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Fast blood plasma separation device for point-of-care applications

Pavol Ďurč, František Foret, Petr Kubáň



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**Fast blood plasma separation device for point-of-care applications**Pavol Ďurč<sup>1</sup>, František Foret<sup>2</sup>, Petr Kubáň<sup>2</sup><sup>1</sup>Department of Chemistry, Masaryk University, Kotlářská 2, 611 37 Brno, Czech Republic<sup>2</sup>Department of Bioanalytical Instrumentation, Institute of Analytical Chemistry of the Czech Academy of Sciences, Veveří 97, 60200, Brno, Czech Republic

\* corresponding author: Department of Bioanalytical Instrumentation, Institute of Analytical Chemistry of the Czech Academy of Sciences, Veveří 97, 602 00, Brno, Czech Republic. Tel.: +420-532290142; fax: +420-541212113. petr.kuban@iach.cz

**Abstract**

In this work, a simple device for extremely fast separation of blood plasma from diluted whole blood was developed. The device accommodates an asymmetric polysulfone membrane/supporting membrane sandwich that allows collection of 10  $\mu$ L blood plasma into a narrow glass capillary in less than 10 seconds. The composition of diluent solution was optimized in order to achieve maximum recoveries for selected metabolites of alcohol intoxication. 5% solution of [tris(hydroxymethyl)methylamino] propanesulfonic acid provided recoveries of formate, oxalate and glycolate close to 100% and only moderate erythrocyte lysis. Both charged and uncharged compounds from the whole blood samples can be analyzed in the separated blood plasma by capillary electrophoresis with contactless conductometric detection and spectrophotometry, respectively. The developed device might find wide application in on-site testing and point-of-care analysis, when only microliter volumes of whole blood are available.

**Keywords:** blood plasma separation, point of care analysis, capillary electrophoresis, alcohol intoxication, metabolites, methanol.

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