

Fundamental aspects of the electrooxidation of alcohols/polyols. Towards a more sustainable generation of green hydrogen.

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The current concerns about the pollution of the environment and the increasing demand of energy claim for the use of greener sources of energy. In this context, the use of biomass-derived resources and the production of green H₂ appear as exciting opportunities for the consolidation of Brazil as a key player in the generation of green energy and value-added chemicals by using sustainable technologies.

More than 90 % of H₂ still comes from non-renewable sources, which leads to environmental impacts and makes clear the need for an economically viable and competitive production of green H₂. Biomass is CO₂-neutral, abundant, and considered a renewable resource substitute for fossil fuels. Brazil has extensive biomass resources that can be used to meet its own primary energy and to export internationally.

In this context, several cheap and abundant polyols (glycerol, glucose, etc.) have emerged as alternatives to be used in fuel cells (to produce electric energy and value-added oxidation products) and in electrolyzers (to produce value-added oxidation products and high purity hydrogen).

These technologies (some more mature than others) require of intensive research on several technological and fundamental aspects. One of the important components of these devices are the catalyst used to selectively oxidize the biomass-derived resources. Therefore, in this talk, I will briefly discuss the main results from the literature about the selectivity for the electrooxidation of polyols on pure Pt and Pt-based surfaces both, in alkaline and acid media. Finally, I will present some recent results, perspectives, and new insights about the reaction mechanism on metallic oxides surfaces.

Keywords: Biomass-derived resources, polyols, alcohols, high purity hydrogen.

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