

Abstract Submitted
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Synthesis and Characterization of Ytterbium-filled $\text{CoGe}_{1.5}\text{Se}_{1.5}$ compositions¹ WALTER HILL, Department of Engineering, Jacksonville University; Department of Mechanical Engineering, North Carolina Agricultural and Technical State University, YONGKWAN DONG, GEORGE S. NOLAS, Department of Physics, University of South Florida — Polycrystalline skutterudite-related compounds with nominal composition $\text{YbCo}_4\text{Ge}_{6+x}\text{Se}_{6-x}$ ($0 < x < 1$) were prepared by melting of the constituent elements followed by annealing, and subsequent hot-pressing for densification. Structural and phase characterization was achieved by X-ray diffraction and electron microscopy. The crystal structure of skutterudites allows for voids within the crystal lattice that can be filled by “guest atoms” such as ytterbium. It is well known that this guest-atom-filling of the voids can result in significant phonon scattering, although these materials possess relatively good electrical properties, and are therefore thought of as PGEC (Phonon Glass Electron Crystal) materials. The goal of this research was to synthesize these skutterudite-related compounds and examine their thermoelectric properties. Their composition and properties will be discussed.

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Walter Hill
Department of Engineering, Jacksonville University;
Department of Mechanical Engineering,
North Carolina Agricultural and Technical State University

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