Abstract Submitted
for the OSS08 Meeting of
The American Physical Society

Effects of Temperature, Time, and Solution on Nanoparticle Agglomeration[1] MICHAEL MOULTON, KYUNG YU, LAURA BRAYDICH-STOLLE, JOHN SCHLAGER, AMANDA SCHRAND, SABER HUSSAIN — Previous studies from our laboratory have shown that the environment nanomaterials are in can alter nanoproperties. Therefore, prior to nanotoxicity studies, we need to address how different solvents and temperatures can impact nanoparticle behavior. This study examines the effect of increased temperature and time on nanoparticle agglomeration. The nanoparticles used in this study were: SiO2 35nm, 51nm, 110nm, and 420nm, Cu 40nm, 60nm, and 80nm, and Ag 25nm, 55nm, and 80nm. TEM analysis showed that the primary size distributions for the SiO2 nanoparticles were similar to the manufacturer's size. For the Cu nanoparticles, the ranges were Cu 40nm 70.3+/-17.8, Cu 60nm 79.7+/-21.3, and Cu 80nm 110.6+/-26.6. For the Ag nanoparticles the only particle not similar to the manufacturer's range was Ag 80nm with a size of 122.32+/-60.366. The nanoparticles were dispersed in sterile water or exposure media (EM) (media without serum) and stored at 4C or 37C. Using dynamic light scattering, agglomeration was measured at 0, 8, 14, 22, 32, and 48 h to determine if the magnitude of agglomeration was temperature or time dependent. Based on this data, time in solution and temperature appears to impact nanoparticle agglomeration in no predictable or reproducible pattern which should be taken into account in nanotoxicity studies.

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Date submitted: 03 Mar 2008 Electronic form version 1.4