

Abstract Submitted
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The Investigation of Epitaxy and Morphology of Au on MgO (001), (110), and (111)¹ TIMOTHY PULLIAM, SIDDHARTH GOPAL, MICHAEL PIERCE, Rochester Inst of Tech, VLADIMIR KOMANICKY, Safarik University, HOYDOO YOU, ANDI BARBOUR, CHENHUI ZHU, Argonne National Lab — Au nano-crystals serve a central role in catalysis and surface chemistry, with the catalytic properties of the crystals highly dependent on physical characteristics. Characteristics such as surface area to volume ratio, crystal symmetry, and surface energy define the catalytic properties. We present our analysis of the morphology of deposited Au on substrates and how they vary with macroscopic parameters. Au was evaporated onto single crystals of each of the MgO (001), (110), and (111) principal facets to study the epitaxy, morphology, and overall crystalline nature of the nanoparticles on the substrates. The depositions were performed in vacuum at 700°C using an e-beam evaporator. The samples were then analysed using x-ray diffraction (XRD) and atomic force microscopy (AFM) techniques revealing epitaxy, and morphology respectively. The samples were then annealed at progressively higher temperatures and the measurements repeated. Au nano-crystals deposited on TiO₂ (110) were also concurrently studied.

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