

BIOSENSOR AS FIA DETECTORS

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Flow injection analysis has the advantages of rapid sample throughput, small sample volumes, simplicity and minimal sample handling. Further improvements in the analytical capabilities of FIA systems can be achieved by developing new detectors and detection methodologies. In particular, biosensors hold a great promise for future FIA systems.

Biosensors are based on the coupling of a biological recognition layer and an appropriate (electrochemical or optical) transducer. Such integration of biological microreactors with the detection of biologically generated or consumed species assures as fast and sensitive response. Extremely low detection limits can be achieved, without compromising the speed inherent to FIA system. Most significantly, the remarkable selectivity of biological recognition processes simplifies the FIA manifold as it obviates many of the sample handling and manipulation steps. The microscopic and nanoscopic dimensions of modern biosensor devices address the trend towards miniaturization of FIA systems. Modern microfabrication technology should lead to the development of low-cost, even disposable, FIA detectors. Overall, such devices meet many of the desired characteristics of an ideal FIA detection system.

FIA systems are also extremely useful for rapid testing of biosensors, e.g., evaluation of potential interferences, response time or reproducibility. The controlled dispersion inherent to FIA systems can be exploited for extending the limited linear range of enzyme-based biosensors.

Given the diversity and versatility of biological recognition elements, and the speed and reproducibility inherent to FIA system, we are very optimistic that FIA systems with biosensor detectors will find important applications in clinical, environmental, food or process analyses.