Electronic Supplementary Information for Dalton Transactions

Thermo- and photoswitchable spin-crossover nanoparticles of an iron(II) complex trapped in transparent silica thin films.

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Supplementary Materials

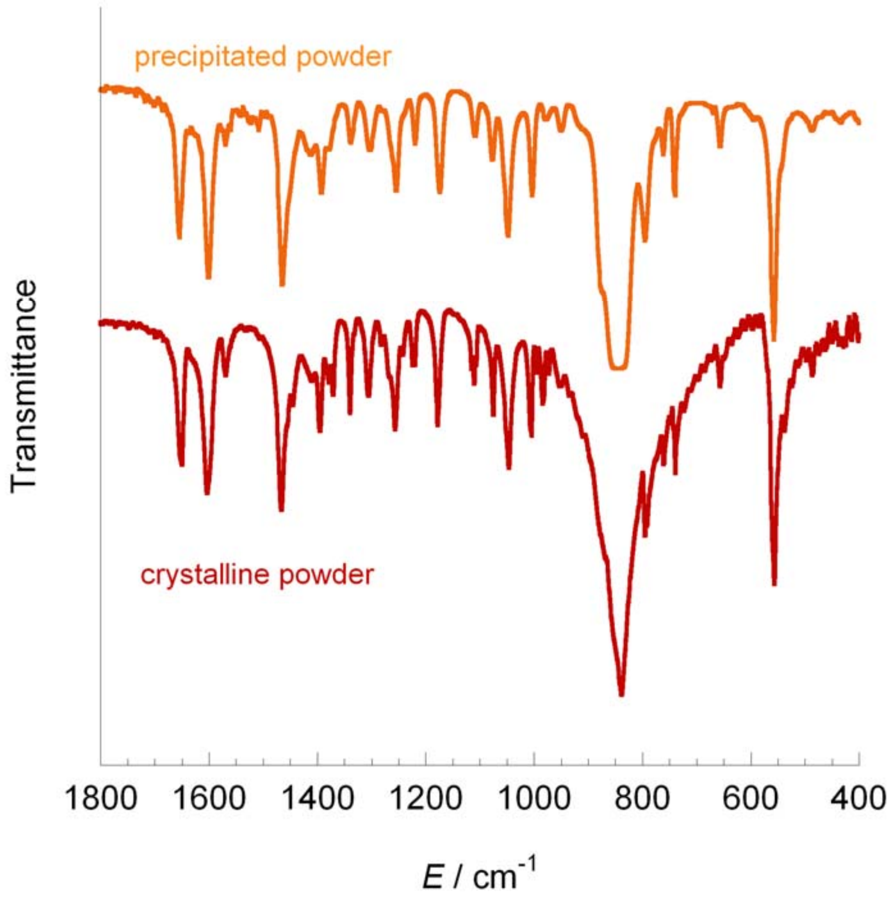

Figure S1. Infra-Red spectra of the crystalline powder (red) and the precipitated powder (orange) in the 1800 – 400 cm^{-1} range.

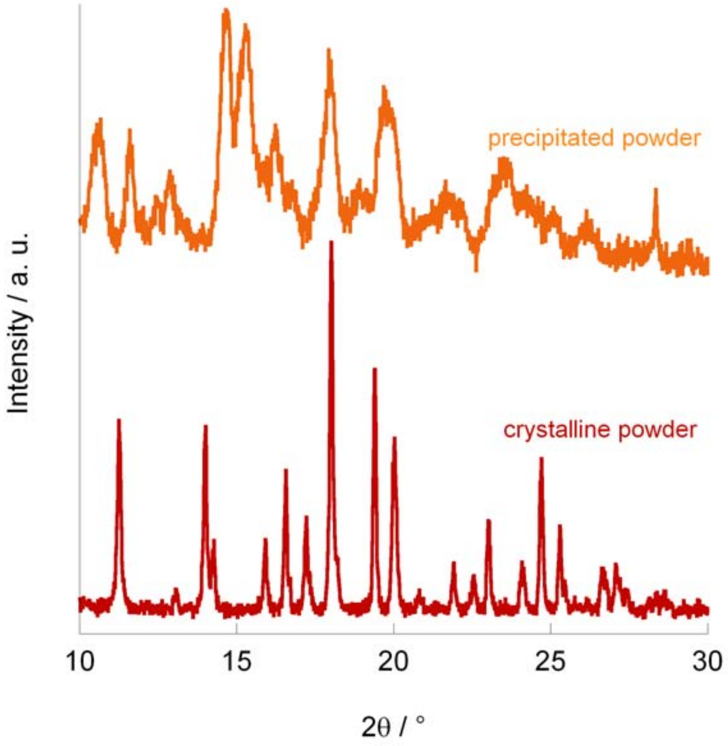

Figure S2. X-Ray Powder Diffraction patterns of the crystalline powder (red) and the precipitated powder (orange) in the 10 – 30 ° range.

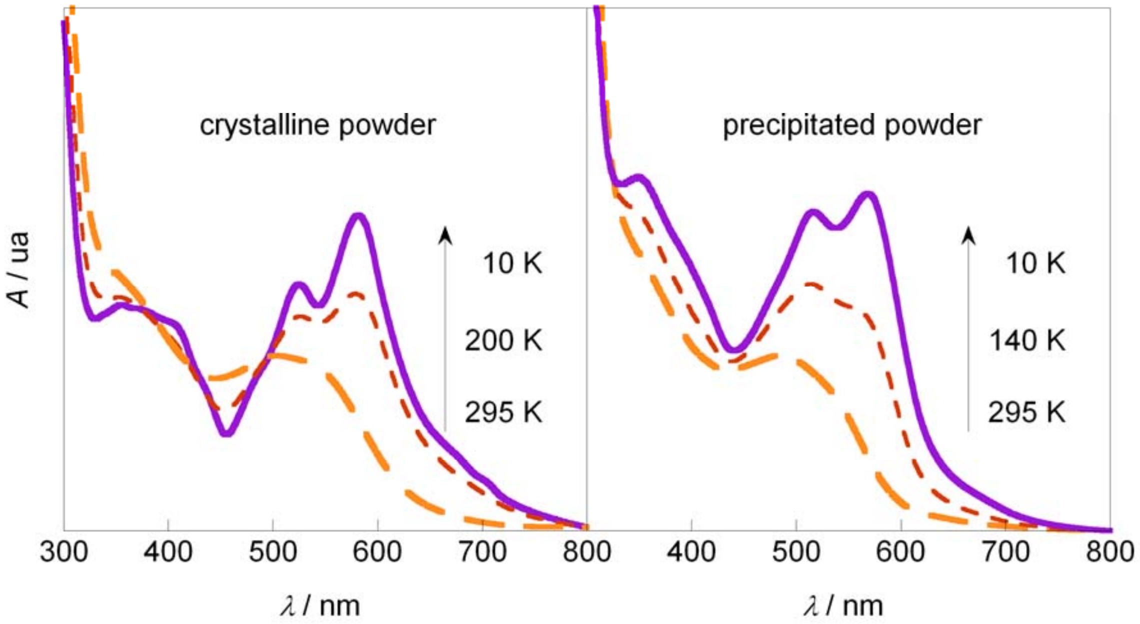

Figure S3. Variable temperature UV-Visible spectra of the microcrystalline powder (left) and the precipitated powder (right) dispersed in a KBr pellet.

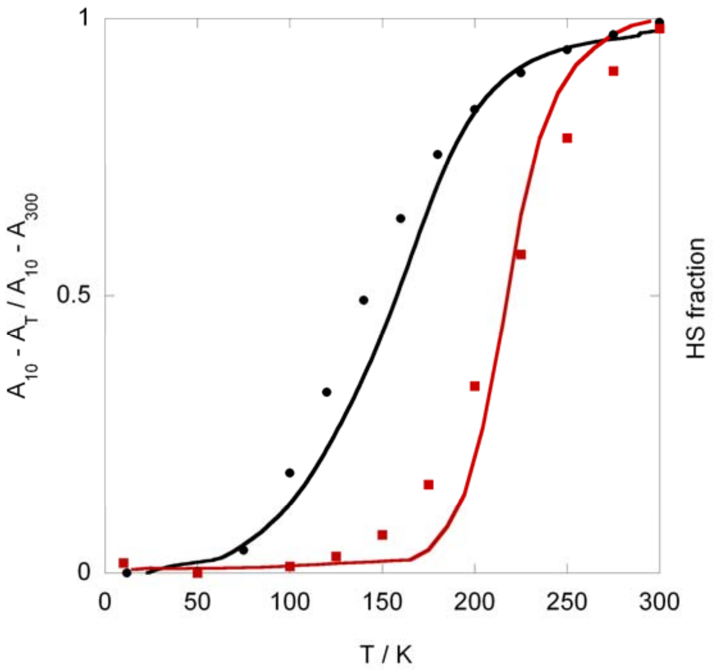

Figure S4. HS fraction versus Temperature curves determined from the UV-visible spectra of precipitated (●) and microcrystalline solid (■). The solid lines represent the HS fraction determined from the magnetic data for the precipitated phase (black) and for the crystalline powder (red). To compare with the spectroscopic data of the precipitated solid, the residual HS fraction at low temperature has been extracted.

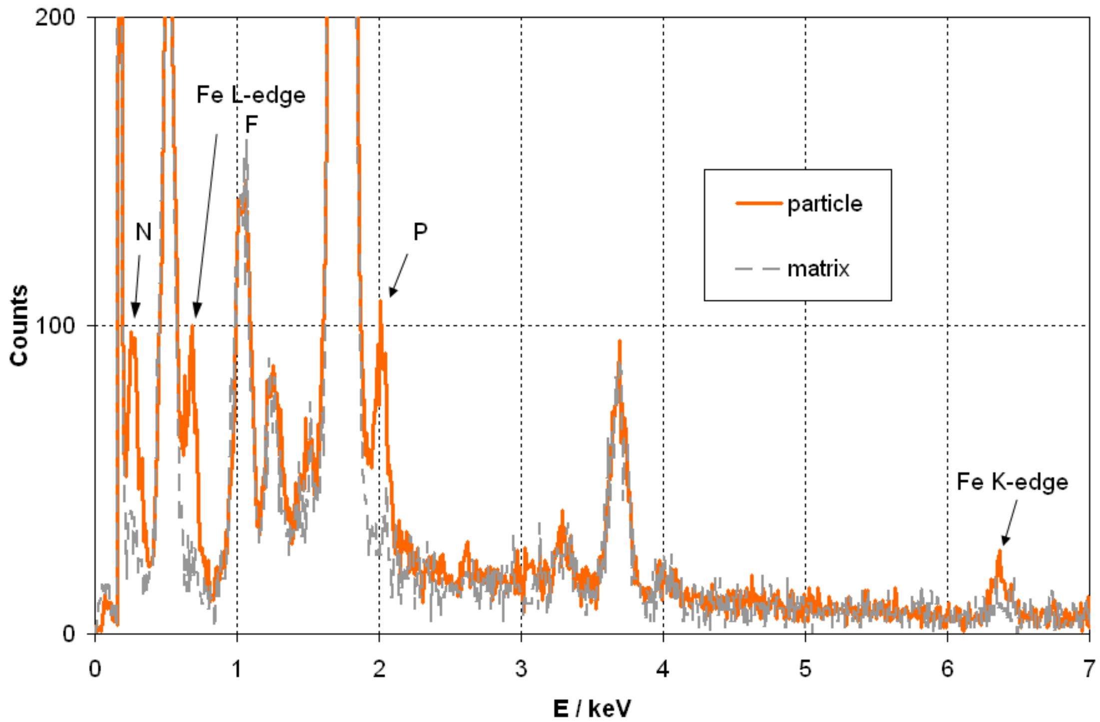

Figure S5. EDX spectra of a 730 nm nanoparticle (orange) and of the silica matrix (gray).

EDX Spectra of nanoparticles show the presence in of iron (K-edge at 6.4 keV, L-edge at 0.7 keV), phosphorus (K-edge at 2.0 keV), fluor (K-edge at 0.7 keV) and nitrogen (K-edge at 0.4 keV), while those of the silica matrix show prevailing signals of silicium (K-edge at 1.75 keV) and oxygen (K-edge at 0.5 keV). Additional peaks are assigned to sodium (K-edge at 1.05 keV), magnesium (K-edge at 1.3 keV) and calcium (K-edge at 3.7 keV) from residual dust.

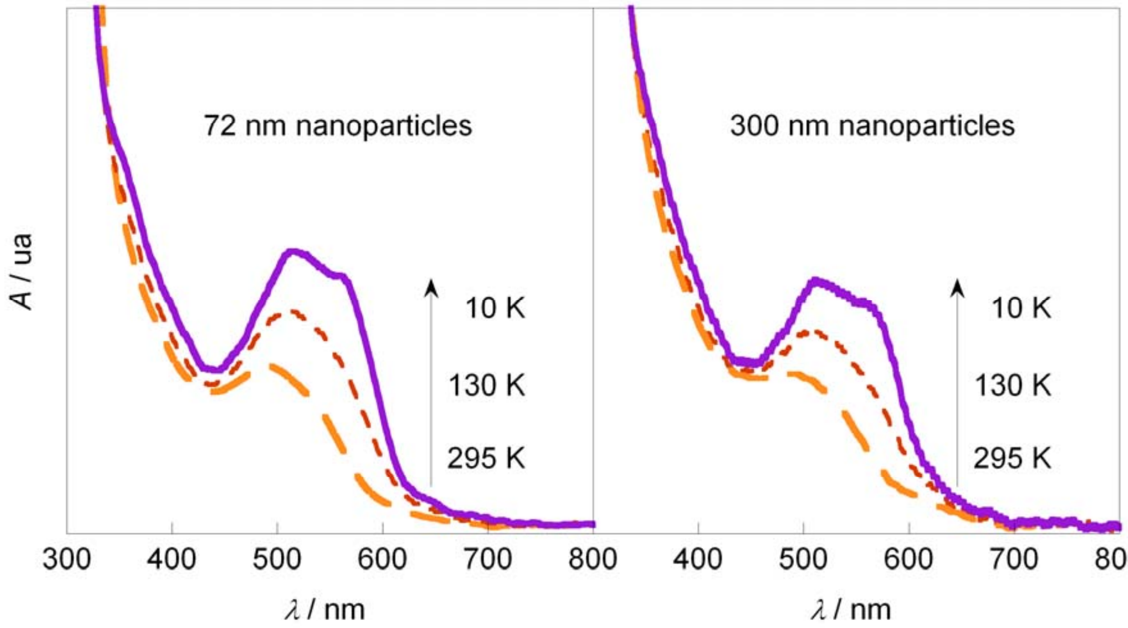

Figure S6. Variable temperature UV-Visible spectra of thin films containing (left) 72 nm nanoparticles and (right) 300 nm nanoparticles.

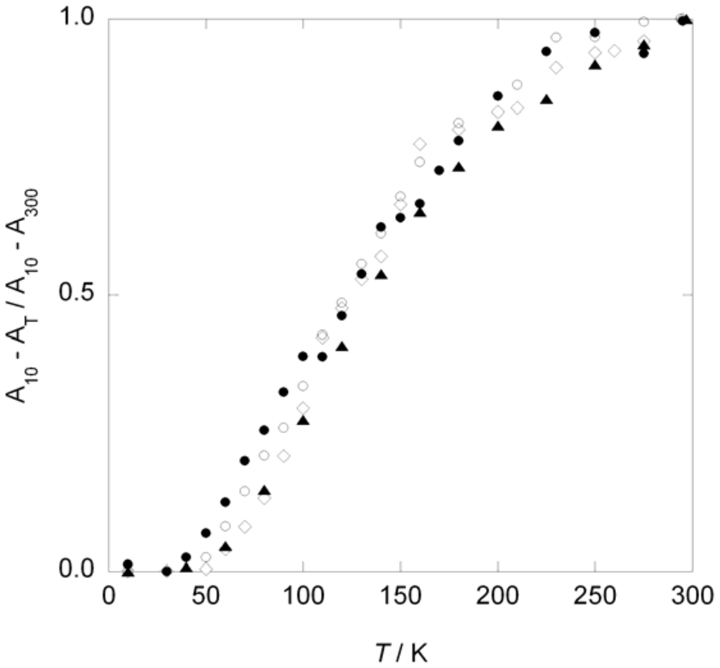

Figure S7. HS fraction versus Temperature curves determined from the UV-visible spectra of thin films doped with nanoparticles (● 47 nm, ◊ 72 nm, ○ 300 nm and ▲ 730 nm).

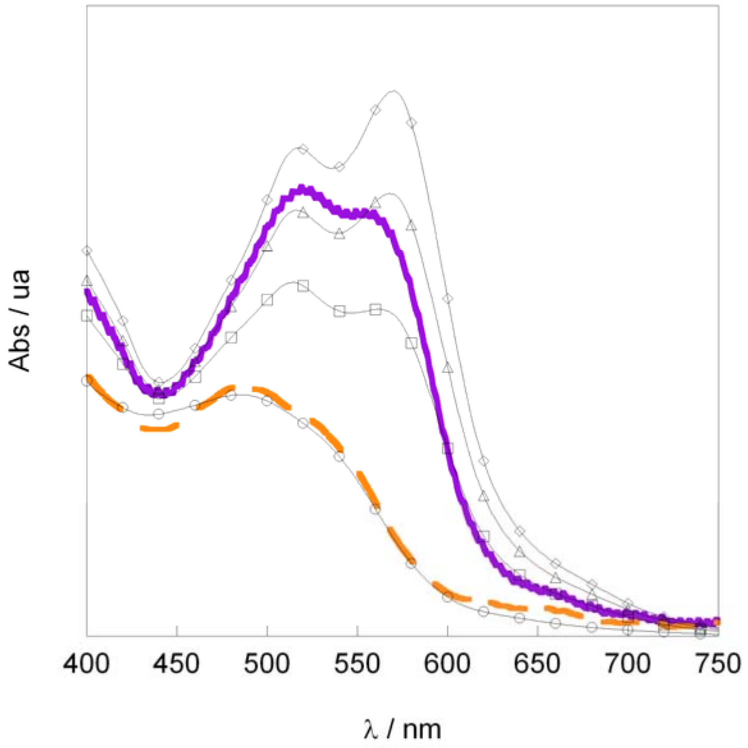

Figure S8. Comparison between the Vis spectra of the 47 nm nanoparticles at 295 K (orange line) and 10 K (purple line) and those of the precipitated solid (in the HS state (○), LS state (◊) and combinations 50 % LS and 50 % HS (□), 77% LS and 23 % HS (Δ)).

The 300 K spectrum of the precipitated solid is considered as the HS state. The LS spectrum is calculated from a linear combination of the 10 K and the 300 K spectra weighted the LS (82 %) and the HS fraction (18 %) determined by magnetic measurements. The same procedure is applied for calculating the two other spectra.

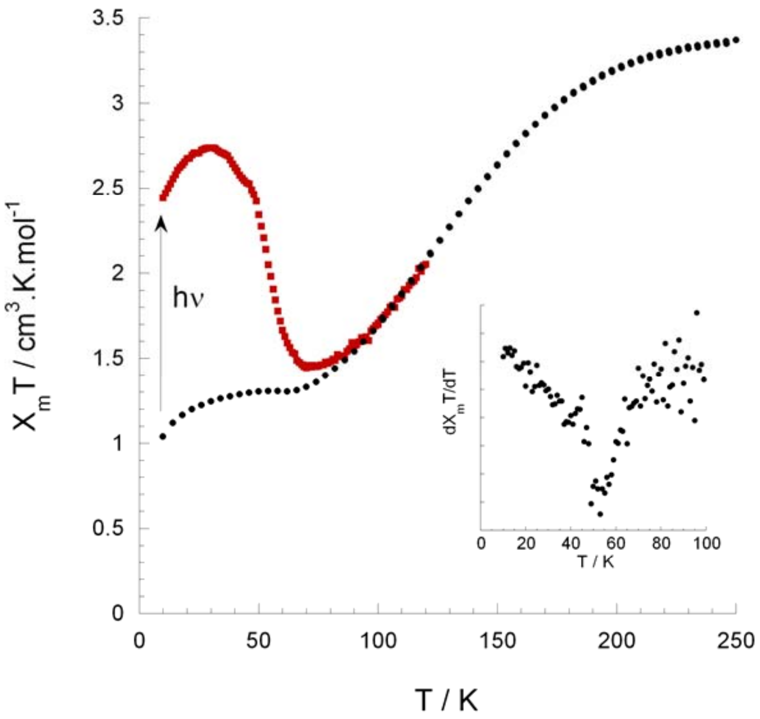

Figure S9. LIESST effect: Magnetic properties of the precipitated phase monitored at 2 K/min in dark (●) and at 0.3 K/min in warming mode after irradiation at 642 nm (■) (P = 15 mW.cm^{-2}).