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MATERIALS, MODELS, AND APPLICATIONS OF THERMOELECTRIC COOLING

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ABSTRACT

This paper examines current developments in thermoelectric materials, modeling techniques, and applications. Thermoelectric cooling systems offer a number of benefits over traditional cooling technologies. There are no mechanical moving components, no working fluid, and the device is small, light, and reliable. Direct current is used, and the cooling and heating modes may be switched simply. In this research. The history of thermoelectric cooling has been briefly discussed initially. The development of thermoelectric materials was then discussed, as well as the accomplishments of the previous decade. Summarized. Modeling methods have been used to enhance the performance of thermoelectric cooling systems. Both thermo element modeling and thermoelectric cooler (TEC) modeling have been reported. includes one-dimensional and three-dimensional versions of the classic simple energy equilibrium model numerical compact model, and models. Thermoelectric cooling applications have now been completed. Household refrigeration, electronic cooling, scientific application, and automobiles were all examined. With summaries for commercially available thermoelectric modules and thermoelectric refrigerators,

air conditioning and seat temperature control are covered. This research is anticipated to be helpful to Design, modeling, and analysis of thermoelectric cooling systems.

KEYWORDS: *Thermoelectric cooling Thermoelectric Material Modeling Application.*

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