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Reverse Micelle Synthesis of Gadolinium Nanoparticles[1] R.H. FUKUDA, M.M. CASTRO, P.-C. HO, Department of Physics/California State University, Fresno, S. ATTAR, M. GOLDEN, Department of Chemistry/California State University, Fresno, D. MARGOSAN, United States Department of Agriculture - Agriculture Research Service — Nanotechnology is an area of great interest due to its variety of applications such as nano-medicine. The reverse micelle method has been used to synthesize Gd nanoparticles by our research group. Through this method, a surfactant protectively cages particles of Gd in the presence of polar methanol and nonpolar hexane. This method can control particle size by growth temperature and the molar ratio of polar solvent to surfactant. The Gd was reduced from its chloride compound by using sodium borohydride. The final products have been derived either through a method of liquid liquid extraction or filtration. Scanning electron microscopy (SEM) paired with energy dispersive x-ray spectroscopy (EDX) was used to examine the size, shape, and composition of the products. The size and shape were also examined using a Leica light microscope between SEM analyses. We found that liquid liquid extraction does not work in the solvent combination of methanol-hexane due to the instability of the reverse micelles. Additionally, the process of carbon coating SEM samples may have destroyed the reverse micelle structures.

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