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Separation of peptides and proteins in open tubular capillary electrochromatography with highly improved chromatographic performance

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A novel step elution technique was demonstrated in open tubular capillary electrochromatography column (OT-CEC) for the separation of peptides in tryptic digest of cytochrome C. The OT-CEC (100 cm long pre-treated silica capillary column having 50 μm internal diameter and 92 cm effective length) was prepared by the impregnation of a co-polymer layer of controlled thickness on its inner surface. The attachment of 4-(trifluoromethoxy) phenyl isocyanate onto the silanol groups on inner capillary wall was assisted by catalyst then sodium diethyl dithiocarbamate attachment was carried out and finally styrene mediated polymerization was taken place. About 37 peptide peaks were separated from a sample of tryptic digest of cytochrome C in

capillary electrochromatography under isocratic elution mode while over 50 peptide peaks were separated in step elution mode where, two mobile phases having different water content were used during the same run. The column of current study resulted in extraordinary high separation efficiency (N- value over 2 million/column) for a mixture of five synthetic peptides. Increased column length along with open tubular nature and step elution technique could be a good approach towards better proteomic profiling by LC/MS study in future. The abstract briefly states the problem or purpose of the research, indicate the methodology used, summarize the principal findings and major conclusions.

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