Herein we present surface sensitive operando XAS L-edge measurements on IrO$_x$/RuO$_2$ thin films as well as mass-selected RuO$_x$ and Ru nanoparticles. We observed shifts of the white line XAS peak toward higher energies with applied electrochemical potential. Apart from the case of the metallic Ru nanoparticles, the observed potential dependencies were purely core-level shifts caused by a change in oxidation state, which indicates no structural changes. These findings can be explained by different binding energies of oxygenated species on the surface of IrO$_x$ and RuO$_x$. Simulated XAS spectra show that the average Ir oxidation state change is strongly affected by the coverage of atomic O. The observed shifts in oxidation state suggest that the surface has a high coverage of O at potentials just below the potential where oxygen evolution is exergonic in free energy. This observation is consistent with the notion that the metal-oxygen bond is stronger than ideal.