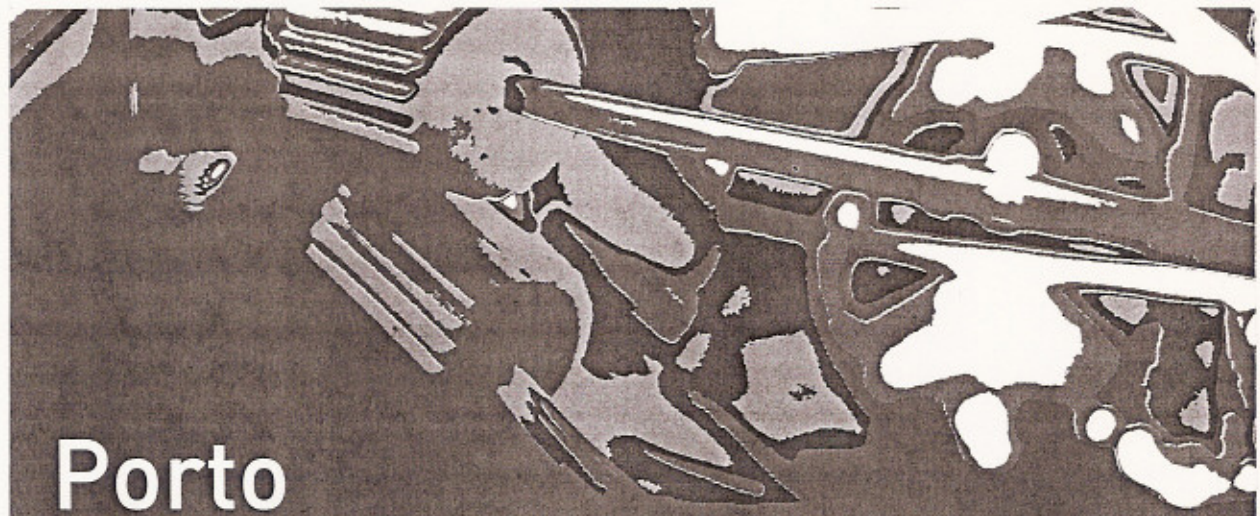

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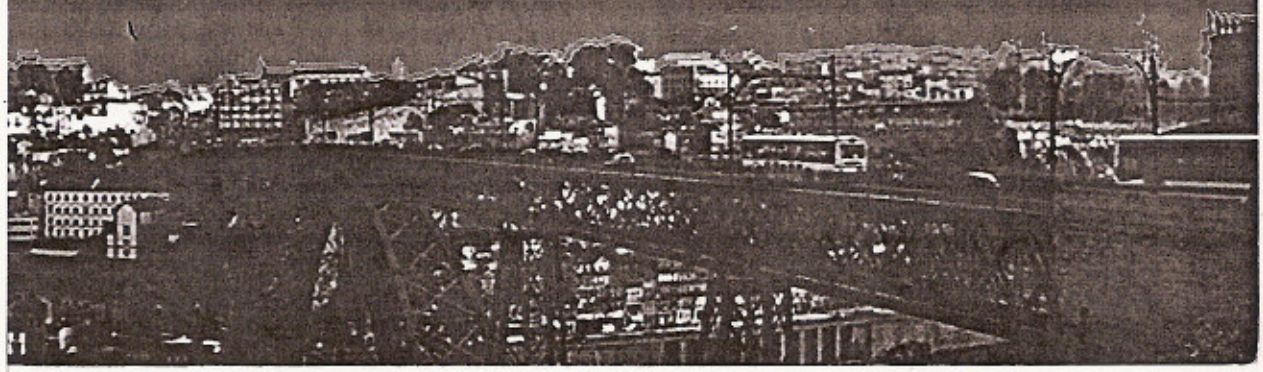

P204

GAS-DIFFUSION SEQUENTIAL INJECTION ENZYMATIC DETERMINATION OF ETHANOL IN WINES: STUDY OF MATRIX EFFECTS DERIVED FROM DIRECT SAMPLE INTRODUCTION

Teresa F. M. Pais, Susana S. M. P. Vidigal, Ildikó V. Tóth and António O. S. S. Rangel

Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Rua Dr. António Bernardino de Almeida, 4200-072 Porto, Portugal
email: aorangel@esb.ucp.pt

The determination of ethanol is not only a key parameter in terms of quality and stability for alcoholic beverages, but also an important factor for fermentation monitoring. The official methods for determination of ethanol in wines are laborious and complex, and require in most cases the separation of the analyte from the sample matrix by distillation. The enzymatic determination of ethanol only requires a sample dilution step before the analysis. Automated flow procedures applied to the determination of this analyte are mostly based on the use of immobilized enzymes with the aim of reducing enzyme consumption.
The objective of this work was to develop a flow method based on the sequential injection concept for the determination of ethanol in different wine samples. The determination was based on the enzymatic conversion of ethanol to acetaldehyde by alcohol dehydrogenase (ADH). The system development also aimed minimum sample treatment with reduced reagent consumption. With this objective, a gas-diffusion process was used to isolate ethanol from the sample matrix and to provide a high apparent sample dilution. However, difficulties arising from direct introduction of samples with complex matrix (essentially port wine) into the flow system were observed, both in the reproducibility in sample aspiration and also in the gas-diffusion process itself. The study of these matrix effects are discussed in this communication. The figures of merit of the developed methodology (LOQ: 0.3%(v/v) ethanol, RSD (n=10): < 3%, determination rate: 21/hour; ADH consumption: 0.45 U/assay; effluent production: 3.4 mL/assay) were compared with those of the existing alternatives.

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