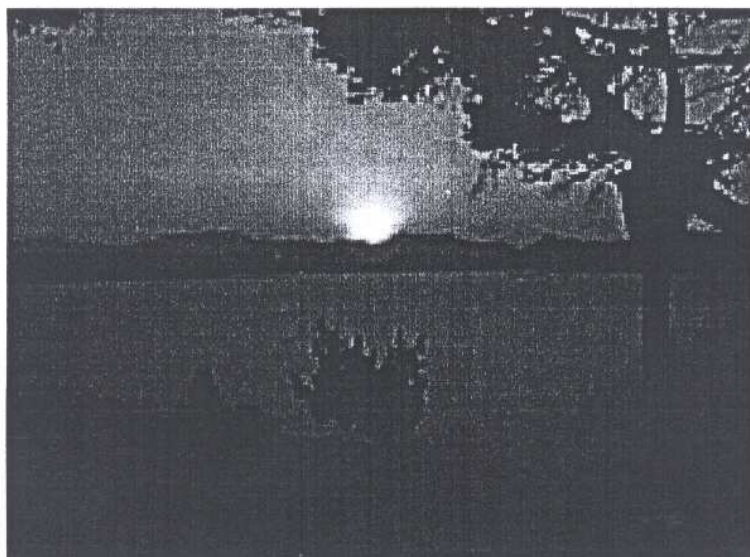


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## AUTOMATION

### P129 A DOUBLE-LINE SEQUENTIAL INJECTION SYSTEM USING A LONG PATH LENGTH LIQUID WAVEGUIDE CAPILLARY FLOW CELL FOR THE SPECTROPHOTOMETRIC IRON DETERMINATION IN WATERS

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Iron is present at abundance in earth crust, although in waters it appears in very low concentrations. Iron plays a crucial role in phytoplankton productivity as well in temperature cycle because of the interaction of phytoplankton with carbon dioxide. In some regions where iron has a low concentration there is no presence of phytoplankton, behaving like a limiting reagent. Besides being at low concentration, the water matrix offers a great number of variables influencing the performance of an analytical method due to the presence of different biological and chemical species.

The objective of this work was to determine trace levels of iron using spectrophotometric detection, based on the reaction with ferrozine. A long liquid waveguide capillary flow cell with 100 cm of optical path was applied to increase the sensitivity of the reaction for iron determination. A double-line sequential injection analysis (SIA) system was developed to automate this determination. The developed flow technique offers some advantages as small sample/reagent volume, small waste volumes, and a determination rate of 45 h<sup>-1</sup>. The quantification and detection limits were 0,9 and 0,3 µg/L respectively, without any kind of pre-concentration step. In recovery tests of iron in natural waters, recovery percentages close to 100% were obtained, when iron concentrations of 2, 10 and 20 µg/L were added.

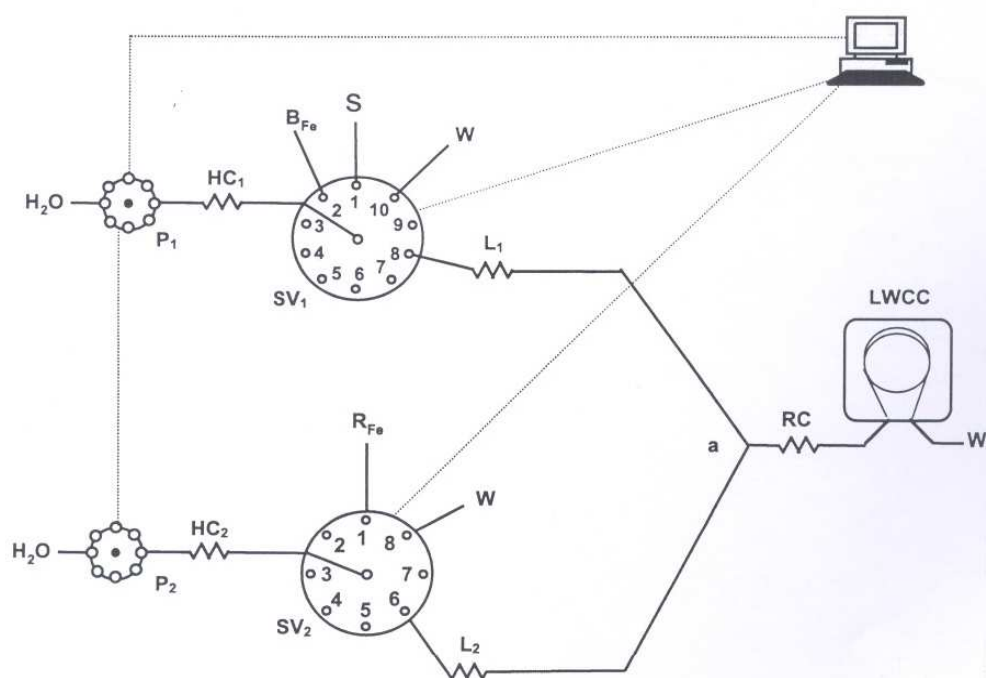


Fig. 1. Double line sequential injection manifold for the determination of iron in waters. SV<sub>1</sub>, SV<sub>2</sub>: selection valves; P<sub>1</sub>, P<sub>2</sub>: peristaltic pumps; HC<sub>1</sub>, HC<sub>2</sub>: holding coils (2 m); RC: reaction coil (85 cm); L<sub>1</sub>, L<sub>2</sub>: reactors (25, 14 cm); a: confluence; LWCC: liquid-core waveguide capillary flow cell (100 cm of optical path); W: waste; S: sample or standard; B<sub>Fe</sub>: acetate buffer solution; R<sub>Fe</sub>: color reagent (ferrozine).

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