Short Communication

Processes of Hydrogen Release Relaxation at Thermal Decomposition of Electrodes of Nickel-Cadmium Batteries

Nataliya N. Yazvinskaya, Nikolay E. Galushkin^{}, Dmitriy N. Galushkin, Inna A. Galushkina*

Don State Technical University, Laboratory of electrochemical and hydrogen energy, 147 Shevchenko Street, Town of Shakhty, Rostov Region, Russia, 346500.

^{*}E-mail: galushkinne@mail.ru

doi: 10.20964/2017.04.28

Received: 13 January 2017 / Accepted: 8 February 2017 / Published: 12 March 2017

In this study, it is shown that processes of hydrogen release relaxation at thermal decomposition of sintered electrodes of nickel-cadmium batteries are conditioned by the combination of the following factors. Firstly, this is the distribution of atomic hydrogen all around the entire volume of a ceramic-metal matrix of an electrode. Secondly, this is the very low diffusion coefficient of the atomic hydrogen in ceramic-metal matrices, which is connected with the fact that inside of the ceramic-metal matrix of the electrode, the atomic hydrogen is found in its bound state (β -phase). Thirdly, this is a large concentration of the atomic hydrogen in the ceramic-metal matrix of the porous electrode: the atomic hydrogen is accumulated in such electrodes in a course of batteries long-term operation.

Keywords: relaxation, hydrogen accumulation, thermal runaway, battery, nickel–cadmium

[FULL TEXT](#)

© 2017 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).