TRACE ANALYSIS USING CAPILLARY ELECTROPHORESIS AND SAMPLE STACKING TECHNIQUE

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Capillary electrophoresis (CE) is now a mature technique for analytical separation and it has several advantages over other separation techniques: high efficiency separation, minimum requirements of sample and chemical amounts, almost no need of the use of organic solvents.

One of the disadvantages of CE is generally thought to be poor concentration sensitivity of photometric detectors, which are the most popular among CE detectors. Since the volume or length of the injected sample zone in capillary is very small (nL) or short (mm), it is essential to develop a preconcentration method to meet the requirement of trace analysis.\textsuperscript{[1]}

On-line sample preconcentration can be performed just by injecting a large volume of sample solution without modification of the instrument and the analyte can be focused into a minimum volume inside the capillary. Therefore, on-line sample preconcentration is a useful technique to improve the concentration sensitivity of the detector by taking advantage of small sample volume requirement in CE.\textsuperscript{[2]}

We will present here two studies dealing with trace analysis based on large volume sample stacking technique in capillary electrophoresis. First one is separation and determination of amino acids in a plant extract. The seeds of grass pea (\textit{Lathyrus sativus} L.), a drought tolerant crop, were analysed for quantitative determination of free amino acids, namely β-N-oxalyl-L-α,β-diaminopropionic acid (β-ODAP), homoarginine and asparagine by a simple and fast capillary electrophoretic method. The concentration ranges of amino acids were found as 0.21 - 1.27 % (w/w) for homoarginine, 0.10 - 0.87 % (w/w) for β-ODAP and 0.006-0.47 % (w/w) for asparagine.\textsuperscript{[3]}

Recently a capillary electrophoretic method for the simultaneous determination of nitrate, nitrite and oxalate in vegetables was proposed by using an acidic run buffer at pH 3.5.\textsuperscript{[4]} Here we have adopted this rapid capillary electrophoretic method for determination of nitrate and nitrite concentrations in CSF with minimal sample preparation. In order to improve the limit of detection we have employed large volume sample stacking which was necessary for especially nitrite ion determination.

REFERENCES