

Fig. 1: (a) Pt 4f core-level XPS spectrum corresponding to metallic Pt following photo-ALD at 100°C. (b) In situ XRF traces showing enhanced nucleation with illumination, while no growth occurs if the O<sub>3</sub> half-cycle is absent.

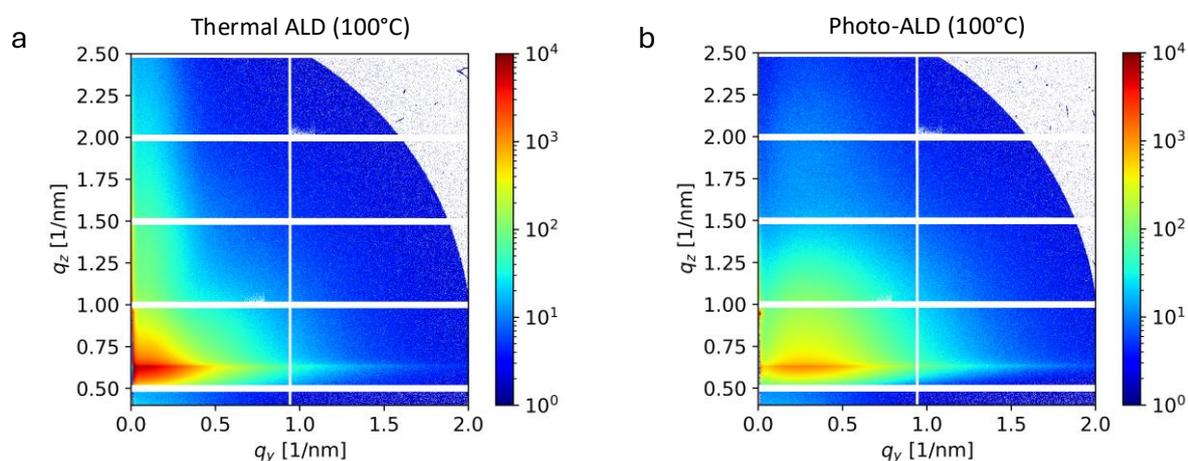


Fig. 2: Comparison of (a) thermal ALD and (b) photo-ALD GISAXS patterns at similar Pt loading ( $5.25 \times 10^{15}$  at./cm<sup>2</sup>). The distinct lobe at higher q<sub>y</sub>-values for photo-ALD indicates particles with a smaller width and higher areal density.

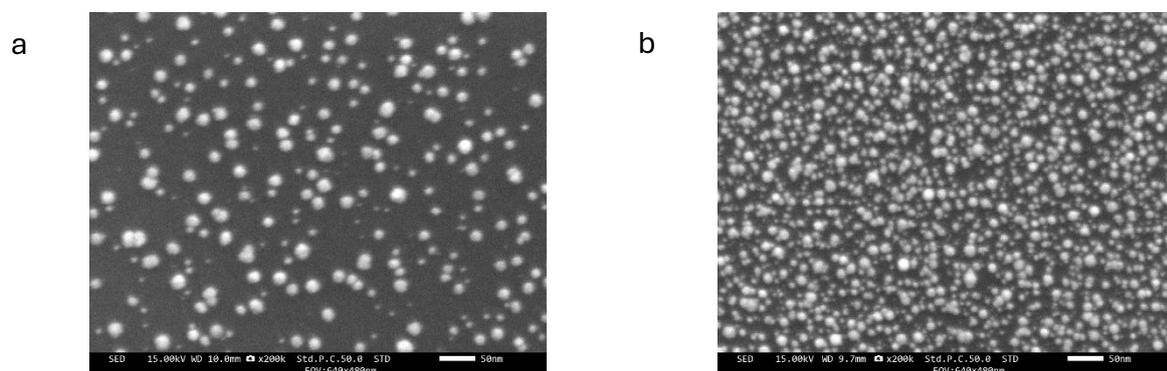


Fig. 3: SEM images showing the particle size and inter-particle spacing following (a) 108 cycles of thermal ALD ( $8.92 \times 10^{15}$  at./cm<sup>2</sup>) and (b) 84 cycles of photo-ALD ( $22.56 \times 10^{15}$  at./cm<sup>2</sup>) at 100°C.