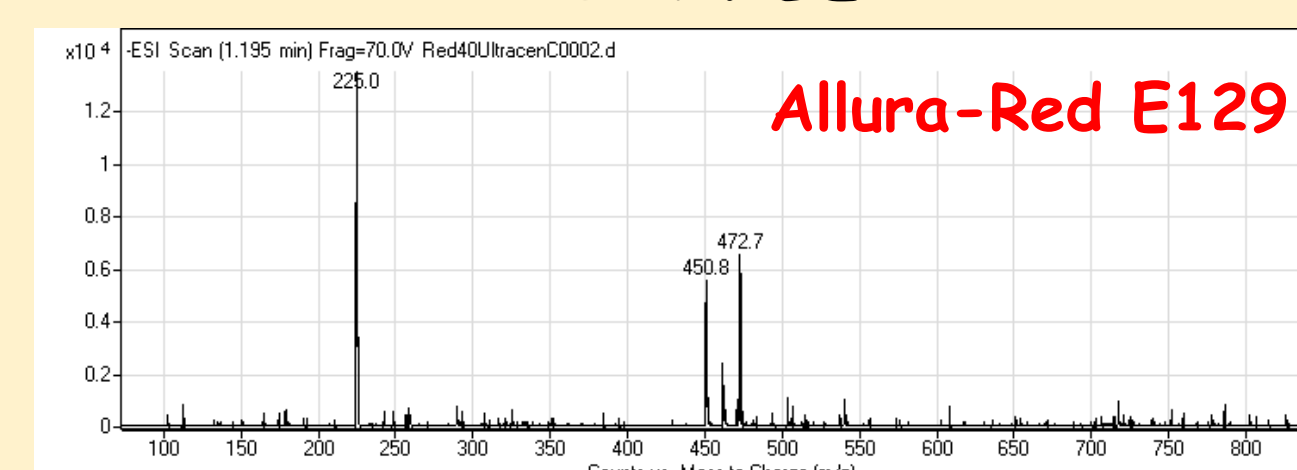
LC-ESI-MS (+) ON THE RAW SAMPLE.



2

Tangential ultrafiltration

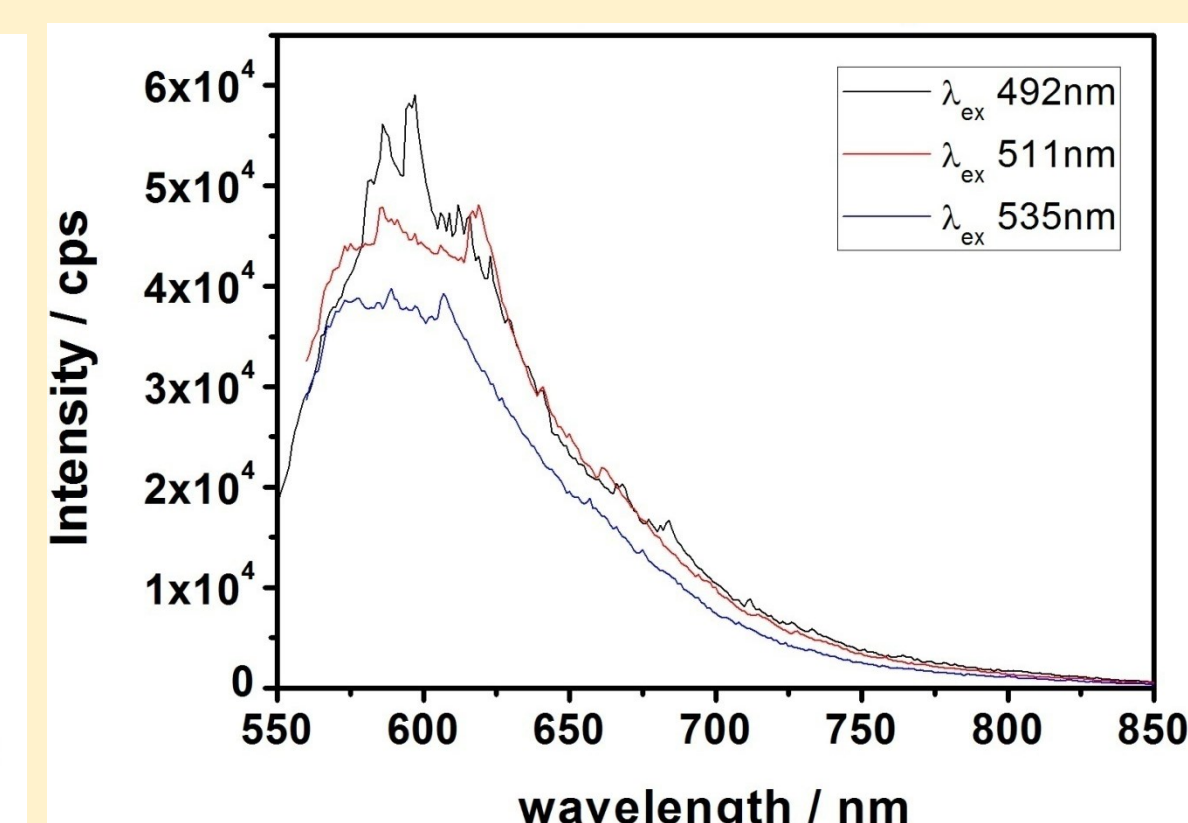
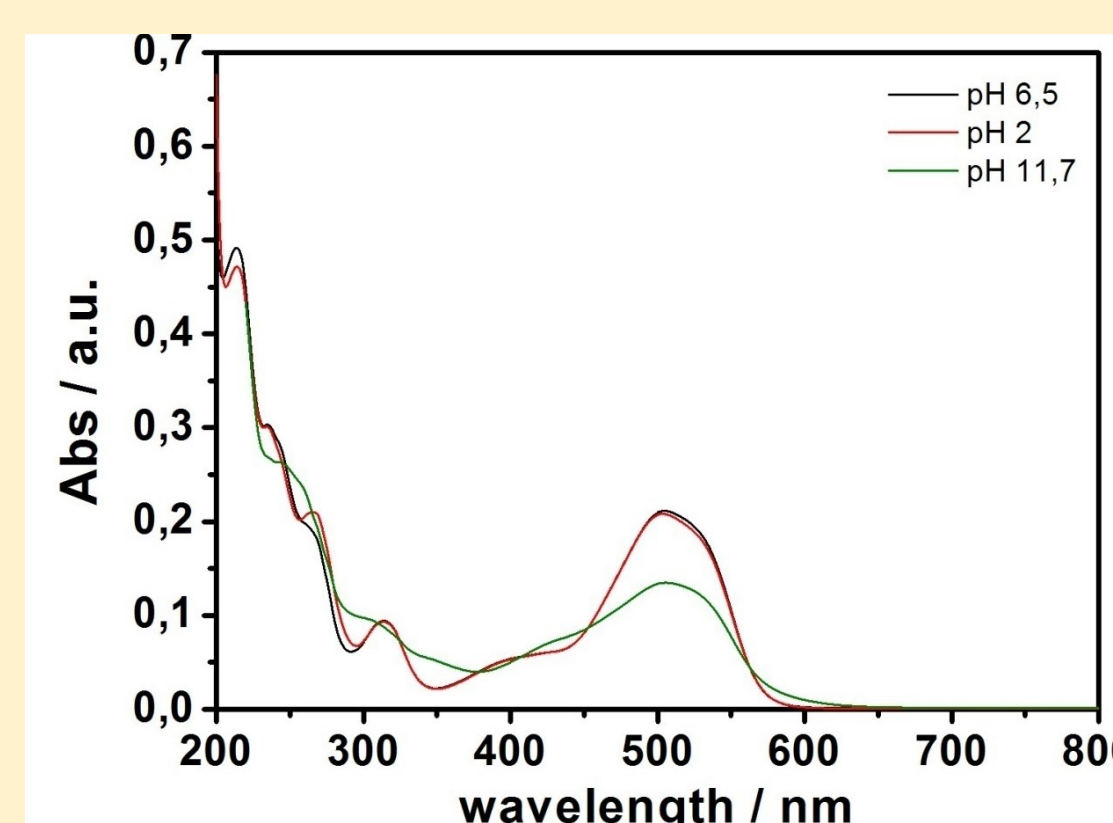
LC-ESI-MS (-) ON THE ENRICHED SAMPLE



Semi-quantitative step

3

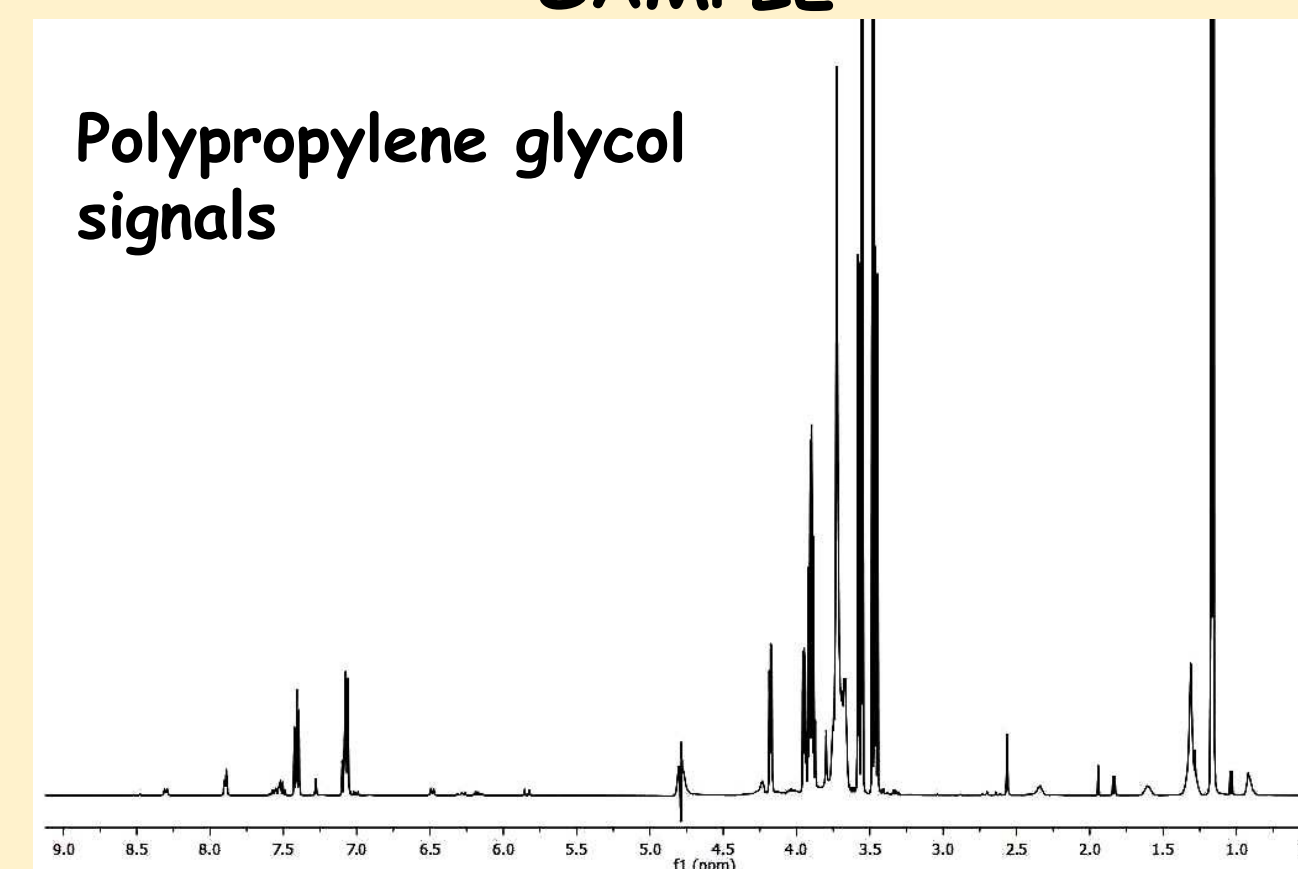
UV-VIS AND FLUORESCENCE SPECTROSCOPY ON THE RAW SAMPLE



5

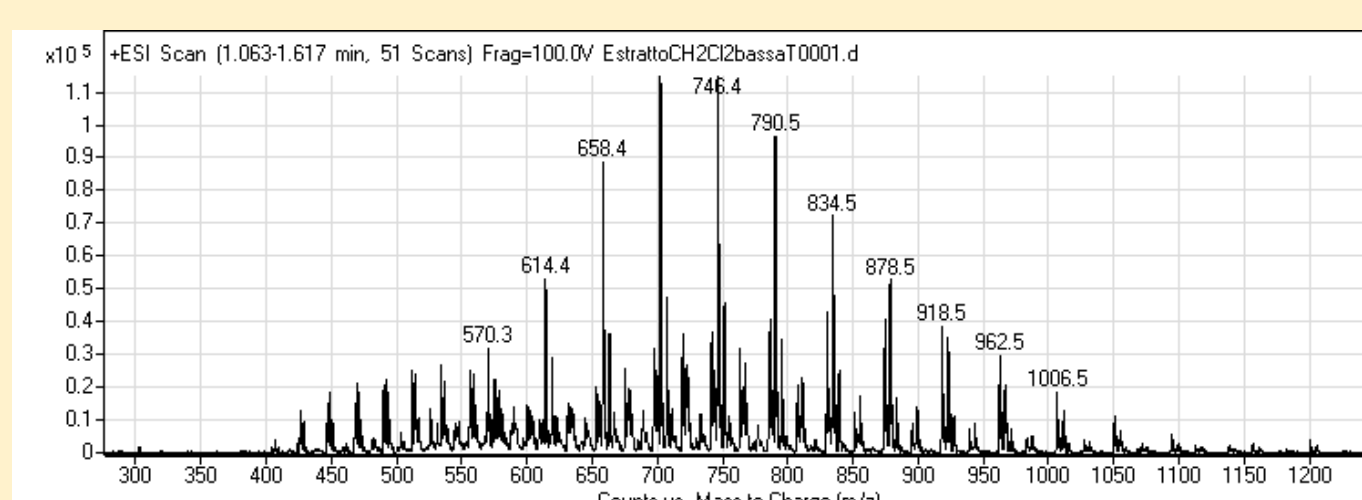
1H-NMR ANALYSIS ON THE RAW SAMPLE

Polypropylene glycol signals

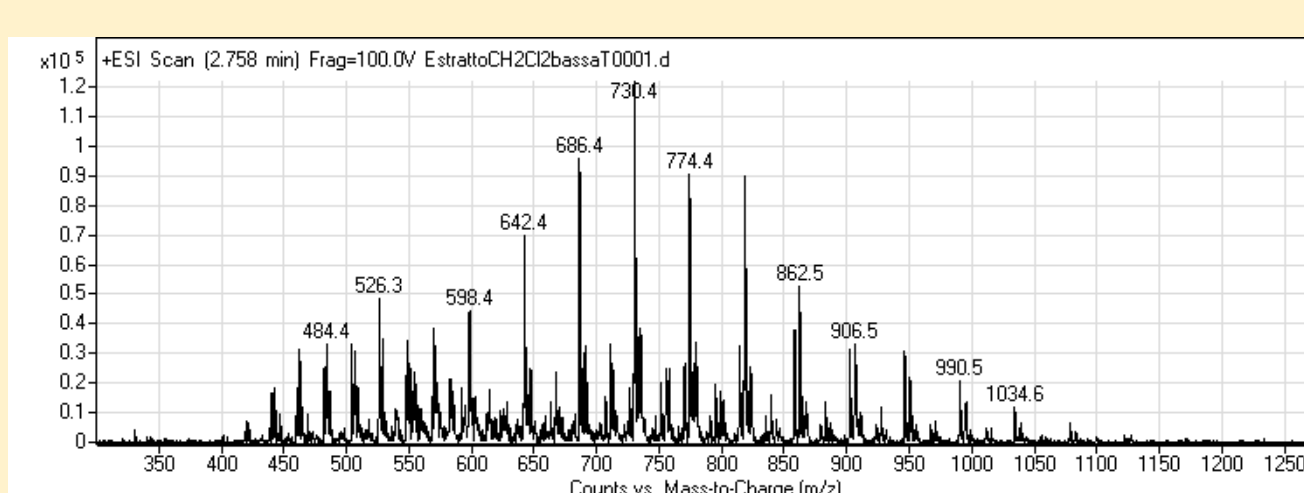
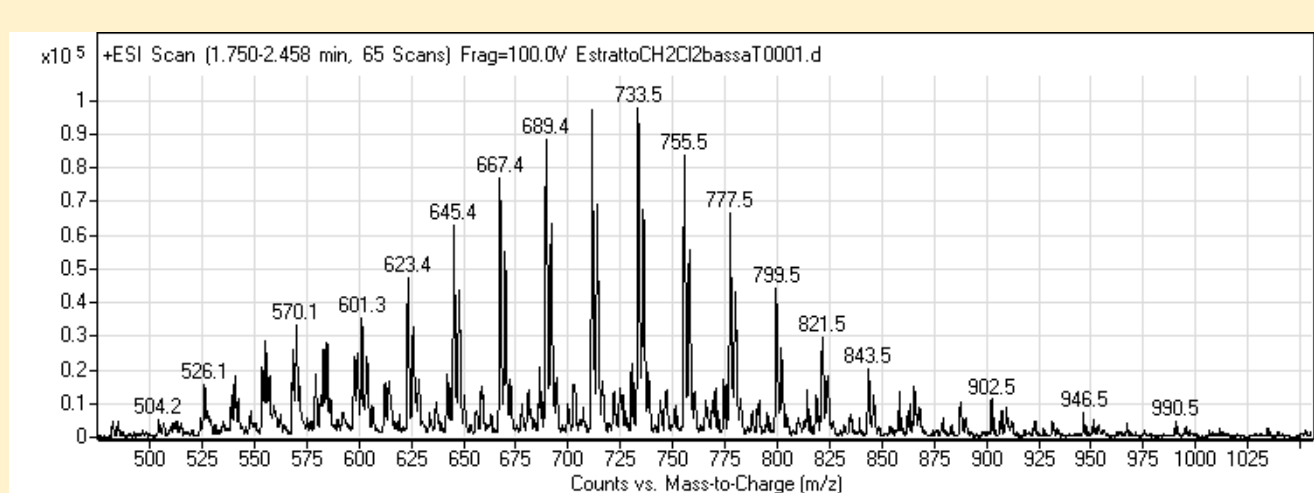


4

LC-ESI-MS (+) ON DICHLOROMETHANE EXTRACT

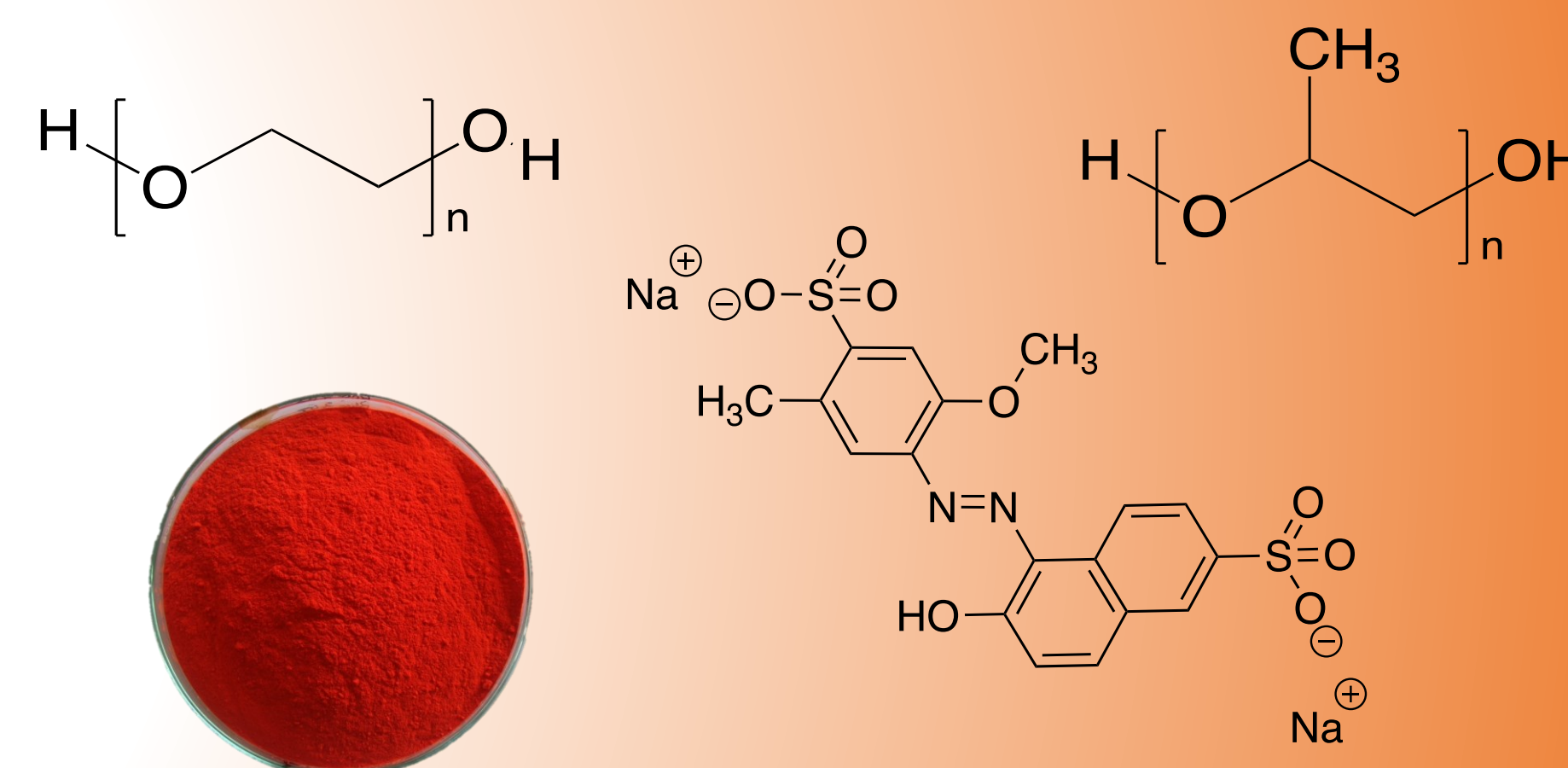


Polyethylene glycol evidence



RESULTS AND DISCUSSION

From the analysis carried out, the sample was found to consist of an aqueous solution of **Polypropylene glycol**, which represents approximately 90% of the organic constituents present in the sample, while the remaining 10% contained non-ionic surfactants such as **TritonX-100**, **Triton X-101 Reduced** and other minor constituents whose molecular structure is largely made up of **polyethylene glycol** polymer chains. The red colour of the sample is due to the presence of the azo dye **Allura Red (E129)**, the concentration of which was found to be **5.45 g/L**.



REFERENCES

- Varray, S. & Aubagnac, J.-L & Lamaty, F. & Lazaro, R. & Martinez, Jean & Enjalbal, C. *Analisis*. 28. 263-268, 2000
- R. Chib et al. *Meas. Sci. Technol.* 27, 2016.