

Abstract Submitted
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Inhomogeneous strain of single-crystalline polyhedral gold nanocrystals revealed by coherent x-ray diffraction imaging¹ JONG WOO KIM, Univ of California - San Diego, EDWIN FOHTUNG, New Mexico State University, SOHINI MANNA, SEBASTIAN DIETZE, ANDREW ULVESTAD, Univ of California - San Diego, ROSS HARDER, Argonne National Lab, ERIC FULLERTON, OLEG SHPYRKO, Univ of California - San Diego — Coherent x-ray diffractive imaging was used to measure strain in gold nanocrystals grown by a single-step thermal chemical vapor deposition (CVD). Gold nanocrystals with well-defined facets such as triangular thin plates and octahedra were investigated. The inhomogeneous strain distributions were observed in both nanocrystals. This strain likely results from defects on the substrate in triangular plate nanocrystal. The resulting strain on the spherical surface of octahedral nanocrystal shows good congruence with theoretical prediction, but shows a discrepancy near the bottom surface on a silicon substrate. This inhomogeneous stain fields may be attributed to not only the dissimilar interface energies during growth, but also different thermal expansions between nanocrystals and the substrate after cooling down.

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