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Abstract

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Influence of Treatment of Various Carbon Supports on Electrochemical Activity of Pt Catalysts

Stevanović, S.I., Tripković, D.V., Nikolić, N.D.*

Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoševa 12, 11 000 Belgrade, Serbia

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***Corresponding author:**
Nebojša Nikolić
E-mail: nnikolic@ihtm.bg.ac.rs
Phone: 00-381-11-3370390
Fax: 00-381-11-3370389

Abstract: The development of novel materials to be used in energy production, conversion and storage is one of the largest challenges of today. The good alternative to use of fossil fuels is the fuel cell using methanol as fuel. Platinum is an excellent catalyst for methanol oxidation, but it is very expensive and its stock is limited. One of the ways to decrease an amount of Pt and simultaneous keep high catalyst activity is to increase real surface area of Pt catalyst by suitable treatment of catalyst support. In this study, influence of physical-chemical and electrochemical treatments of various carbon supports, such as Glassy carbon (GC) and Vulcan XC-72 Carbon, on electrochemical activity of Pt catalyst for methanol reaction oxidation has been investigated. The treated carbon supports were characterized by optical microscopic and atomic force microscopic techniques, as well as in situ electrochemical atomic force microscopic technique. Optimization of carbon support treatments is made through analysis of roughness, shape and size of Pt particles. The best activity showed Pt catalyst supported on Vulcan XC-72 Carbon.