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Investigating the effective hydrodynamic size of dextran coated iron oxide nanoparticles PREM VAISHNAVA, Kettering University, VIKAS GUMBER, RAJESH REGMI, CORREY BLACK, AMBESH DIXIT, Wayne State University, VAMAN NAIK, University of Michigan-Dearborn, CHANDRAN SUDAKAR, RATNA NAIK, GAVIN LAWES, Wayne State University — We report synthesis and functionalization of magnetite nanoparticles by coating with dextran having 5, 15-20, 60-90, and 670 kDa molecular weights. The hydrodynamic radii of the functionalized nanoparticles suspended in water measured by dynamic light scattering technique assuming the bulk value for viscosity, were 91, 100, 106, and 132 nm, respectively. By measuring the ac magnetic loss, we determined the effective sizes to be 105, 113, 122, and 136 nm, respectively. The sizes measured by these techniques are approximately twice as large as expected given the iron oxide nanoparticle size and surfactant molecular chain length, at least for the lower molecular weight dextran. Comparing the results of hydrodynamic sizes studies, we conclude that the effective viscosity for the coated nanoparticles may be different than the bulk viscosity of the carrier liquid.

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