

— Supporting information available —

In situ study on the thermal stability of supported Pt nanoparticles and their stabilization via Atomic Layer Deposition overcoating.

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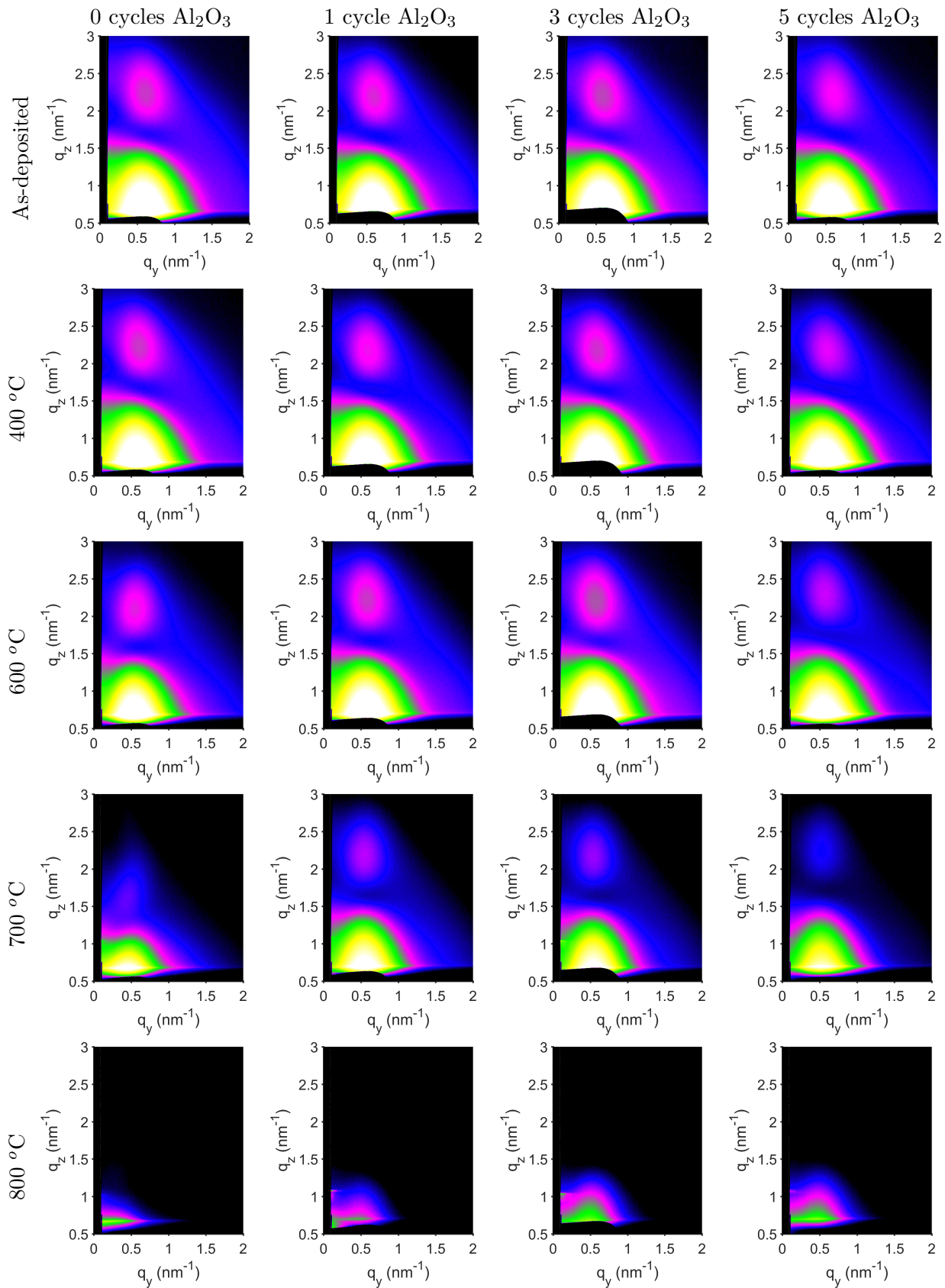


Figure S.1: Selected snapshots of the continuous GISAXS images acquired during the *in situ* experiments of the Pt-O sample with different overcoat layers.

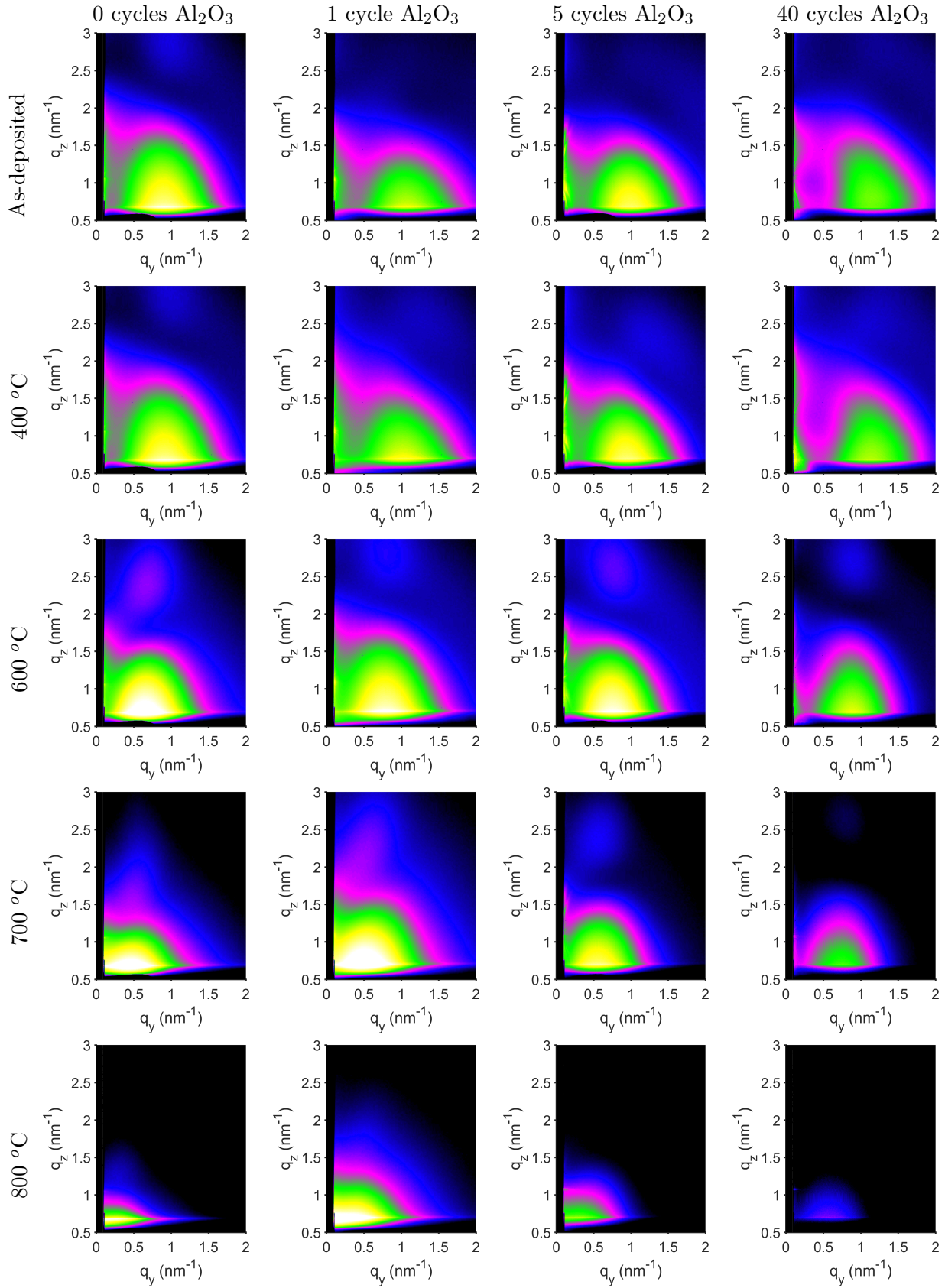


Figure S.2: Selected snapshots of the continuous GISAXS images acquired during the *in situ* experiments of the Pt-N sample with different overcoat layers.

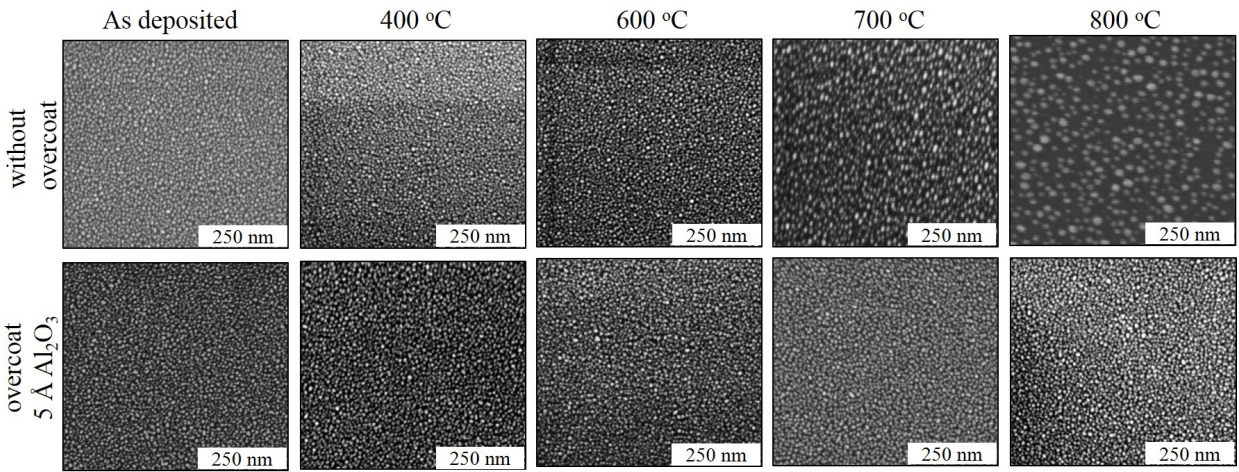


Figure S.3: SEM images of some representative quenches of the as-deposited and after 5 cycles of Al₂O₃ overcoat Pt-O sample during the annealing treatment.

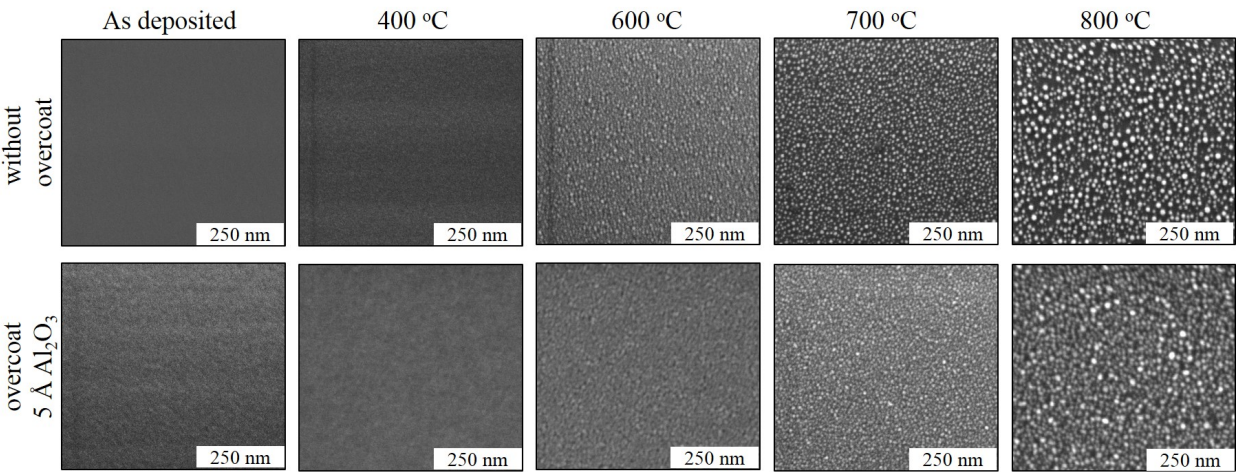


Figure S.4: SEM images of some representative quenches of the as-deposited and after 5 cycles of Al₂O₃ overcoat Pt-N sample during the annealing treatment.

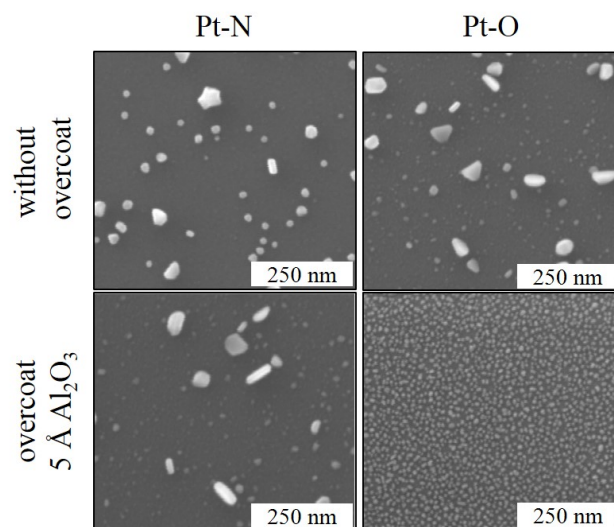


Figure S.5: SEM images of Pt-N and Pt-O samples with and without 5 cycles of Al₂O₃ overcoating after 3 h of isothermal annealing at 800 °C.

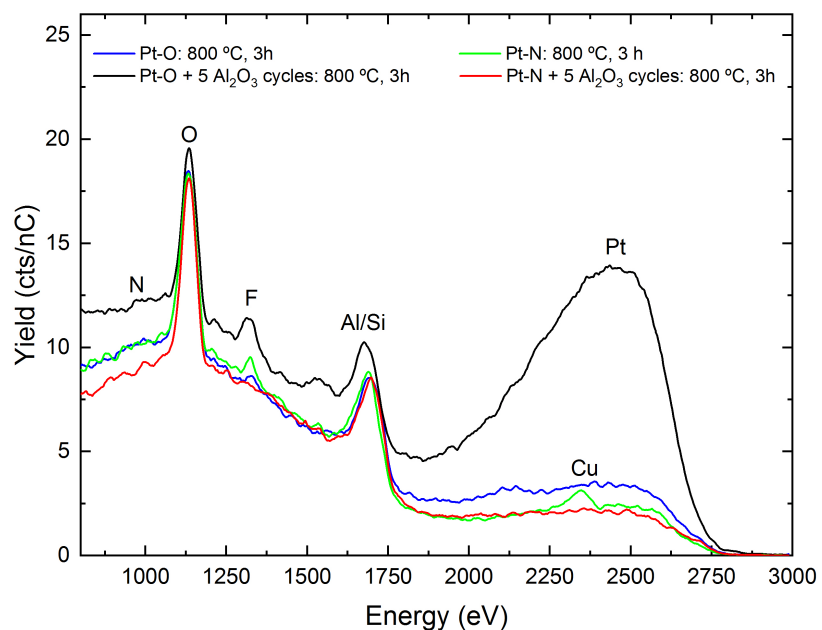


Figure S.6: LEIS data of Pt-O and Pt-N samples after an isothermal annealing at 800 °C during 3h. LEIS proved that overcoating of Pt-O sample with 5 cycles of Al₂O₃ efficiently prevented particle coarsening, since it presented a higher amount of exposed Pt.