Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Formation and Sintering of Pt Nanoparticles on Vicinal Rutile TiO_2 Surfaces

Supporting Information

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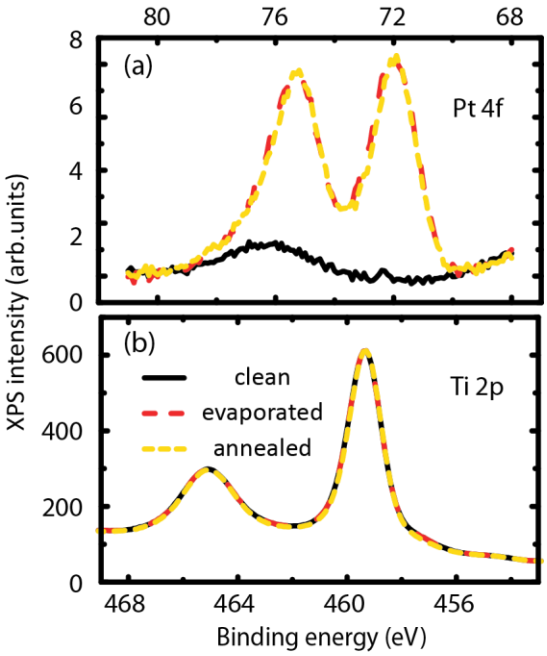

Figure S1. XPS Pt 4f (a) and Ti 2p (b) spectra of the clean (black), freshly Pt covered (red) and subsequently at 800 K annealed (yellow) HR-TiO_2 (110) surface. These XPS data indicate that no Pt was lost during vacuum-annealing. Similar results were obtained for the SR-TiO_2 (110) surface and the vicinal (870) and (771) surfaces. The peak at 76 eV BE in the Pt 4f spectrum of clean HR-TiO_2 arose from the sample holder (tantalum).

Additional STM data, showing the evolution of an SR-TiO_2 (110) surface upon 10 L O_2 exposure at ~108 K, followed by vacuum-annealing at various temperatures. Clearly, O_{br} vac.'s re-appear in substantial amounts only following vacuum-annealing at ~700 K.

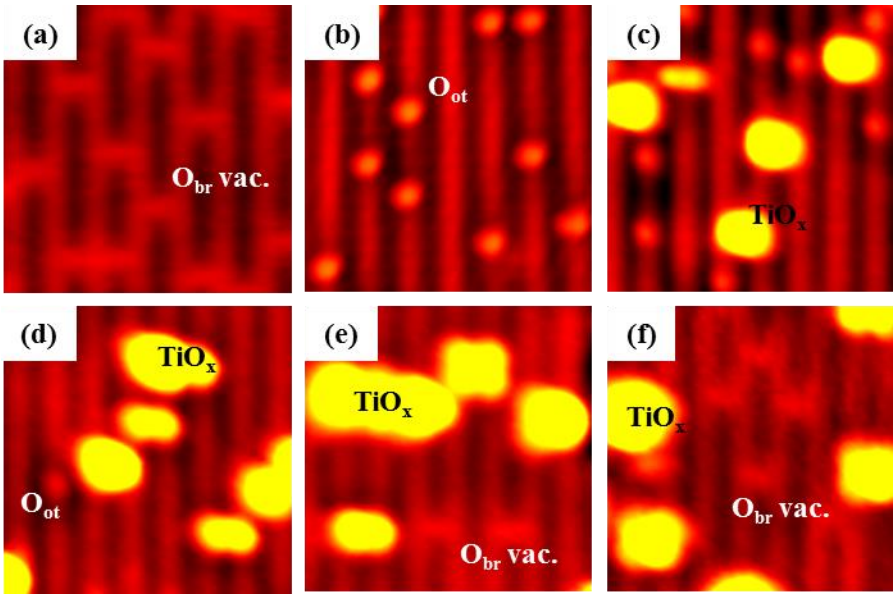

Figure S2. Zoom-in STM images (45 Å × 45 Å) of a clean TiO_2 (110) acquired after 22 preparation cycles (a), after 10 L O_2 exposure at ~108 K to clean TiO_2 (110) (b), after subsequent vacuum-annealing at ~450 K (c), ~520 K (d), ~600 K (e) and ~700 K (f), respectively. All the annealing experiments were conducted within the same series of STM experiments. The annealing time was in each case 2 min. Examples for O_{br} vac.'s, O_{ot} adatoms, and TiO_x species are indicated directly in the STM images.