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# Towards Realisation of High-Performance Thermoelectrics for Energy Conversion

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Thermoelectric materials directly convert thermal energy into electrical energy, offering a green and sustainable alternative for the global energy market.[1, 2] So far, extensive investigations have been made to improve the thermoelectric efficiency, which governed by the dimensionless figure-of-merit ZT ( ), where σ is the electrical conductivity, S is the Seebeck coefficient, T is the absolute temperature, and  is the total thermal conductivity which is the sum of the contributions from its electron (e) and lattice (L) components. Here, we developed cost-effective, and low-toxic thermoelectrics for high-efficiency energy conversion using novel industry-level approach, coupled with nanostructure and band engineering strategies. Through effective design of thermoelectric materials with engineered chemistry and unique structure, and advanced manufacturing, high-performance thermoelectrics, such as Cu2Se,[3] Bi2Se3,[4] Bi2Te3,[5-8] In3Se4,[9, 10] etc., have been realised in our group. Such innovative technology can be used for harvesting electricity from waste heat or sun light.

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