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Formation of Silver Nanostructures (nanowires, nanoshells, and nanorods) on MgZnO hexagonal and Cubic Alloys SHIVA HULLAVARAD, TA KUN CHEN, R. VISPUTE, T. VENKATESAN, University of Maryland — With potential applications in many fields from fundamental science to engineering technology, multi-dimensional (MD) metal nanostructures such as nanowires, nanoshells, and nanotubes have been very popular topics of research. They have been used to experimentally probe the effects of quantum confinement on electronic, magnetic, and other related properties, and they could be used as active components or interconnects in fabricating electronic, photonic, and sensing devices. Silver nanowires are particularly interesting to explore because bulk silver exhibits the highest electrical and thermal conductivities among all metals. Other modern applications of silver nanowires have also been discovered in many fields including catalysis, electronics, photonics, and photography. In this study, we present the formation of silver nanowires, shells and rods by the thermal reduction of an aqueous silver nitrate solution on the surface of Magnesium Zinc Oxide ($Mg_xZn_{1-x}O$) multiphase alloy thin films. In this context, the formation of silver nanostructures on MgZnO alloy films is technologically important as it would lead in to the potential area of nano metallic contacts to emerging oxide electronic materials.

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