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

Supporting information

Water and CO (co-)adsorption on pseudomorphic Pt films on Ru(0001) – A low-temperature scanning tunneling microscopy study

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1. Stability of pure CO structures during STM imaging

The stability of the CO_{ad} adlayer derived from CO adsorption only was determined by subsequently recorded STM images, as shown in Fig. S1. On the 2 ML Pt area (Fig. S1a and S1b), we observed local changes, such as transformations between c(4×2) and (√7×√7)R19.1° structures, marked by yellow circles. For the 3 ML Pt area (Fig. S1c and S1d), very similar changes were observed as marked by yellow circles. This indicates that for the pure CO adlayer the tendency for domain restructuring or relaxation is very similar on the 2 and 3 ML Pt areas.

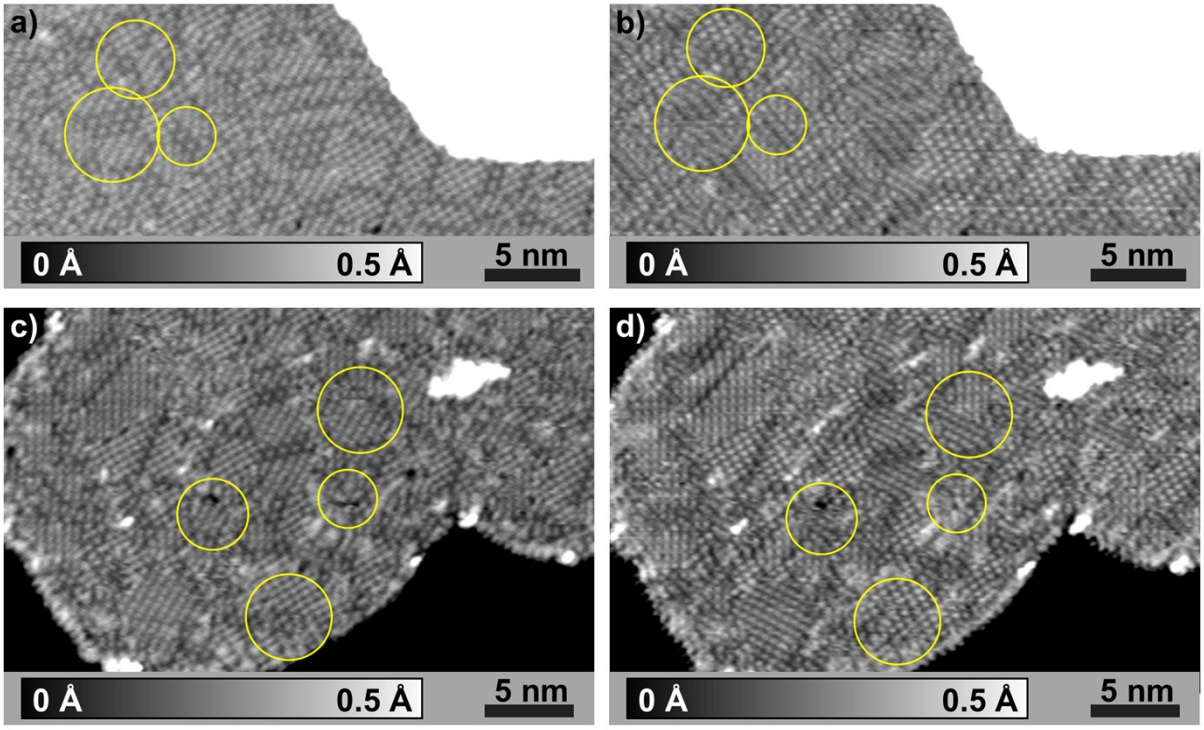

Figure S1: Subsequently recorded STM images illustrating the stability of the pure CO adlayer (T_{sample} = 107 K, with V_t= -0.45 V and I_t = -15 pA). Changes are marked by yellow circles. a),b) Sequence of 2 STM images recorded subsequently on a 2 ML Pt area,. c),d) as a), b) but on a 3 ML Pt area.

2. Mobile cluster species upon coadsorbing CO with pre-adsorbed water

The STM images in Fig. S2 show the position changes of larger cluster species observed upon CO adsorption on a surface covered with pre-adsorbed water on a larger scale. Figs. S2a and S2b are subsequently recorded at the same position, and the contrast is optimized for the 2 ML Pt area. The yellow circles mark areas where cluster positions changed. In Figs. S2c and S2d the same images are displayed with an extended color scale, including also the 3 Pt-ML areas. They show no changes in cluster positions on the 3 ML Pt area.

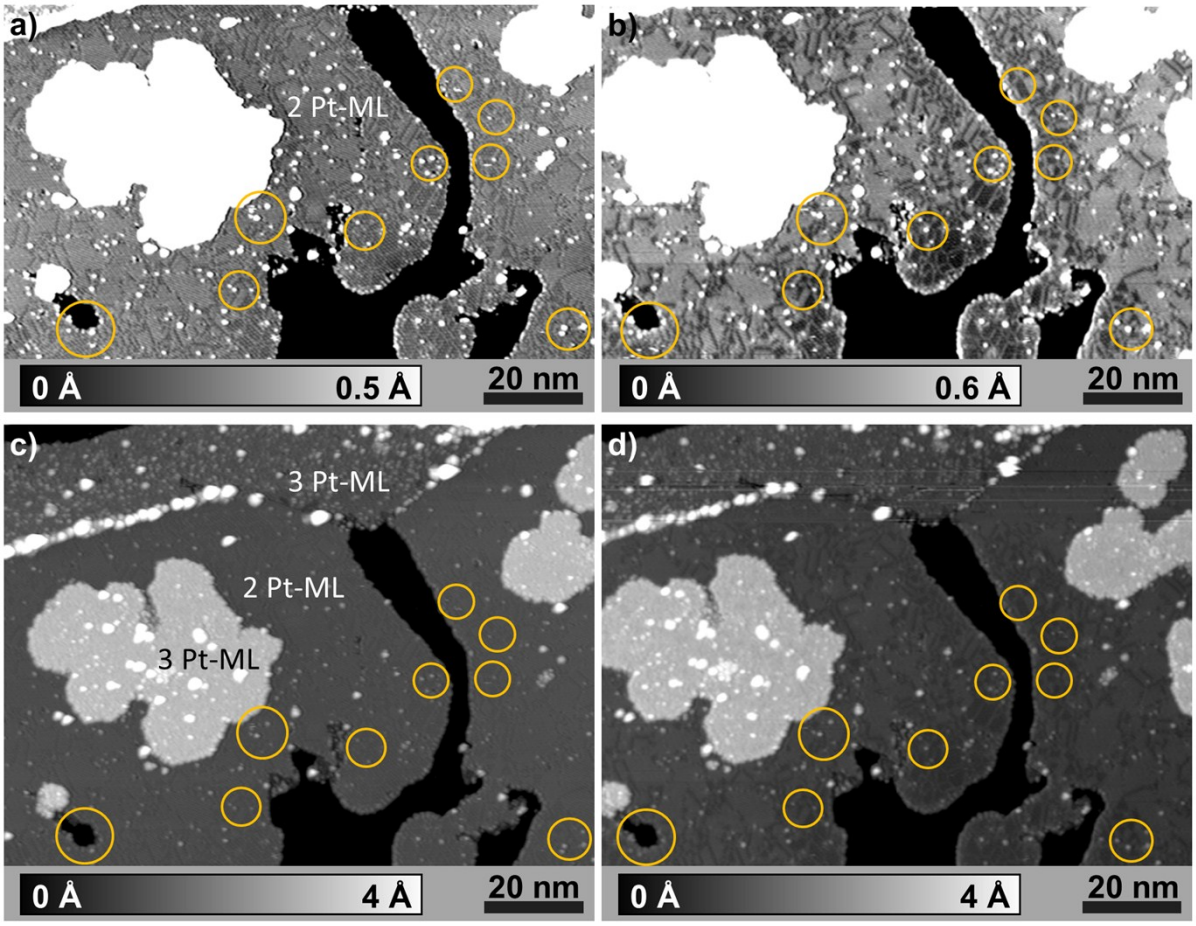

Figure S2: Sequence of 2 STM images recorded subsequently on a $Pt_{2\text{-}3\ ML}$/Ru(0001) surface covered by CO coadsorbed with pre-adsorbed water, resolving mobile cluster species ($T_{imageing}$ = 107 K). Changes are marked with yellow circles. a),b) Images with optimized contrast for a 2 ML Pt area, revealing a number of changes in the cluster positions. c),d) Extended color range including also 3 ML Pt island. No cluster mobility is visible on the 3 ML Pt area.