

Carbon free supported noble metal nanostructures for green energy production- challenges and perspectives

Nevenka R. Elezovic

University of Belgrade Institute for Multidisciplinary Research- Centre of Excellence for Green Technologies

Serbia, e-mail: nelezovic@tmf.bg.ac.rs

Abstract: Statement of the problem: The contemporary industrial processes, as well as transportation vehicles power are based on fossil fuels usage. Intensive fossil fuel application leads to the growing environment pollution, causing the "greenhouse effect". During the 20th century the CO₂ concentration increased about 20%, being the main reason for average temperature increase on Earth. This fact has already caused undesirable climate changes, connected to animal and plants biodiversity disorder, Sea level rise, melting Arctic Sea ice layers, extreme nature disasters. United Nations has recognized environment pollution effects and global actions to prevent it have already been taken. From Stockholm conference held in 1972 and Kyoto in 1997 up to Paris Climate Agreement 2015 United Nations announced several declarations to stabilize gas emission and decrease greenhouse effect. European Union has established main targets until 2050, in the frame of Climate and Energy Package, to increase alternative power sources usage and save environment for future generations.

Thus, the further development of water electrolysis and fuel cells catalysts (the subject of this work), as environmental friendly, green technologies are extremely desirable, to contribute to the environment protection and sustainable development. Hydrogen – high efficiency and environmental friendly fuel, produced by water electrolysis is used in low temperature fuel cells, while oxidative agent is oxygen from air. In this work novel nanostructured materials with noble metal nanoparticles (Pt and Pd) deposited onto carbon free- titanium-oxide based supports have been investigated as the catalysts for fuel cells, promising alternative power sources. Several ceramic supports were prepared – non-stoichiometric oxides -Ebonex, Nb or Ru doped titanium oxide nanoparticles, as well as titanium oxide nanotubes supports. Physical-chemical and electrochemical characterization of these novel materials confirmed higher efficiency and long term stability to decrease the costs and increase life time of fuel cells acceptable for commercial application.

What will audience learn from your presentation?

- The audience will learn about state of the art in renewable, environmental friendly hydrogen energy production and application, as well as progress is being made beyond state of the art;
- The consciousness and alert will be arisen: what to do and how, to make our planet sustainable and leave better environment for the future generations;
- The audience will learn about scientific efforts and directions to change the existing fossil fuel based energy world causing undesirable climate changes, to future environmental friendly power sources.
- Finally, some environmental friendly energy solutions, that we have been working in for years, will be given and future research directions to clean energy world.

Biography: Dr Nevenka R. Elezovic completed her PhD in 2005, from University of Belgrade. She is currently Research Professor at the Institute for Multidisciplinary Research, University of Belgrade. Her research interests include: Nanostructured materials and alloys for low temperature fuel cells and water electrolysis application - green energy production. Since 2013 she is served as representative of Serbia and member of the European board in European Academy of Surface Technology,
<http://www.east-site.net>.

She has published more than 40 papers in reputed peer reviewed journals of eminent Publishers such as Elsevier, Royal Society of Chemistry, The Electrochemical Society and more than 70 conference papers. She has been serving

Euro-Global Climate Change Conference

as a reviewer for: Energy and Environmental Science, Applied Materials and Interfaces, Journal of Materials Chemistry A, Electrochimica Acta, Applied Catalysis B: Environmental, RSC Advances, PCCP, Chemical Communications, Journal of the Electrochemical Society, International Journal of Hydrogen Energy, as well as adjudicative (senior) reviewer for Energy and Environmental Science, Journal of Materials Chemistry A and Physical Chemistry Chemical Physics. She has given numerous invited lectures at the International conferences, recently at International Summit on Conventional and Sustainable Energies, March 30-31, 2018 Orlando, Florida, USA, Global Experts Meeting on Frontiers in Green Energy and Expo, October 14-16, 2019 Rome, Italy and Materials, the Building Block for the Future 3rd AAAFM-UCLA conference, August 18-20 2021.

Web page:

<http://www.imsi.bg.ac.rs/en/researchers/nevenka-r-elezovic>

Email: nelezovic@tmf.bg.ac.rs. elezovic@imsi.rs

Details of presenting author to be mentioned in certificate:

Name: Nevenka R. Elezovic

Affiliation: University of Belgrade Institute for Multidisciplinary Research - Centre of Excellence for Green Technologies, Serbia,

Country: Serbia

Other Details:

Presentation Category: Keynote lecture

Session Name: Renewable Energy to Mitigate Climate Change

Email: nelezovic@tmf.bg.ac.rs

Alternative email: elezovic@imsi.rs

Contact Number: +381641151967

Twitter/Facebook/LinkedIn: Nevenka Elezovic

Suggestion of speakers to be invited: Names and email address of your colleagues or friends interested to attend Climate Change 2022.

Recent Photograph: (High Resolution)

