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Broad-Band Sum-Frequency Generation Spectroscopy at Platinum/Solution Interfaces[1]

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Vibrational Broad-Band Sum-Frequency Generation Spectroscopy (BB-SFG) is the second-generation SFG method for studying surfaces, including wet electrochemical interfaces. BB-SFG measurements, which are based upon the second-order nonlinear optical process are inherently interface specific (as is SFG) but add sensitivity and control to SFG. The electrochemical cell used for the reported measurements has an ideal configuration where the thickness of the supporting electrolyte (25 μm) is controlled by a spacer, allowing for rapid spectral acquisitions (5 s^{-1}) synchronized with the potential sweep at 5 mV s^{-1}). In the talk, simultaneous electrochemical and BB-SFG measurements will be reported for adsorption/oxidation of carbon monoxide on polycrystalline and well-ordered Pt(hkl) electrodes with both CO-free and CO-saturated electrolytes. The emphasis will be on the combination between thin layer electrochemistry (TLE) and vibrational electrode surface analysis, and on dynamics of Pt/solution interfaces probed by the CO molecule adsorption and oxidation.

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