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Potentiometry as a tool for monitoring of antioxidant activity

Khiena Z Brainina¹, Yan E Kazakov² and Aleksey V Tarasov¹

¹Ural State University of Economics, Russia

²JSC Medical Technology, Russia

The complexity of biological objects and the rapid change in their composition after sampling, the variety of compounds of different chemical nature, possessing oxidative and antioxidant properties, make the task of its estimating extremely important. The use of potentiometry in determining integral antioxidant/oxidant activity (AOA/OA) mainly of biological fluids and human skin is discussed. The source of information is the electrode potential shift that occurs when the analyzed sample is introduced into the solution of the mediator system or when the mediator system is brought into contact with the skin. Results of analysis of blood plasma of groups of patients with different pathologies and skin studies are presented. The decrease of AOA in patients with coronary heart disease, hypertension and malignancy, in particular, was shown. It is demonstrated an increase in skin AOA after taking ascorbic acid, enriched by vitamins juices, as well as the application of creams containing antioxidants. Zones of healthy people, risk and pathology are found. The findings open up new opportunities in expanding the use of analytical chemistry in such an important field as medicine. The trends include laboratory and on-site variants, the wearable, implementations on the way from the test tube to the smartphone.

Biography

Khiena Brainina holds a Ph.D. in chemical sciences (Ural State University, 1959), D.Sc. in chemical sciences (Moscow State University, 1967) and Professor in chemistry. More than 500 papers, abstracts and patents are published in Russian and international journals. 5 books in stripping analysis are published by Chemistry (Russia) and Willey & Sons (USA). Main research interests are: electrochemical sensors, stripping voltammetry, environmental monitoring, flow-through analysis, solid substance electrochemical characterization, sensors and antioxidants monitoring.

baz@usue.ru

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