

Abstract Submitted
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Study on thermoelectric properties of n-type PbSe doped with B, Ga, and In QIAN ZHANG, Boston College, QINYONG ZHANG, Xihua University, BO YU, DEZHI WANG, Boston College, GEORGE NI, GANG CHEN, Massachusetts Institute of Technology, ZHIFENG REN, Boston College, BOSTON COLLEGE TEAM, XIHUA UNIVERSITY COLLABORATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY COLLABORATION — We report here systematic study of the thermoelectric properties of n-type PbSe with B, Ga, and In doping. The comparison of the electrical resistivity, Seebeck coefficient, and thermal conductivity is conducted. Room temperature Hall measurements show the effective increase of carrier concentration by both Ga and In doping to $\sim 10^{20}$ cm^{-3} . The high power factor $\sim 2.4 \times 10^{-3} \text{Wm}^{-1} \text{K}^{-2}$ is obtained when B is doped, however, it is decreased with increasing temperature, which is inversed with the other dopants. No resonant state is found in all these three materials. A figure of merit, $ZT > 1.2$ at 873 K is achieved in 0.5% In doped PbSe.

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