

Abstract Submitted
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Ion scattering from Au nanoclusters formed by buffer layer assisted growth SNJEZANA BALAZ, JORY YARMOFF, University of California-Riverside — Ion scattering is used to probe the atomic and electronic structure of Au nanocrystals grown by Buffer Layer Assister Growth (BLAG). Amorphous solid water (ASW) was adsorbed as a buffer layer onto SiO₂/Si(111) at liquid nitrogen temperature. Au was then evaporated onto the buffer layer to form nanoclusters. The samples were subsequently annealed to room temperature, causing the water to desorb and the clusters to deposit directly onto the substrate. Time-of-flight (TOF) spectroscopy was used to measure 2 keV ⁷Li⁺ and ³⁹K⁺ ions scattered from Au atoms both at low temperature when the clusters reside atop the buffer layer, and after desorbing the water. Small Au depositions yielded a sharp single scattering peak that indicates single layer structures. Following larger depositions, multiple scattering features were present indicating the formation of multilayer nanoclusters. The neutral fraction of scattered K⁺, which provides an indication of the filled quantum states, starts at ~50% for small Au coverages and decreases with further deposition, indicating changes in the quantum state occupancy with cluster size.

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