

Electronic Supplementary Information

Monitoring the Insertion of Pt into Cu_{2-x}Se Nanocrystals: A Combined Structural and Chemical Approach for the Analysis of New Ternary Phases[†]

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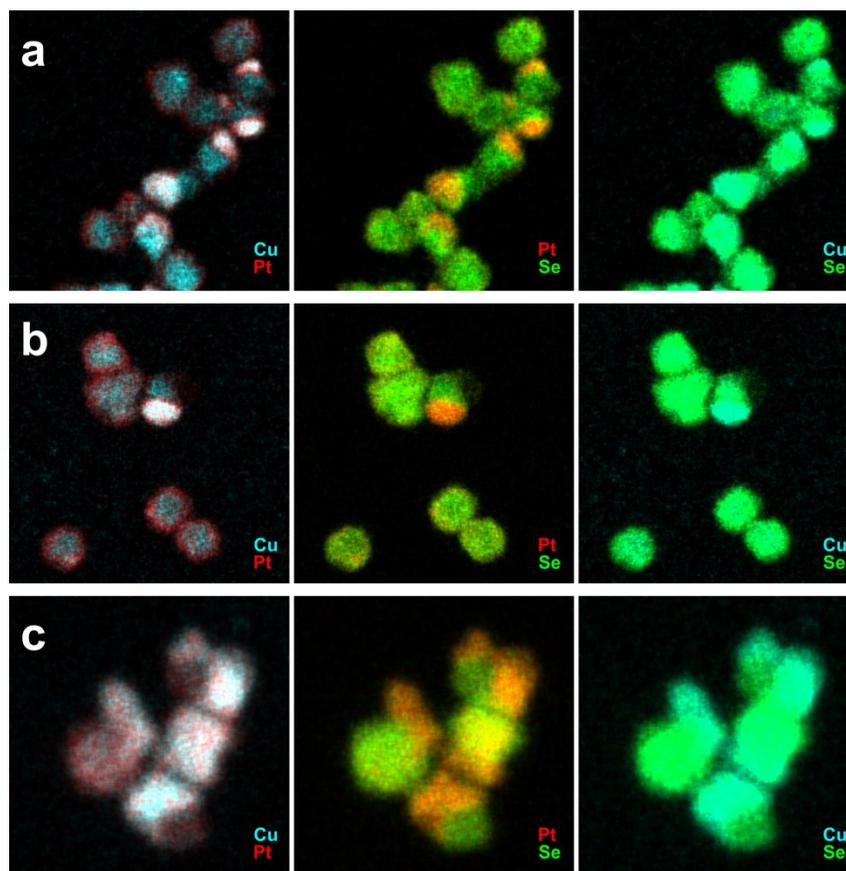


Figure S11: Combined elemental maps by STEM EDS of Pt-Cu-Se_A (a, single elemental maps presented in Figure 3), Pt-Cu-Se_B (b, single elemental maps presented in Figure 4), Pt-Cu-Se_C (c, single elemental maps presented in Figure 5). Copper was represented in cyan, platinum in red and selenium in green in all the elemental maps.

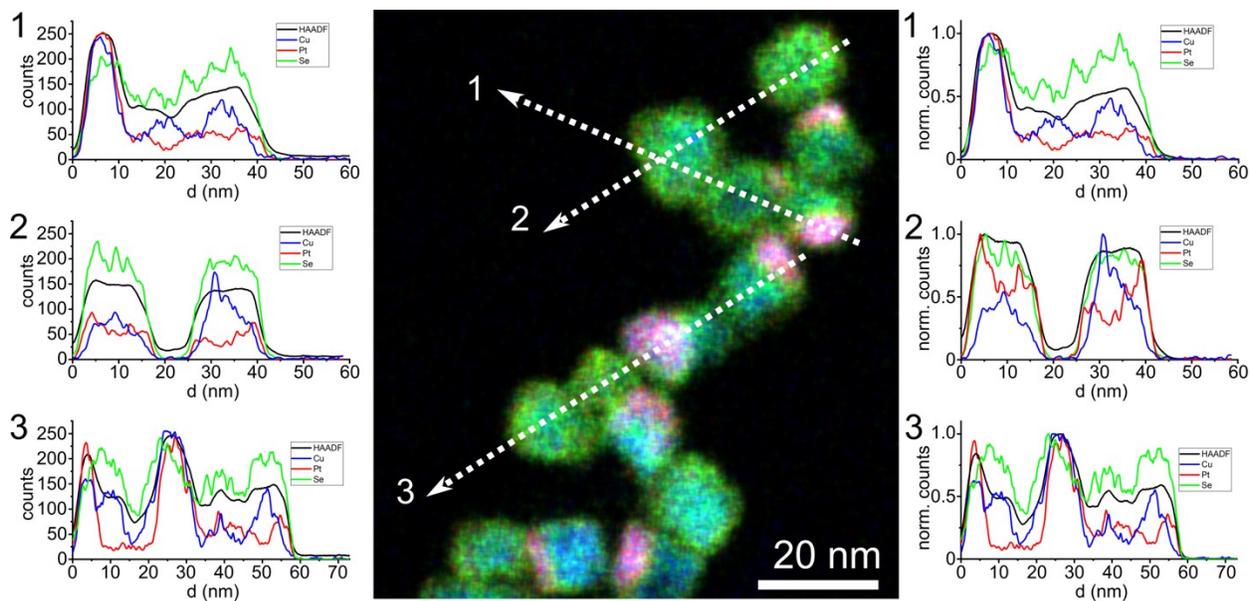


Figure S12: Nominal (left) and normalized (right) elemental line scans of Pt-Cu-Se_A indicating the distribution of platinum, copper and selenium. The corresponding single elemental maps are presented in Figure 3 and the two-elements combined elemental maps are presented in Figure S11a. Copper, platinum and selenium are represented in blue, red and green, respectively, in the combined elemental map. The same color coding applies to the line scan profiles, where the HAADF intensity profile (indicated in black) was also added as a further reference. The corresponding HAADF image is presented in Figure 3.

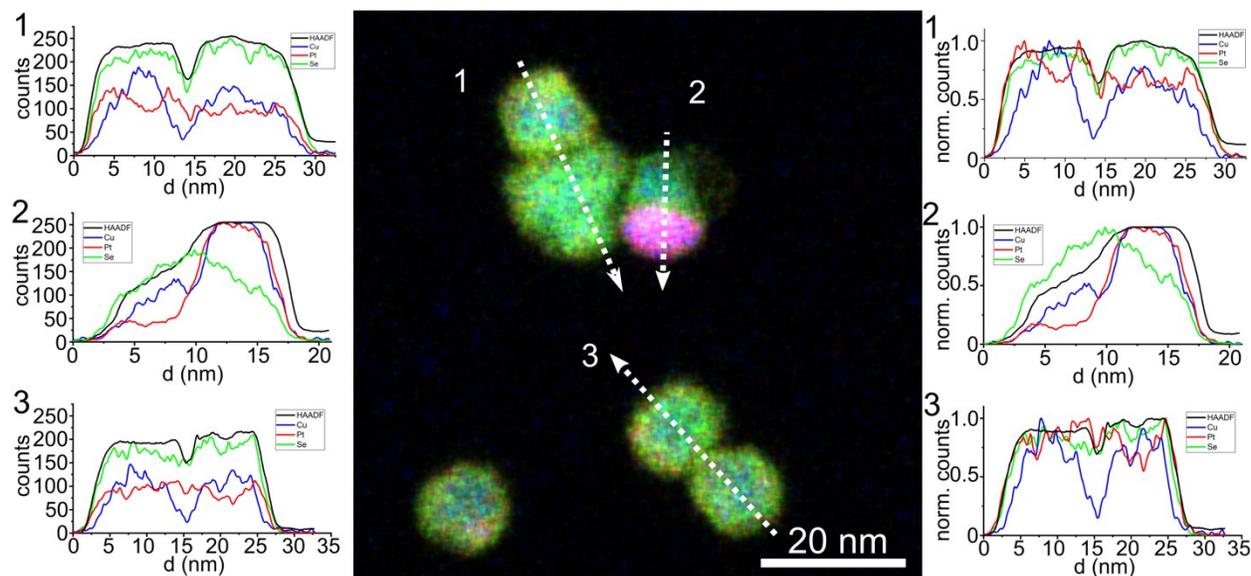


Figure S13: Nominal (left) and normalized (right) elemental line scans of Pt-Cu-Se_B indicating the distribution of platinum, copper and selenium. The corresponding single elemental maps are presented in Figure 4 and the two-elements combined elemental maps are presented in Figure S11b. Copper, platinum and selenium are represented in blue, red and green, respectively, in the combined elemental map. The same color coding applies to the line scan profiles, where the HAADF intensity profile (indicated in black) was also added as a further reference. The corresponding HAADF image is presented in Figure 4.

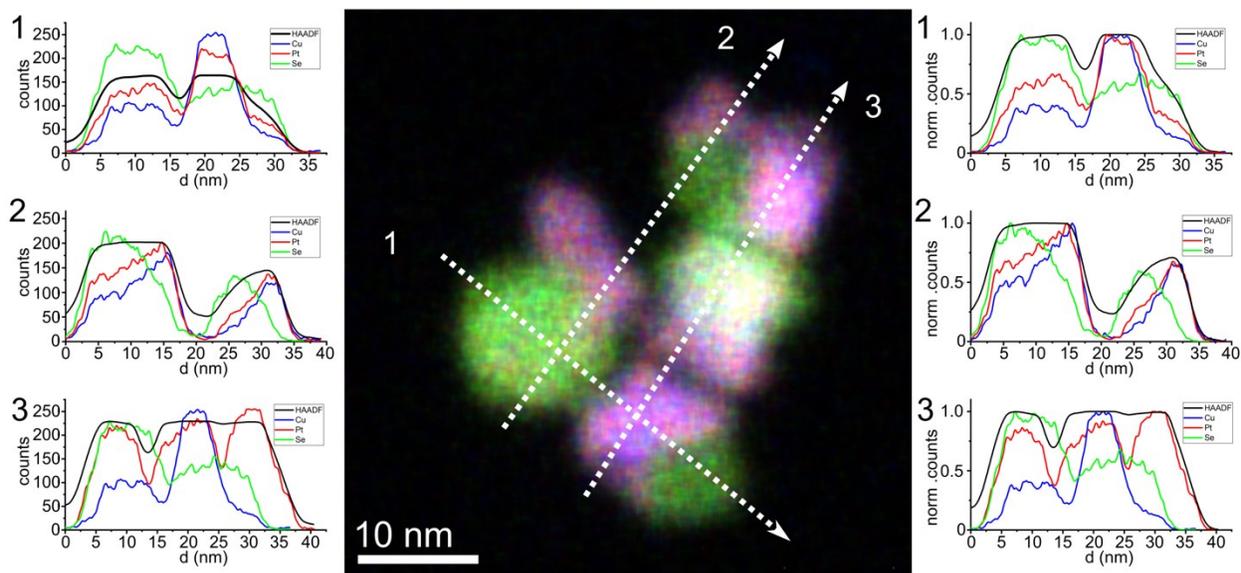


Figure S14: Nominal (left) and normalized (right) elemental line scans of Pt-Cu-Se_C indicating the distribution of platinum, copper and selenium. The corresponding single elemental maps are presented in Figure 5 and the two-elements combined elemental maps are presented in Figure S11c. Copper, platinum and selenium are represented in blue, red and green, respectively, in the combined elemental map. The same color coding applies to the line scan profiles, where the HAADF intensity profile (indicated in black) was also added as a further reference. The corresponding HAADF image is presented in Figure 5.

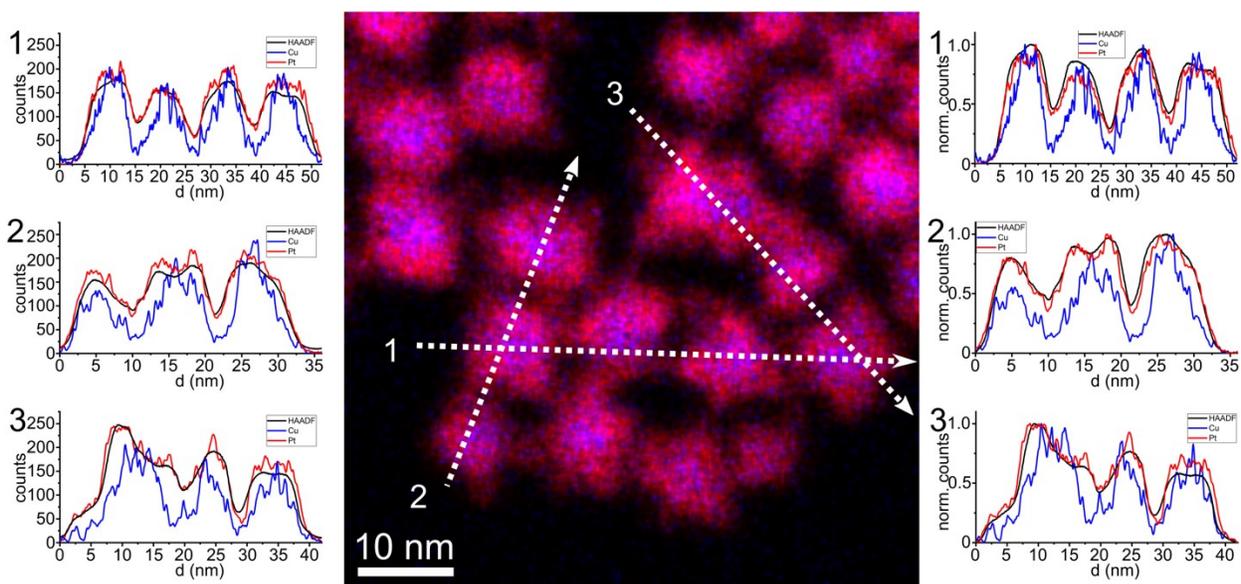


Figure S15: Nominal (left) and normalized (right) elemental line scans of Pt-Cu-Se_D indicating the distribution of platinum and copper. The corresponding single elemental maps are presented in Figure 6. Copper and platinum are represented in blue and red, respectively, in the combined elemental map. The same color coding applies to the line scan profiles, where the HAADF intensity profile (indicated in black) was also added as a further reference. The corresponding HAADF image is presented in Figure 6.

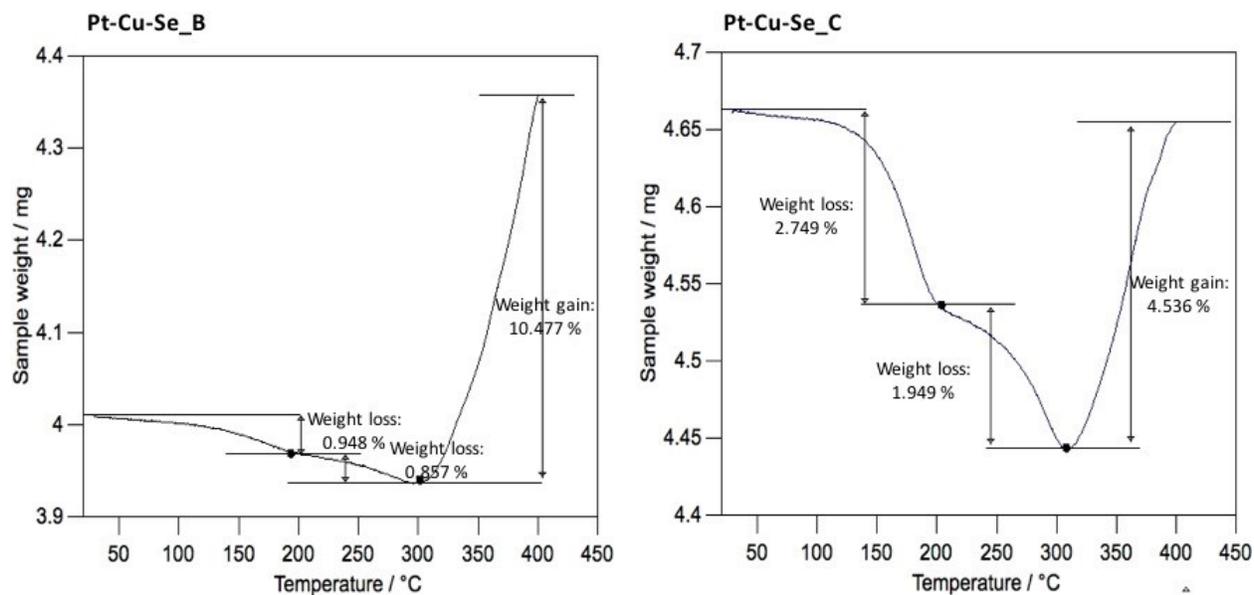


Figure S16: TGA data for Pt-Cu-Se_B and Pt-Cu-Se_C.

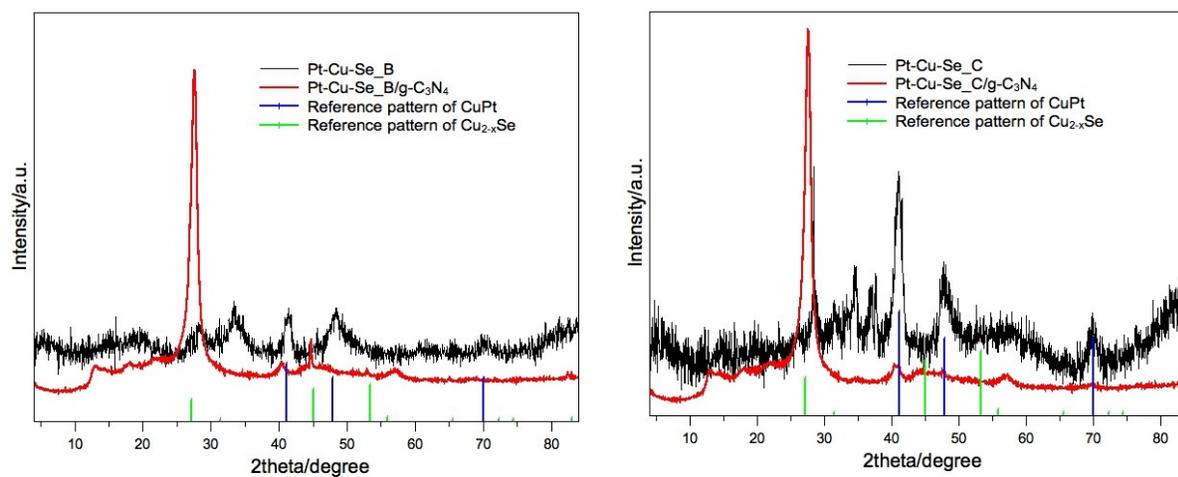


Figure S17: X-ray diffractograms of Pt-Cu-Se_B/g-C₃N₄ and Pt-Cu-Se_C/g-C₃N₄ nanocomposites used as photocatalysts, compared to those of the precursor Pt-Cu-Se_B and C nanostructured materials.

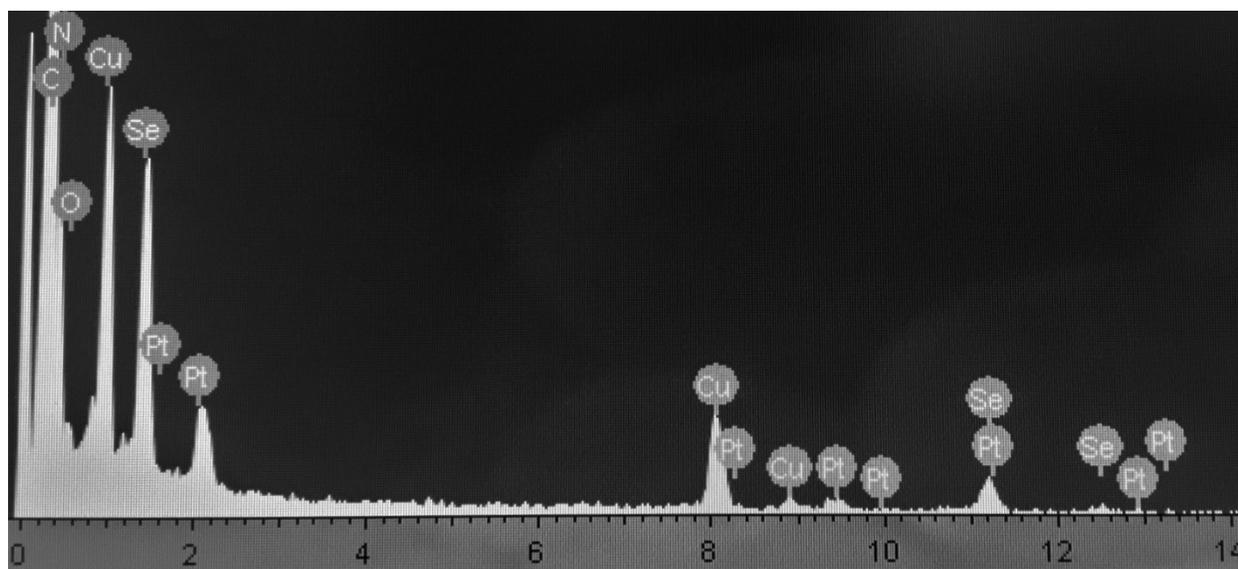


Figure S18: EDS spectrum of Pt-Cu-Se_B/g-C₃N₄ nanocomposite used as photocatalyst. The energy units are in keV.

Table S11: XPS data for Pt-Cu-Se_B/g-C₃N₄ and Pt-Cu-Se_C/g-C₃N₄ nanocomposites.

Sample	Tag	BE / eV	FWHM	% Atomic	Specie
Pt-Cu-Se_B/g-C ₃ N ₄	C 1s	284.2	1.5	23.4	carbon
	C 1s	285.3	1.5	9.25	carbon
	C 1s	288.0	1.5	30.5	C ₃ N ₄
	N 1s	398.5	1.4	25.8	C ₃ N ₄
	N 1s	399.6	1.4	5.95	C ₃ N ₄
	N 1s	400.8	1.5	4.39	C ₃ N ₄
	Cu 2p _{3/2}	932.7	3.2	0.05	Cu _(2-x) Se
	Se 3d _{5/2}	54.2	1.9	0.26	Cu _(2-x) Se
	Se 3d _{5/2}	51.4	2.2	0.24	Cu _(2-x) Se
	Pt 4f _{7/2}	70.9	2.3	0.04	Pt ⁽⁰⁾
	Pt 4f _{7/2}	73.4	2.5	0.02	Pt ⁽²⁺⁾
Pt-Cu-Se_C/g-C ₃ N ₄	C 1s	284.4	1.5	8.48	carbon
	C 1s	285.5	1.5	5.51	carbon
	C 1s	288.1	1.5	38.2	C ₃ N ₄
	N 1s	398.5	1.4	33.8	C ₃ N ₄
	N 1s	399.7	1.4	7.72	C ₃ N ₄
	N 1s	400.9	1.5	5.92	C ₃ N ₄
	Cu 2p _{3/2}	932.7	2.1	0.06	Cu _(2-x) Se
	Se 3d _{5/2}	54.6	1.4	0.15	Cu _(2-x) Se
	Se 3d _{5/2}	51.6	2.5	0.10	Cu _(2-x) Se
	Pt 4f _{7/2}	71.4	2.2	0.03	Pt ⁽⁰⁾
	Pt 4f _{7/2}	73.3	2.6	0.03	Pt ⁽²⁺⁾