Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary information

Numerical modeling and *in-situ* Small Angle X-ray Scattering characterization of ultra-small SPION magnetophoresis in a high field and gradient separator

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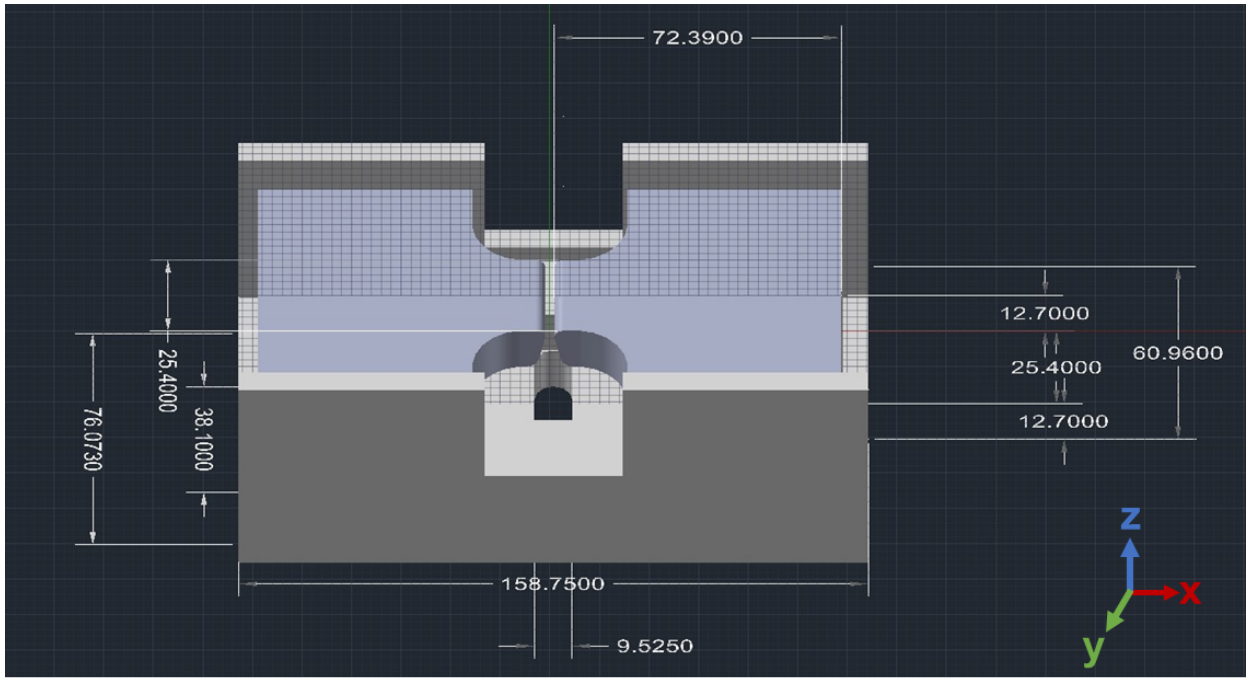

Figure S1. CAD drawing of the magnet separator.

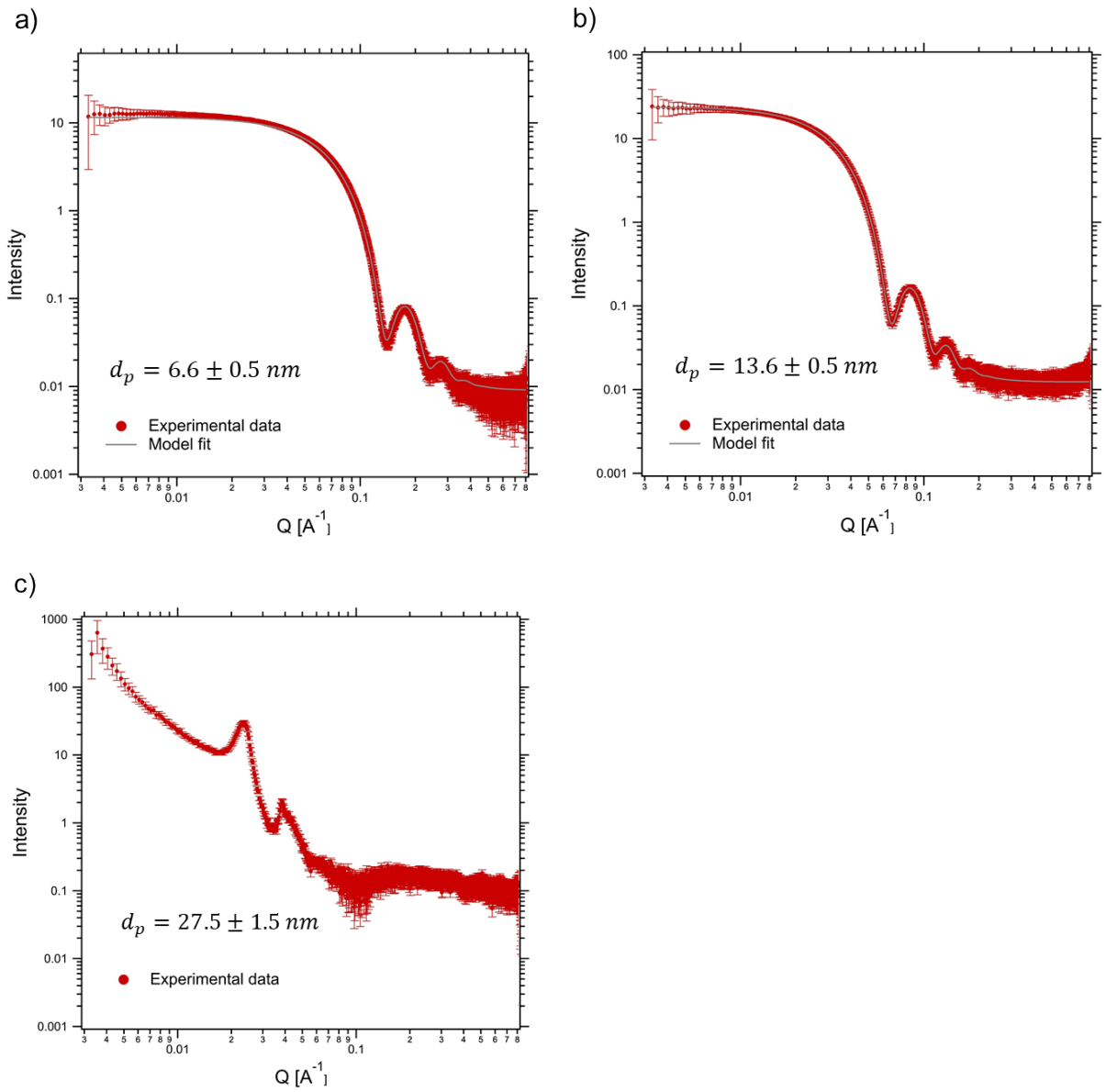

Figure S2. Final SAXS scattering spectra measured for particle suspensions after exposure to the magnetic field for the times indicated. a) 6.6 nm (t = 10.5 h), b) 13.6 nm (100 min) and c) 27.5 nm (30 min). For the two smaller particle sizes, the model fits assume scattering from a polydisperse (Gaussian) collection of uniformly dispersed spheres. For the largest particle size, the reported size is based on fitting the scattering data collected prior to placing the sample in the magnetic field.

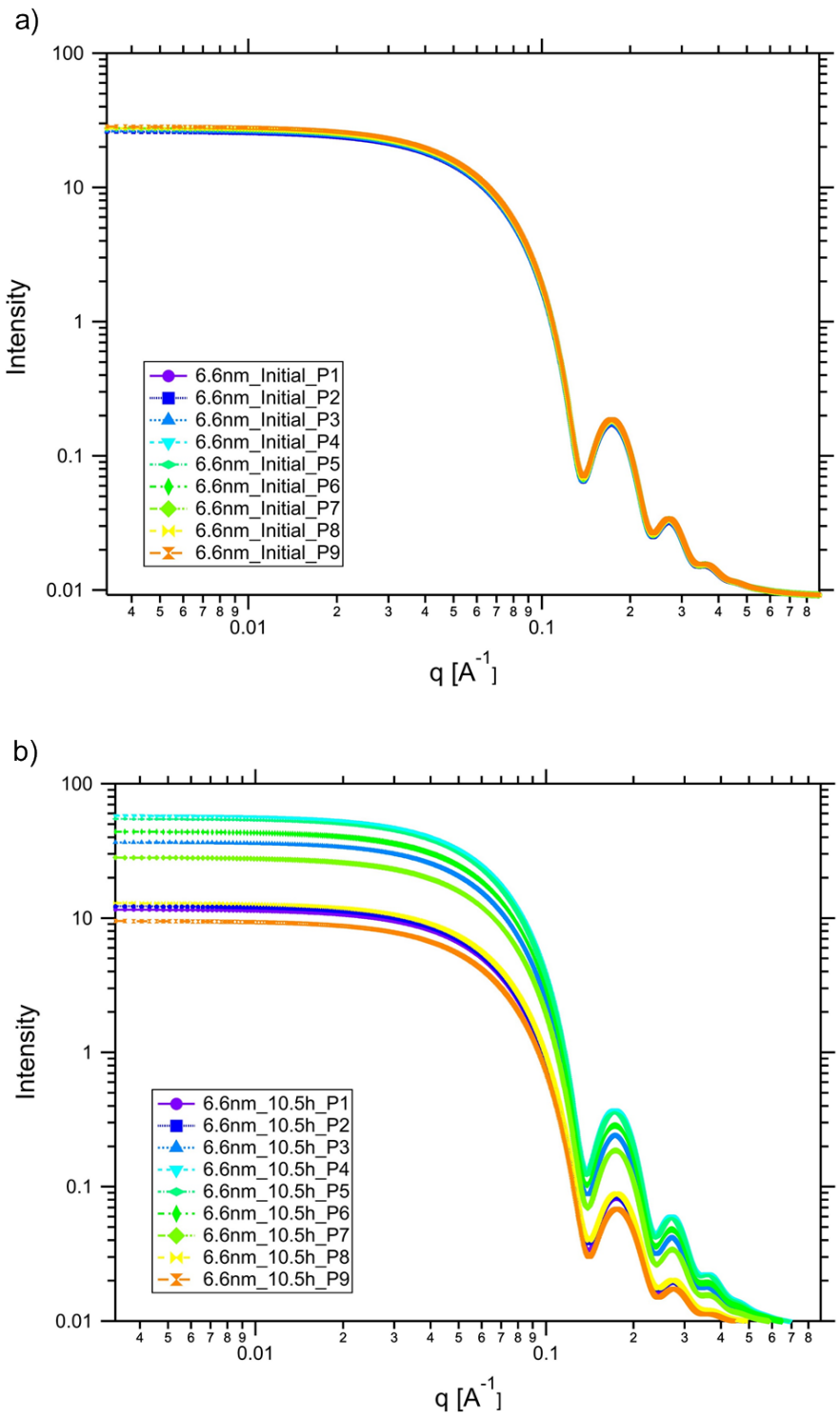

Figure S3. X-ray scattering spectra for 6.6 nm SPIONs at a) the beginning of the experiment and b) after 10.5h exposure to the magnetic field.

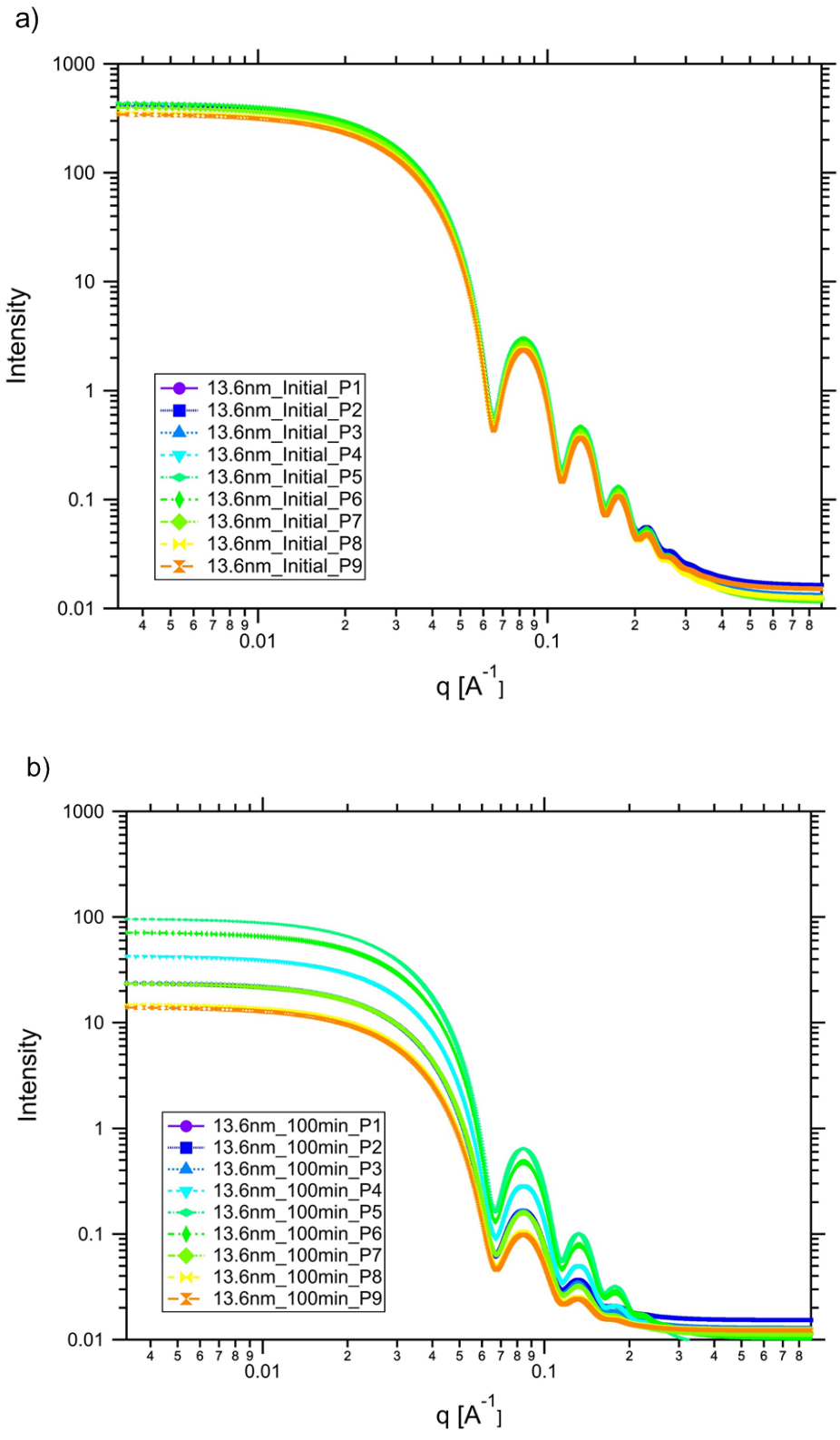

Figure S4. X-ray scattering spectra for 13.6 nm SPIONs at a) the beginning of the experiment and b) after 100min exposure to the magnetic field.

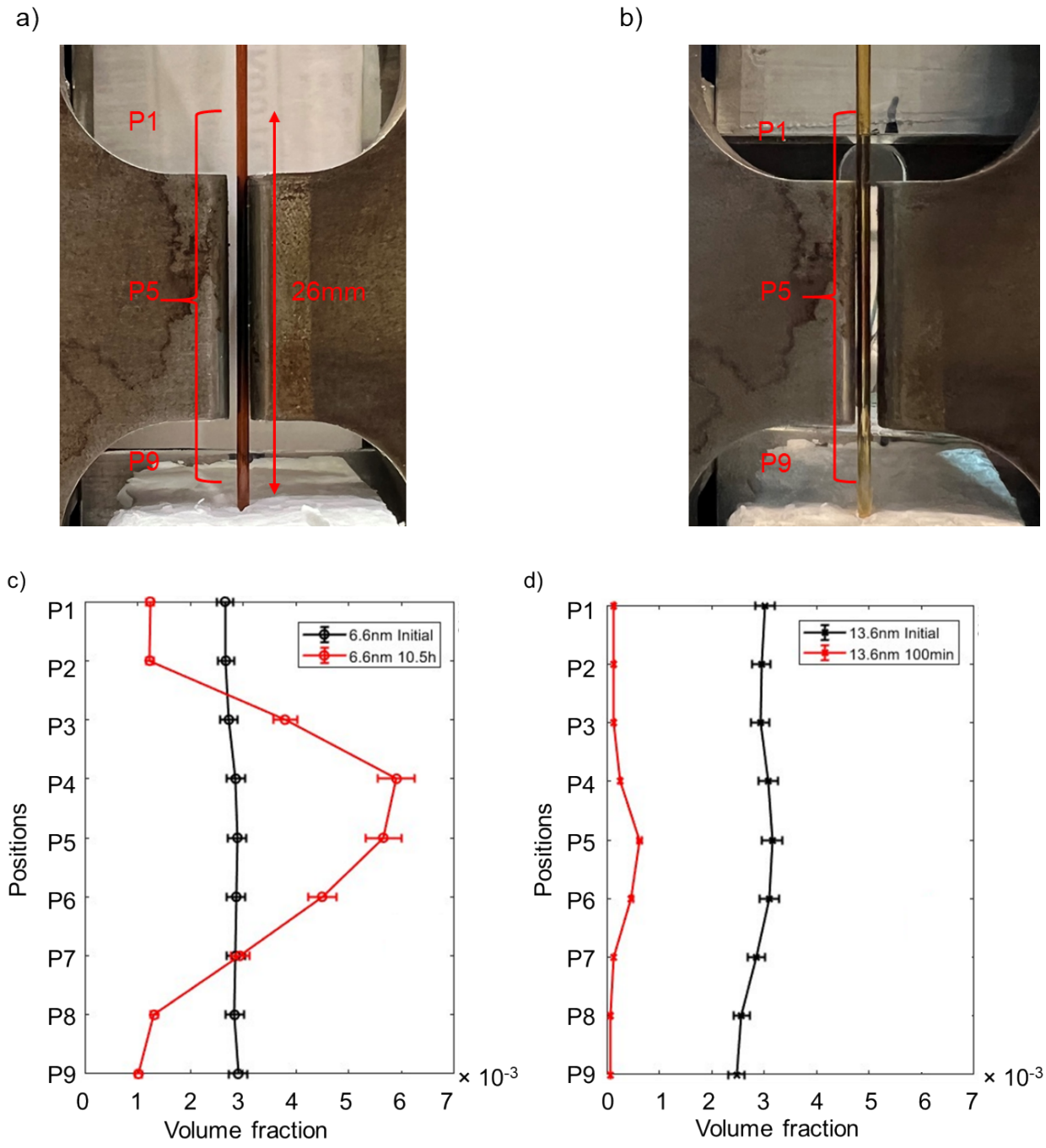

Figure S5: The changes in the color of the SPION suspensions reflect the observed changes in volume fraction determined from SAXS measurements. a) and c) are for the 6.6 nm particles, b) and d) are for the 13.6 nm particles.