

ABOUT PHYSICAL TRANSFORMERS TO CREATE TOXICITY BIOSENSORS

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There are proposed to solve the task of improving noise immunity biosensor systems and simultaneous determination of several toxic substances proposed to solve through the use of two or more individuals converters (transducers), which is measured simultaneously change multiple parameters of information caused by various physical and chemical effects. Obtained, that To create the biosensor system that can measure the toxicity immediately after several informative parameters offered to pick up such biological signal converters that were manufactured to be modern microelectronic technology, and therefore:– would be able to miniaturization; have high sensitivity, reliability, stability, reproducibility of measurement; used a small number of samples (max 0,1 ml); characterized by low cost; could be part of an integrated circuit, which also includes analog-to-digital converter and a microprocessor for measurement and calculation of the analytical signal analysis results. It shows that the ceria is not a classical semiconductor material for biosensors.

In the study of ten commercially available biosensors toxicity from enzymes and cells of vertebrates none of the individual sensor does not react to distilled water and only one sensor gave a response to the heavy water [1]. No one reacted sensor not more than six chemicals in a given range response. In addition, none of the presented sensor is not identified with the desired nicotine sensitivity.

However, a combination of three selected sensors (bioluminescent, fluorescent and impedansomesurement (conductometric) gave the best results. In [2] describes attempts to solve the problem of simultaneous determination of several toxic substances by creating a multisensor system based on different enzymes, selective to certain substances. Famous cases of different enzymes. However, the creation of multisensors is a very difficult task, since all enzymes are used to operate simultaneously on the same conditions. In addition, there is the problem of stability of each individual enzyme.

To create the biosensor system that can measure the toxicity immediately after several informative parameters offered to pick up such biological signal converters that were manufactured to be modern microelectronic technology, and therefore:– would be able to miniaturization;

- Have high sensitivity, reliability, stability, reproducibility of measurement;
- Used a small number of samples (max 0,1 ml);
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- could be part of an integrated circuit, which also includes analog-to-digital converter and a microprocessor for measurement and calculation of the analytical signal analysis results.

Experience with ceria showed that while its effect on the bacteria *Escherichia coli* strain TG1, the intensity of bioluminescence is correlated with the enzymatic activity of these bacteria, ceria is not toxic in relation to the test cultures even at maximum concentration in the aqueous suspension (20,000 mg / l).

- [1]. William H. Selection of a battery of rapid toxicity sensors for drinking water evaluation / William H. van der Schaliea, Ryan R. Jamesb, Thomas P. Gargan II // *Biosensors and Bioelectronics*. – 2006. – Vol. 22, Is.1. – P.18–27.
- [2]. Dzyadevich S.V. Naukovi ta tehnologichni zasadystvorennya miniaturnih elektrohimiichnyh biosensoriv / Dzyadevich S.V., Soldatkin O.P. – Kiyev: Naukova dumka, 2006. – 256 s. (ukrainian)