FROM THE EDITOR-IN-CHIEF

In vivo Chemical Analysis

DOI: 10.1134/S1061934810020012

The miniaturization of analytical devices and the reduction of the sizes (weights, volumes) of the test objects are one of the trends in the development of analytical chemistry. The successes in this area are stimulated not so much by the requirements (though these are numerous and their number and complexity are increasing) as by the possibilities, which are increasing, for example, with the progress in electronics or micromechanics. Miniaturization has many attractive aspects: small instruments and devices occupy less place, consume less energy, demand less reactants (if these are necessary), become mobile, and sometimes less expensive. Miniature devices and sensors sometimes allow one to solve analytical problems that can hardly be solved or cannot be solved at all using conventional analytical devices. Among such problems is, for example, the continuous determination of the necessary substances in a living organism.

However, this task gives rise to principal difficulties, which are associated with the bioincompatibility of the devices introduced into an organism. The composition of the analyzed medium near, for example, a buried electrode, often, if not always, changes as a result of a reaction to a foreign body. Note that concentrations of the components determined by the introduced sensor can change. In this case, the recorded concentration will have little in common with the actual concentration of the component of interest. All achieve-

ments in the creation of tiny probes in an organism will appear substantially useless.

The problem of biocompatibility, the problem of the minimization of the foreign body's reaction to the introduced device comes to the fore. Here, we again examine the experience gained in surgery, especially in transplantology. In many cases the problem of biocompatibility is somehow solved.

We also accumulate experience directly on implanted chemical sensors. The works in this direction were prepared by Frost and Meyerhoff [1]. One of the directions in this field is the search for special coatings for active sensor surfaces capable of reducing the influence on the environment (and vice versa).

Studies are ongoing, and in some cases lead to very interesting results. Thus, experiments on the determination of oxygen in the intercellular liquid of the brain of living rats have recently been described in [2].

REFERENCES

1. Frost, M. and Meyerhoff, M.E., *Anal. Chem.*, 2006, vol. 78, p. 7370.
2. Griffiths, J., *Anal. Chem.*, 2009, vol. 81, p. 2416.

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