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Iron-Platinum Nanoparticles Dispersible in Aqueous Solutions[1]
JASON HUYNH, University of Delaware, ANGSHUMAN PAL, HAFSA KHURSHID, None, GEORGE HADJIPANAYIS, University of Delaware — In this work, we have used a low temperature method that reduces $Pt(acac)_2$ and thermally decomposes $Fe(CO)_5$ in the presence of oleic acid (OA) and oleyl amine (OY) to fabricate monodispersed fcc FePt nanoparticles [1]. Adjusting the parameters, such as injection temperature and heating rate, could control the size and shape, respectively. The nanoparticles made for this study had a cubic shape and an average diameter of 5.3 nm. The particles were found to be superparamagnetic at room temperature with low coercivity. The aim of this project was to disperse nanoparticles in aqueous solutions. The surfactants (OA/OY) were then exchanged with tetramethylammonium hydroxide (TMAOH) to allow water phase transfer [2]. After the transformation, the FePt nanoparticles were dispersed in 20 mL of a 0.01-wt % TMAOH solution. The structural and magnetic properties were maintained as shown by X-Ray Diffraction and Vibrating Sample Magnetometer data. From these findings, the FePt nanoparticles are being modified for higher coercivity for potential use in hyperthermia studies. [1] L. Colak and G. C. Hadjipanayis, Nanotechnology 20 (2009) 485602. [2] V. Salgueiriño-Maceira, L. M. Liz-Marzán and M. Farle, Langmuir 20 (2004) 6947.

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