

Abstract Submitted
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High Temperature Elastic Moduli Measurements and Phase Transition Studies of Novel Thermoelectric Materials GUANGYAN LI, RESHEED ADEBISI, JOSH GLADDEN, University of Mississippi — Thermoelectric (TE) materials can be used to convert heat including waste heat to electrical power. They are one component to energy savings and independence. Silicon germanium (SiGe) and Zintl phase compounds are excellent candidates for high temperature applications. The mechanical properties of these materials need to be known before their actual applications in high temperature (1000C) environments. The temperature dependent elastic moduli of five different SiGe alloys were successfully measured using a high temperature resonant ultrasound spectroscopy (RUS) technique. A linear trend is generally observed up to 600C, a downward curvature especially in two n-type samples is noticeable at higher temperatures. Hysteresis is only observed in one of the n-type SiGe samples. Phase transitions, indicated by shifts in the natural frequencies of a Zintl sample, were observed near 792, 892, 931C. The nature of these transitions will be discussed.

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