

Abstract Submitted
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Development and Characterization of Dynamic Light Scattering Instrumentation to Determine Nanoparticle Size¹ SAMUEL HARDING, JAKE HARDING, KATE HOLMAN, TJ SEBASTIAN, Towson University, JEFF SIMPSON, Towson University Professor — Dynamic Light Scattering (DLS) provides a high-throughput and accurate measurement of particle sizes for monodisperse (MD) spherical nanoparticles (NPs). We report on the development and characterization of homebuilt DLS instrumentation to measure the size of MD NPs of gold and polystyrene. HeNe and Ar-ion lasers comprise the excitation sources for the scattering experiment. An avalanche photodiode detects scattered light and an autocorrelation card analyzes the signal to provide a measurement of the translational diffusion coefficient which, for MD and spherical particles, allows for the determination of NP radius. We have tested our apparatus using commercially produced gold NPs in the range 10nm to 200nm. After identifying temperature dependence of viscosity as a source of error, periodic ambient temperature measurements were used to produce dynamic values for viscosity and minimize uncertainty in NP size. DLS measurements will be compared to measurements obtained by Atomic Force Microscopy (AFM). K.H., T.J.S. and J.H. acknowledge support from Towson University. J.R.S. acknowledges support from NSF - CBET #1236083.

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