

Abstract Submitted  
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**Surface Site Characterization of CO<sub>ads</sub> on Platinum**<sup>1</sup> PATRICK MCGRATH, AURORA MARIE FOJAS, ELTON CAIRNS, JEFFREY REIMER, University of California - Berkeley — Nuclear magnetic resonance (NMR) spectroscopy is used in conjunction with cyclic voltammetry (CV) to explore the surface chemistry of CO on platinum electrocatalysts. Electrochemically prepared CO<sub>ads</sub> (from different sources and electrode potentials) are studied on platinum at various coverages in sulfuric acid electrolyte. A model is presented to parse the total oxidation current into its separate contributions and these are correlated with the type of surface site occupied by the adsorbate. Accounting of the CV oxidation currents suggest that the species left on the surface after partial oxidation of a saturated CO<sub>ads</sub> layer is a mixture of linear- and bridged-CO. <sup>13</sup>C-NMR of the surface species resulting from electrochemically adsorbing labeled methanol provides direct insight into the surface electronic structure of the catalysts. We observe a shift in the <sup>13</sup>C-NMR spectra associated with different surface preparations. These shifts correlate with the corresponding coverage of the adsorbate on different types of platinum sites. NMR is used to probe the dynamics of these species to elucidate the interaction of the adsorbate with the platinum surface.

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