

Abstract Submitted
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Single Mode Microwave Processing of Thermoelectric Materials

ALETHEIA P. SCHMIDT, N. W. GOTHARD, Bob Jones University — Thermoelectric materials are promising solid state energy conversion devices, whose energy conversion efficiency depends on the material's thermal and electrical conductivity, as described by the Figure of Merit. Previous work has indicated that the Figure of Merit can be affected favorably by microstructural refinement via a variety of methods. Single-mode microwave processing has the potential to dramatically impact microstructures, but little study has been done of the impact on thermoelectric efficiency. We initiate a study of the effect of 2.45 GHz single-mode microwaves on several thermoelectric materials, including half-Heusler and Zintl phases. We report the effects of electromagnetic field coupling on the composition and transport properties, as affected by the material's phase purity, compositional variation, grain size, and thermoelectric transport properties.

Nick Gothard
Bob Jones University

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