

Abstract Submitted
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Growth and Characterization of VLS-type (Zn,Mn)Se nanowires

BENJAMIN COOLEY, Dept. of Physics and Materials Research Institute, Penn State University, TREVOR CLARK, Materials Research Institute, Penn State University, NITIN SAMARTH, Dept. of Physics and Materials Research Institute, The Pennsylvania State University — Magnetically-doped semiconductor nanowires offer an interesting regime for exploring carrier-induced ferromagnetism in the presence of a 1D density of states [Dietl *et al*, Phys. Rev. B **55**, R3347 (1997)]. We discuss the growth and structural characterization of ZnSe nanowires doped with Mn. With diameters ranging from ~ 30 nm down to ~ 5 nm, these wires potentially provide 1D or quasi-1D systems in which to study collective magnetic behavior. The wires are grown via the vapor- liquid-solid mechanism on GaAs substrates using an ultra-high vacuum molecular beam epitaxy system, with gold nanoparticles as the seeds for wire growth. The wires form in a dense random array, as shown by scanning electron microscopy. Transmission electron microscopy is used to study the structure and growth direction of individual wires released from the substrate, and the composition of individual wires is studied with energy dispersive x-ray spectroscopy. Supported by NSF MRSEC and ONR MURI.

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