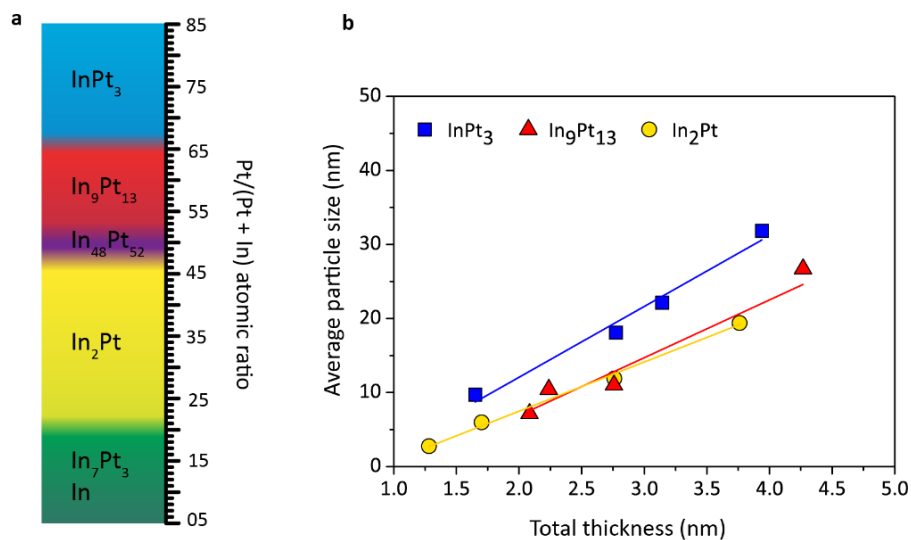
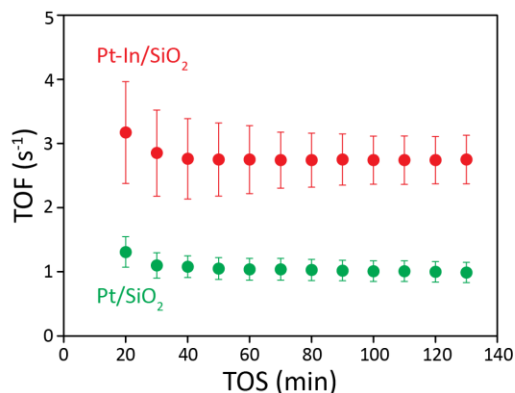


**Figure 1.** (a) ALD-based Pt-In bimetallic nanoparticle synthesis. (b) *In situ* XRD patterns measured during TPR in hydrogen. (c) XANES measured on the BMNPs obtained after TPR (green, dashed) and metallic Pt fcc reference (blue, full).



**Figure 2.** (a) Color bar demonstrating composition tuning. (b) Graph demonstrating size tuning. Composition tuning is achieved by controlling the ratio of Pt/ $\text{In}_2\text{O}_3$  thickness, while the size control is achieved by scaling the total (Pt +  $\text{In}_2\text{O}_3$ ) layer thickness.



**Figure 3.** Turnover frequency (TOF) of propylene production as a function of time-on-stream (TOS) for reaction over supported Pt nanoparticles (in green) and Pt-In BMNPs (in red). ( $W_{\text{cat}}/F_{\text{C}_3\text{H}_8,0} = 20 \text{ kg}_{\text{cat}} \cdot \text{s} \cdot \text{mol}^{-1}$  and  $P_{\text{C}_3\text{H}_8,0} = 20 \text{ kPa}$  at a total pressure of 101.3 kPa at 600°C). The error bars represent twice the standard deviation.