

## Infrared and Thermoelectric Properties of $\text{Bi}_x\text{Te}_y$ -Based Alloyed Thin Films

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We studied the infrared (IR) and thermoelectric properties of  $(\text{Bi}_x\text{Te}_y+\text{Cd})$  and  $(\text{Bi}_x\text{Te}_y+\text{InSb})$  alloyed thin films prepared on  $\text{SiO}_2$  glass substrates by electron beam evaporation (EB). Cd was used in terms of the enhancement of sensitivity to IR radiation because CdTe is known to be highly sensitive to IR radiation. The voltage sensitivities were 0.71 and 43.9 mV for  $\text{Bi}_2\text{Te}_{2.4}$  and  $\text{Bi}_2\text{Cd}_{2.6}\text{Te}_{5.5}$ , respectively, at a bias current of 10 mA and a blackbody furnace temperature of 1000°C. The maximum values of the power factor ( $P_f$ ) were  $1.15 \times 10^{-3}$  W/mK<sup>2</sup> at 450 K for  $\text{Bi}_2\text{Te}_{2.4}$ ,  $2.46 \times 10^{-4}$  W/mK<sup>2</sup> at 550 K for  $\text{Bi}_2\text{Te}_{3.6}+\text{InSb}_6$ , and  $8.90 \times 10^{-6}$  W/mK<sup>2</sup> at 550 K for  $\text{InSb}_{2.2}$ .

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