Supporting Information

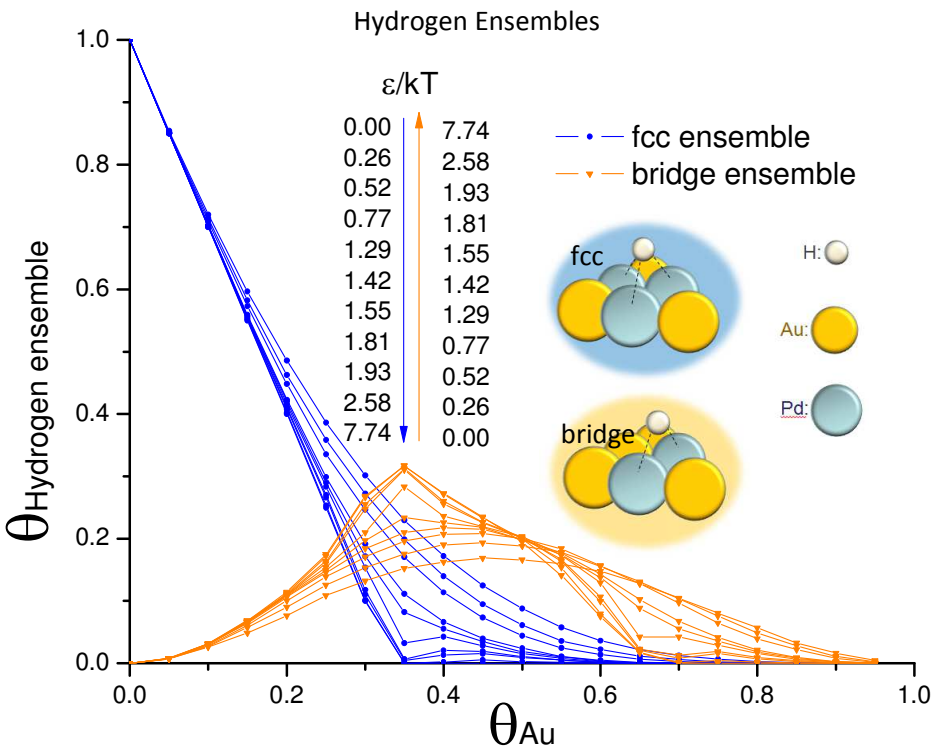

Figure S1: Ensembles for hydrogen adsorption on alloy surfaces with varying values of the interaction parameter, ε/kT.

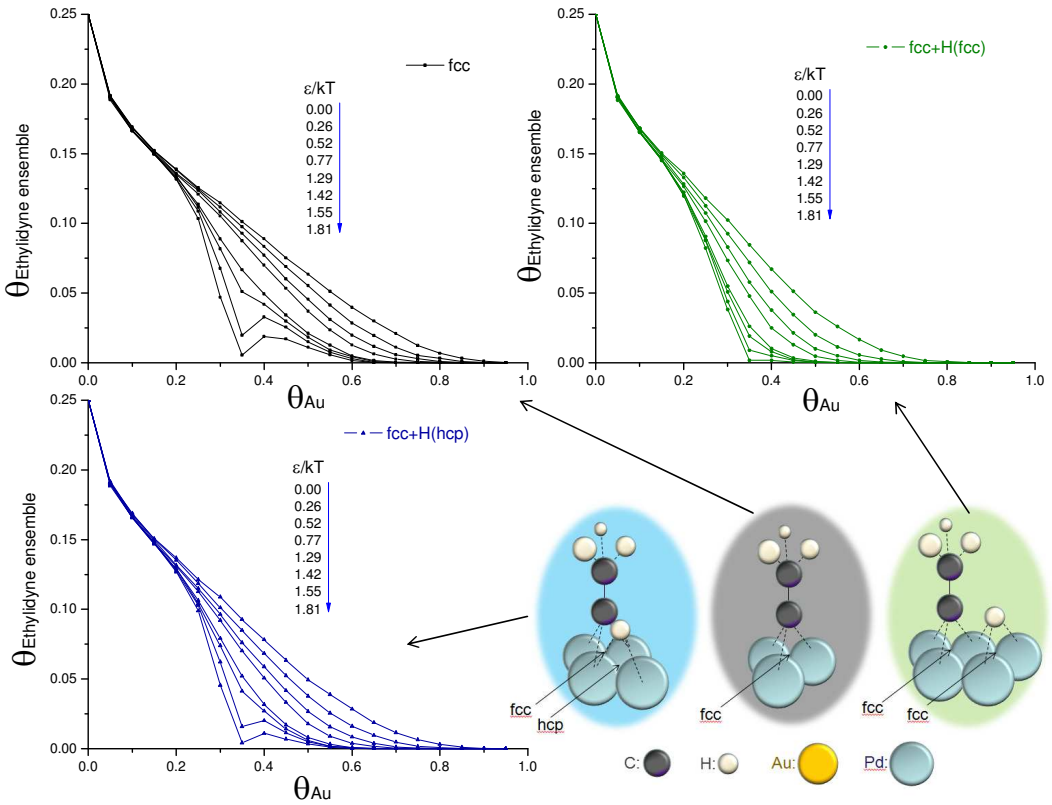

Figure S2: Ensembles for ethylidyne adsorption on alloy surfaces with varying values of the interaction parameter, ε/kT.

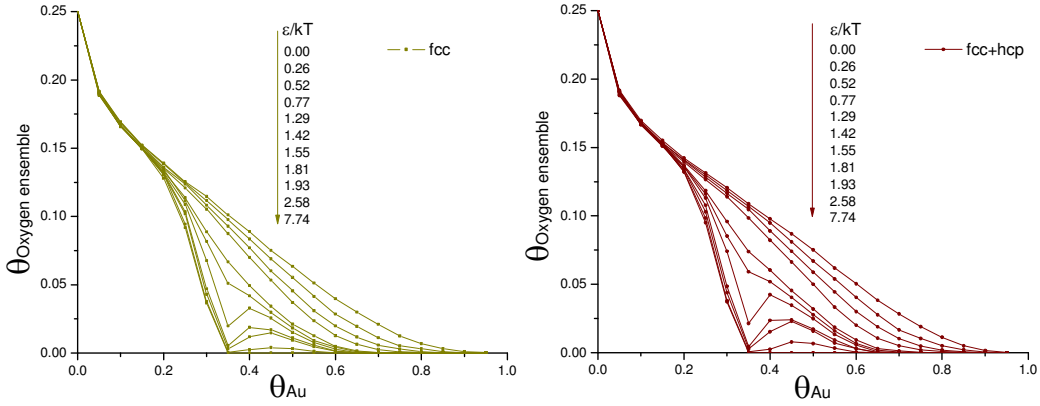

Figure S3: Ensembles for oxygen adsorption on alloy surfaces with varying values of the interaction parameter, ε/kT. Although these two graphs look very similar to each other, the one in which both *fcc* and the remaining available *hcp* three-fold hollow sites are counted has ensemble coverages that are slightly higher than those for which only *fcc* three-fold hollow sites are counted.