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Temperature Dependence of Energy Gap in Semiconductors—Influence on Solar Cell Performance

Rayan Daroowalla, Ritvik R. Rangaraju, Leqi Lin, and Nuggehalli M. Ravindra

Abstract An analysis of the temperature dependence of the energy gap in semiconductors is presented. Its influence on solar cell performance is examined for various semiconductor candidates. In particular, semiconductors belonging to groups IV, III–V, II–VI, as well as perovskites are considered. The results presented in this study are anticipated to be of direct applications to the utility of solar cells in space as well as in the design and manufacture of tandem solar cells.

Keywords Solar cells · Energy gap · Temperature · Efficiency · Semiconductors · Perovskites

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