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Multi-scale Size Distributions of Colloidal Gold Clusters Measured by Ultrasmall Angle X-ray Scattering (USAXS) and Dynamic Light Scattering (DLS) ASHLI NIEVES, Rowan University, JAN ILAVSKY, Advanced Photon Source, Argonne National Laboratory, TABBETHA DOBBINS, Rowan University — Gold colloids are of interest as: (1) catalysts for energy conversion and (2) absorption agents for laser photothermal therapy. This research examines the agglomerate sizes (using DLS) and primary particle sizes (using USAXS) for gold nanoparticles synthesized by trisodium citrate reduction of gold chloroauric acid (HAuCl4). USAXS data was collected at the Advanced Photon Source, beamline 15ID-D. Model fitting of the data show primary particle sizes of 7nm to 14nm formed. DLS results show these particles to aggregate into a bimodal set of clusters centered on approximately 20nm and approximately 200nm. Preliminary results aimed at effectively breaking apart these aggregates are presented.

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