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Double-differential pair distribution function analysis to study hydration shells around iron oxide nanoparticles

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Here we present a high energy X-ray total scattering study of aqueous IONP dispersions. Pushing the boundaries of detection efficiencies for diminutive signals from weak scatterers (sub 1% of total scattered intensity), hydration shell signals are retrieved by careful double-difference pair distribution function analysis of the total scattering data from the dispersion minus bulk water minus the IONP powder. Impact of different factors like particle size and ligand decoration were investigated.

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