Supplementary data

Impact of crystallinity and local disorder on the luminescence properties of solvothermally synthesized $LuPO_4:Pr^{3+}$ nanocrystals

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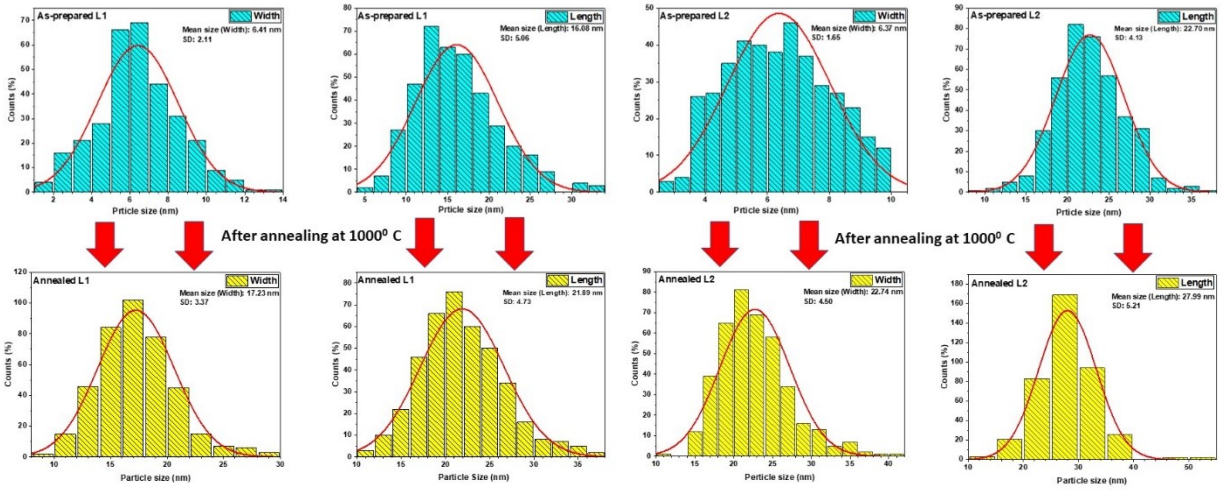

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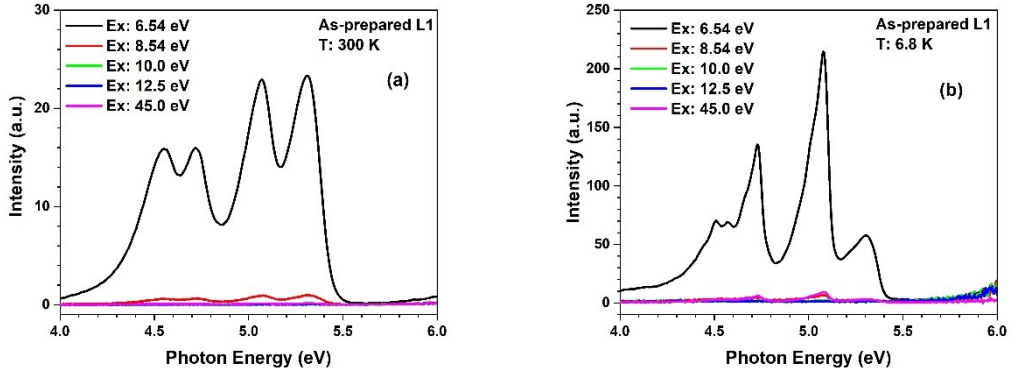
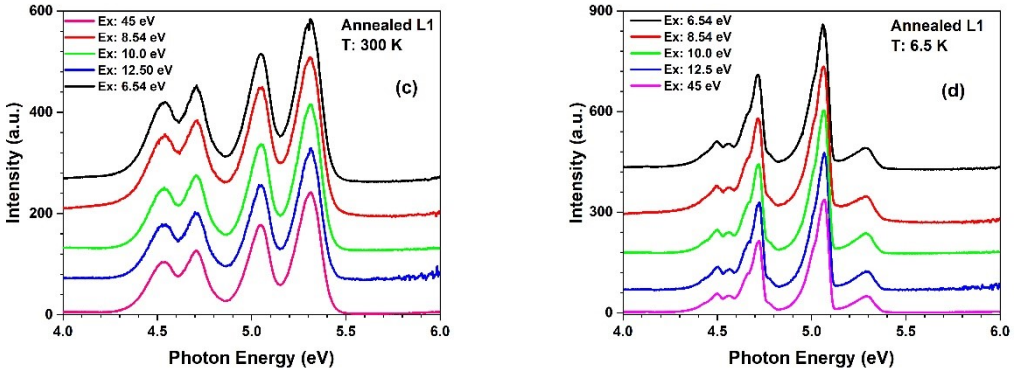
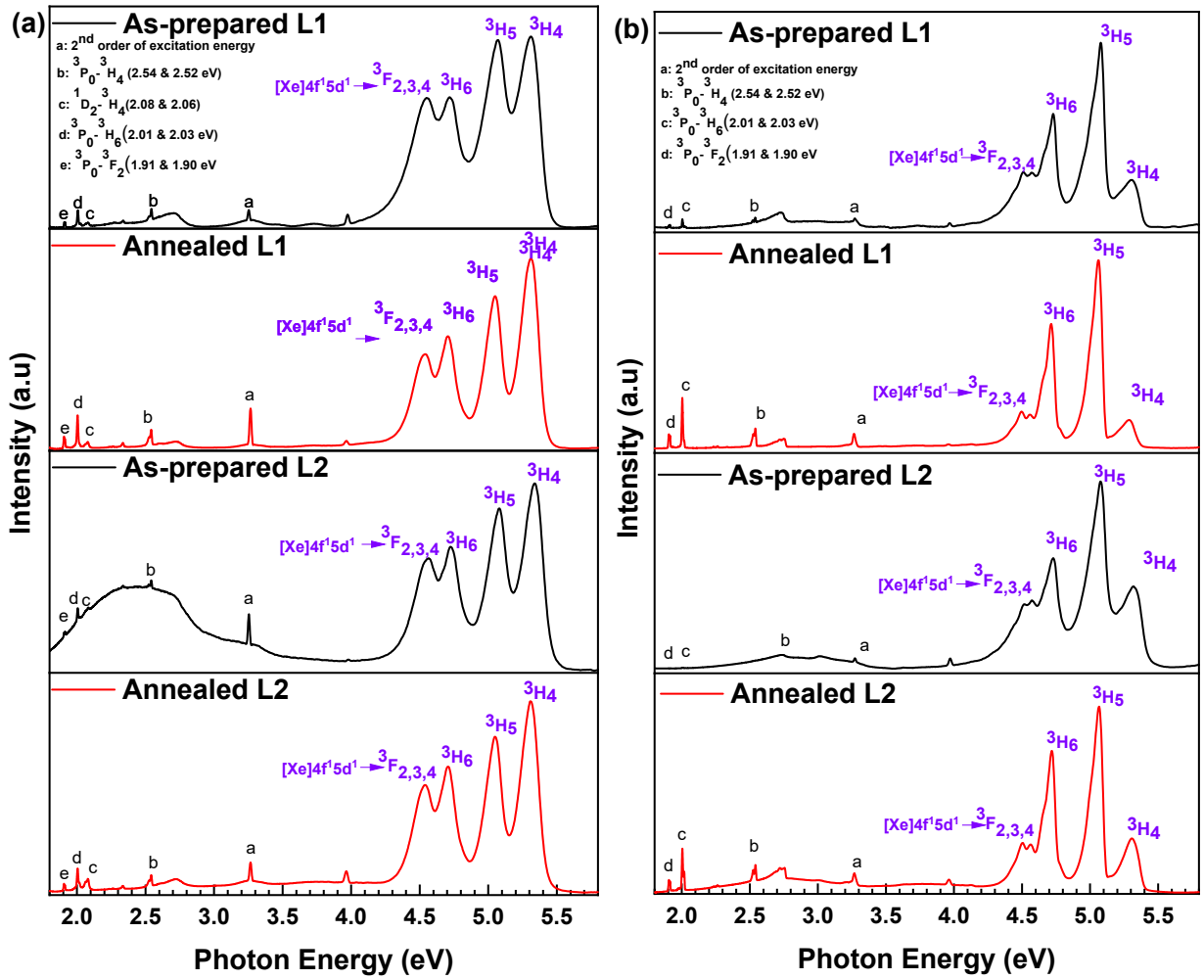
1. Effect of annealing on the particle size distribution profile of as-prepared $LuPO^4:Pr^{3+}$(1%) nanoparticles.

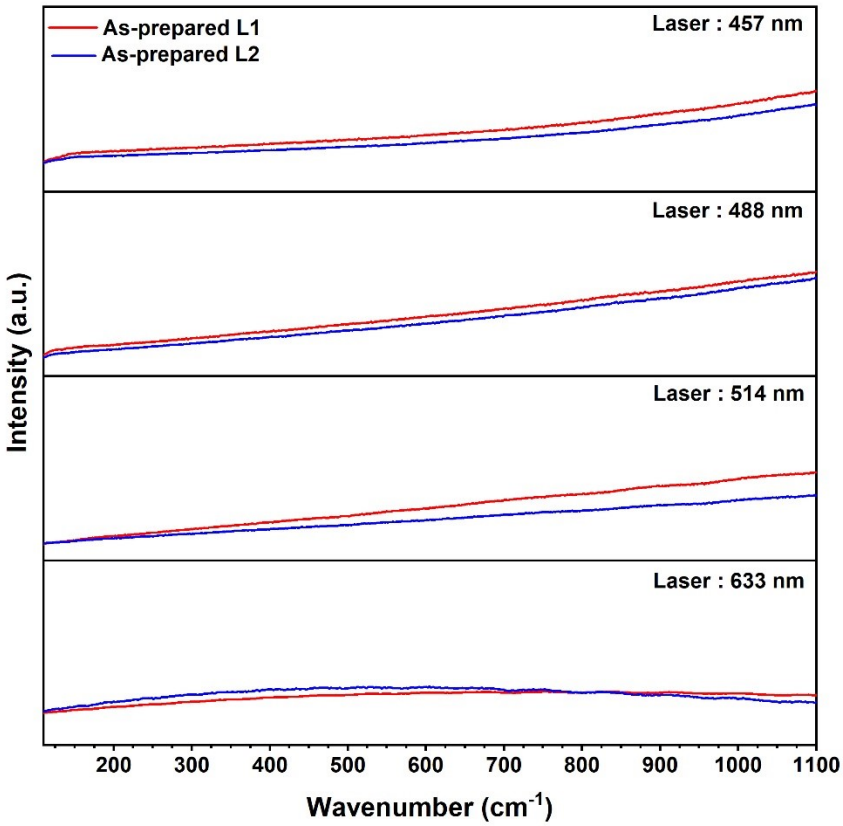




S2. Pr^{3+} $4f^15d^1 \rightarrow 4f^2$ luminescence in as-prepared and annealed $LuPO_4$:Pr^{3+}(1%) nanocrystals (L1) measured at room temperature and liquid helium temperatures excited by SR photons with different energies.



S3. Pr^{3+} $4f^15d^1 \rightarrow 4f^2$ luminescence under intra center excitation energy of Pr^{3+} ion (6.54 eV) measured at (a) 300K and (b) 6.8 K temperatures



S4. Raman spectra of as-prepared $LuPO_4:Pr^{3+}$ (1%) nanoparticles L1 and L2 (see the main text) under different laser excitation wavelengths (633 nm, 514 nm, 488 nm, 457 nm).

S5. Decay times (in ns) and estimation of light sums (in %) for different Pr^{3+} emissions from each samples in the UV-C spectral range under intra-center excitation at 7 K.

Sr. No	Sample Name	Radiative transitions with the assignments and emission energies (eV)					
		Pr^{3+} $4f^15d^1 \rightarrow {}^3H_4$ (5.31 eV)		Pr^{3+} $4f^15d^1 \rightarrow {}^3H_5$ (5.06 eV)		Pr^{3+} $4f^15d^1 \rightarrow {}^3H_6$ (4.71 eV)	
		τ_1	τ_2	τ_1	τ_2	τ_1	τ_2
1.	As-prepared L1	1.2 ns (98.9 %)	6.8 ns (1.1 %)	1.6 ns (97.7%)	7.5 ns (2.3 %)	1.9 ns (95.3 %)	8.2 ns (4.7 %)
2.	Annealed L1	2.9 ns (63.9 %)	9.9 ns (36.1 %)	3.6 ns (60.5 %)	10.9 ns (39.5 %)	3.6 ns (60.6 %)	11.0 ns (39.4 %)
3.	As-prepared L2	3.0 ns (85.6 %)	13.9 ns (14.4 %)	3.3 ns (79.7 %)	14.5 ns (20.3 %)	3.3 ns (73.3 %)	15.0 ns (26.7 %)

4.	Annealed L2	4.4 ns (51.4 %)	14.9 ns (48.6 %)	5.1 ns (52.2 %)	16.0 ns (47.8 %)	5.6 ns (54.3 %)	16.5 ns (45.7 %)