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ESR study of spin adducts of the direct electrocatalytic decomposition of light aliphatic alcohols in a polymer electrolyte fuel cell

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Abstract

Spin adducts of methanol and ethanol electrocatalytic oxidation were detected by the spin trap method using a tiny H₂/O₂ fuel cell (FC) designed for ESR in situ with a Nafion/Pt membrane electrode assembly. Spin adducts of intermediates of the direct electrooxidation of ethanol, which have not been observed earlier, were obtained by the variation of oxidation conditions, in particular, the FC potential. The work of the FC was controlled by monitoring the diagnostic curves potential³-current density, power density³-current density, and efficiency-power density. © 2010 Springer Science+Business Media, Inc.

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Keywords

diagnostic curves, ESR spectroscopy, ethanol, free radical, fuel cell, methanol, polymer polyelectrolyte, spin adduct, spin trap