

FORMIC ACID ELECTROOXIDATION AT PLATINUM-MODIFIED GOLD SURFACE: A COMBINED STUDY BY ELECTROCHEMISTRY AND SURFACE ENHANCED RAMAN SPECTROSCOPY. Ranjani Muralidharan, Xiao Li
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Present Formic acid fuel cell efficiency is limited by low kinetics at the anode indicating the need for effective catalysts to improve the formic acid oxidation. As a prerequisite, we investigated the nature of adsorbed species and reaction intermediates formed in this process. Current work involves the electrooxidation of formic acid and study of the intermediates including formate at platinum-modified gold surface by combination of electrochemistry and in situ Surface enhanced Raman Spectroscopy (SERS). The oxidation currents obtained on Pt/Au electrode is higher than that on bare Pt surface and about 48 times higher than that on bare Au surface. The electrochemical results affirm the enhanced catalytic activity of Pt/Au for formic acid oxidation. Furthermore, the SERS formate peak which appears at 300 cm^{-1} showed a characteristic stark effect. A unique relationship has been observed between the formic acid oxidation currents and the relative SERS intensity of this formate adsorbate on Pt/Au.