

## Meeting Abstracts

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Abstract MA2018-02 1587

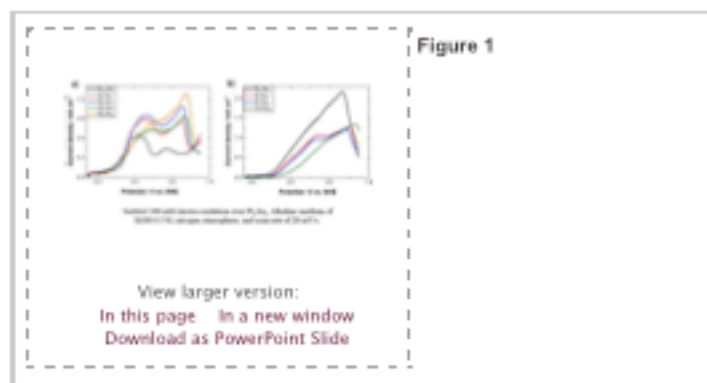
## Electrocatalytic Effect of the Bimetallic Composition of Pt<sub>x</sub>Au<sub>y</sub> in the Sorbitol Electro-Oxidation Reaction in Alkaline Medium

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### Abstract

Fuel cells has been developed as an alternative energy source, with the advantage of using renewable fuels like alcohols obtained from biomass. Among the 12 most important building blocks from biomass is sorbitol, capable of transferring up to 26 electrons in its complete electro-oxidation. The existing literature about the sorbitol electro-oxidation reaction (SOR) is few and mostly focused on platinum alone materials in acid medium, and the proposed SOR pathway leads to glucose and then follows the glucose electro-oxidation pathway. Since there is no report concerning the effect of bimetallic nanoparticles for the SOR, we decided to test the effect of the bimetallic composition of platinum-gold nanoparticles in alkaline medium, not only for sorbitol, but also for the reported by-products; gold was chosen due to its excellent electroactivity towards glucose oxidation. The highest current density was achieved by the catalysts Pt<sub>30</sub>Au<sub>70</sub> with 2.16 mA/cm<sup>2</sup>, while the lowest peak potential was obtained by Pt alone at -0.03 V/NHE. The addition of gold to the bimetallic composition also change the electrochemical behavior, from various oxidation signals at low potentials for high Pt loadings to a single oxidation signal at higher potentials for low Pt loadings.



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### May be of interest

Electrochemical and Physicochemical Characterizations of Gold-Based Nanomaterials: Correlation between Surface Composition and Electrocatalytic Activity

Yaovi Holade et al., Journal of The Electrochemical Society

Hydrogen Oxidation and Evolution

One-pot synthesis of Au@Pt star-like nanocrystals and their enhanced electrocatalytic performance for formic acid and ethanol oxidation

Yi Peng et al., Nano Research

Touch of gold improves nanoparticle fuel-cell reactions

Brown University, ScienceDaily

**Reaction Kinetics on Platinum: Acid vs Alkaline Electrolytes**

Wenchao Sheng et al., *Journal of The Electrochemical Society*

**Facile Synthesis of Platinum Alloy Nanoparticles with Enhanced Activity for Ethylene Glycol Electro-Oxidation**

Qin-Hao Zhang et al., *ECS Electrochemistry Letters*

**Effective and Stable CoNi Alloy-Loaded Graphene for Ethanol Oxidation in Alkaline Medium**

Nasser A. M. Barakat et al., *Journal of The Electrochemical Society*

**Study of the Supported Catalysts Core-Shell Type of Gold and Palladium: Analysis of the Reaction Products and Mechanism for the Electrooxidation of Ethanol in Alkaline Medium**

José Gabriel Ruiz Montoya et al., *ECS Meeting Abstracts*

**New cobalt-graphene catalyst could challenge platinum for use in fuel cells**

Brown University, *ScienceDaily*

**Sulphur and Chloride Deposition and Ecosystem Transport in a Strongly Acidified Lake Watershed**

Hans Hultberg et al., *Water Sci Technol*

**Effects of crystal phase and composition on structurally ordered Pt-Co-Ni/C ternary intermetallic electrocatalysts for the formic acid oxidation reaction**

*Journal of Materials Chemistry A*

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To Whom It May Concern:

This is to certify that Luis Torres-Pacheco attended the AiMES 2018 Meeting held in Cancun, Mexico on September 30th through October 4th, 2018.

This also certifies that Luis Torres-Pacheco presented the following paper titled: Electrocatalytic Effect of the Bimetallic Composition of Pt<sub>x</sub>Au<sub>y</sub> in the Sorbitol Electro-Oxidation Reaction in Alkaline Medium by: L. Torres-Pacheco (CIDETEQ), L. Álvarez-Contreras (CIMAV), M. Guerra-Balcázar (Universidad Autónoma de Querétaro), and N. Arjona (CIDETEQ).

Sincerely,



Chris Jannuzzi  
ECS Executive Director