

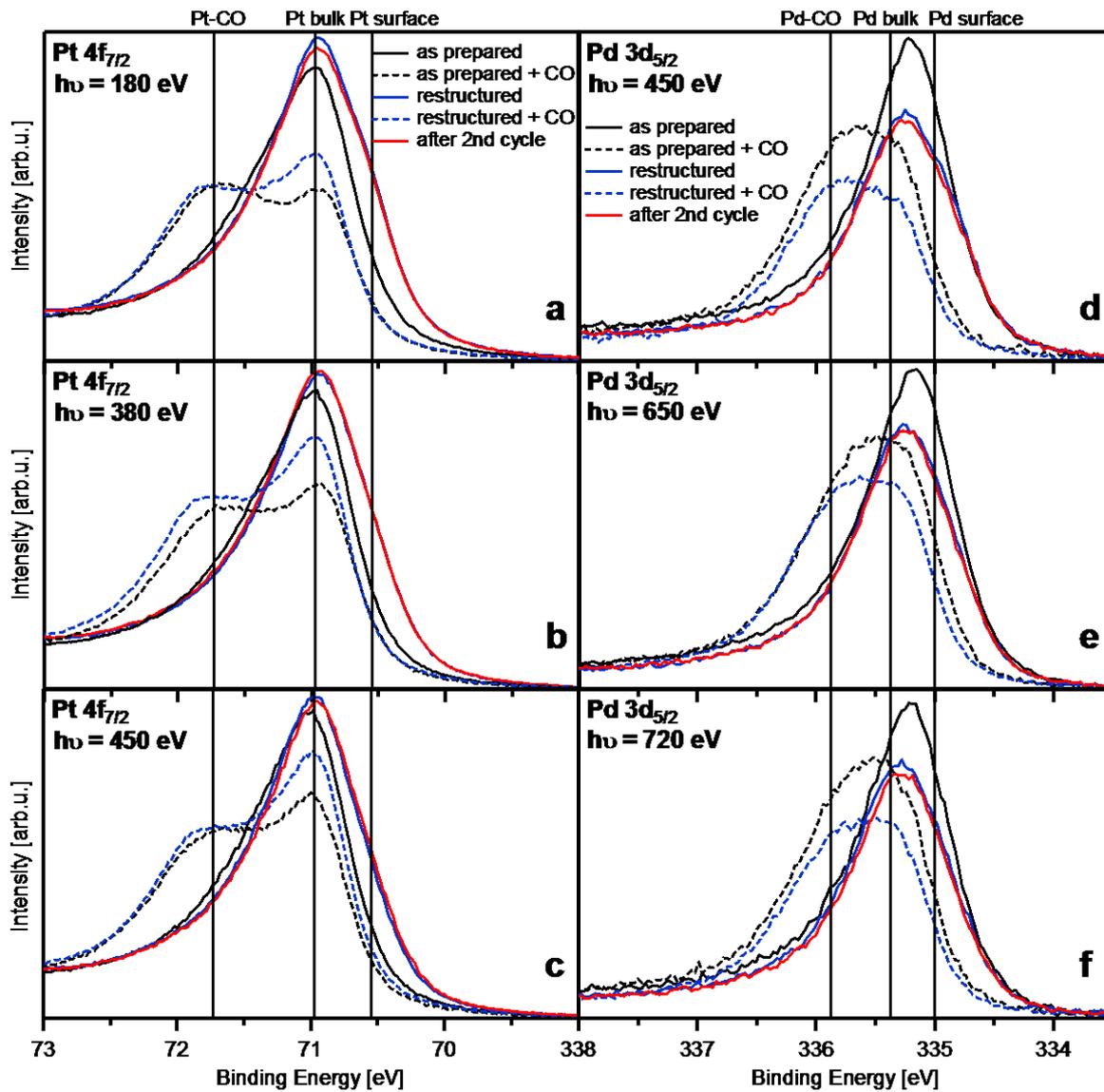
**Supporting Information:**

**Bimetallic Pd-Pt Alloy Nanocluster Arrays on Graphene/Rh(111):  
Formation, Stability, and Dynamics**

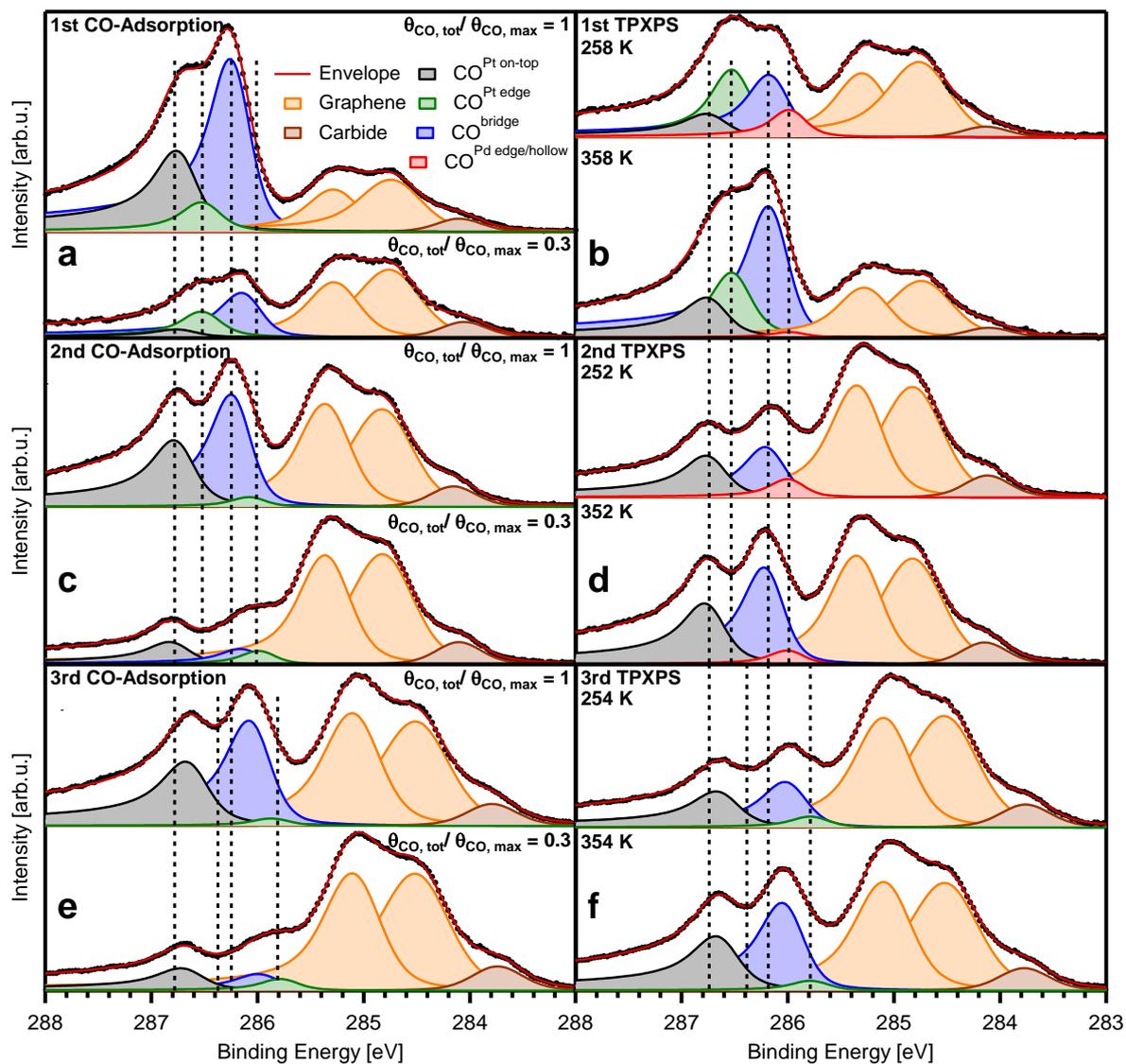
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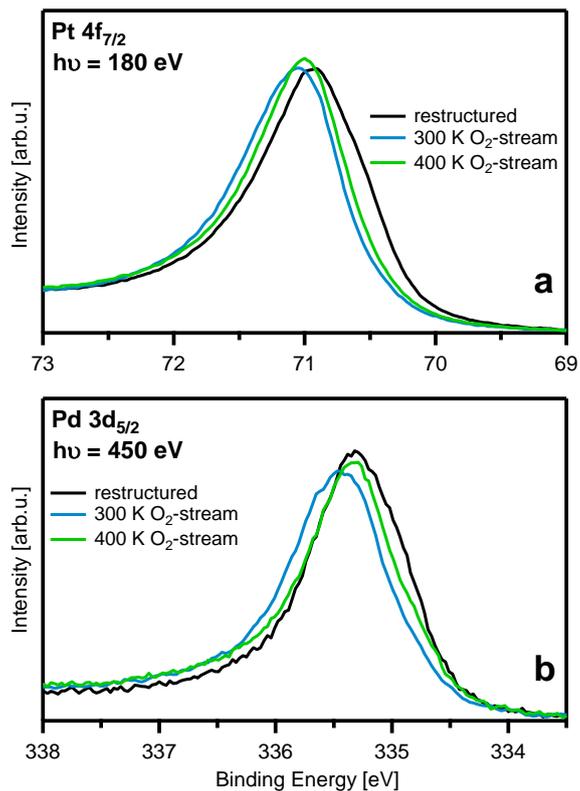
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**Figure S1:** XP-spectra of PdPt-alloy nanoclusters (0.87 ML Pd, 0.68 ML Pt) on Graphene/Rh(111) measured with different excitation energies after preparation and for CO-adsorption/desorption cycles: a)-c) Pt  $4f_{7/2}$ , d)-f) Pd  $3d_{5/2}$ .



**Figure S2:** Fits of selected C 1s XP-spectra from the first (a), second (c), and third (e) adsorption of  $2 \times 10^{-9}$  mbar at 150 K on PdPt-alloy nanocluster arrays (0.87 ML Pd, 0.68 ML Pt) on Graphene/Rh(111) and the subsequent TPXPSs (b, d, f),  $\beta = 0.5$  K/s.



**Figure S3:** XP-spectra of PdPt-alloy nanoclusters (0.87 ML Pd, 0.68 ML Pt) on Graphene/Rh(111) measured for restructured particles at 150 K, and for temperatures of 300 and 400 K with an O<sub>2</sub> pressure of  $2 \times 10^{-6}$  mbar applied on the sample for 5 min before and during the measurement: a) Pt 4f<sub>7/2</sub>, b) Pd 3d<sub>5/2</sub>.