

Vertically Aligned Wurtzite CdTe Nanowires Derived from a Catalytically Driven Growth Mode

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Substrate based catalytic growth modes have been widely used to fabricate vertically aligned nanowires for most technologically relevant semiconducting systems, with CdTe being a notable exception. Here, we demonstrate how such nanowires can be derived from a newly developed catalytically driven process. Catalysts are formed by first applying an alcohol layer to the surface of a sapphire substrate followed by a bismuth overlayer. When heated the combination forms the seed material needed to nucleate CdTe nanowires. Two-dimensional X-ray diffraction (2D-XRD) spectra indicate that the CdTe exists in the wurtzite (WZ) crystal structure instead of the zinc blende (ZB) structure normally associated with the bulk material. The work presented here adds substrate based wurtzite CdTe nanowires to the growing list of potential building blocks for nanowire based devices.

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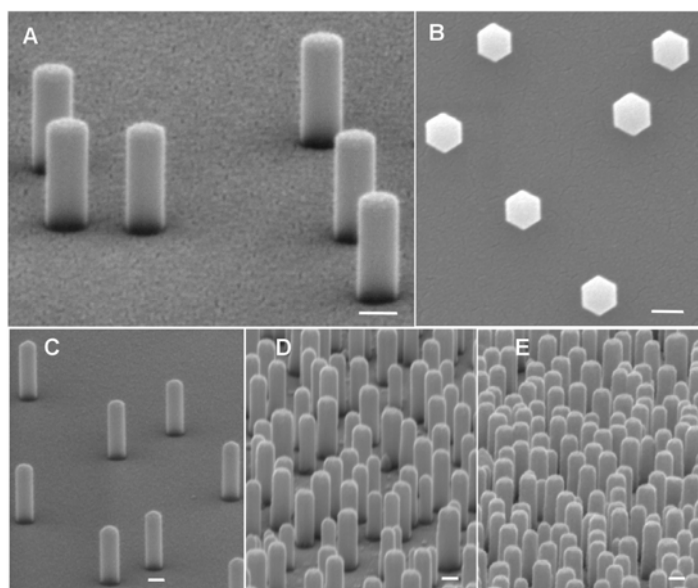


Fig. 1. SEM images of CdTe presented from (A) a 70° tilt side view and (B) a top view. The tilt corrected dimensions for the nanowires shown are width = 100 nm and height = 300 nm. Figures (C), (D) and (E) show nanowire images at progressively higher densities. The samples were coated with a thin layer of gold to improve the imaging. For all images the scale bar = 100 nm.

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