ELECTROCHEMICAL INVESTIGATION OF METAL NANOPARTICLES OBTAINED BY LASER ABLATION

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Abstract

Pulsed laser ablation (PLA) is a method that allows obtaining of nanoparticles of different materials – metals, oxides, binary systems, etc. The process of ablation can be performed either in pure liquid, or in the presence of different chemical additives (such as stabilizers, surfactants). In the first case it is possible to obtain “pure” nanoparticles, which is very useful for some applications, for example, in modelling of chemical and physical processes where additives can cause interference. But even in the absence of additional chemicals, nanoparticles can react with the liquid, dissolved gases, with each other. Thus, it is necessary to investigate and control their structure and composition.

Many different analytical methods can give information of structure and composition of obtained nanoparticles, including electron microscopy, X-ray diffraction, spectroscopy, and others. But obtaining of information on objects under study using express, cheap, and sensitive electrochemical methods is of a high interest. This work deals with an attempt of using voltammetry for characterization of nanoparticles. “Pure” nanoparticles of different metals were adsorbed from their dispersions on an indicator electrode, and obtained signals gave the information on studied samples.

Keywords: Nanoparticles, laser ablation, voltammetry

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