

KORONCENKOV, G., BRINZARI, V. et al. In₂O₃-Based Thermoelectric Materials: The State of the Art and the Role of Surface State in the Improvement of the Efficiency of Thermoelectric Conversion. In: Crystals. 2018, Vol. 8, Issue 1, 14. ISSN 2073-4352.

In this paper, the thermoelectric properties of In₂O₃-based materials in comparison with other thermoelectric materials are considered. It is shown that nanostructured In₂O₃ Sn-based oxides are promising for thermoelectric applications at moderate temperatures. Due to the nanostructure, specific surface properties of In₂O₃ and filtering effects, it is possible to significantly reduce the thermal conductivity and achieve an efficiency of thermoelectric conversion inaccessible to bulk materials. It is also shown that a specific surface state at the intergrain boundary, optimal for maximizing the filtering effect, can be achieved through (1) the engineering of grain boundary parameters, (2) controlling the composition of the surrounding atmosphere, and (3) selecting the appropriate operating temperature.