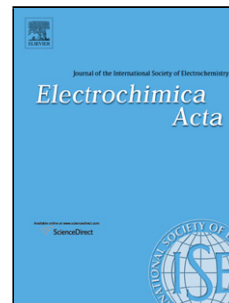


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Effect of TiO₂ Loading on Pt-Ru Catalysts During Alcohol Electrooxidation

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Graphical Abstract

Highlights

- TiO₂ can be used to modify Pt-Ru based electrodes for alcohol oxidation.
- TiO₂ modified electrodes with lower amount of metals had higher active surface area than pure Pt-Ru electrodes.
- TiO₂ modified electrodes showed comparable performance with pure Pt-Ru electrode both in a single cell and in a PEM fuel cell under alcohol fuelling.

Abstract

In this study, Pt-Ru based electrodes modified by TiO₂ were prepared by means of thermal decomposition of chloride and isopropoxide precursors on Ti substrates, characterised by X-ray Diffraction (XRD), Scanning Electron Microscopy (SEM), X-ray Photoelectron Spectroscopy (XPS), electrochemical techniques and CO stripping and used as anodes for alcohol oxidation. The minimization of the metal loading without electrocatalytic activity losses was also explored. TiO₂ was chosen due to its chemical stability, low cost and excellent properties as substrate for metal dispersion. It was found that TiO₂ loading up to 50% results in a 3-fold increase of the Electrochemically Active Surface (EAS). This conclusion has been

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