Abstract Submitted
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Nanostructure and physical properties in novel thin film misfit layered chalcogenides[1] M. BEEKMAN, C. HEIDEMAN, Q. LIN, M. SMELLER, M.D. ANDERSON, S. TEPFER, N. NGUYEN, D.C. JOHNSON, Department of Chemistry, University of Oregon — An expansive collection of novel misfit layered chalcogenide compounds has been prepared *via* the method of modulated elemental reactants. Despite a lack of epitaxial relationships between the transition metal dichalcogenide and Group IV or rare earth chalcogenide components in these materials, X-ray diffraction and high resolution transmission electron microscopy studies show these nanostructured materials exhibit remarkably sharp and atomically smooth interfaces, indicating the potential for interfacial "engineering." Ultra-low thermal conductivities are found to be characteristic, of interest in the context of new approaches to thermoelectric materials design. Results are presented from our ongoing program to understand the interplay between nanostructure and physical properties in these materials, in particular the electrical transport. Structural and compositional flexibility in these systems, which offers unique opportunities for understanding and realizing thermoelectric enhancement through nanostructure, will be discussed.

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