

## **On-line separation in flow injection analysis based on polymer inclusion membranes and beads**

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### **Abstract**

Separation based on the use of polymer inclusion membranes (PIMs) offers an attractive alternative to conventional solvent extraction because it eliminates the use of hazardous solvents and allows extraction and back-extraction to occur simultaneously on the corresponding opposite sides of a PIM [1]. PIMs have been widely used for the extraction and transport of numerous inorganic cationic and anionic species as well as some small organic molecules [1-3]. All these features have made PIM-based separation a valuable and highly promising tool for sample pretreatment in flow analysis which can provide better sensitivity through high degree of analyte preconcentration and better selectivity through efficient separation of the analyte(s) from the sample matrix. Flow injection and continuous flow analysis systems, incorporating PIM-based separation modules, have been used successfully for the selective and sensitive determination of zinc(II) in pharmaceutical products and samples from the galvanizing industry [4,5], orthophosphate in pristine water samples [6], thiocyanate impurity in ammonium sulfate fertilizer [7], and recently for the analysis of vanadium(V) and copper(II) in aqueous samples with complex matrices. Beads, made of the polymer extracting material, used for the manufacturing of PIMs, have shown promising results in the bead injection determination of copper(II). All these applications illustrate the significant potential of polymer inclusion membranes and beads in flow analysis.

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