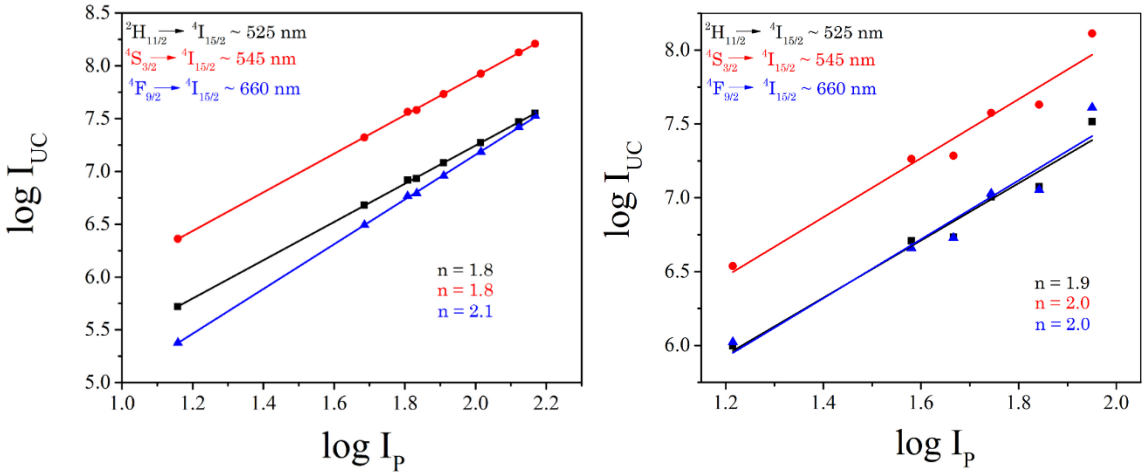
Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information:

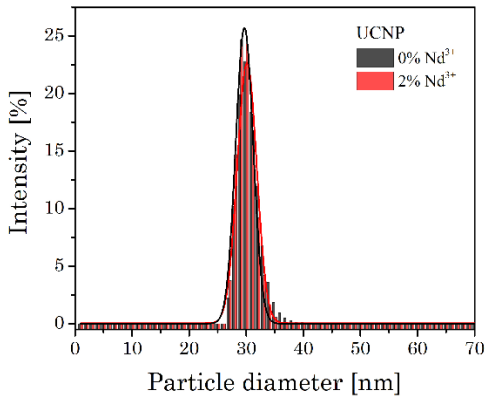
Upconversion $NaYF_4$:Yb:Er nanoparticles co-doped with Gd^{3+} and Nd^{3+} for thermometry on nanoscales

Dennis T. Klier and Michael U. Kumke[#]

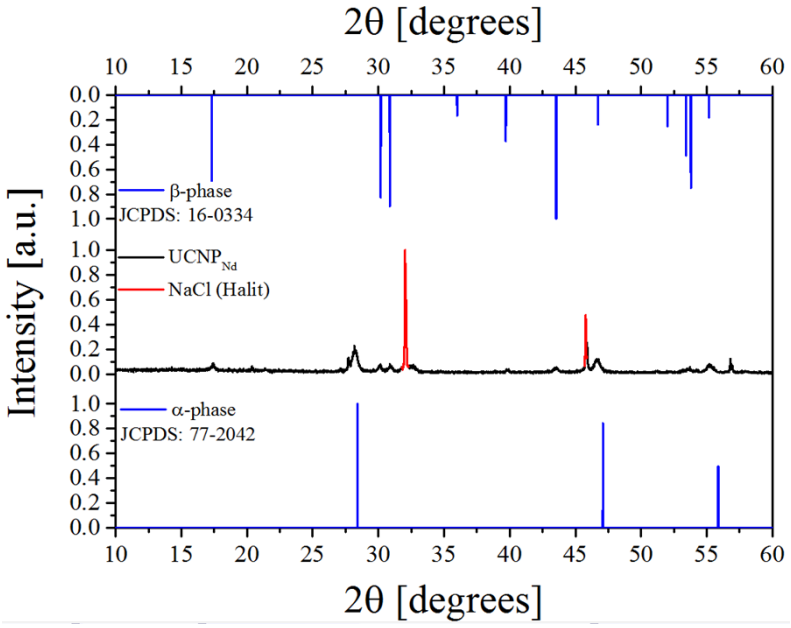
University of Potsdam, Department of Chemistry (Physical Chemistry), Karl-Liebknecht-Str. 24-25, 14476 Potsdam, Germany



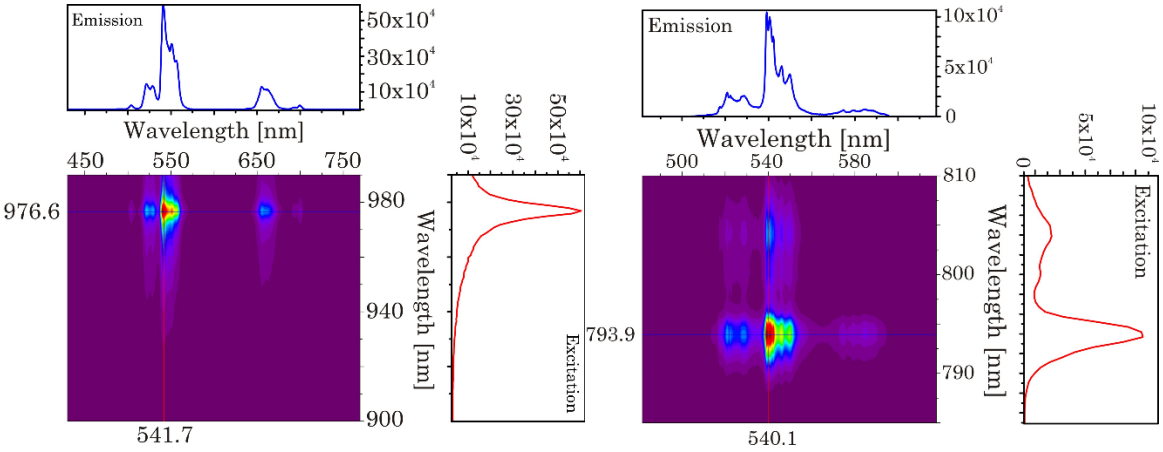
SI.Fig.1: Power dependence (Log I_{UC} – Log I_P plot) of the Er^{3+} transitions G1, G2 and R of oleic acid capped UCNP using different excitation wavelength (left: λ_{ex} = 976 nm; right: λ_{ex} = 795 nm).



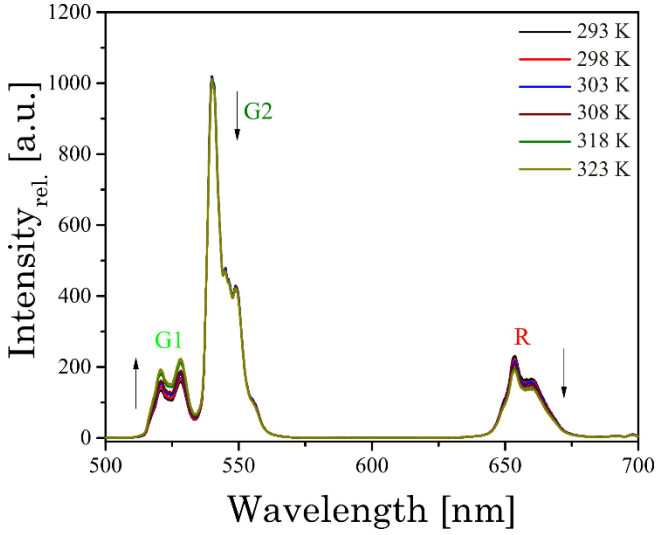
SI.Fig.2: DLS analysis of UCNP and $UCNP_{Nd}$ fitted using a Gaussian function.



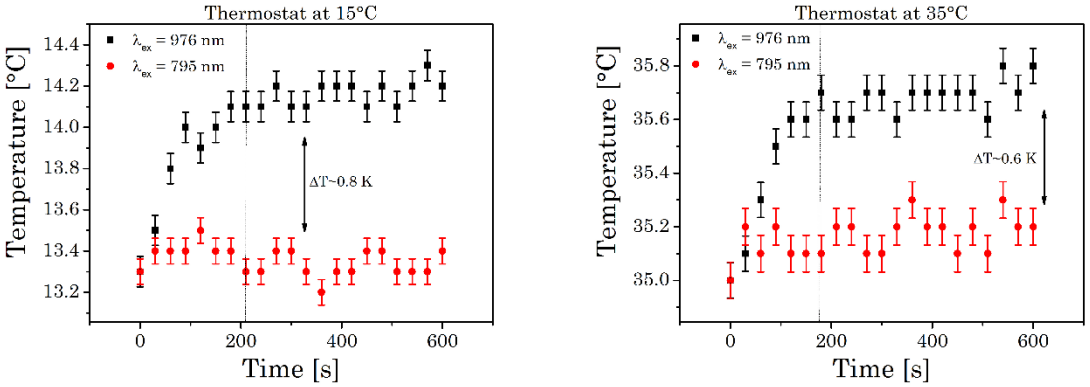
SI.Fig.3: Diffractogram of $UCNP_{Nd}$ with the reference data of α-$NaYF_4$ (JCPDS:77-2042) and β-$NaYF_4$ (JCPDS:16-0334) [39].



SI.Fig.4: Excitation emission spectra (total luminescence spectra) of UCNP and $UCNP_{Nd}$.



SI.Fig.5: Upconversion emission spectra of UCNP excited at λ_{ex} = 976 nm at temperatures between 293 K and 323K are shown.



SI.Fig.6: Temperature dependence of $UCNP_{Nd}$ dissolved in water at different irradiation wavelength and thermostat temperature over time.