Electronic Supplementary Material (ESI) for RSC Advances.

Simple procedure for vacant POMs-stabilized palladium (0) nanoparticles in water: structural and dispersive effects of lacunary polyoxometalates

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Supplementary Informations

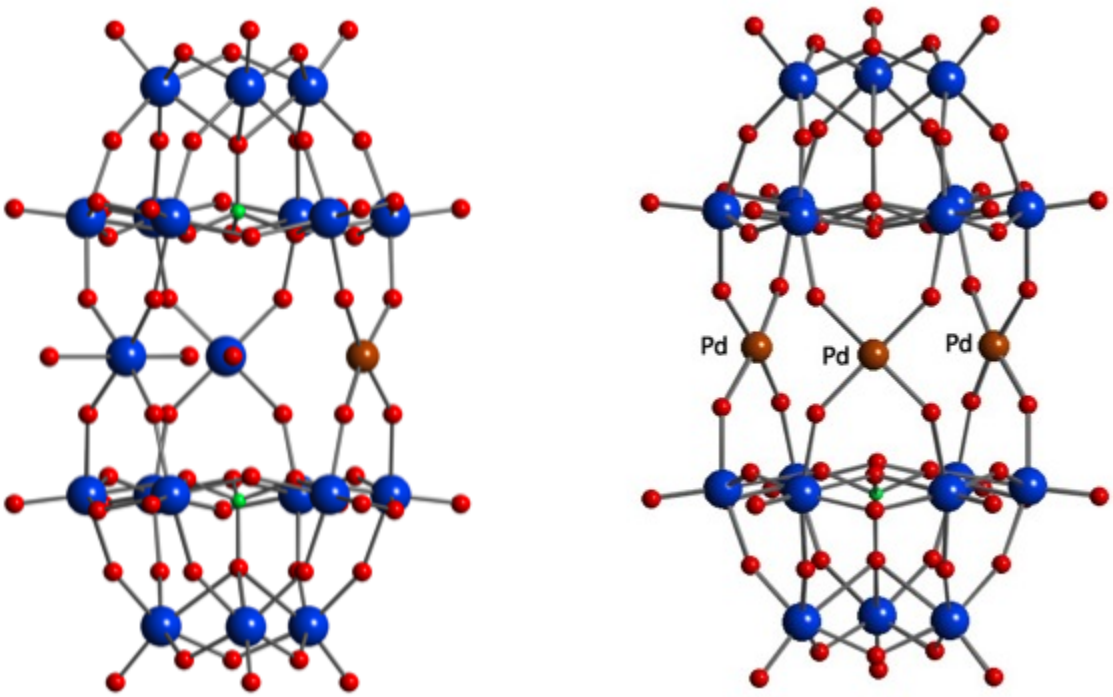

Fig S1: Structural representation of the anions $[Pd\{P_2W_{20}O_{70}(H_2O)_2\}]^{8-}$ anion of **1** (left) and $[Pd_3\{PW_9O_{34}\}_2]^{12-}$, anion of **2** (right).

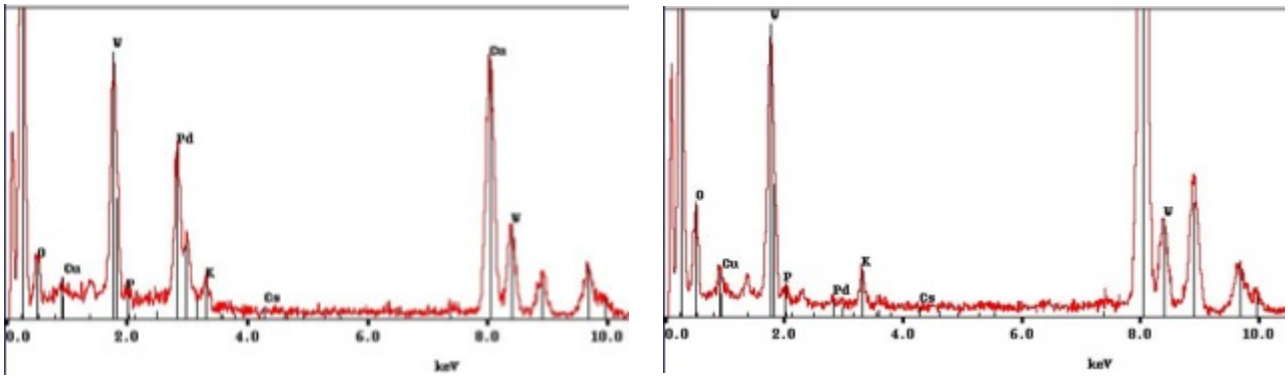

Fig S2: EDX spectra of a single NP of Pd^0 stabilized by $[PW_{11}O_{39}]^{7-}$ anions (left) and of the amorphous materials around the NPs of Pd^0 stabilized by $[PW_{11}O_{39}]^{7-}$ anions (right).

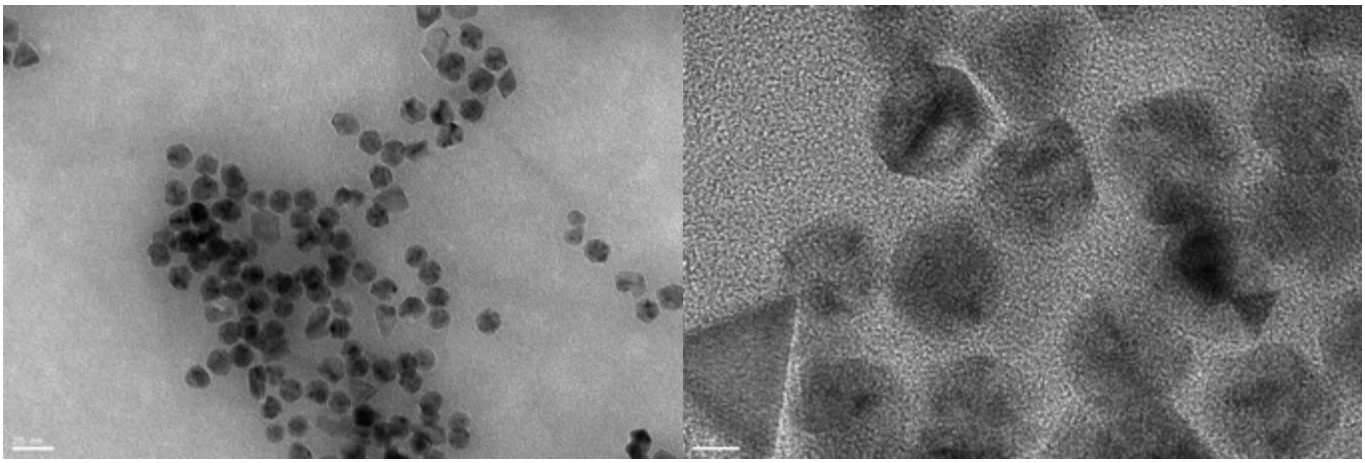

Fig S3: HR TEM micrographs of NPs of Pd^0 stabilized by $[PW_{11}O_{39}]^{7-}$ anions at 2 magnifications. The size of the bars in the left corners corresponds to 20 (left) and 5 nm (right) respectively. The picture on the right correspond to the entire micrograph from which the NPs displayed in figure 4 are taken from.

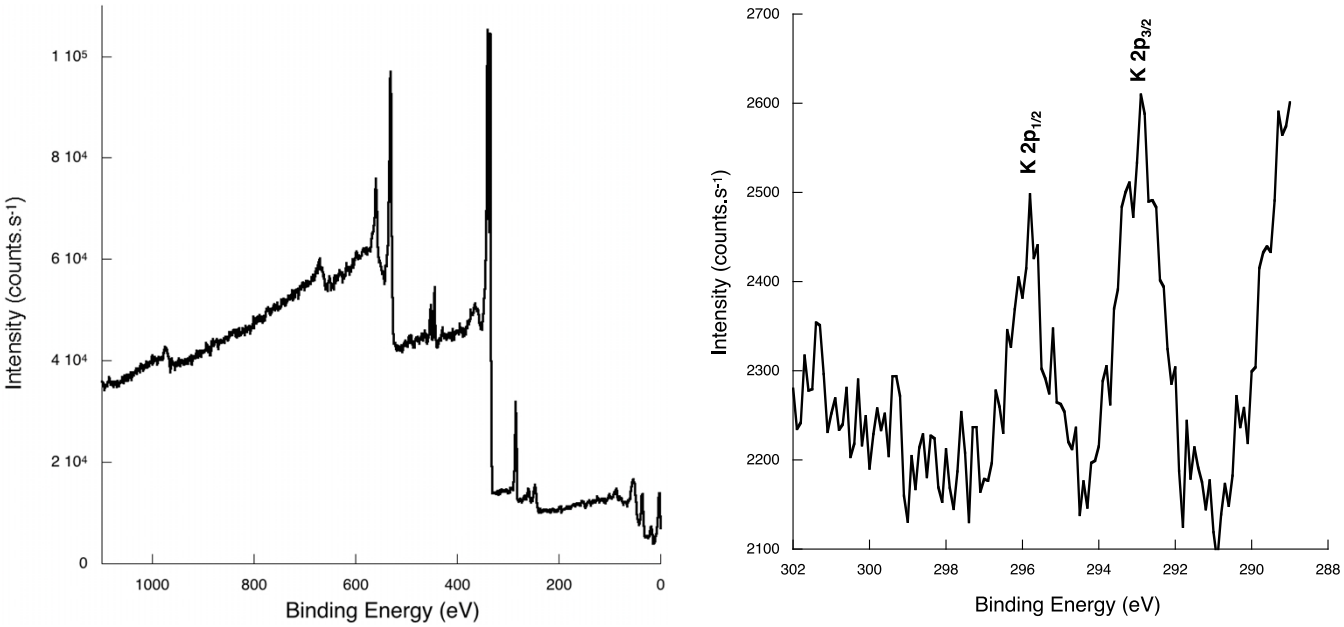

Fig S4: Full XPS spectrum (left) and high resolution K2p spectrum (right) of a solid sample of Pd^0 NPs stabilized by $[PW_{11}O_{39}]^{7-}$ anions prepared by precipitation and filtration of POMs-decorated NPs obtained by reduction of a highly concentrated solution of compound **3** (initial concentration of **3** = 5.10^{-3} mol L^{-1}).

	$Cs_6K_6[PdAs_2W_{19}O_{67}(H_2O)]\approx 7H_2O$
Empirical formula	$As_2Cs_6K_6O_{75}PdW_{19}$
Formula weight	5981.45
Crystal system	triclinic
Space group	$P\bar{1}$
a [Å]	12.5599(6)
b [Å]	12.9532(6)
c [Å]	30.1487(15)
α [°]	80.150(3)
β [°]	84.645(3)
γ [°]	67.299(2)
V [Å^3]	4456.2(4)
Z	2
$D_{calculated.}$ [Mg/m^3]	4.458
μ [mm^{-1}]	28.132
F(000)	5124
Crystal size [mm^3]	0.15x0.10x0.05
θ range [°]	2.55 – 30.10
Index ranges	-17 < h < 17 -17 < k < 18 -42 < l < 42
Refl. collected/unique	25329/16611
Data/restraints/parameters	16611/0/1006
Goodness-of-fit on F^2	1.040
Final R indices [I>2⍰(I)]	R_1 = 0.1211 wR_2 = 0.3851
R indices (all data)	R_1 = 0.1654 wR_2 = 0.3452
Largest difference peak and hole [e.Å^{-3}]	6.118 and -6.714
CSD deposition numbers	427416

Table S5: crystallographic data for compound $Cs_6K_6[PdAs_2W_{19}O_{67}(H_2O)]\approx 7H_2O$ which contains the anion of **4**.