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Epitaxial growth of Ge-Si_xGe_{1-x} core-shell nanowire heterostructures with tunable shell content KAMRAN VARAHRAMYAN, DOMINGO FERRER, EMANUEL TUTUC, SANJAY BANERJEE, The University of Texas at Austin — Core-shell nanowire heterostructures are an interesting testbed for band engineering at the nanoscale. Here we present the growth of germanium (Ge) – silicon-germanium (Si_xGe_{1-x}) epitaxial core-shell nanowire (NW) heterostructures, with tunable Si and Ge shell content. The Ge NWs were grown using the Au-catalyzed vapor-liquid-solid (VLS) growth mechanism. Subsequently, the Si_xGe_{1-x} shells are grown *in-situ*, conformal onto the Ge NW using ultra-high-vacuum chemical vapor deposition. We use transmission electron microscopy to confirm that both the core and shell are single crystal, and cross-sectional scanning transmission electron microscopy energy dispersive x-ray spectroscopy to determine the shell thickness and content. Our data show that the Si and Ge shell content can be tuned depending on the SiH_4 and GeH_4 partial pressures during the shell growth, effectively enabling band engineered core-shell nanowire heterostructures.

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