

LTCC MICROFLUIDIC SYSTEMS FOR BIOCHEMICAL DIAGNOSIS

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Abstract

This paper presents design, fabrication and testing of three LTCC (Low Temperature Co-fired Ceramics) based microfluidic systems. These microdevices are: enzymatic microreactor for urea determination, potentiometric sensor with ion selective electrodes (ISE) based array sensitive to potassium ions and amperometric glucose sensor. Performance of the presented LTCC-based microfluidic systems has been tested. All ceramic microdevices have revealed high output signal and large detection range. The properties of the presented LTCC-based microfluidic systems are comparable with similar ones made of silicon. Obtained results has shown that presented ceramic microsystems can work as a stand-alone device or can be integrated into a more sophisticated micro analysis system for *in vivo* or *in vitro* monitoring of various (bio)chemical compounds.

Keywords: LTCC (Low Temperature Co-fired Ceramics), thick-film, numerical modelling, microreactor, sensor