Enhanced thermoelectric properties of n-type filled skutterudite Yb_0.35Co_4Sb_{12} by substitution on both the Co and Sb sites

TIANYI SUN, Boston College, GANG CHEN, MIT, ZHIFENG REN, Boston College —

A dimensionless thermoelectric figure of merit (ZT) of about 1.2 was reported in Yb_0.35Co_4Sb_{12} at 550°C by ball milling and hot pressing. Through alloying on both the Co and Sb sites, we expect to achieve lower thermal conductivity while maintaining the power factor. The composition tuning is aimed for reducing the electrical conductivity and increasing the Seebeck coefficient, which will lead to a lower thermal conductivity, and ultimately higher ZT. In this report, we present the thermoelectric properties of skutterudites Yb_0.35Fe_{x}Co_{4-2x}Ni_{x}Sb_{12} and Yb_0.35Co_{4}Sb_{12-y}M_{y} (M=Si, Ge, Sn, B, Al, Ga, In, etc.).

Tianyi Sun

Date submitted: 30 Nov 2010