Supporting Information

Real-time imaging of lead nanoparticles in solution –

determination of the growth mechanism

Diana. L. Delach[†], Madeline J. Dukes[‡], A. Cameron Varano[#], Deborah F. Kelly[#], and

Albert D. Dukes III[†]*

[†]Lander University, Department of Physical Sciences, 320 Stanley Avenue, Greenwood,

South Carolina 29649, United States

[‡]Protochips, Inc. Applications Science, 3800 Gateway Center Blvd., Suite 306, Morrisville,

North Carolina 27560, United States

[#]Virginia Tech Carilion Research Institute, 2 Riverside Circle, Roanoke, Virginia, 24016,

United States

Supporting information Movie S1. *In situ* **TEM movie of lead nanoparticles in solution.** Images were recorded to demonstrate the process of lead nanoparticles growth in solution (40 mM lead nitrate). Segments of the movie were exported to show particle formation in both real-time and 4x acceleration.

Supporting information Movie S2. Lead nanoparticle growth in solution. The mechanisms that best describe the non bi-modal distribution of lead nanoparticle formation (40 mM lead nitrate) included the sequence of nucleation, Oswald ripening, and aggregation. This process appeared to be independent of electron dose. Segments of the movie were exported to show particle formation in both real-time and 4x acceleration.

Supporting information Movie S3. Reduced concentrations of lead nitrate in solution do not form aggregates. Lower concentrations of lead nitrate (10 mM) in solution can nucleate and undergo Oswald ripening. However, due to reduced quantities of free lead ions in solution, macrostructures do not readily form. Segments of the movie were exported to show particle formation at 4x acceleration.