



High ZT Thermoelectric Materials

Researcher

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Research

The search for alternative energy sources is at the forefront of applied research. In this context, thermoelectricity, or the direct conversion of thermal energy into electrical energy, plays an important role, particularly for the exploitation of waste heat. Materials for such applications should exhibit thermoelectric potential and high thermodynamic and mechanical stability.

Prof. Gelbstein's lab is investigating many classes of thermoelectric materials for various power generation applications, including automotive, marine and PV-TE. Both high efficiency and nano-structure stability under practical application conditions are considered, and both experimental and theoretical approaches are being applied to achieve the group's agenda. Advanced methods for nano-structuring of bulk thermoelectric materials, including thermodynamic / physical metallurgy driven nano-features methods, are investigated. So far, high maximal thermoelectric figure of merit (ZT) values of >2 were obtained with reasonable stability characteristics, placing the materials developed by the group at the forefront of the most advanced thermoelectric materials developed globally.

Applications & Products

Thermoelectric generator in the range of 300-600W output electrical power for automotive applications (gasoline engines), converting the waste exhaust heat generated into useful electrical power.