Supplemental Document for

Application of electron-beam-excited localized surface plasmon resonance to provide guidelines for plasmonic catalysts

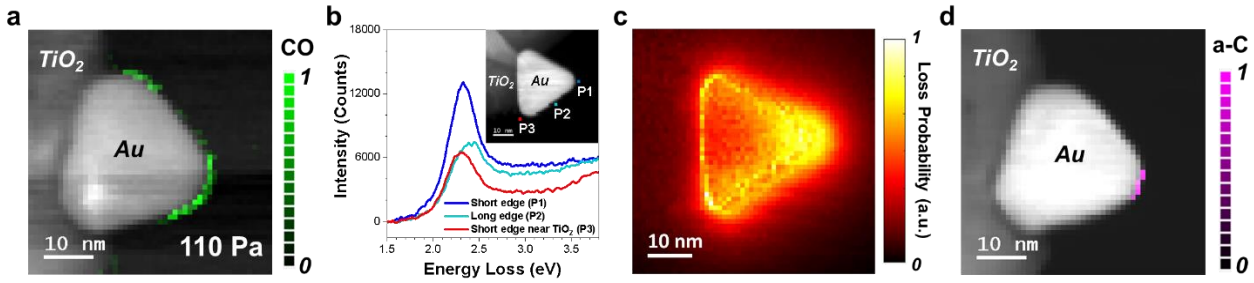

Figure 1. a, *In situ* electron energy-loss spectroscopy (EELS) map of a Au nanoprism on TiO_2 support showing the adsorbed CO (green, C K-edge signal corresponding to adsorbed CO normalized to the maximum intensity) at selective edges instead of on the entire surfaces in CO environment. The adsorbed CO map is overlaid with a scanning transmission electron microscopy annular dark-field image (STEM-ADF, gray scale) of the same area. **b,** EELS spectra measured at three aloof beam positions: P1, P2, and P3, shown in the inset. **c,** EELS map integrated using the energy-loss range from 1.8 eV to 3.8 eV indicating that an electron beam is most efficiently coupled with the localized surface plasmon (LSP) dipole mode when placed at the cantilevered nanoprism corner and several nanometers beyond in the vacuum, suggesting a strong electric field at the same corner due to this resonance mode. **d,** EELS map, acquired after CO evacuation, of carbon deposits (magenta, C K-edge signal corresponding to amorphous carbon (a-C) normalized to the maximum intensity) resulting from room-temperature LSP-induced CO disproportionation in CO environment showing that the catalytically active sites on the Au nanoprisms are where the preferred CO adsorption sites and the locations of maximum electric field amplitude superimpose.