

e requer

- pequenos volumes (ordem de μl) de amostras e demais reagentes envolvidos no processo.

A detecção potenciométrica é, pelas suas características, de utilização particularmente vantajosa.

Neste trabalho descreve-se a construção duma célula de fluxo para aplicação em potenciometria, com uma versatilidade que permite a utilização de diferentes tipos de sensores iónicos, pela utilização de módulos descartáveis.

São feitos estudos de sistemas conducentes aos tipos de dispersão limitada, média e grande, conforme a situação o justifique.

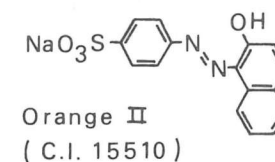
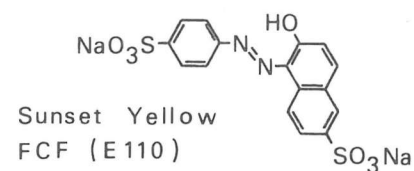
A qualidade dos resultados é comprovada na avaliação potenciométrica de NO_3^- em diferentes condições experimentais, por comparação com determinações em potenciometria simples.

Identification and Determination of Colouring Matters in Corks using Differential-Pulse Polarography

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The corks used as stoppers for bottles need to be artificially coloured to restore their natural colour lost during the many manufacturing procedures. These procedures (several sorts of bleachings) tend to produce a much whiter material than the initial raw material and with an uneven colour. As corks are generally used in contact with drinks, only permitted food colouring matters are allowed to colour them. One of the colouring matters most widely used is Sunset Yellow FCF (E 110) (1), but the application of this colouring matter to the corks is not very easy, a better product being obtained if another, Orange II (C.I. 15510), is used. Although both dyes have similar structures (Figure 1), the problem is that Orange II is not a food additive and then cannot be used in this situation. In the present work a method is described that permits to determine which of these two dyes is used in a certain batch of corks.



As the dyes have a different number of sulphonic groups, their separation using TLC is possible, either in silica-gel or in cellulose plates, using several solvent systems (2). The problem is that very often the stains of the colouring matters extracted from the corks are not visible on the chromatograms, as the amount of dye in

the corks is very small. In all the experiments we have made with corks we never obtained useful chromatograms.

The Polarographic approach

In a previous work (3) the differential-pulse polarographic identification of some colouring matters, including the questioned dyes, was studied. The polarographic differentiation of these two dyes was not possible due to their similar behaviour (Figure 2).

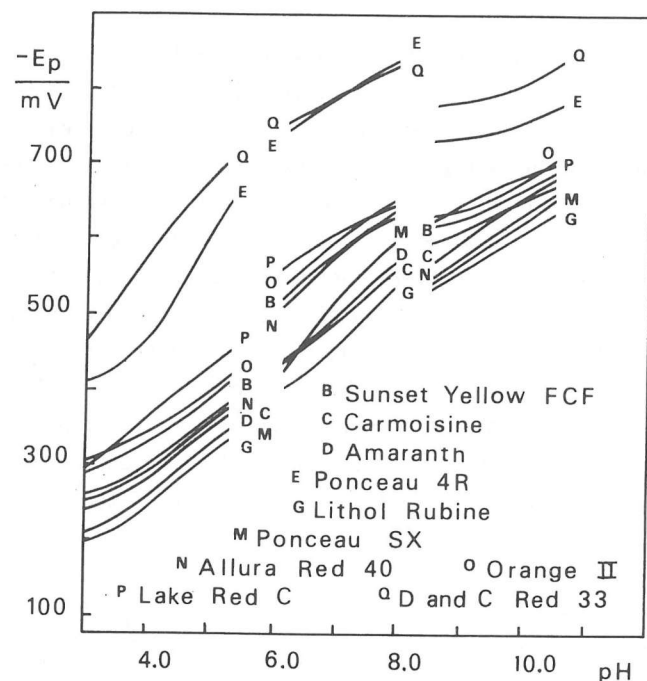


Figure 2. Differential-pulse polarographic analysis of food and cosmetic red colours (Extracted from reference 3).

Tetraphenylphosphonium chloride (TPPC) was added to improve the polarographic identification of the colouring matters, at three different pH values (4.5, 7.0 and 9.5), but the similarity in the behaviour of the two dyes still occurred (Figure 3).

In this work a more complete study of the effect of

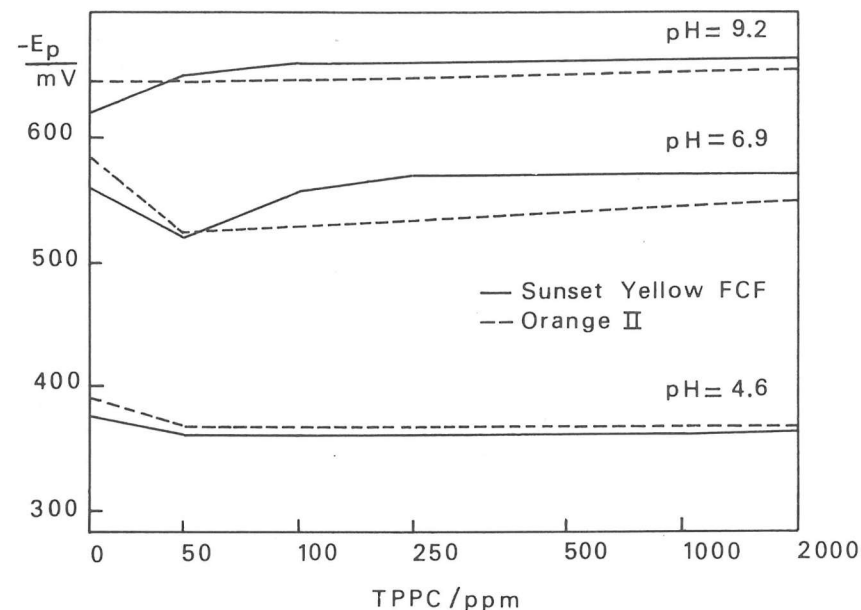


Figure 3. Effect of TPPC on polarographic peak potentials at three different pH values (Extracted from reference 3).

TPPC on the polarographic behaviour of the two dyes was undertaken and it was possible to find conditions to distinguish between them. In fact, using more than 100 p.p.m. TPPC in an alkaline electrolyte, two distinct polarographic peaks were obtained for Sunset Yellow FCF and for Orange II (Figure 4).

The polarographic analysis of one particular type of corks is shown in Figure 5. It can be seen that the dye used in the colouration of these corks is Sunset Yellow.

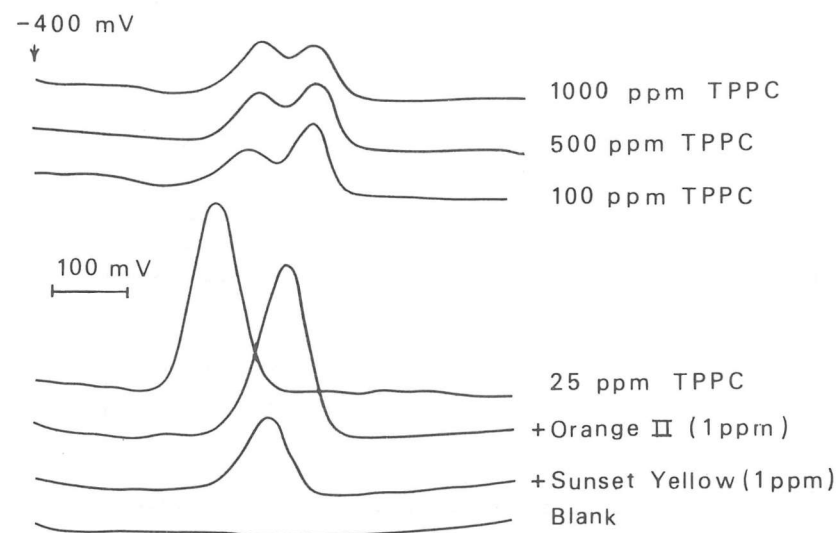


Figure 4. Effect of TPPC on the separation of the polarographic peaks of dyes in 0.01M NaOH (pH = 12.1).

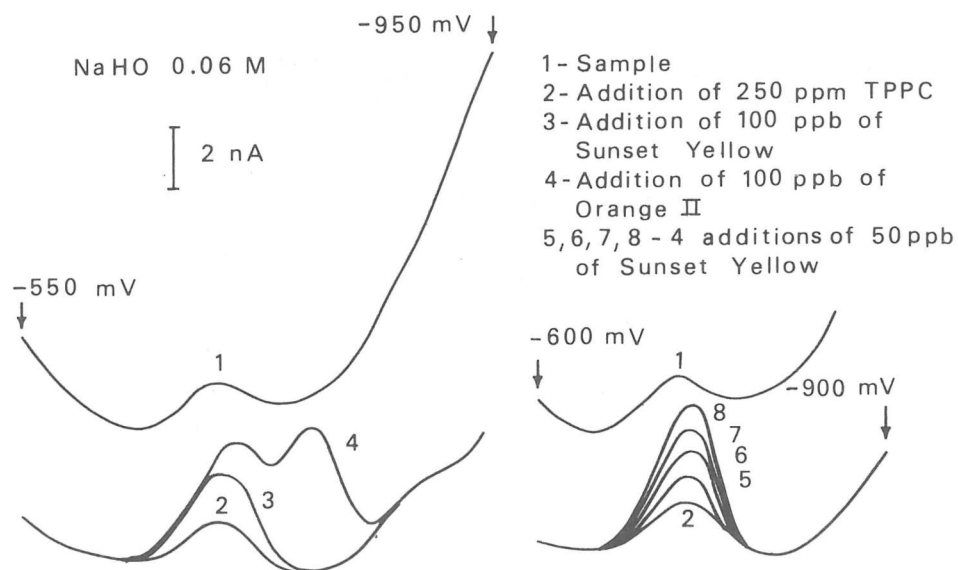


Figure 5. Polarographic analysis of corks.

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References

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2. Hoodless, R. et al., Journ. Chromat., 1971, 54, 393.
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