

Novel portable capillary electrophoretic instrument for analysis of very small samples and its application in the analysis of exhaled breath condensate.

M. Greguš^{1,2}, F. Foret¹ and P. Kubáň^{1,2}

¹Bioanalytical Instrumentation, CEITEC Masaryk University, Veveří 97, 602 00, Brno, Czech Republic

²Department of Chemistry, Masaryk University, Kotlářská 2, 611 37 Brno, Czech Republic

E-mail: gregus@mail.muni.cz

Capillary electrophoresis (CE) surpasses others analytical techniques in terms of its high separation efficiency, short analysis time and low consumption of sample and chemicals. Typical CE device consists only of a capillary, vessels for BGE with electrodes, detector unit and a high voltage supply. All these parts can be easily miniaturized. Thus portable CE instruments, P-CE, can be easily constructed in contrast to other instrumentation, such as HPLC or MS, respectively. There are many reasons for constructing miniature and portable CE instruments. For instance to reduce degradation and risk of contamination of the samples during the transport and the storage or to obtain the results of analysis immediately at the sampling site. One major technical difficulty in constructing portable CE instruments is the injection part that is either requiring large sample volumes or uses electrokinetic injection that is not suitable for quantitative analysis. In here we present a novel P-CE with a special interface for low-volume sampling able to repeatedly analyze sample volume as low as 20 μ L. Moreover, this instrument is constructed for direct sampling of exhaled breath condensate (EBC) from a miniature sampling device, which was developed in our laboratory [1]. EBC is formed by cooling and subsequent process of condensation of exhaled breath. EBC is a promising and interesting liquid sample, which has a potential to be used in clinical research and diagnosis (especially for different respiratory diseases). To this date, there are just few articles, where the EBC was analyzed by CE [1-3]. Analysis of EBC obtained by one, single exhalation is also possible by this instrument. The developed instrument is however not limited only to EBC, but samples of different origin and amount can be analyzed too. Construction, technical details and characterization of developed P-CE are discussed.

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