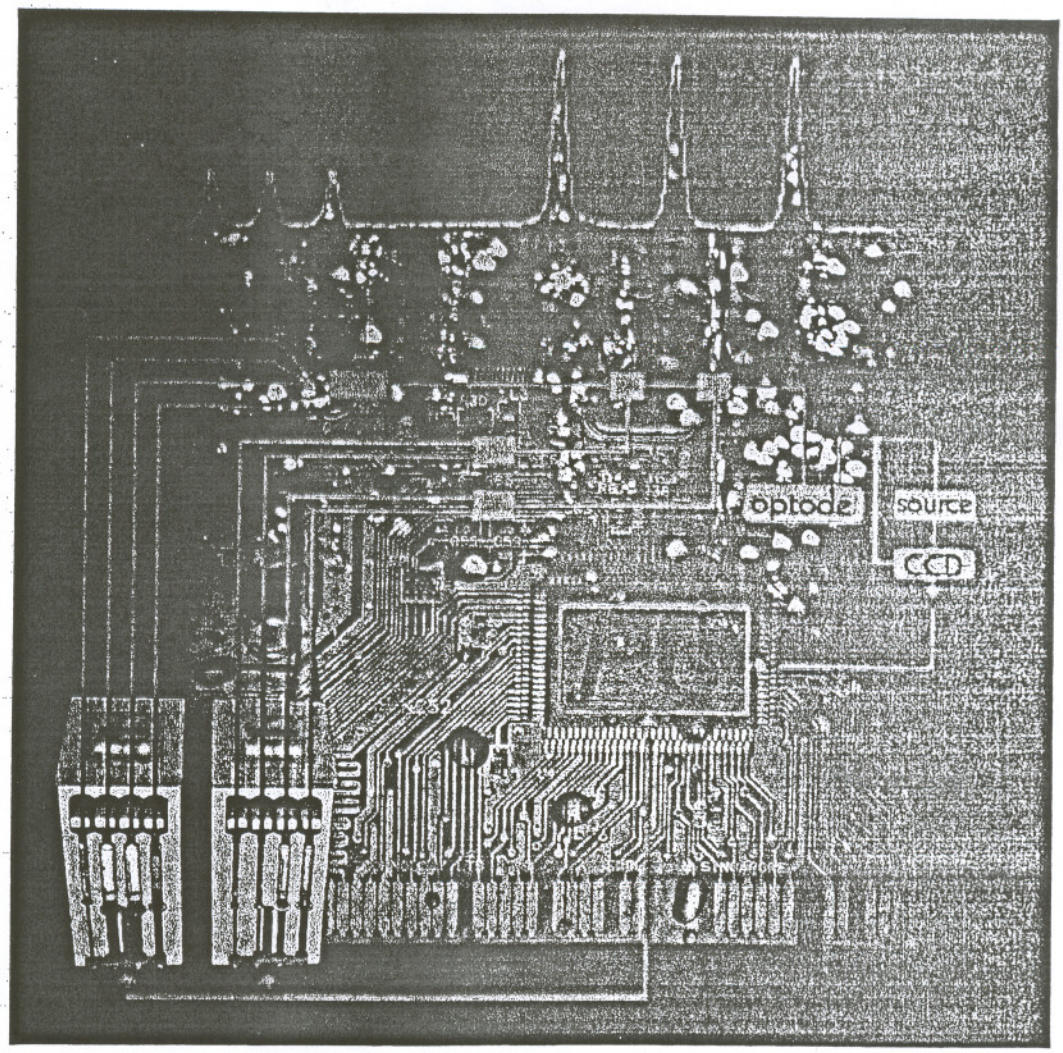

FLOW ANALYSIS XI

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P018

FLOW INJECTION DETERMINATION OF FLUORIDE FOR MONITORING THE BIODEGRADATION OF FLUOROPHENOL IN A BIORREACTOR

Raquel B. R. Mesquita [a, b], Inês C. Santos [a], Marta F. F. Pedrosa [a], Anouk F. Duque[a], Maria F. Carvalho [a], Paula M. L. Castro [a] and António O. S. S. Rangel [a]

[a] *CBQF/Escola Superior de Biotecnologia, Universidade Católica Portuguesa, 4200-072 Porto, Portugal*

[b] *Laboratory of Hydrobiology, Institute of Biomedical Sciences Abel Salazar (ICBAS) and Institute of Marine Research (CIIMAR), Universidade do Porto, Porto, Portugal*

Halogenated aromatic compounds are important environmental pollutants of soil, water and air. Fluorinated compounds are among these due to their useful applications, such as aerosol propellants, surfactants, refrigerants, plastics, pesticides, plant growth regulators, medicines, adhesives and fire retardants [1]. The improper disposal together with the chemical inertness and hydrophobicity of many of these compounds led to their persistence in the environment; the use of bioreactors as remediation technologies has been increasing recently, fully exploiting the microorganisms' activity [2]. Bioreactors represent a highly potential technology of biological treatment in the degradation of organic pollutants. Systems with high biomass retention that are extremely promising are rotating biological contactors (RBC). RBCs could be used as a biological post-treatment for polishing of wastewaters contaminated with organic pollutants, including micropollutants. These technologies benefit from a continuous monitoring of the biodegradation process through the quantification of the real time byproducts resulting from the biodegradation of the pollutants.

In this scenario, flow methodologies present a fast, simple, reliable and automated solution, and present an advantageous alternative to gas chromatographic methods.

In this work, a flow system for the potentiometric determination of fluoride for a RBC monitoring is described. The operation conditions of the fluoride electrode in the required dynamic range were studied, using different flow configurations in order to

obtain maximum sensitivity with the simpler assembly. Different arrangements (cascade and wall-jet) for incorporating the (ion-selective electrode) ISE in the manifold were also compared in terms of reproducibility and robustness.

The aim for in-line monitoring also required an extensive interference study due to the use of growth medium in the bioreactor.

The samples were collected from different points of the RBC reactor, centrifuged (3000 rpm), filtrated (0.45 μm) and stored in the freezer. Before analysis, they were unfrozen and directly introduced into the system.

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