Sequential Injection Chromatography against HPLC

Abubakr M. Idris, Ahmed O. Alnajjar, Rafea E.E. Elgorashe

Department of Chemistry, College of Science, King Faisal University, Hofuf, Saudi Arabia
abubakridris@hotmail.com

Recently, sequential injection chromatography (SIC) has been proposed to overcome some challenges of HPLC regarding instrumentation cost, tedious operation system procedure, large dimension system, sizable reagent consumption, long system stabilization time and complicated maintenance process. SIC is a new version of flow injection techniques that gathers the advantages of automation, miniaturization, versatility, simplicity and inexpensiveness [1,2]. SIC is a liquid chromatographic/flow-based technique equipped with a monolithic column, low pressure pump, selection valves and fiber optic spectrometric devices [3,4].

The current communication aims to arouse the interest of researchers on the potentials of SIC. Principally, the communication describes the basics, developments and benefits of SIC. In contrast, challenges confronting SIC along with proposed developments are explained as well. Some experimental guidelines for developing SIC methodologies are also provided. Practicable flow rates for conditioning columns, injecting samples and separation, besides suitable volumes of samples and mobile phase for conditioning columns and separation, are all demonstrated. The communication also presents some SIC methods that have been recently developed at our laboratory. In these methods, multi-response optimization processes, using various chemometric approaches, are presented. In addition, the validation results of the SIC methods according to the International Union of Pure and Applied Chemistry are characterized. Moreover, a comprehensive comparative study on the efficiency of the SIC methods against that of previous HPLC methods are described. The communication, eventually, discusses future perspectives of SIC with respect to sensitivity, selectivity and range of applications.

Schematic diagram of SIC coupled with a miniaturized fibre optic spectrometric devices

ACKNOWLEDGEMENTS
Thank is due to King Abdullah City for Science and Technology, Riyadh, Saudi Arabia, for financial support, award # MT-3-6. King Faisal University is also appreciated for allowing the authors to conduct this work.

REFERENCES