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Nanocomposite amperometric diosensor for lactate determination

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An amperometric biosensor for lactate determination at an operating potential of 0.5 V is presented based on immobilized lactate oxidase in BSA gel at a gold screen-printed electrode (BVT Technologies). In order to increase the biosensor sensitivity, the working electrode surface was modified with a layer Nafion (1%)//nanodiamonds (ND) (1%) nanocomposite film (Fig.1, curve 2).

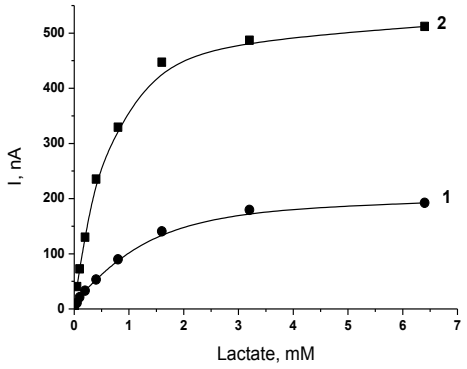

Fig.1. 1-Calibration curves of biosensors for lactae determination; 2-images of gold screen-printed electrode surface with Nafion (1%)/ ND (1%) nanocomposite film

The effect of the Nafion (1%)/ND (1%) nanocomposite film on the electrochemical properties of electrode was investigated by means of cyclic voltammetry and amperometric measurements. The developed biosensor for the measurement of lactate concentration is characterized by the detection limit of 0.001·mM the linear range 0.05 mM to 0.7 mM, and sensitivity of 72.5 $nA \cdot mM^{-1} \cdot cm^{-2}$.