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Comparison between Sn modified single crystal and preferentially Pt electrodes towards ethanol oxidation in acidic medium

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Polycrystalline, preferentially oriented and low-index plane Pt single crystal electrodes modified by submonolayer deposition of Sn have been tested for ethanol oxidation in acidic media using cyclic voltammetry and chronoamperometry. In contrast to spontaneous deposition, forced deposition facilitates the irreversible adsorption of Sn particularly on Pt (110), and allows the study of electrochemical activity of Sn modified Pt with all electrodes understudy. For all substrate planes, Sn adlayer enhance the current greatly by the ethanol oxidation process. The enhancement factor for ethanol oxidation depends on both substrate crystallography and Sn coverage. The optimum coverage was found to vary from 0.2 for Pt (100) to around 0.6 for preferentially oriented t“(100)". Preferentially oriented Sn/Pt"(110)" exhibited the highest enhancement factor towards ethanol oxidation. On the other hand, the lowest tolerance ability was found to be Sn modified Pt (111). This was attributed to the accumulation of acetate species at the electrode surface.

Biography

A A El-Shafei, Science Doctor (Ph.D.-Chemistry), he became a Full Professor of Physical Chemistry at Mansoura University in October 2001. He got his BSc in chemistry, MSc in Physical Chemistry and Specialist in electro-chemistry, Doctor's Degree (Ph.D.) under channel system program (Bonn University, Germany & Mansoura University, Egypt). He acts as active participants in various electrochemist groups in Germany, Japan, France and USA. In 1994 he has spent six months as a Research Associate at CNRS, France. He got various research fellowships from distinguish scientific organizations such as, AxVH, JSPS and JICA. He got the Arab Fund for Economic and Social Development Research Award in 2006. He got the Prize of Distinction in Chemistry from Mansoura University, 1998/1999. Currently, his researches focus on modified electrodes for fuel cell technology and corrosion inhibition. He has published more than 40 papers in reputed journals and has been serving as an Editorial Board Member and Reviewer of Repute Inetrnational Secientific Journals.

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