Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Thermoelectric Properties of Barium Plumbate Doped by Alkaline Earth Oxides ANDREZA EUFRASIO, RUDRA BHATTA, IAN PEGG, BIPRODAS DUTTA, Vitreous State Laboratory. The Catholic University of America — Ceramic oxides are now being considered as a new class of thermoelectric materials because of their high stability at elevated temperatures. Such materials are especially suitable for use as prospective thermoelectric power generators because high temperatures are encountered in such operations. The present investigation uses barium plumbate ($BaPbO_3$) as the starting material, the thermoelectric properties of which have been altered by judicious cation substitutions. $BaPbO_3$ is known to exhibit metallic properties which may turn semiconducting as a result of compositional changes without precipitating a separate phase and/or altering the basic perovskite crystal structure. Perovskite structures are noted for their large interstitial spaces which can accommodate a large variety of "impurity" ions. As $BaPbO_3$ has high electrical conductivity, σ =2.43x$10^5 \Omega^{-1}m^{-1}$ at room temperature, its thermopower, S, is relatively low, 23μV/K, as expected. With a thermal conductivity, k, of 4.83W$m^{-1}K^{-1}$, the figure of merit ($ZT = S^2\sigma T k^{-1}$) of $BaPbO_3$ is only 0.01 at T =300K. The objective of this investigation is to study the variation of thermoelectric properties of $BaPbO_3$ as Ba and Pb ions are systematically substituted by alkaline earth ions.

Andreza Eufrasio
Vitreous State Laboratory. The Catholic University of America

Date submitted: 05 Nov 2015 Electronic form version 1.4