Supporting information

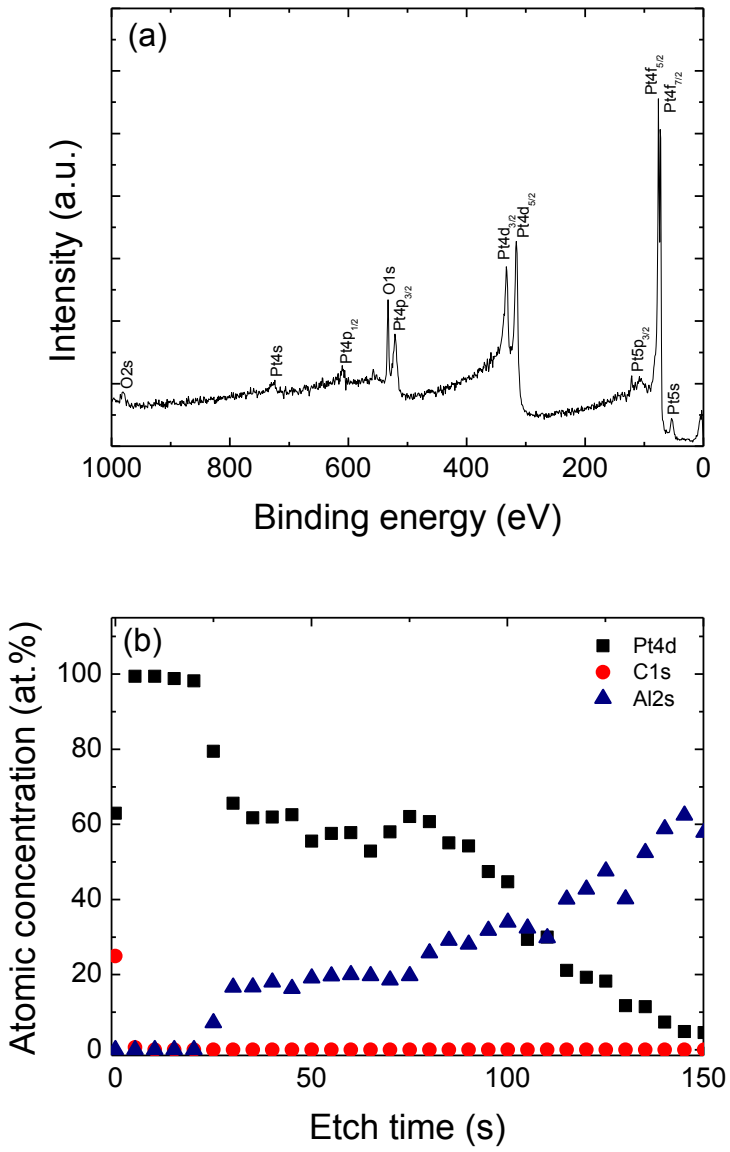

Figure S1. (a) XPS spectrum of ~46 nm thick Pt deposit prepared by direct-write ALD on an Al_2O_3 substrate. The material has a high purity with only 2 ± 1 at.% oxygen impurities and no detectable amount of carbon. (b) Depth profile of the same deposit obtained by XPS. Apart from the adventitious carbon, no carbon was detected in the Pt deposit, even not at the Pt-Al_2O_3 interface where the EBID seed layer is present.

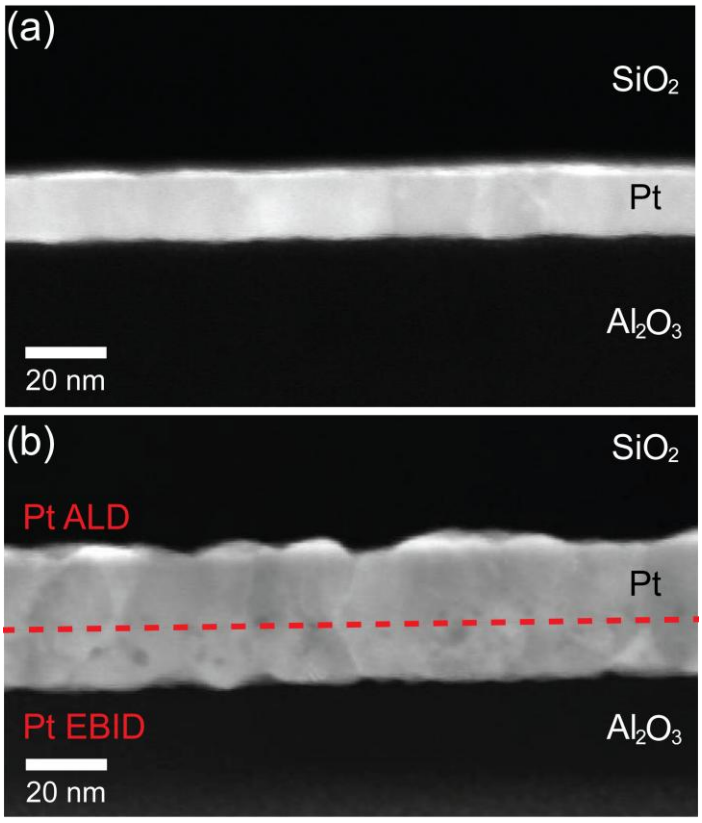

Figure S2. High-angle annular dark field (HAADF) TEM cross-sectional images corresponding to bright-field TEM of the deposits depicted in Figure 2. Image (b) reveals the presence of voids in the bottom EBID layer.

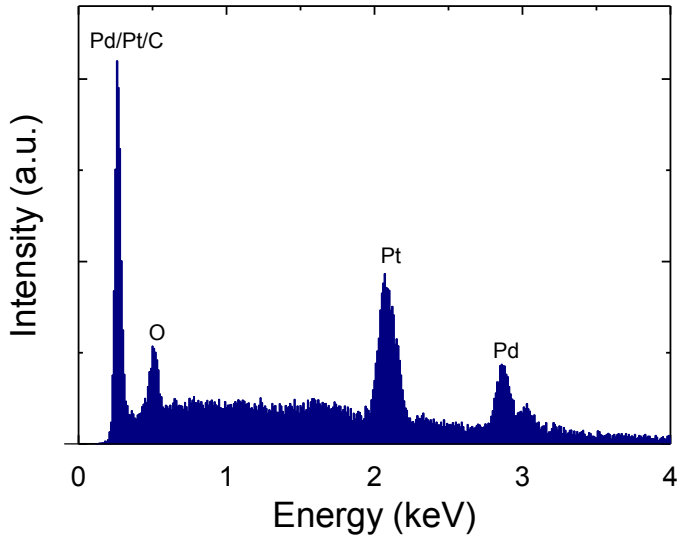

Figure S3. Energy dispersive x-ray spectroscopy (EDX) spectrum of a deposit fabricated by area-selective Pd ALD growth on a Pt EBID seed layer. The overlap of the C K (0.28 keV), Pt N (0.25 keV) and Pd M (0.29 keV) peaks complicates the quantification of the carbon impurity level in the material. The O K x-ray peak at 0.52 keV originates (partly) from by the penetration of the electron beam through the deposit and the generation of x-rays in the Al_2O_3 substrate material. The Pd signal in the spectrum clearly demonstrates that Pd ALD is able to initiate on the Pt seed layer.

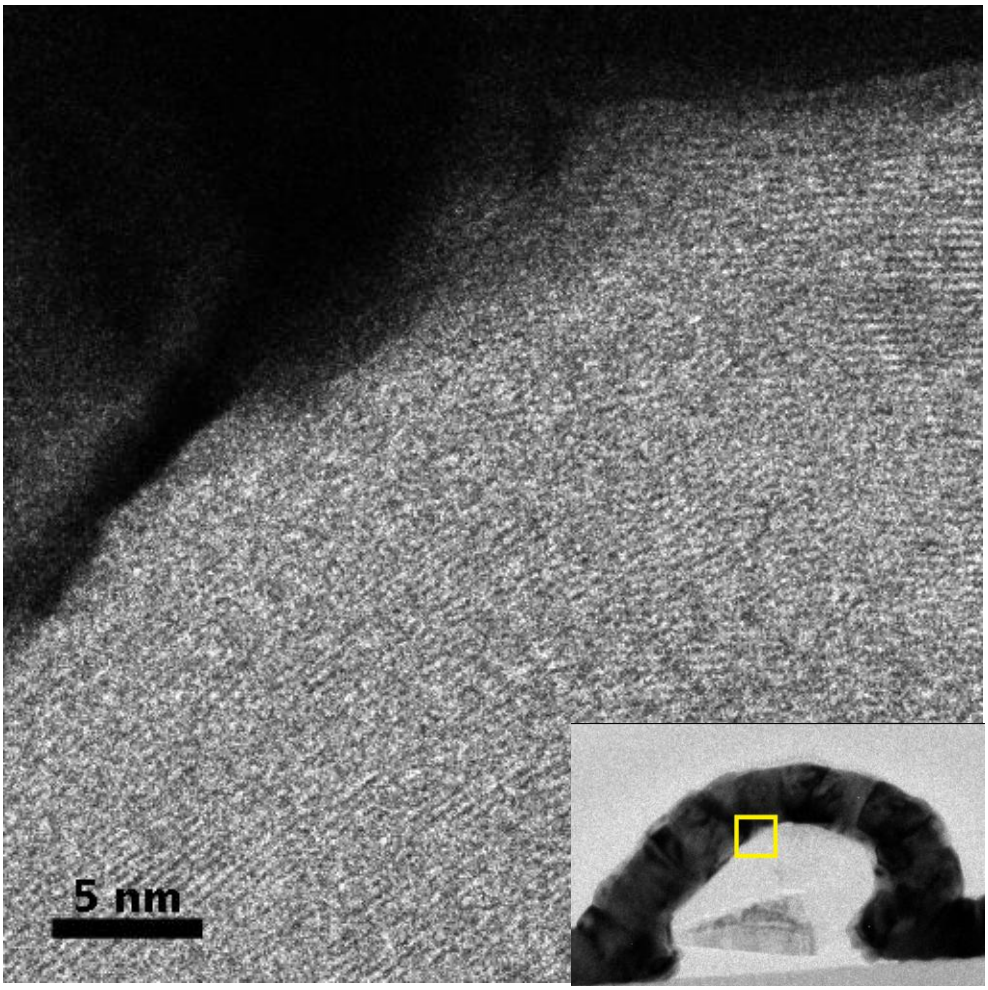

Figure S4. Bright-field TEM cross-sectional image of a contacted multi-walled CNT. The image shows the concentric shells of the multi-walled CNT. The observation of the shells suggests that the damage of the CNT as caused by the electron beam is limited.