

A colorful new morning - teaching applied chemistry in pandemic times

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Colour is one of the most effective stimuli to capture the attention and elicit the fantasy of learners, and this is especially true for those who are not primarily interested in “hard sciences”.

The world of textile chemistry offers a lot of didactic chances that could be helpful even for those not directly involved in that sector of applied chemistry [1].

We are teaching at a historic *Istituto Tecnico* devoted to the study of textile production (weaving, finishing, printing...). During the pandemic periods, laboratory practice had several limits and normal lessons were often given via web, so it was hard to keep the concentration on experimental observations and on the subsequent theoretical interpretations.

The occasional aim of this job was already introduced elsewhere [2]; here we would like to stress the scientific and operational part of the job as a didactic approach for future works.

This presentation will discuss how we organized our lab practice dividing the tasks among different classes, where the younger students (3rd class, 16-17 yo) were “leading” and the older ones (4th-5th classes) were more or less acting as consultants to better explain several points.

We also decided to collect our materials in a bound catalogue to be kept at our school museum, to remember this terrible period.

Both in research and in daily life, one of the most relevant differences between fibres of different chemical nature or different structure is the ability to be dyed by substances grouped in the traditional *dye classes*, and within each of them by the structural peculiarities of related molecules. Dyeing conditions (e.g. temperature, time, pH, salinity...) can differentiate those behaviours.

In order to save time, we simply used two not-so-different dyes, a blue and a magenta from the *direct* and *acid* classes, to simultaneously dye fibres like viscose, silk, nylon and wool; dyes were then partly stripped by washing. The only instrument used to study their behaviour was the reflection spectrophotometer. From the graphs in the “old” chromaticity diagram and in k/s vs. λ it is possible to argue the different ideas of equilibrium; numbers do not require physical presence.

A study of the chemical composition of the dyes and of the auxiliaries introduced to the topics of ecotoxicological evaluations and sustainability issues, relevant not only in textile production. Students also realized that the distinction between “natural” and “man made” fibres is an artefact of our traditional prejudices, whereas the understanding of chemical properties and microstructural features is quite more relevant also to design new and more acceptable technological processes.

[1] S. Palazzi, *CnS – La chimica nella scuola*, **2012**, XXXIV-3, 284-289

[2] S. Palazzi, *A Campione*, AICTC, **2021**, 58, 1/21, 12-13

