INCORPORATION OF IrO_2 AND RuO_2 INTO Pd NANOPARTICLES FOR BOOSTING THE ELECTROCATALYTIC ACTIVITY TOWARD ELECTRO-OXIDATION OF CRUDE GLYCEROL FROM BIODIESEL

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Crude glycerol from biodiesel industries is composed mainly by a mixture of soups, remnants of biodiesel/oils, methanol and glycerol. Moreover, crude glycerol is considered as an undesired byproduct and it is mostly burned or storage, increasing the biodiesel costs. Methanol and glycerol are considered as electro-active species than can be used as fuels for energy conversion applications such as fuel cells. Therefore, the use of crude glycerol as fuel can give it an added-value increasing the renewable aspect of fuel cells technology. Consequently, in this work, we synthesized Pd, $PdIrO_2$ and $PdRuO_2$ (which have shown in literature high affinity for methanol electro-oxidation) electrocatalysts deposited on Vulcan carbon as support. These materials presented according to TEM images, nanoparticulate sizes ranging 8-16 nm. In addition, the elemental composition performed by XRF indicated that both are in a mass ratio of Pd-76% IrO_2-24% and Pd-79% RuO_2-21%. Evaluation of the electrocatalytic activity for crude glycerol electro-oxidation indicated that Pd-RuO_2 presented the most negative onset potential (-0.23 V *vs*. NHE); however, Pd-IrO_2 presented the maximum current density at 2 M crude glycerol (3 and 5-fold higher current density than Pd-RuO_2 and single Pd nanoparticles).

Keywords: crude glycerol, electrocatalysis, energy conversion, Pd-RuO_2, Pd-IrO_2.

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Dear Noé Velázquez Arjona
Departamento de Tecnología
Centro de Investigación y Desarrollo Tecnológico en Electroquímica S. C.

We are pleased to inform you that your abstract entitled:

"INCORPORATION OF IrO_2 AND RuO_2 INTO Pd NANOPARTICLES FOR BOOSTING THE ELECTROCATALYTIC ACTIVITY TOWARD ELECTRO-OXIDATION OF CRUDE GLYCEROL FROM BIODIESEL"

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Has been accepted for the ***14th International Topical Meeting on Nanostructured Materials and Nanotechnology (Nanotech 2018)*** at the ***oral session*** of ***Tuesday October 23th*** with the key ***NTC-ST08***, in the Auditorium of Crown Paradise Club Hotel, Puerto Vallarta, Jalisco, Mexico.

With kind regards

The organizing committee
Nanotech 2018

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Awards the following

Certificate

to:

Noé Velázquez Arjona

for acknowledge his attendance as speaker on the short talk entitled:

"Incorporation of IrO_2 and RuO_2 into Pd nanoparticles for boosting the electrocatalytic activity toward electro-oxidation of crude glycerol from biodiesel"

at the International conference NANOTECH 2018.

Puerto Vallarta, Jalisco,
October 22th - 26th 2018.

Dr. Alfredo Tlahuice Flores

Dr. Iván Guillén Escamilla