Formic Acid Oxidation at BiPt Ordered Intermetallic Electrodes

H. D. Abruña, F. J. DiSalvo, E. Casado-Rivera, A.C.D. Angelo, Z. Gal, C. Lind D. Volpe and C. Korzeniewski#
Dept. of Chemistry & Chemical Biology
Baker Laboratory, Cornell University
Ithaca, New York 14853-1301
#Dept. of Chemistry
Texas Tech University
Lubbock, Texas

We have studied the electrocatalytic activity of ordered intermetallic phases of Bi and Pt toward formic acid oxidation. These materials exhibit enhanced electrocatalytic activity as compared to polycrystalline platinum, as well as to platinum electrodes modified with irreversibly adsorbed bismuth. Using cyclic voltammetry, rotating disk electrode voltammetry (RDE), FTIR and DEMS (differential electrochemical mass spectrometry) we have characterized the current density, onset potentials, kinetics of oxidation, reaction intermediates, and product distribution. The results will be discussed within the framework of structural, geometric, and electronic effects.