

Figure 1. *In situ* recorded 2D GISAXS patterns and *ex situ* Scanning Electron Micrographs (SEM) of as-deposited and overcoated sample with 5 cycles of ALD Al_2O_3 showing the effect of the overcoating on the particle thermal stability when annealed up to 800°C (0.2°C/s) in an O_2 -rich atmosphere.

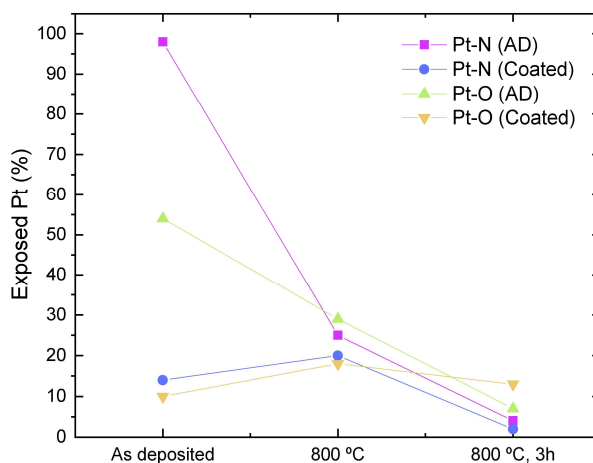


Figure 2. Amount of surface exposed Pt obtained by LEIS of the as-deposited (AD) and coated (5 Al_2O_3 ALD cycles) samples: widely spaced nanoparticles (Pt-O) and closely packed nanoparticles (Pt-N). Data is normalized against the Pt-N sample. After a ramp anneal to 800°C (0.2°C/s), coarsening is observed for the as-deposited samples, while the amount of surface exposed Pt increases for the coated samples due to crack formation. After long isothermal annealing (800°C , 3h), the exposed Pt for the overcoated Pt-O sample is higher than for the uncoated Pt-O sample, proving the efficiency of the Al_2O_3 overcoat layer.