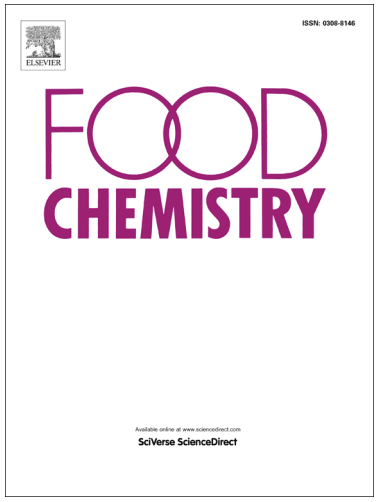

A disposable, simple, fast and low-cost paper-based biosensor and its application to the determination of glucose in commercial orange juices

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A disposable, simple, fast and low-cost paper-based biosensor and its application to the determination of glucose in commercial orange juices.

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Abstract

A new biosensor for monitoring glucose levels in beverages is presented. The measurements are performed using potentiometric detection. Working electrodes are made using platinised paper as support and a biocompatible polymeric membrane made of a mixture of polyvinyl alcohol and chitosan containing glucose oxidase as the recognition layer. The system is based on the detection of the hydrogen peroxide generated by an enzymatic reaction performed in a highly sensitive, selective and simple way. The biosensors display suitable analytical performance (sensitivity -119.6 ± 6.4 mV/dec in the 0.03-1.0 mM range with a limit of detection of 0.02 mM). Determination of glucose in commercial orange juices is presented. These results were validated against conventional standard methods, showing good accuracy and fast analytical response. The methodology presented herein does not require complex samples treatment, offering an alternative to conventional methods, particularly for determinations performed with minimal expertise and without a laboratory infrastructure.