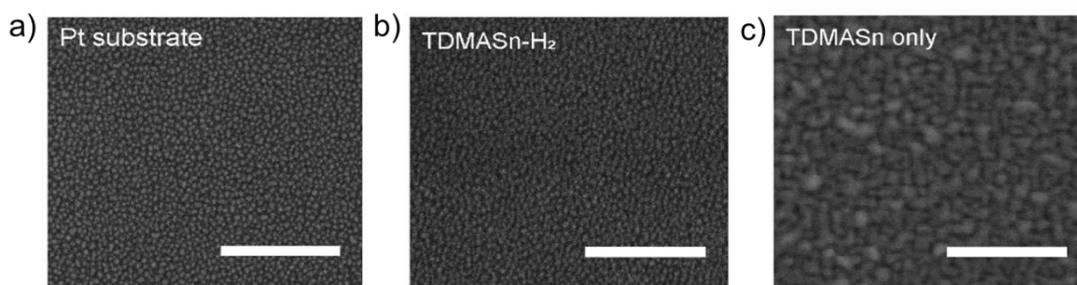
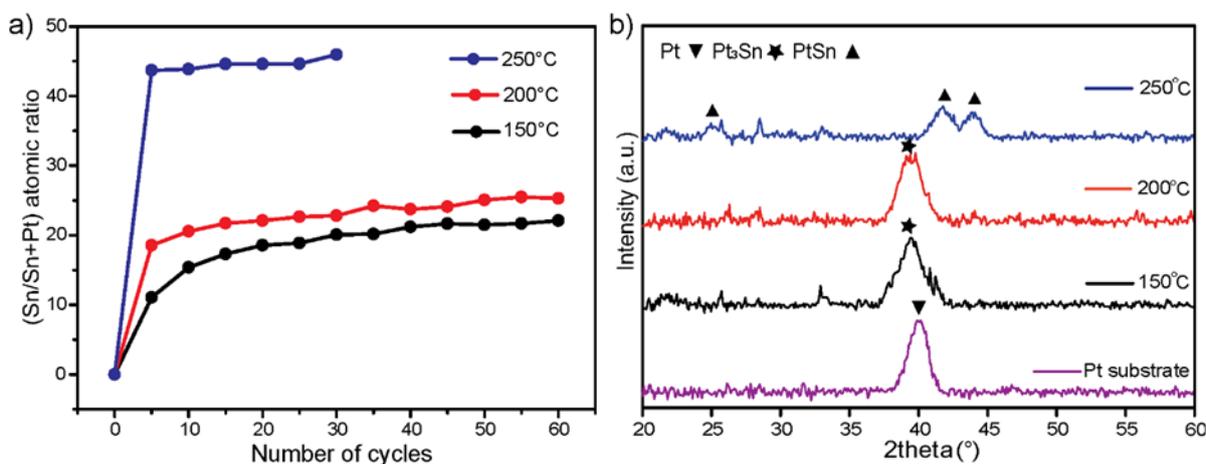


**Figure 1. a)** *Ex situ* XRF data showing the selective decomposition of TDMASn on Pt thin films. The TDMASn was pulsed into the reactor in discrete pulses, followed by a pumping step after each exposure. **b)** XRD patterns showing the formation of different Pt-Sn alloys after the TDMASn introduction to Pt.



**Figure 2.** SEM images of the **a)** ALD synthesized Pt NPs, **b)** the same Pt NPs after TDMASn-H<sub>2</sub> process, and **c)** Pt NPs after the TDMASn only process (right). The white scale bars indicate 200 nm. The similar morphologies of Pt and after the TDMASn-H<sub>2</sub> conversion process is evident.



**Figure 3. a)** *In situ* XRF data showing the variation of Sn/(Sn+Pt) atomic ratio of TDMASn-H<sub>2</sub> process on a 3 nm (equivalent thickness) ALD Pt substrate at 150°C, 200°C, and 250°C. **b)** Corresponding XRD data showing the different alloys formed.