Faceting of Re (1121) induced by oxygen HAO WANG, WENHUA CHEN, THEODORE E. MADEY, Department of Physics and Astronomy and Laboratory for Surface Modification, Rutgers University, Piscataway, NJ 08854 — The oxygen-induced nanoscale faceting of Re (1121) has been studied by low energy electron diffraction (LEED) and Auger electron spectroscopy (AES); the results are compared with recent STM and LEED studies of O-induced faceting of Re(1231). The evolution of surface morphology depends on oxygen exposures and deposition temperatures. Re(1121) remains planar after oxygen deposition at 300K. Annealing O-covered Re(1121) between 800K-1200K leads to the formation of (0110) and (1010) facets that coexist with the (1121) surface. Under oxidation conditions, i.e. dosing a large amount of oxygen at high temperatures (900-1000K), the (1121) surface is completely covered by 4-sided nanoscale pyramidal structures whose facets are identified as (0110), (1010), (0111) and (1011). The fact that the (1121) surface becomes completely faceted only after oxidation is consistent with our previous data for O-induced faceting of Re(1231), where one facet has the (1121) orientation and is unstable against oxidation. The faceted O/Re surfaces may be potential templates to grow nano-structures with narrow size distribution, and may also be substrates to study structural sensitivity in catalytic reactions.