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Physical Character and Morphology of Platinum Nanocrystals on Strontium Titanate JOSHUA GILD, MICHAEL PIERCE, Rochester Institute of Technology, VLADIMIR KOMANICKY, University of Pavol Jozef Šafárik, ANDI BARBOUR, HOYDOO YOU, Argonne National Lab — The physical characteristics of platinum nanocrystals on single crystal strontium titanate, $SrTiO_3$, can effect the chemical properties of this important model catalyst. The morphology, epitaxy, distribution, and size of the Pt nano-crystals can all be controlled through different growth and processing mechanisms. Nanometer scale platinum thin films are deposited on strontium titanate at ambient temperatures then annealed at range of temperatures and in various oxidizing environments. The process of how these conditions influence the formation of uniformly epitaxial platinum crystals on the sample surface has been investigated using basic materials characterization techniques. Single crystal x-ray diffraction is the primary tool for these experiments, coupled with atomic force microscopy for morphology and x-ray and electron spectroscopy to determine chemical bonding between the particles and gases introduced into the system. These substrate supported nanoparticle samples will then be utilized in experiments to test their catalytic activity compared to an amorphous platinum film.

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