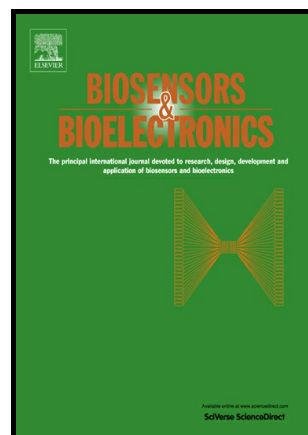


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## Pin-based electrochemical glucose sensor with multiplexing possibilities

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## Abstract

This work describes the use of mass-produced stainless-steel pins as low-cost electrodes to develop simple and portable amperometric glucose biosensors. A potentiostatic three-electrode configuration device is designed using two bare pins as reference and counter electrodes, and a carbon-ink coated pin as working electrode. Conventional transparency film without any pretreatment is used to punch the pins and contain the measurement solution. The interface to the potentiostat is very simple since it is based on a commercial female connection. This simple electrochemical system is applied to glucose determination using a bienzymatic sensor phase (glucose oxidase/horseradish peroxidase) with ferrocyanide as electron-transfer mediator, achieving a linear range from 0.05 to 1 mM. It shows analytical characteristics comparable to glucose sensors previously reported using conventional electrodes, and its application for real food samples provides good results. The easy modification of the position of the pins allows designing different configurations with possibility of performing different measurements simultaneously. This is demonstrated through a specific design that

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