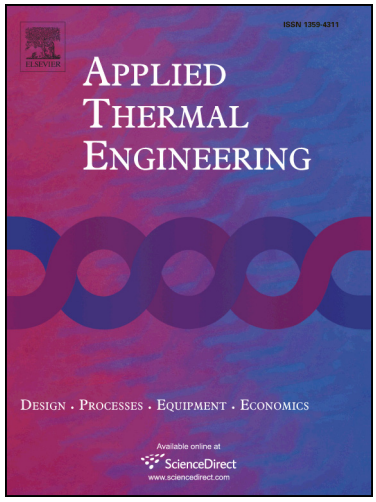

Optimized design for flexible polymer thermoelectric generators

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Optimized design for flexible polymer thermoelectric generators

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Abstract

Intrinsically conducting polymers are cheap, flexible, environmentally friendly and easy to manufacture. These characteristics and their low thermal conductivity make them suitable for thermoelectric generation. In this study a PEDOT:tos-Silver thermoelectric module (TEM) has been printed and tested. A computational model able to simulate the behavior of polymer thermoelectric generators (TEGs) has been developed and validated with the experimental data.

The validated computational model has been used to geometrically optimize the power generation of the polymer TEM. The π-sectional area of the p-type and n-type legs, their length and the number of thermocouples have been modified obtaining an improvement of 50 times the power generated by the printed module, the base design. The optimized geometry has been studied into a real application scenario of waste heat harvesting, a tile furnace with a