Electronic Supplementary Material (ESI) for Dalton Transactions.

Unlocking Room-Temperature Bistable Spin Transition at the Nanoscale: Synthesis of Core@Shell [Fe(NH2Trz)3(NO3)2]@SiO2 Nanoparticles

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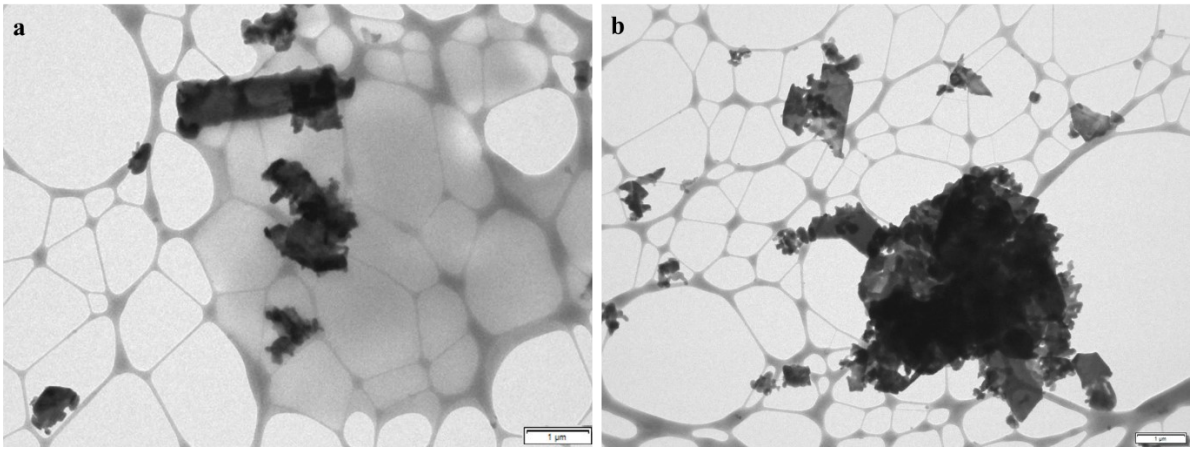

Figure S1. TEM images of two areas of sample SCO-bulk.

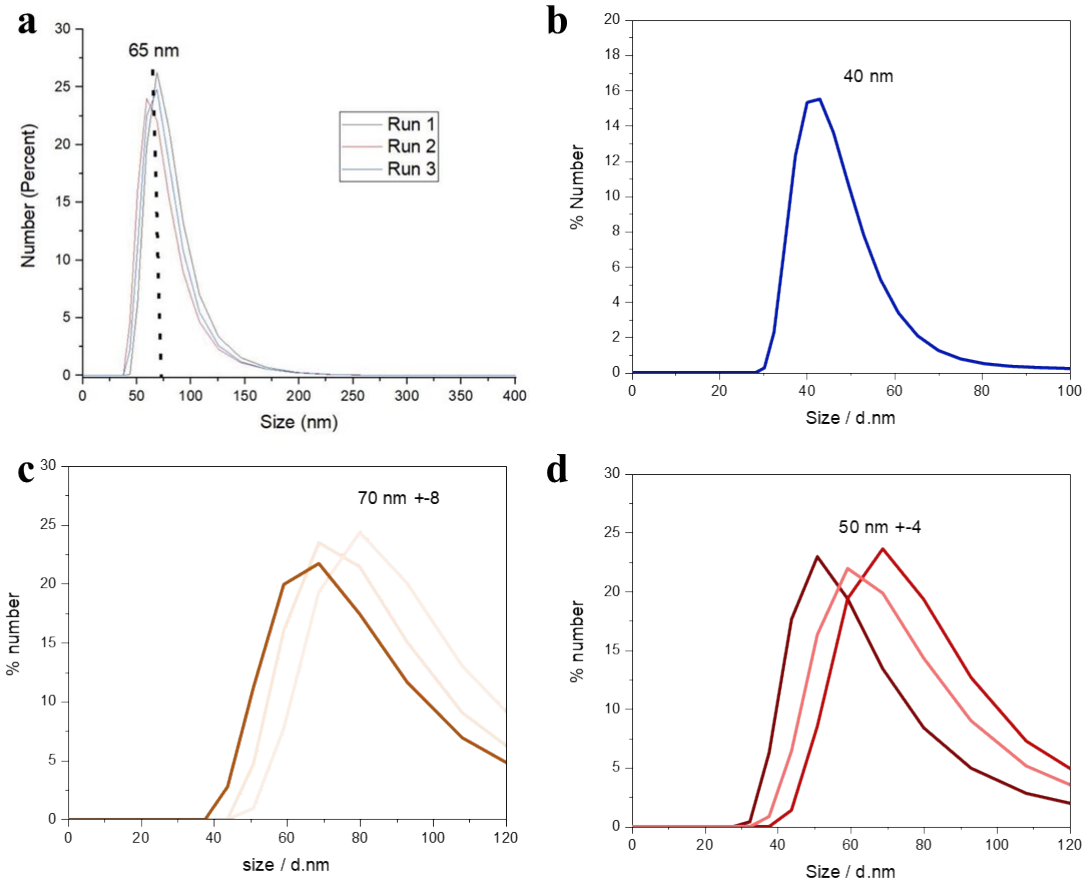

Figure S2. DLS measurements of SCO-1 (a), SCO-2 (b), SCO-SiO_2-1 (c), and SCO-SiO_2-2 (d).

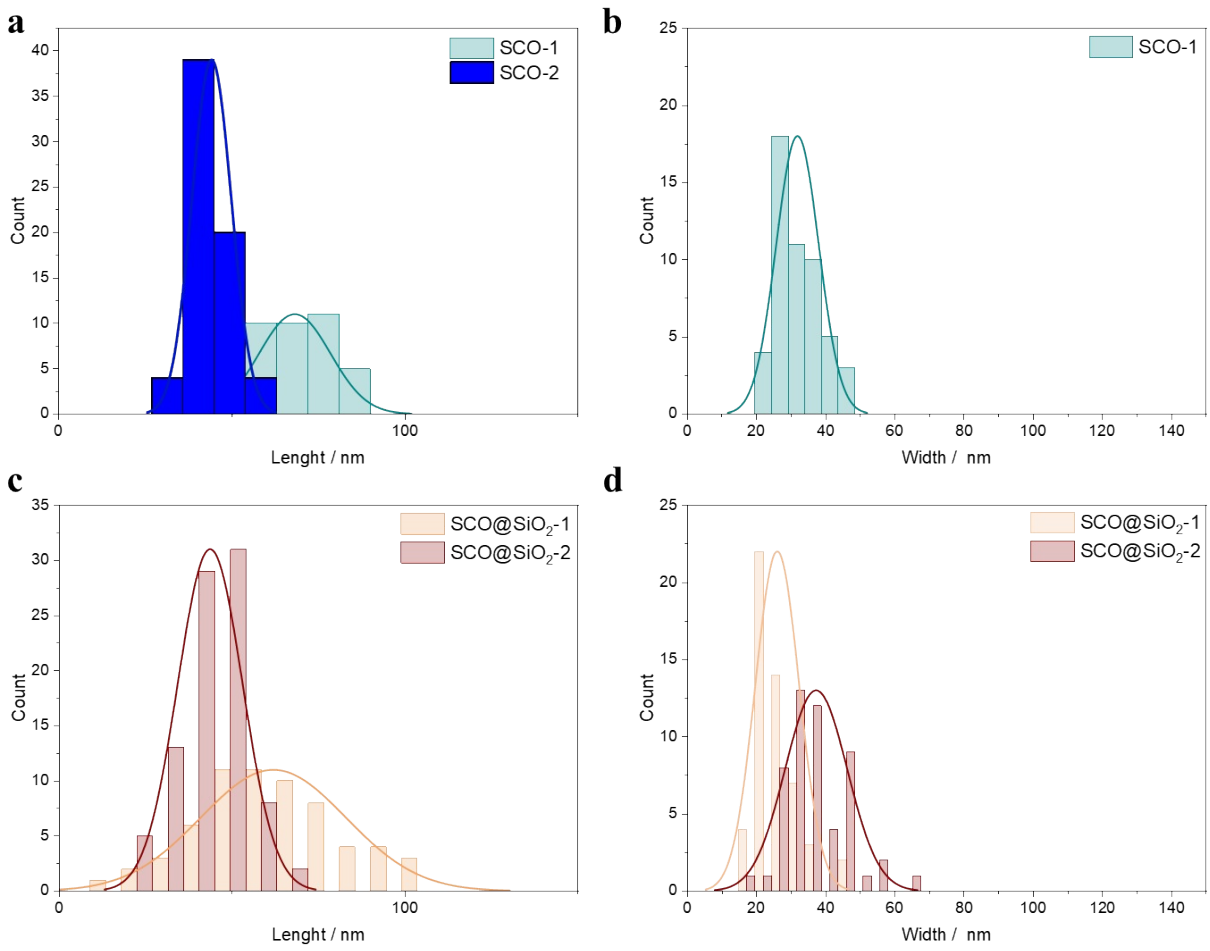

Figure S3. The plot of the length and width size extracted from manual counting from SEM or TEM images. Length of SCO-1 to 2 (a) and width (b), of SCO-SiO_2-1 to 2 lengths (c) and width (d).

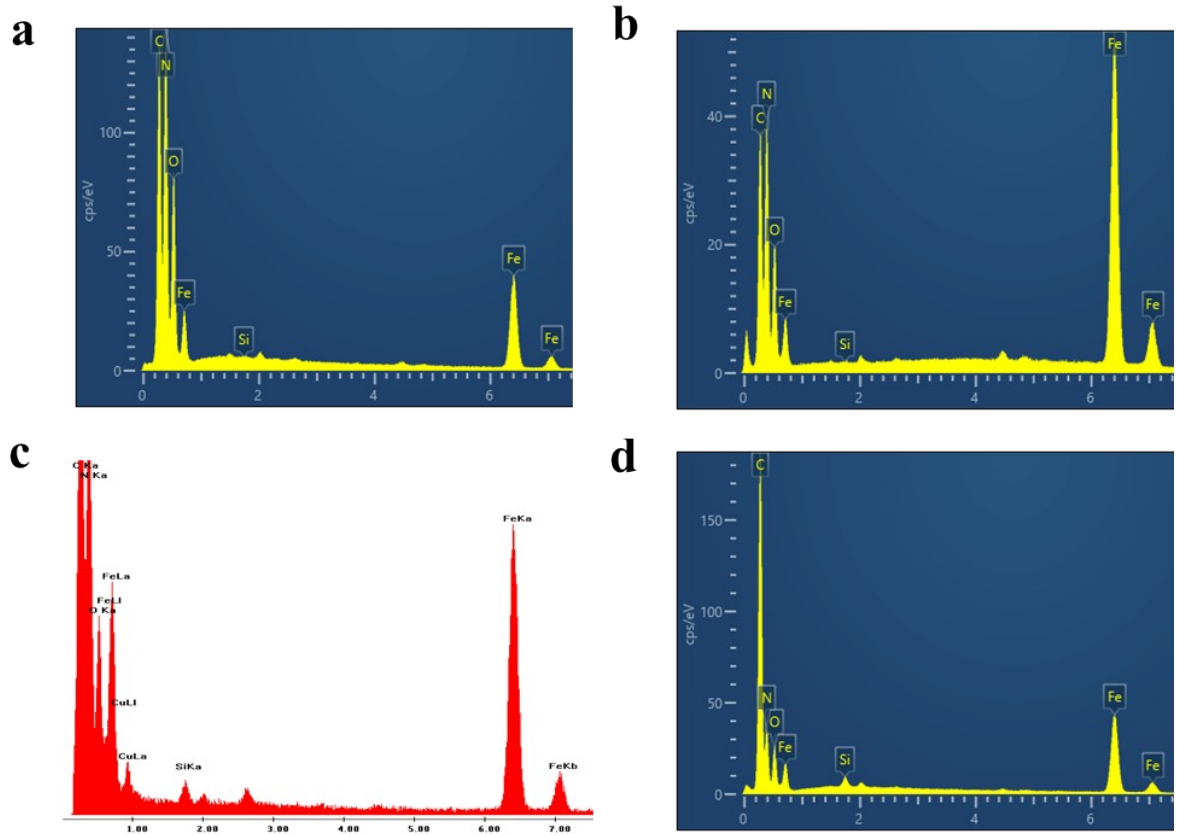

Figure S4. EDX signal of SCO-1 (a), SCO-2 (b), and SCO@SiO_2-1 (c), and SCO@SiO_2-2 (d)

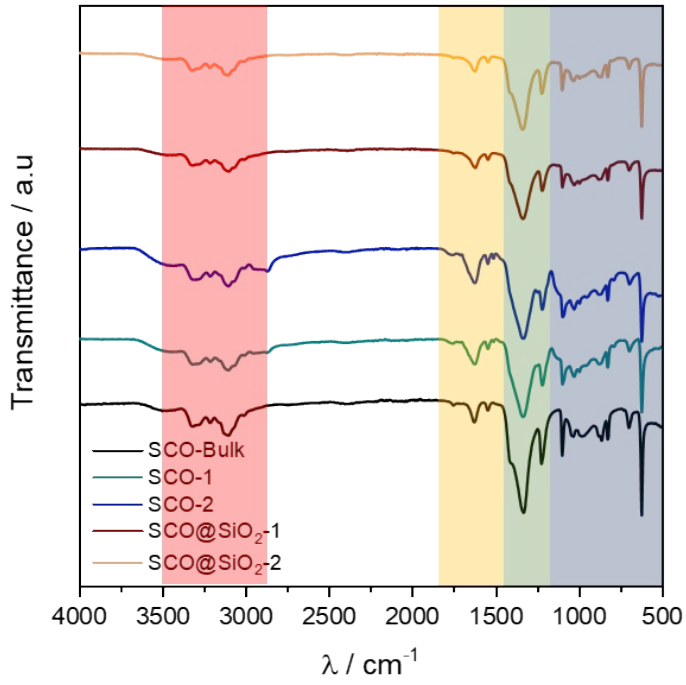

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Figure S5. ATR-IR spectra of SCO-Bulk (black), SCO-1 (dark blue), SCO-2 (olive green), and SCO@SiO_2-1 (burgundy red), and SCO@SiO_2-2 (orange).

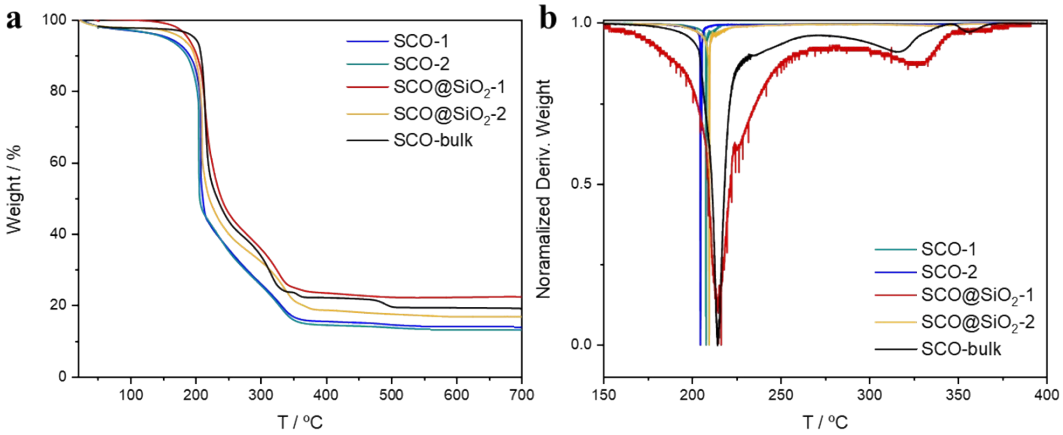

Figure S6. (a) Thermo gravimetric analysis of SCO-bulk (Black), SCO-1 (dark blue), SCO-2 (olive green), and SCO@SiO_2-1 (burgundy red), and SCO@SiO_2-2 (orange).(b) Normalized Derivative of the different TGA plots

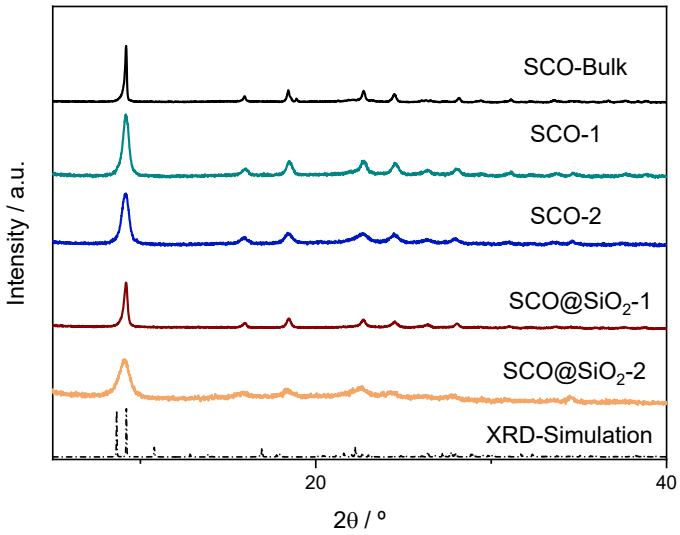

Figure S7. XRD spectra of SCO-bulk (black), SCO-1 (dark blue), SCO-2 (cyan), and SCO@SiO_2-2 (burgundy red), SCO@SiO_2-2 (orange), and simulated pattern dashed line.

Figure S8. SCO@SiO_2-1 freshly redispersed in EtOH (pink solution), and after heated to 60°C, and cool down to room temperature (white solution).

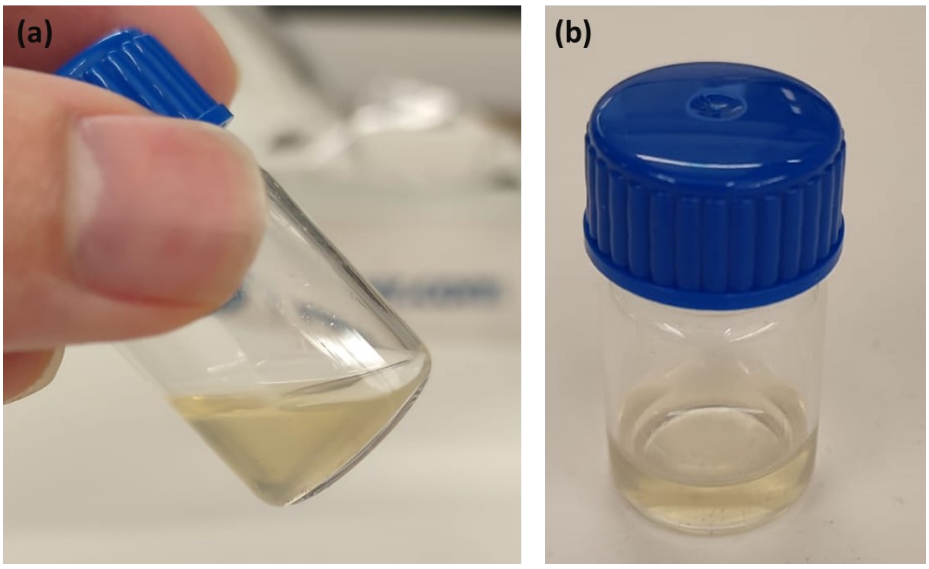

Figure S9. SCO-1(a) and 2 (b) redispersed in H_2O.

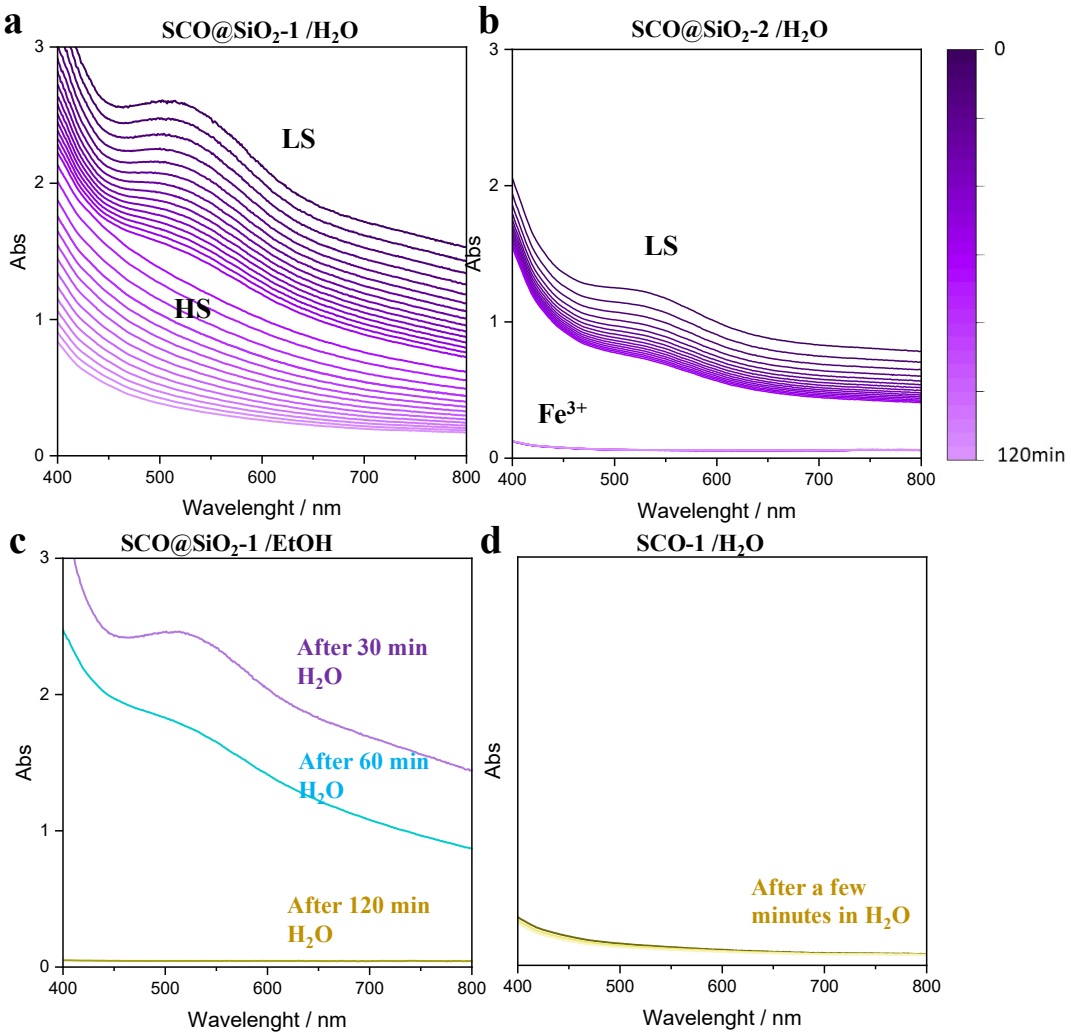

Figure S10. a) Dependency of the UV-VIS absorbance of SCO@SiO_2-1 redispersed in water as a function of the time. (b) Dependency of the UV-vis absorbance as a function of the time of SCO@SiO_2-2. The different measurements in the plot were carried out with a 2.5 min delay. (c) UV-vis spectra of SCO@SiO_2-1 redispersed in EtOH, after 30 min in water (purple), 60 min (cyan), 120 min (dark yellow). (d) UV vis spectra of SCO-1 freshly redispersed in water.

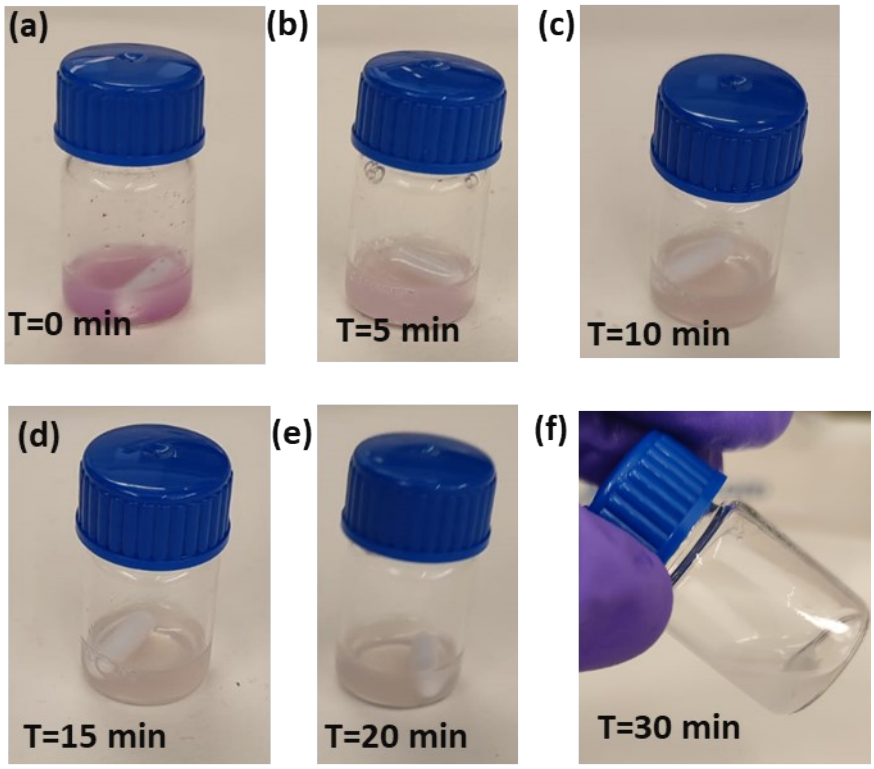

Figure S11. SCO@SiO_2-1 redispersed in H_2O at different times after the redispersion.

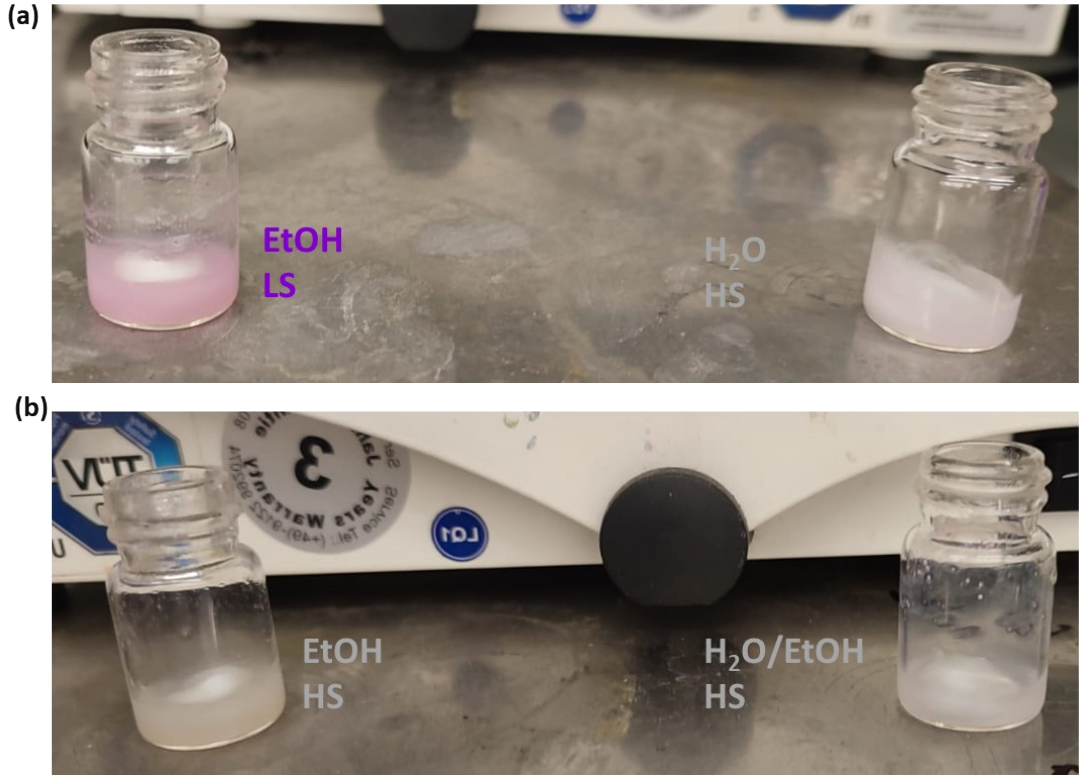

Figure S12. (a) Comparison of SCO@SiO_2-1 redispersed in EtOH (left) and H_2O (right) after 15 min. (b) Comparison of the same SCO@SiO_2-1 presented in (a) after being heated at 60°C, left. At right, we show the SCO@SiO_2-1 redispersed in water (b) after being centrifuged, and the solid resuspended in EtOH.

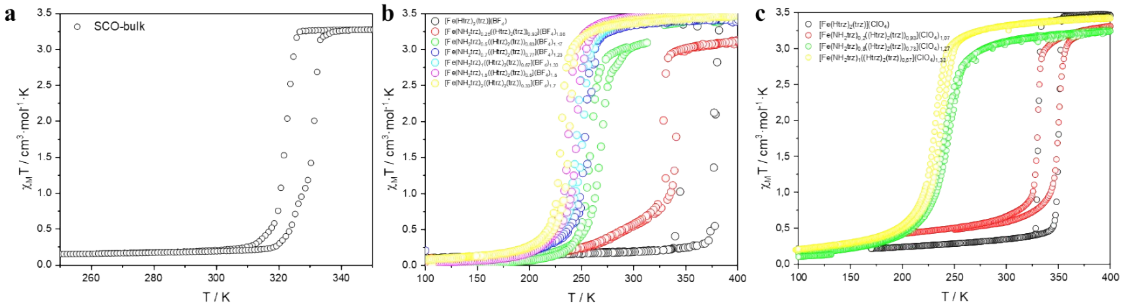

Figure S13. thermal variation of the $\chi_M T$ product for the SCO-Bulk (a) and different SCO based on $[Fe(NH_2trz)_{3x}((Htrz)_2(trz))_{1-x}](BF_4)_{1+x}$ (b), and $[Fe(NH_2trz)_{3x}((Htrz)_2(trz))_{1-x}](ClO_4)_{1+x}$ (c).

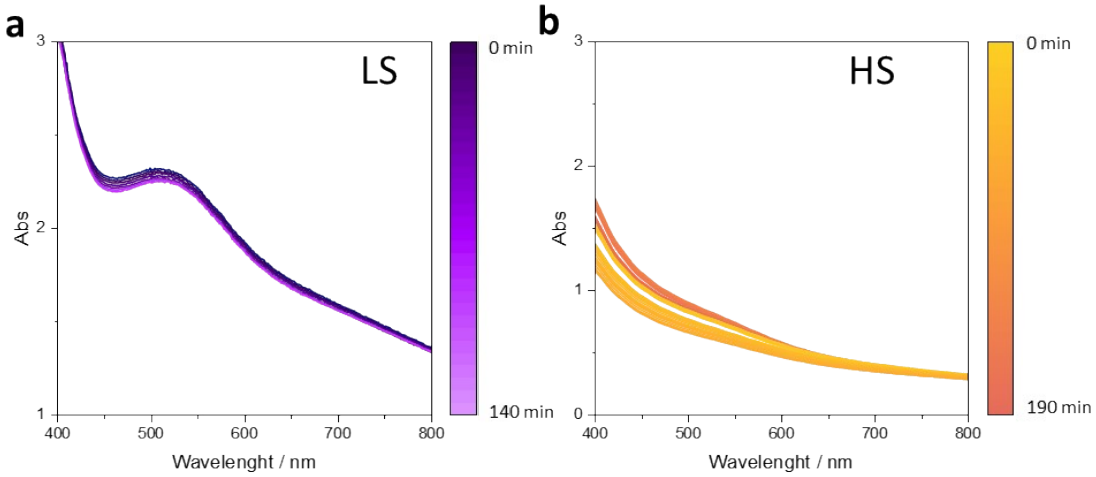

Figure S14. UV vis spectra of SCO@SiO_2-1 redispersed in EtOH(a), and after heated to 60°C, and cooled down to room temperature (b). The different measurements in the plot were carried out with a 20 minutes delay for (a) and 5-minute for (b).