Pt-doped In_2O_3 thin films: control of the chemical state and structure via ALD

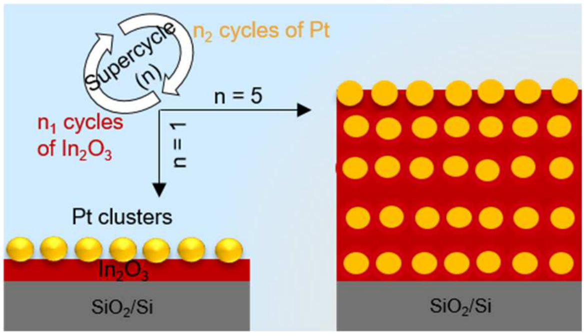

Figure 1. Schematic outline of the supercycle ALD approach for the controlled doping of Pt into the In_2O_3 matrix. Reprinted with permission from Ref. 1. Copyright (2019) American Chemical Society.

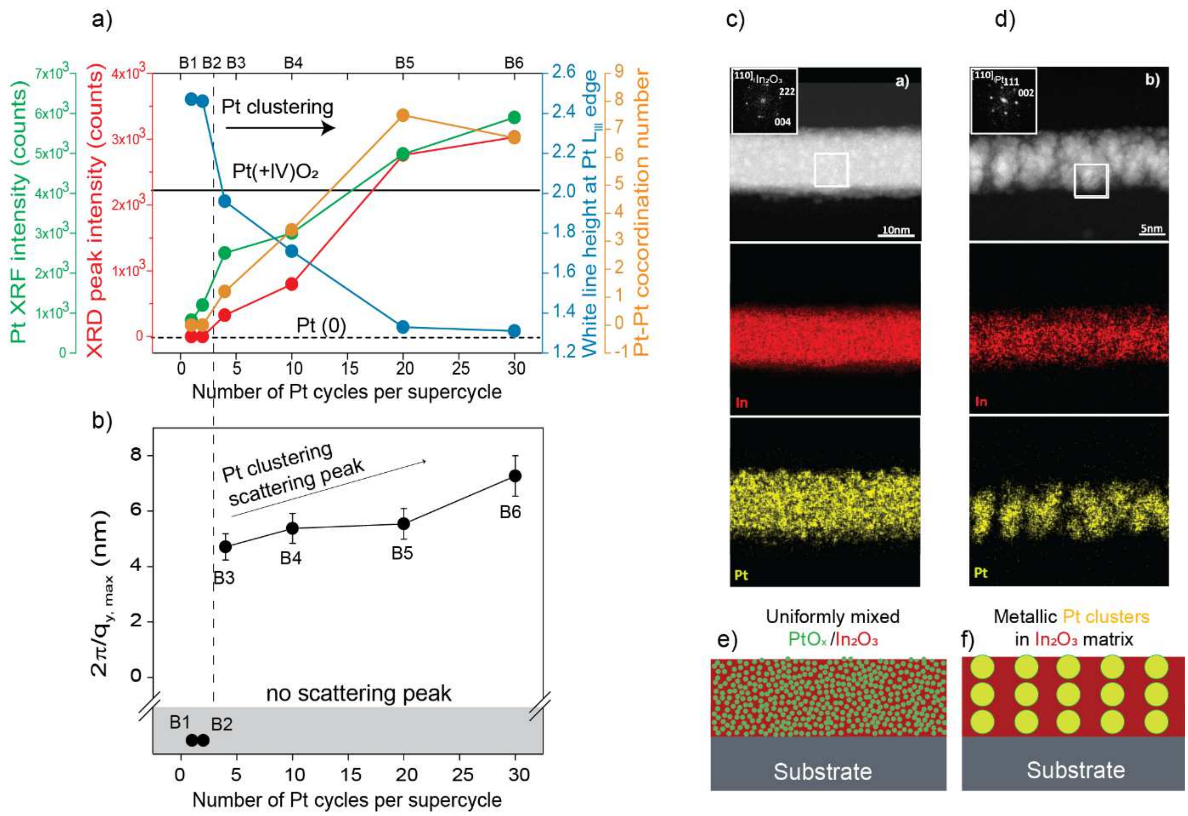

Figure 2. a) Variation of Pt XRF counts (green), Pt (111) XRD peak intensity (red), Pt L_{III} edge white line height (blue) and Pt−Pt coordination number (orange) from XAS with the number of Pt ALD cycles, per supercycle with 30 In_2O_3 ALD cycles (samples B1 – B6). **b)** $2\pi/q_{y,max}$ value obtained from the GISAXS measurements, as an approximation of the lateral intercluster distance, as a function of the number of Pt ALD cycles per supercycle. Shaded parts indicate the region with no scattering peaks. **(c,d)** HAADF-STEM images and the corresponding EDXS elemental maps of In and Pt, which reveals the presence of uniformly mixed PtO_x/In_2O_3 in the case of sample B2 and Pt cluster embedded In_2O_3 matrix for sample B4, respectively. Schematic illustration of the structural configuration of (**e**) uniformly mixed PtO_x/In_2O_3 and (**f**) metallic Pt clusters embedded in In_2O_3 matrix, as interpreted from STEM images. Adapted with permission from Ref. 1. Copyright (2019) American Chemical Society.