BOOK of ABSTRACTS

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CXTM

Сојуз на хемичарите и технолозите на Македонија

Society of Chemists and Technologists of Macedonia

26th Congress of SCTM

with International Participation

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Design of PtSnZn Nanocatalysts for Anodic Reactions in Fuel Cells

S. I. Stevanović,[a]* D.L.Milošević,[a] D. V. Tripković,[a] N.D.Nikolić,[a] V. R. Ćosović[a] and V. M. Maksimović[b]

[a]*University of Belgrade – Institute of Chemistry, Technology and Metallurgy, Njegoševa 12, 11000 Belgrade, Republic of Serbia*

[b]*University of Belgrade – Vinča Institute of Nuclear Sciences, Mike Petrovića Alasa 12-14, 11351 Vinča-Belgrade, Republic of Serbia*

*sanjas@ihtm.bg.ac.rs

In order to achieve widespread application of fuel cell technology, the development of an efficient and economical catalyst is a crucial step. Reducing the diameter of catalyst particles, producing particles with a specific orientation surface, and alloying noble metals with less expensive metals are possible approaches to improve catalyst performance. This study will be focused on novel ways for creating PtSnZn catalysts that are more effective for the anodic reactions in fuel cell such are methanol, ethanol and formic acid oxidation reactions. PtZn and PtSnZn nanoparticles were produced using the microwave assisted polyol method and were supported on high surface area carbon Vulcan XC-72R material. The electrochemical behavior of synthesized catalysts was investigated utilizing the cyclic voltammetry, chronoamperometric technique, and electro-oxidation of adsorbed CO. To determine the catalyst's physicochemical characteristics, X-ray diffraction (XRD), transmission electron microscopy analysis (TEM), and thermogravimetric analysis (TGA) were used. High catalytic activity of the PtSnZn/C catalysts was achieved thanks to the benefits of microwave synthesis and carefully adjusted metal alloying.

Keywords: platinum catalysts; methanol oxidation; ethanol oxidation, formic acid oxidation;

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