

BOOK of ABSTRACTS

26th Congress of Chemists and Technologists of Macedonia

26th Конгрес
на Хемичари
и Технологи
на Македонија

20-23 9 2023 OHRID, RN MACEDONIA





Сојуз на хемичарите и технолозите на Македонија
Society of Chemists and Technologists of Macedonia

**26th Congress of
SCTM
with International Participation**

BOOK of ABSTRACTS

**20–23 September 2023
Metropol Lake Resort
Ohrid, N. Macedonia**

PSSE P-12

**Facile Synthesis of Sn-Pd Catalysts With High Performances
For Ethanol Electro-Oxidation In Alkaline Medium**

J.D. Lović,^{a,*} N.D. Nikolić,^a P. M. Živković^b, M. Stevanović^c

^a*University of Belgrade, ICTM–Department of Electrochemistry, Belgrade, Serbia*

^b*Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia*

^c*Innovation Centre of the Faculty of Technology and Metallurgy, University of Belgrade,
Belgrade, Serbia*

*jelena.lovic@ihtm.bg.ac.rs

Nanostructured materials present unique properties as electrocatalysts for various industrial needs such as electrochemical energy conversion and storage. Aiming to enhance the electrocatalytic properties of Pd towards the electrochemical oxidation of ethanol, we used the electrodeposited Sn dendrites as a sub-layer for Pd. We tested the resulting Sn-Pd electrocatalysts for ethanol oxidation reaction (EOR). It was obtained that different morphological characteristics of Sn contribute to and determine Pd electrochemical behavior in EOR. By varying the amount of Sn loading prepared in the potentiostatic regime and keeping constant Pd loading, a series of Sn-Pd electrocatalysts with various ratios of Sn and Pd were synthesized and among them, Sn_{0.6}-Pd_{0.4} showed to be the most active and poisoning tolerant catalyst in EOR. It was pointed out that optimization of composition and morphology assures well synergy of Sn with Pd towards EOR and at the same time demonstrates the guide for the design of novel materials with specific properties. Therefore Sn-Pd catalysts have emerged as a suitable and promising anode material for direct alcohol fuel cells.

Keywords: tin; palladium; morphology; composition; electrooxidation.

References

1. Bianchini, C.; Shen, P.K. Palladium-Based Electrocatalysts for Alcohol Oxidation in Half Cells and in Direct Alcohol Fuel Cells. *Chem. Rev.* **2009**, *109*, 4183–4206. <https://doi.org/10.1021/cr9000995>.

Acknowledgment: This work was financially supported by MSTDI of RS (Grant No. 451-03-47/2023-01/200026) and Science Fund of RS (Grant No. AdCatFC: 7739802).