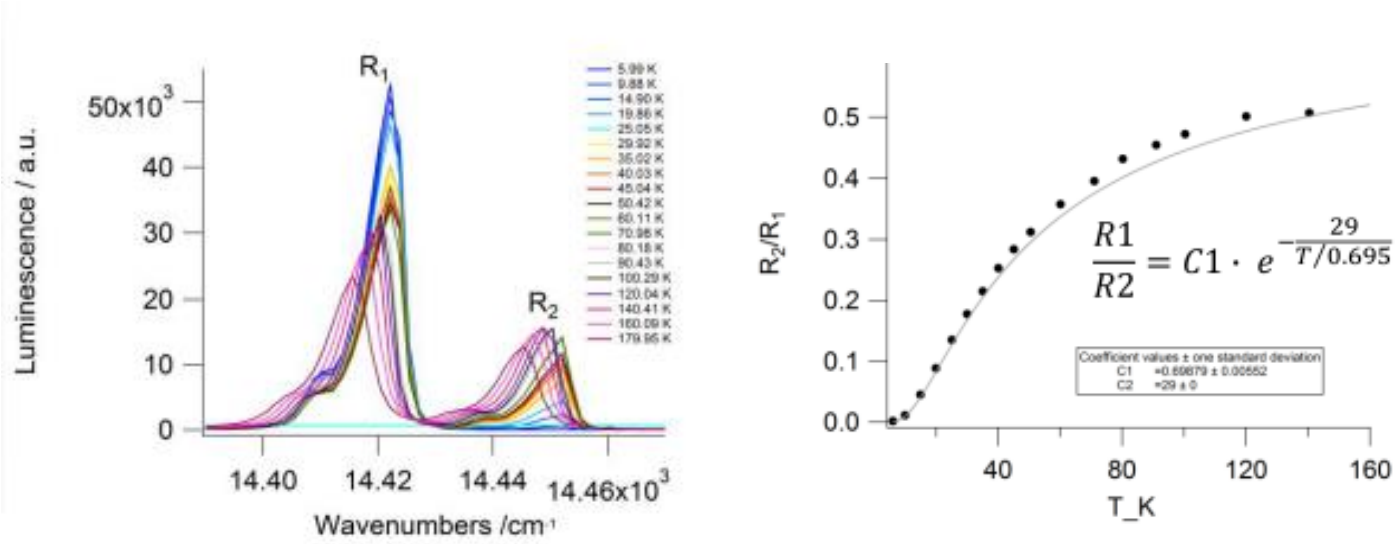
Experimental rapport (work in progress)

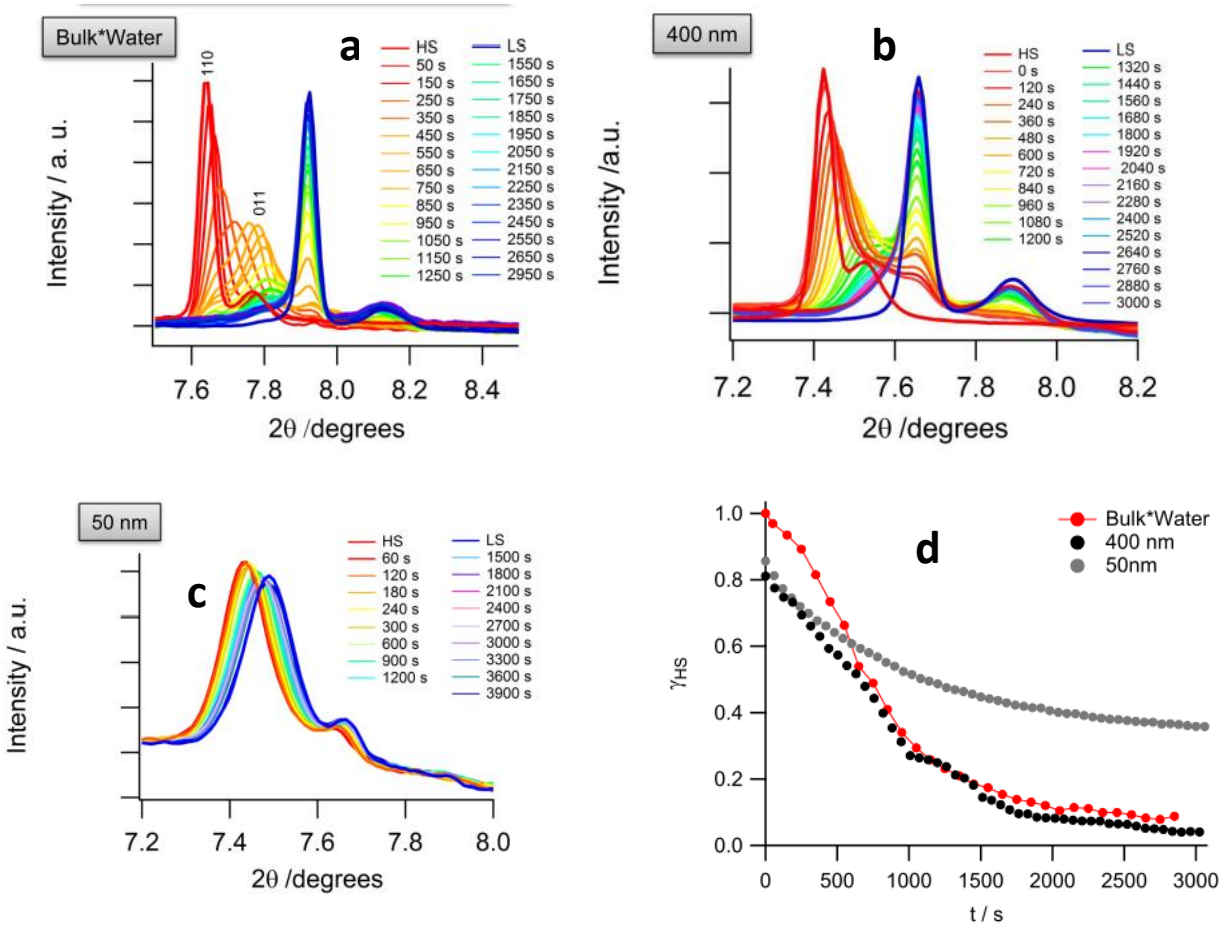
In order to measure the temperature carefully, the luminescence of the Ruby was used (fig 1). We realized during the experiment that we should take into account the shielding of the helium jet by the kapton mount that we used to deposit the sample so that the ruby and the sample had to be on the same side of the kapton foil.

FIGURE 1 : To extract the sample temperature, the luminescence of a ruby crystal was measured as different known temperature in our lab. The ration of the intensities of the R2 and R1 lines could be fitted by an exponenetial function. (b) The calibration curve obtained in this was was used during tFor he experiment to monitor the temperature.



The 400 nm particle, the bulk and the 50nm could be measured at 10K. The relaxation behaviour curves is different. For the large size particles (bulk,400nm), a mixed HS/LS and a pure LS phase is present (figure 2a and 2b) while for the nanoparticles only the mixed phase is present (fig 2c). By fitting the data using the method described in ref [1], preliminary relaxation curves showing the HS fraction as a function of the time could be obtained.

Figure 2 : Small part of the powder diffraction patterns for the different crystallite sizes measured during the relaxation at 10k (a,b,c) and the preliminary relaxation curves (HS fraction as a function of the time) obtained by fitting the powder diffraction data.



1 T. Delgado, A. Tissot, C. Besnard, L. Guénée, P. Pattison and A. Hauser, *Chem. – Eur. J.*, 2015, **21**, 3664–3670.