SUPPLEMENTARY MATERIAL

Reduction of nitrobenzene to aniline by CO/H_2O in the presence of palladium nanoparticles

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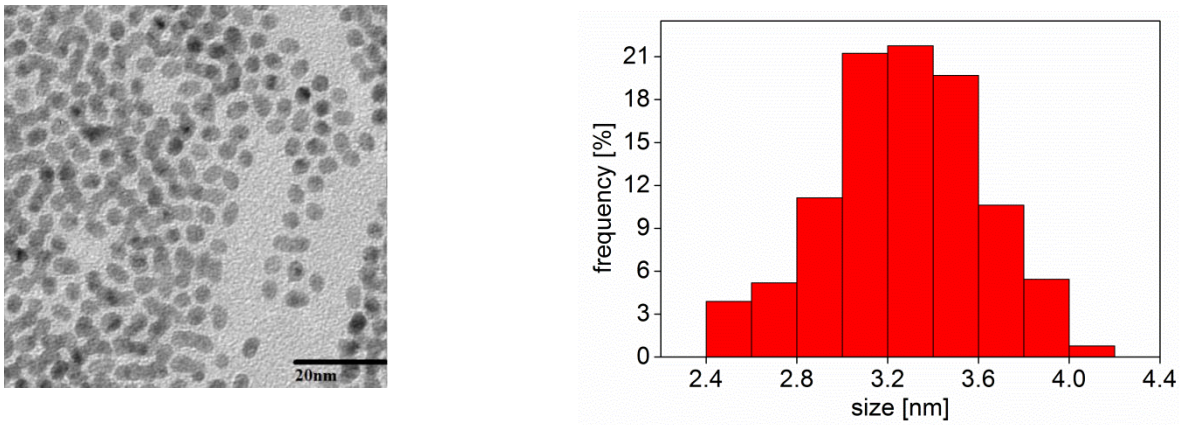


Figure S1. TEM image made for nanoparticles from raw solution. Left panel: TEM image of the PdNPs stabilized by 4-(dimethylamino)pyridine (PdNPs/DMAP). Pd:$NaBH_4$ molar ratio = 1:2, c_{NaBH4} = 1%. See the Experimental Section for synthesis conditions. Right panel: histogram (evaluated from more than 300 NPs) of size distribution (3.2±0.5).

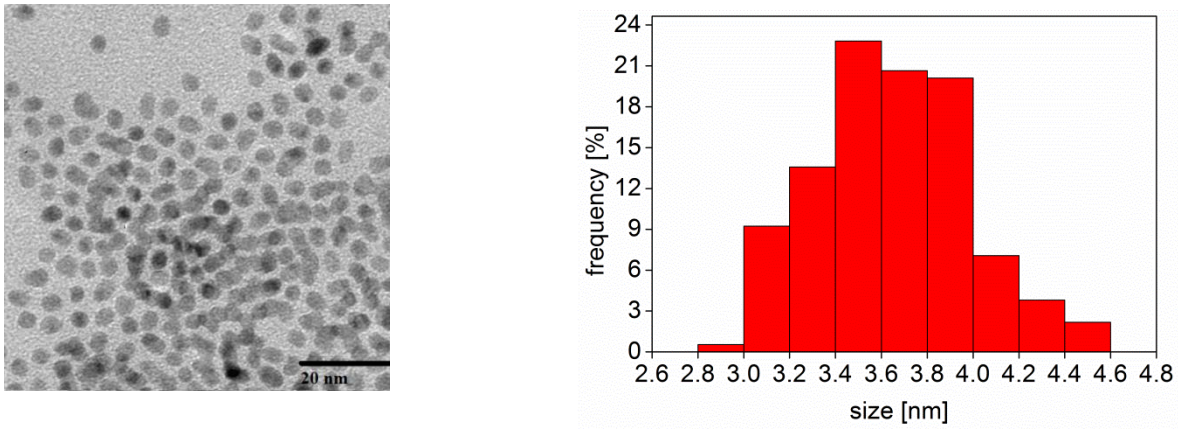


Figure S2. TEM image made for nanoparticles centrifuged and suspended in distilled-deionized water (ddw). Left panel: TEM image of the PdNPs stabilized by 4-(dimethylamino)pyridine (PdNPs/DMAP). Pd:$NaBH_4$ molar ratio = 1:2, c_{NaBH4} = 1%. See the Experimental Section for synthesis conditions. Right panel: histogram (evaluated from more than 300 NPs) of size distribution (3.6±0.4).

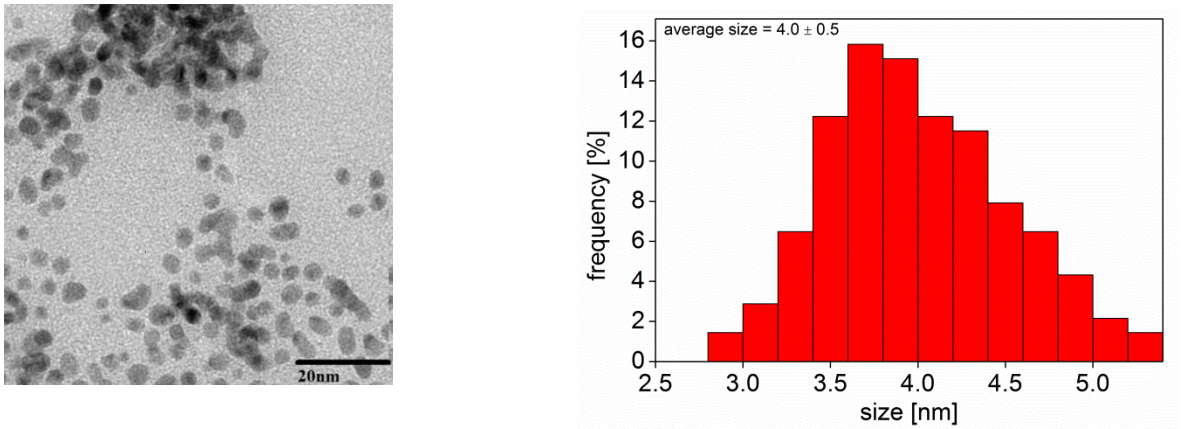


Figure S3. TEM image made for nanoparticles from raw solution. Left panel: TEM image of the PdNPs stabilized by 4-ethylpyridine (PdNPs/4EtPy). Pd:$NaBH_4$ molar ratio = 1:2, c_{NaBH4} = 1%. See the Experimental Section for synthesis conditions. Right panel: histogram (evaluated from more than 300 NPs) of size distribution *(4.0±0.5).

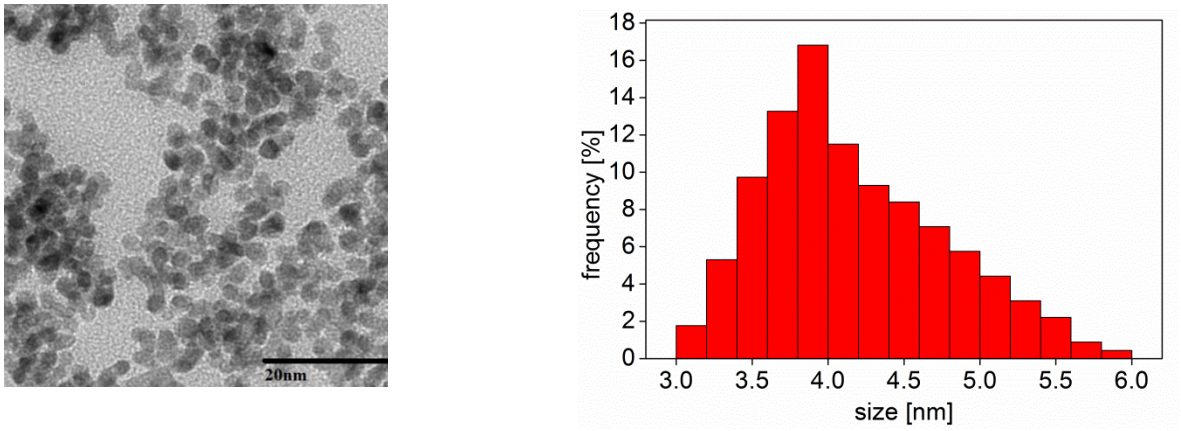


Figure S4. TEM image made for nanoparticles centrifuged and suspended in ddw water. Left panel: TEM image of the PdNPs stabilized by 4-ethylpyridine (PdNPs/4EtPy). Pd:$NaBH_4$ molar ratio = 1:2, c_{NaBH4} = 1%. See the Experimental Section for synthesis conditions. Right panel: histogram (evaluated from more than 300 NPs) of size distribution (4.1±0.6).

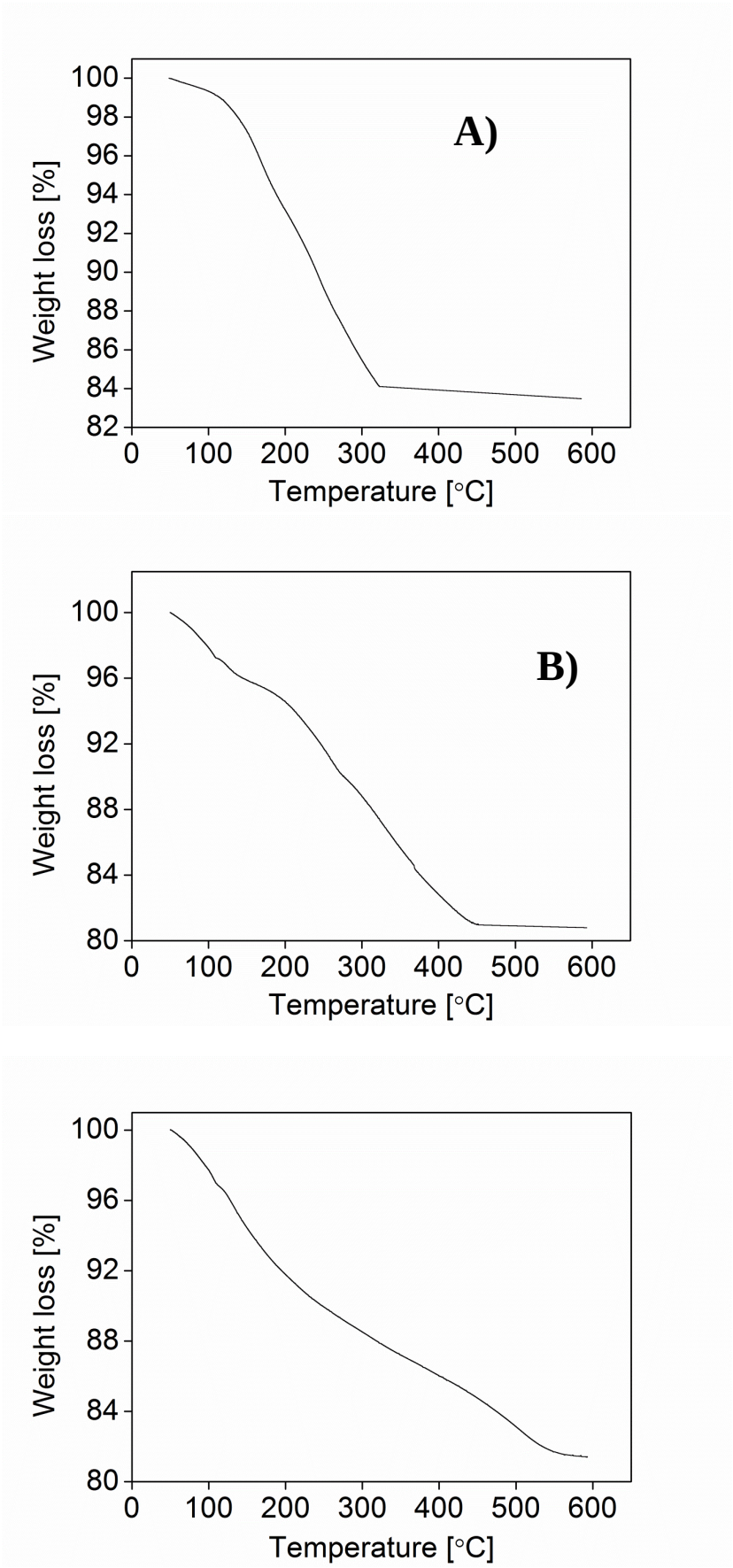


Figure S5. TG curves (nitrogen, 10K/min) for centrifuged PdNPs stabilized by: 4MePy (**A**), DMAP (**B**), and 4EtPy (**C**).

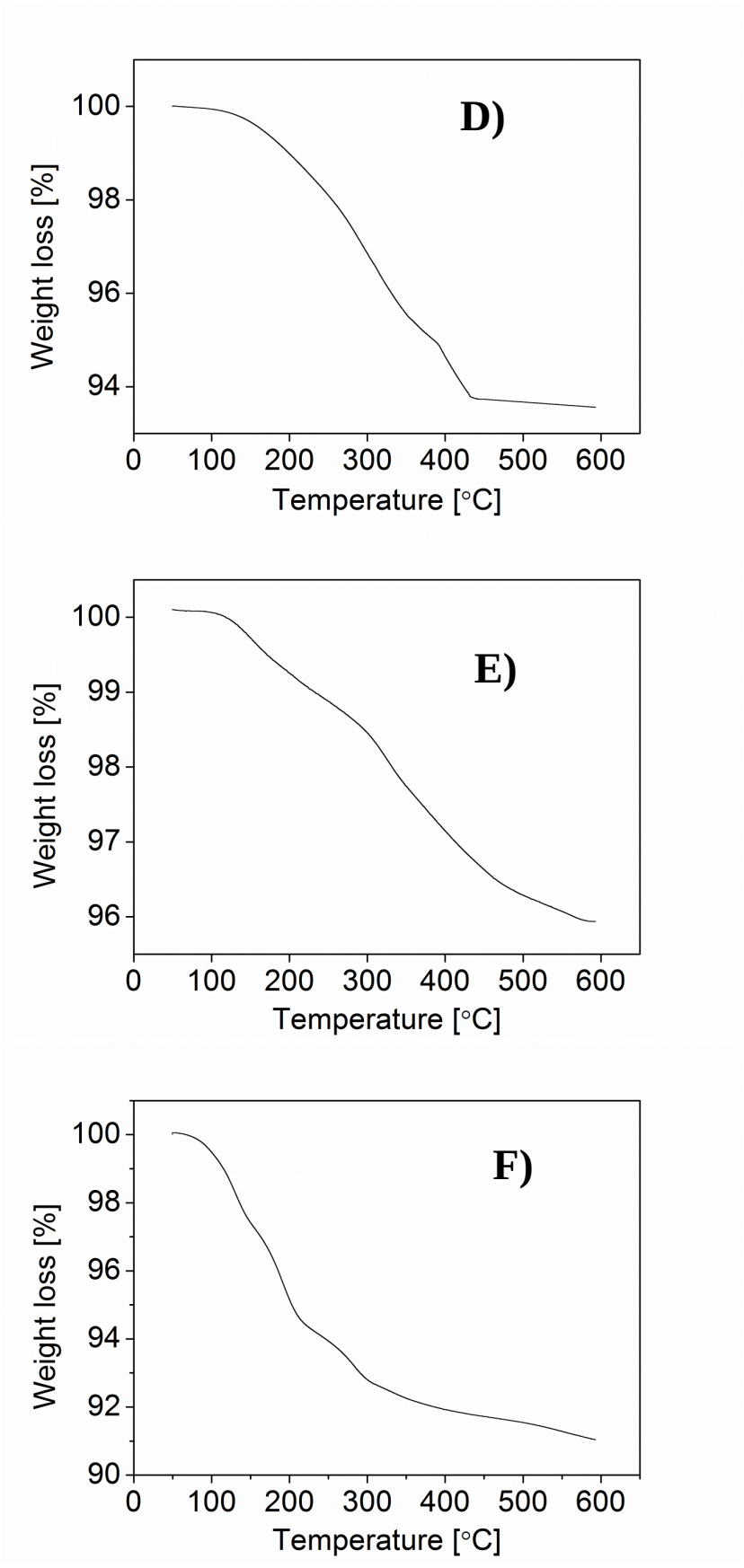
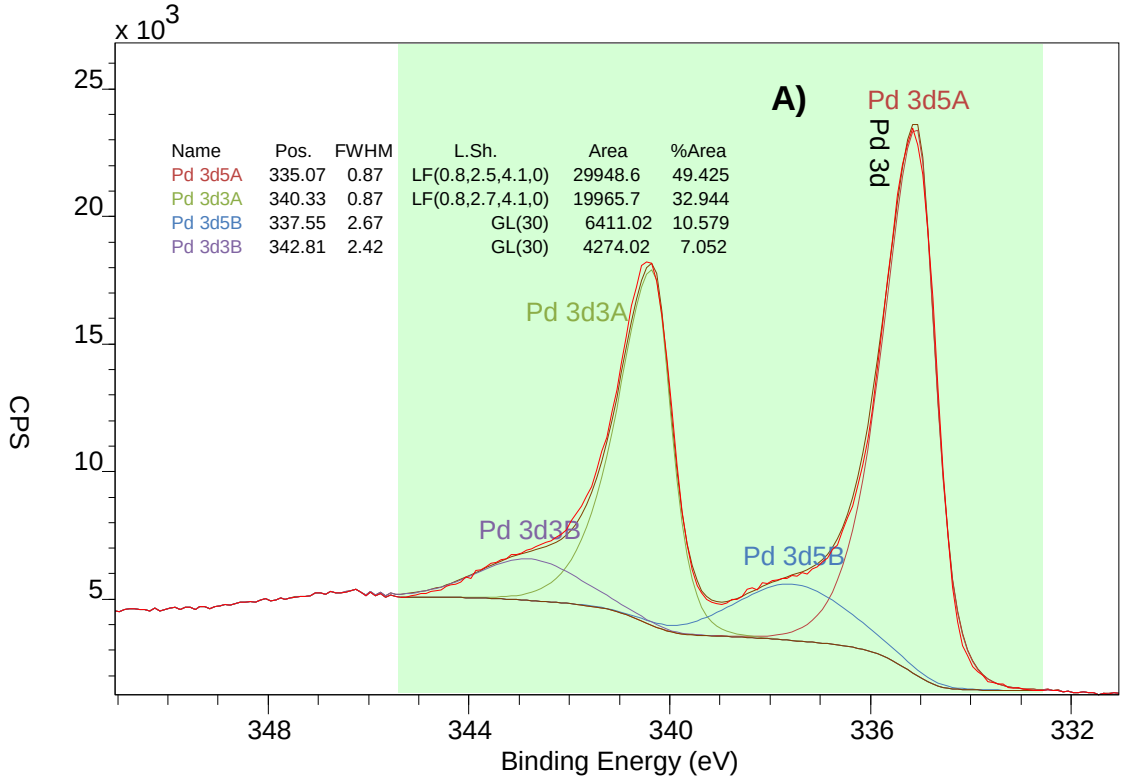


Figure S6. TG curves for centrifuged and dried PdNPs stabilized by: 4MePy (**D**), DMAP (**E**), and 4EtPy (**F**).



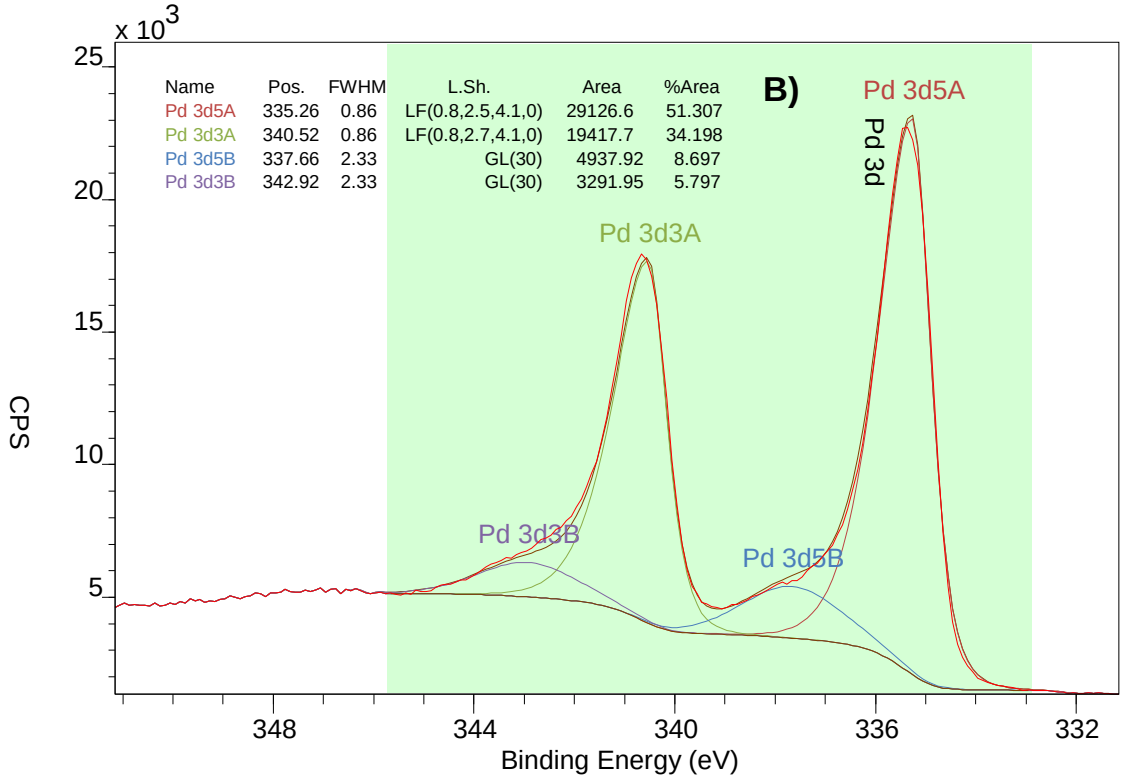


Figure S7A, 7B. See full description on the next page.

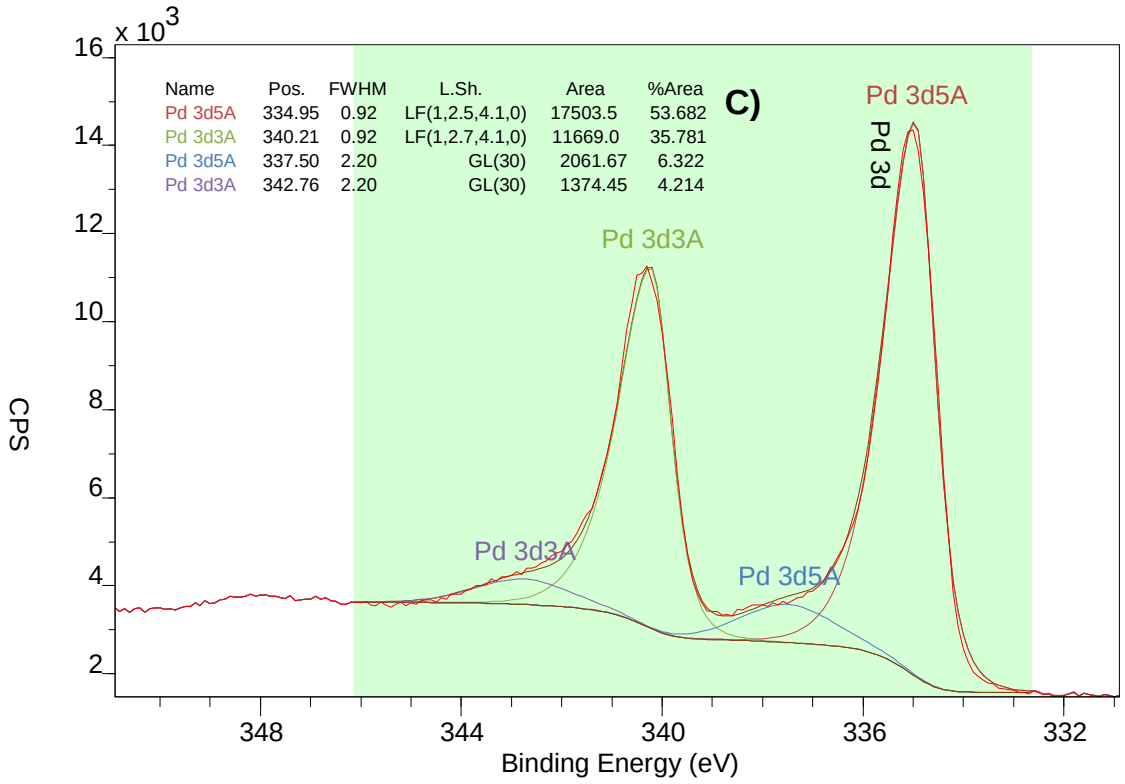


Figure S7. XPS Pd 3d spectra of: **A)** nanoparticles from raw solution, **B)** NPs centrifuged and suspended in ultrapure water, **C)** NPs dried and re-suspended in ultrapure water.

Calculation of the surface of PdNPs.

Assuming the spherical shape of PdNPs, its surface [m^2/g] was calculated from the following formula:

$$\text{surface of PdNPs} = \frac{\text{surface of single PdNP}}{\text{mass of single PdNP}} \left[\frac{m^2}{g}\right]$$

where:
mass of single PdNP = volume of single PdNP × density of Pd

where:
volume of single PdNP = $1.33 \times 3.14 \times (0.5 \times \text{diameter of single PdNP} \times 10^{-7})^3$ $[cm]^3$