

Abstract Submitted
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Characterization of iron oxide-dextran magnetic nanoparticle suspensions J. SHIH, R. BAI, W. CHIOU, R.M. BRIBER, University of Maryland, College Park, J.A. BORCHERS, C.L. DENNIS, NIST, Gaithersburg, MD, C. GRUETTNER, Micromod Partikeltechnologie, GmbH — Magnetic nanoparticles, with structures from core-shell to nanocrystallites in a matrix, are candidates for use in biomedical applications. “Superparamagnetic iron oxide” (SPIO) nanoparticles are nanocrystallites of iron oxide in a dextran matrix, with sizes between 20nm and 250nm. Dynamic light scattering (DLS), transmission electron microscopy (TEM), atomic force microscopy (AFM), and hysteresis measurements were used for structural and magnetic characterization. Additionally, cryoquench-TEM was performed, allowing direct imaging without false aggregation from drying. The DLS-determined size of the particles is 250nm, but cryoquench-TEM yields a smaller size of 150nm. In addition, the particles are relatively well-dispersed, but dimers and trimers are observed. This corresponds with the evidence of weak interactions in magnetic hysteresis measurements. Further magnetic characterization will provide information on how the magnetic properties of these SPIO particles correlate with their size and structure.

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