

## Supplementary information

### UVC Stokes and anti-Stokes emission of $\text{Ca}_9\text{Y}(\text{PO}_4)_7$ polycrystals doped with $\text{Pr}^{3+}$ ions

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Table S1. Distances between yttrium sites and oxygen ligands in  $\text{Ca}_9\text{Y}(\text{PO}_4)_7$ .

<b>Ca1 Y1 [Å]</b>	<b>Ca2 Y2 [Å]</b>	<b>Ca4 Y3 [Å]</b>
<b>CN=8</b>	<b>CN=8</b>	<b>CN=6</b>
2.2751	2.2356	2.1478
2.4007	2.2700	2.1478
2.4124	2.3510	2.1478
2.4617	2.4110	2.2912
2.4342	2.4406	2.2912
2.5657	2.4595	2.2912
2.5612	2.6369	
2.7331	2.9940	
$\text{\AA}_{\text{av}}=2.4805$	$\text{\AA}_{\text{av}}=2.4748$	$\text{\AA}_{\text{av}}=2.2195$

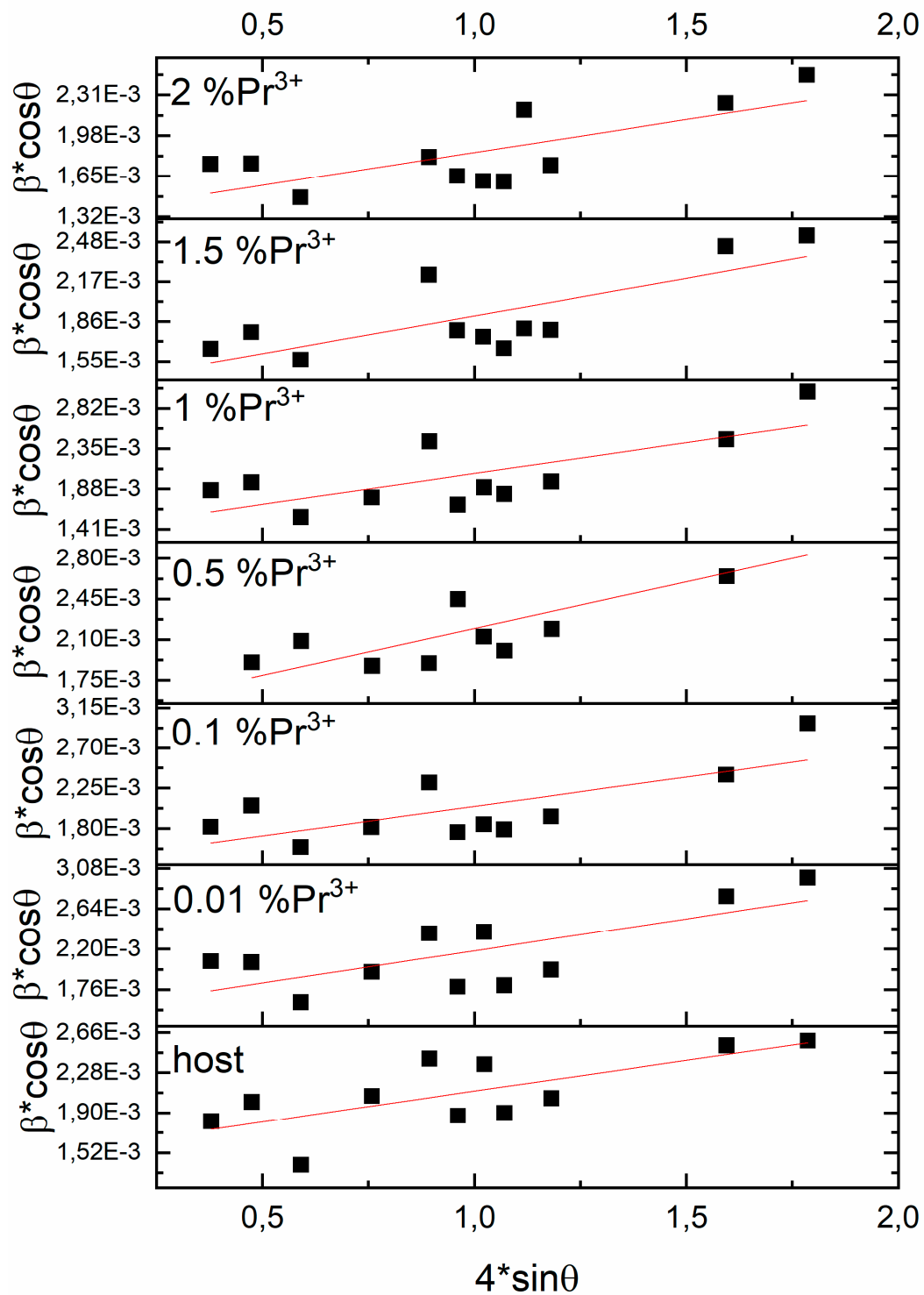


Figure S1. Plots of  $\beta \cos\theta$  versus  $4 \sin\theta$  for  $\text{Ca}_9\text{Y}_{1-x}\text{Pr}_x(\text{PO}_4)_7$  ( $0 \leq x \leq 0.02$ ) nanoparticles.

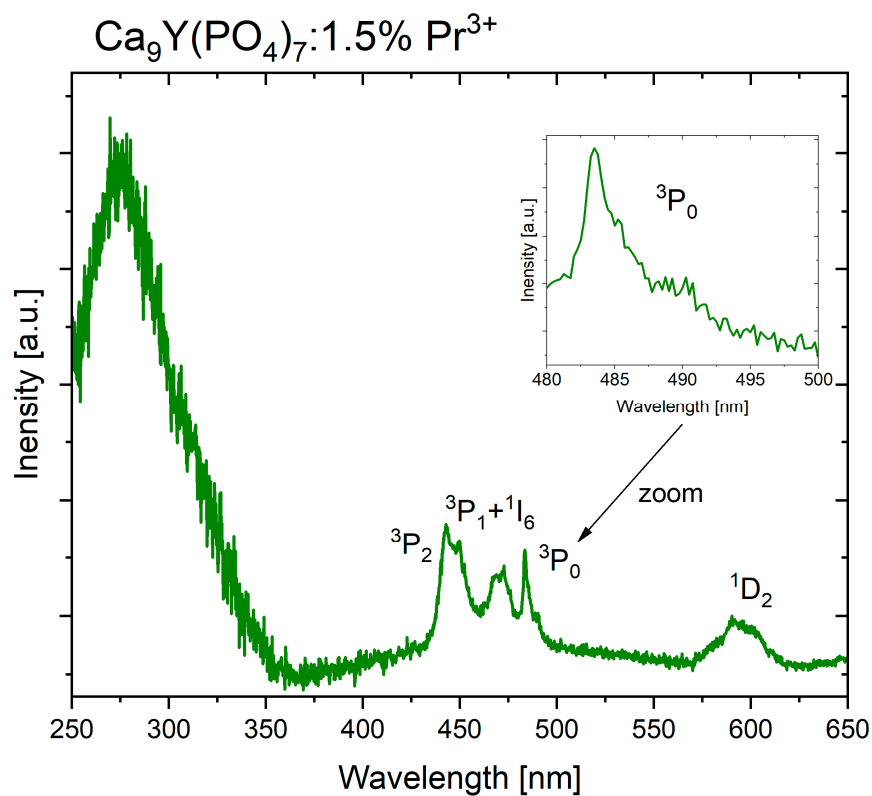


Figure S2. Absorption spectra of  $\text{Ca}_9\text{Y}_{0.085}\text{Pr}_{0.015}(\text{PO}_4)_7$ .

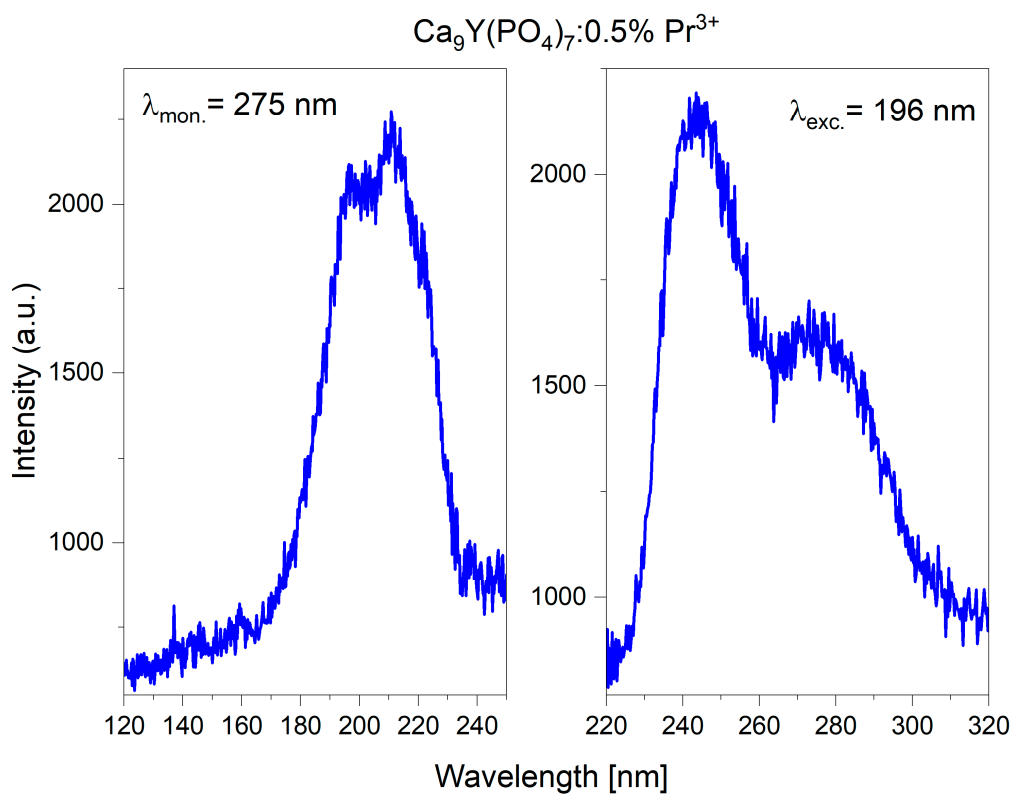


Figure S3. Excitation and emission spectra of  $\text{Ca}_9\text{Y}_{0.995}\text{Pr}_{0.005}(\text{PO}_4)_7$  polycrystals in the UVC range.

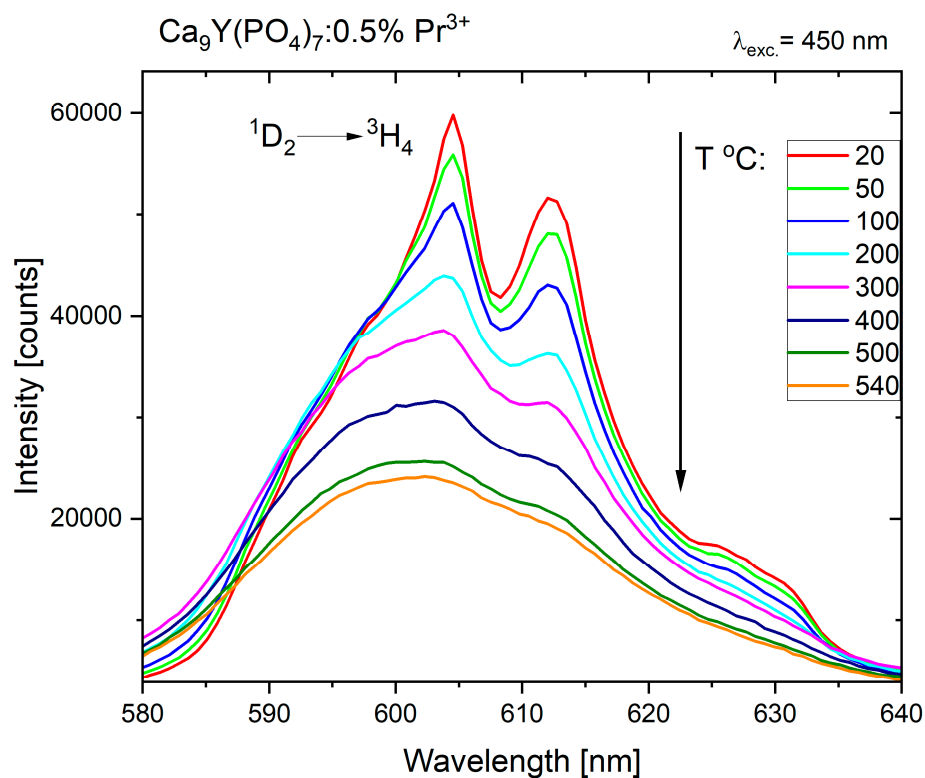


Figure S4. Visualization of the temperature dependence luminescence intensity of  $\text{Ca}_9\text{Y}_{0.995}\text{Pr}_{0.005}(\text{PO}_4)_7$  for the selected temperatures.

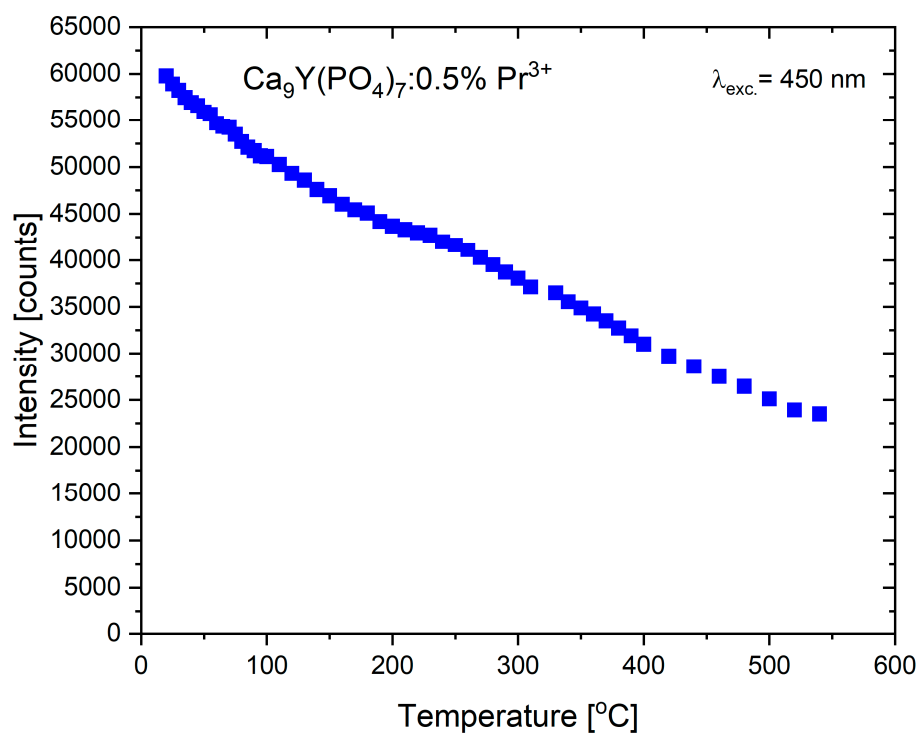


Figure S5. Quenching of the luminescence intensity of  $\text{Ca}_9\text{Y}_{0.995}\text{Pr}_{0.005}(\text{PO}_4)_7$  in a function of temperature.