

Invitation to Flow Analysis IV

G. E. Pacey

Department of Chemistry, Miami University, Oxford, Ohio, 45056, U.S.A

To all the readers and contributors to the Journal of Flow Injection Analysis I would like to extend my cordial invitation to attend the Flow Analysis IV Conference which will be held on April 17-20, 1988 in Las Vegas, Nevada, USA. The scope of this Conference will be similar to that of Flow Analysis I through III. Current research on all aspects of continuous flow analysis will be covered. Items such as utilization of flow injection analysis for atomic spectroscopy, applications to process control, utilization of electrochemical detectors in flowing streams, automated clinical analysis, utilization of the gradient techniques, selectivity enhancement techniques and applications of the separation techniques of FIA will all be major topics at this Conference.

Our invited lecturers include noted flow injection analysis researchers from most continents including, of course, Professors Ruzicka and Hansen from the Technical University of Denmark. Particular emphasis will be paid in one session to the process control aspects of flow analysis where two current industrial users of FIA will discuss their applications and feelings toward this technique. Further information about the Conference can be obtained by directly contacting me or by filling out the announcement forms that have been published in this Journal.

I would like to take a few minutes to just discuss where I feel Flow Injection Analysis is headed and the type of topics that I believe will be covered at this Conference. All forms of automated analysis systems act as bridging technology between sampling and detection. Indeed, sample manipulation has been and continues to be the most critical step in the analysis process. The proliferation of chromatographic techniques is supporting evidence of the chemist's need for sample manipulation to achieve selective separation prior to detection. However, the time of analysis and the subsequent costs of that time is important. In fact, high throughput and low personnel cost per sample was the impetus for the development of automated continuous flow systems.

But until the invention of FIA most automated continuous flow systems were incapable of manipulating samples to improve the selectivity of a given method. Most systems were used simply to convert existing batch methods into an automated form which provided improved productivity and precision. However, the additional capabilities of FIA allow improvements in the capabilities for developing new methods for determinations not easily carried out by other automated techniques.

By combining sample injection with highly reproducible timing the FIA system develops a third characteristic, controlled dispersion. The FIA basic traits of sample injection, high reproducibility and controlled dispersion allows the analyst the freedom of not having to let the chemistry reach a steady-state signal. The way that samples are processed now and in the future will certainly be influenced by the non-steady-state approach of the FIA technique. FIA is a tool for the analyst to use in the manipulation of chemistry. Clearly, realizing the full potential of FIA demands a complete understanding of the chemistry involved with the method.

In the area of industrial application of the FIA technique both on-line and off-line applications are and will continue to be demonstrated. In the area of FIA research considerations are being given for the kinetic advantages of FIA. This work is beyond the classical experiments using stopped-flow FIA to overcome an interfering background. Since the kinetic rates a reaction between most analytes and their interferences with a specific reagent usually vary, the FIA system can be used in a way to kinetically discriminate between an analyte and an interferent.

One area which has essentially been neglected and, in fact, will be heavily used and explored in the future, is the FIA concentration gradient. The concept of controlled dispersion makes classical homogeneous mixing obsolete. An example using the gradient in a more productive way is the generation of multiple calibration curves with a single injection. While another area of excitement is the concept of the chasing zones where one zone contains a sample and the chasing zone contains a standard. After these two zones overlap each other the entire standard edition and curve is developed in the overlapped zones.

We hope that this letter of invitation has stimulated your interest in the future of Flow Injection Analysis and that you will plan to attend Flow Analysis IV in Las Vegas, Nevada, USA in April of 1988. Although the scopes and techniques of FIA continue to expand it is already applicable in many areas. At this point, FIA is no longer a laboratory curiosity but, in fact, a most helpful analytical tool.