

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

The Study of the Thermoelectric Properties of Phase Change Materials¹ MING YIN, MOHAMMED ABDI, ZIBUSISU NOIMANDE, GODWIN MBAMALU, Benedict College, DHEYAA ALAMEERI, TIMIR DATTA, University of South Carolina — We study thermoelectric property that is electrical phenomena occurring in conjunction with the flow of heat of phase-change materials (PCM) in particular GeSbTe (GST225). From given sets of material parameters, COMSOL Multiphysics heat-transfer module is used to compute maps of temperature and voltage distribution in the PCM samples. These results are used to design an apparatus including the variable temperature sample holder set up. An Arbitrary/ Function generator and a circuit setup is also designed to control the alternation of heaters embedded on the sample holder in order to ensure sequential back and forward flow of heat current from both sides of the sample. Accurate values of potential differences and temperature distribution profiles are obtained in order to compute the Seebeck coefficient of the sample. The results of elemental analysis and imaging studies such as XRD, UV-VIS, EDEX and SEM of the sample are obtained. Factors affecting the thermoelectric properties of phase change memory are also discussed.

¹NNSA/ DOD Consortium for Materials and Energy Studies

Ming Yin
Benedict College

Date submitted: 05 Nov 2015

Electronic form version 1.4