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Equilibrium crystal shape and structure transition of Au nano particles formed on Al_2O_3(0006)

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The formation of metallic nano crystals from thin films on substrates depends sensitively on the metal-substrate interface. The size and shape of the Au nanocrystals formed by annealing Au films on oxide substrates are different from those formed on semiconductor. In this experiment, we deposited thin Au films on Al_2O_3(0006) using E-beam evaporator, and annealed them at various temperatures and thickness under various conditions. We measured behavior of the Au during annealing Au structure and shape are changed when Au film becomes thicker. The shape of the resultant Au nano particles and their coarsening process are investigated using SEM and AFM.

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Structural and Physical Properties of Aluminum Oxide Doped Zinc Oxide (AOZO) Nanofibers Synthesized by Electrospinning

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One-dimensional nanostructures such as nanowires and nanobelts have been extensively studied as building blocks for nanoscale electronic devices. Recently, ZnO nanofibers and nanowires have attracted considerable interest in wide applications for optoelectronics, piezoelectric devices, chemical sensors, and solar cells due to high transparency, piezoelectricity, and direct wide bandgap (3.37 eV) semiconductor with large exciton binding energy of 60 meV. The bandgap of the zinc oxide nanofibers could be shifted with the addition of aluminum in the form of aluminum oxide in the nanofiber matrix. The relation between bandgap and resistivity was found to be a trade-off; i.e., the larger the bandgap, the higher the resistivity. The fibers were observed by SEM, XPS, XRD, UV-Vis spectroscopy, and electrical property measurements.