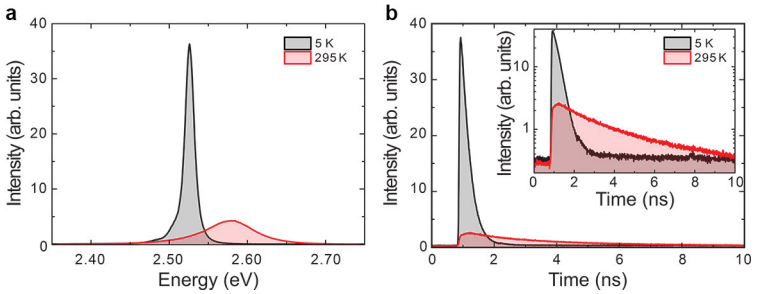

Extended Data Figure 2 | Measurements to estimate the low-temperature quantum yield for our $CsPbBr_2Cl$ nanocrystals. **a**, **b**, Photoluminescence spectra (**a**) and decays (**b**) for $CsPbBr_2Cl$ nanocrystals ($L = 14 \pm 1$ nm) embedded in a PMMA film at 295 K (red) and 5 K (black). Data for the two temperatures are plotted on the same intensity scale. For the same sample, a calibrated integrating sphere was used to measure the photoluminescence quantum yield at 295 K ($43\% \pm 1\%$). To obtain the quantum yield at 5 K, the photoluminescence and optical absorption for several spots at 295 K and 5 K under constant weak excitation (at 3.06 eV) were measured. The photoluminescence increased substantially, as seen in both the spectra and decay signal, whereas the absorption stayed nearly constant (data not shown). From these results, the quantum yield at 5 K was estimated to be $88\% \pm 14\%$. The photoluminescence decays in **b** are plotted on both a linear and a logarithmic (inset) intensity scale, with decay times of 1.60 ns (295 K) and 0.23 ns (5 K). The decrease in decay time at low temperature is clearly accompanied by an increase in the total emitted intensity (area under the decay traces).