

Abstract Submitted  
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**Synthesis and thermoelectric property of Ca-doped n-type  $\text{Bi}_{85}\text{Sb}_{15}$  alloy** KAMAL KADEL, WENZHI LI, Florida International University, GIRI JOSHI, GMZ, ZHIFENG REN, Boston College —  $\text{Bi}_{1-x}\text{Sb}_x$  ( $0.09 < x < 0.20$ ) alloys are n-type semiconducting materials that exhibit a good thermoelectric property at low temperature, around 80 K. In the present work we investigated the thermoelectric properties of undoped  $\text{Bi}_{85}\text{Sb}_{15}$  and different Ca-doped  $\text{Bi}_{85}\text{Sb}_{15}\text{Ca}_x$  alloys ( $x=0.5, 2, \text{ and } 5$ ) synthesized via arc-melting first and followed by ball milling and hot pressing. Effect of different Ca doping levels on transport properties of  $\text{Bi}_{85}\text{Sb}_{15}$  alloys has been investigated. It is found that thermal conductivity decreases with increasing Ca. Electrical transport measurements show that power factor increases with doping level of Ca up to  $\text{Bi}_{85}\text{Sb}_{15}\text{Ca}_2$  and then decreases, yielding the maximum value of power factor of  $3.8 \times 10^{-3} \text{ Wm}^{-1}\text{K}^{-2}$  and ZT of 0.39 at room temperature for  $\text{Bi}_{85}\text{Sb}_{15}\text{Ca}_2$ . Properties at below room temperature will also be presented.

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