

**SYNTHESIS AND BACTERIA TESTING OF METAL OXIDE NANOPARTICLES - AN UNDERGRADUATE LABORATORY EXPERIMENT** Julia Logsdail, Christopher Fischer, Kelsey Savery, Kurt Winkelmann, Department of Chemistry, Florida Institute of Technology, 150 West University Blvd, Melbourne, FL 32901

Students perform a low-temperature synthesis of zinc oxide nanoparticles and monitor their growth using UV/visible spectroscopy. Particles grow to bulk size within 30 minutes and their size can be calculated based on the solution's absorbance spectrum. Students then add nanoparticles to Petri dishes containing non-infectious *E. coli* bacteria. After incubating overnight, students can observe the antibacterial effect of the nanoparticles. Bacteria test results using ZnO nanoparticles, bulk ZnO and dissolved  $\text{Zn}^{2+}$  salts are compared. Students may also perform a variation of this experiment in which they synthesize mixed metal oxide particles ( $\text{Zn}_{1-x}\text{M}_x\text{O}$ ) and perform bacteria tests. In some cases the results of these studies may not have been reported in the scientific literature, therefore representing original research by the students.