

MICRO-LITER LIQUID HANDLING SYSTEM DESIGN AND APPLICATIONS

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Current trend in analytical chemistry is miniaturization and integration. Miniaturized instruments are not as interesting and important as their possibility to integrate them into autonomous vehicles and rovers. Autonomized systems provide numerous advantages over conventional stationary laboratory analytical instrumentation. Greatest advantage is that on the site sampling and analysis reduces errors due to sample transportation and makes analytical process faster. What is more important, if hazardous sites, such as chemical warfare usage cases, or remote savage areas are investigated, the threat to human researcher is not posed.

In this work we present micro-liter handling system that precisely supplies required liquid using silica capillary from the required bottle of reagent. The system can be operated from the battery (or AC power supply for laboratory operations). The system is intended for use with autonomous capillary electrophoresis, miniaturized colorimeters, or digital-droplet microfluidic systems [1–3].

The system was tested with various inner diameter capillaries for supplying different volumes of required chemical reagents. Design and application issues will be presented and discussed during the conference.

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- [1] T. Drevinskas, L. Telksnys, A. Maruška, J. Gorbatošova, M. Kaljurand, Compensation of the baseline temperature fluctuations for autonomous CE-C4D instrument working in harsh environments, *Electrophoresis*. (2018). doi:10.1002/elps.201800132.
- [2] T. Drevinskas, A. Maruška, E. Gladkauskas, L. Telksnys, V. Girdauskas, J. Gorbatošova, M. Kaljurand, O. Ragažinskienė, Design and Applications of Miniaturized, Portable LED Based Colorimeter, *Chemija*. 4 (2018) 1–8 Accepted for publication.
- [3] J. Gorbatošova, M. Jaanus, M. Vaher, M. Kaljurand, Digital microfluidics platform for interfacing solid-liquid extraction column with portable capillary electropherograph for analysis of soil amino acids, *Electrophoresis*. 37 (2016) 472–475. doi:10.1002/elps.201500284.