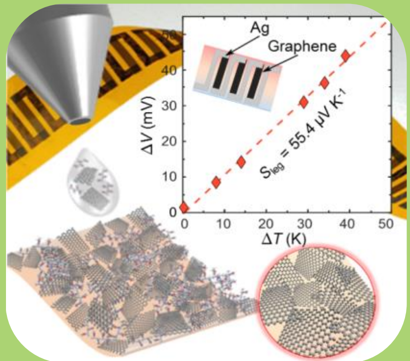
TRANSFLEXTEG

2018 News

Steering thermoelectrics towards large scale



Aalto: First graphene ink for inkjet printing large-area flexible TE generators

Juntunen, T. *et al.* "Inkjet Printed large-area flexible few-layer graphene thermoelectrics". ***Advanced Functional Materials***, (2018)
DOI: 10.1002/adfm.201800480

Organic nanocomposites have ascended as promising candidates for thermoelectric energy conversion. To adopt existing scalable printing methods for developing flexible large-area thermoelectric devices, Aalto has developed the **first thermoelectric graphene ink for inkjet printing** in collaboration with Cambridge university. The all-graphene films show a room-temperature thermoelectric power factor of 18.7 μW $m^{-1} K^{-2}$, representing over a **threefold improvement** to previous solution-processed all-graphene structures. TFT unveils the potential of printed thermoelectrics for future flexible, scalable, and low-cost thermoelectric applications

TFT consortium in Brussels

Uninova: Worlds first fully transparent thermoelectric p-n modules

Faustino, B. M. M. *et al*. "CuI p-type thin films for highly transparent thermoelectric pn modules." ***Scientific reports*** 8, no. 1 (2018): 6867.
DOI: 10.1038/s41598-018-25106-3

N-type transparent oxides with thermoelectric potential are vastly seen in today's technology. However, access to their p-type counterpart is often limited. Uninova optimized p-type transparent CuI thin films as a highly promising material candidate to maximise optical transparency (>70% in the visible range), as well as electrical (σ = 1.1 × 10^4 S m^{-1}) and thermoelectric properties (**maximum zT value of 0.29** for single CuI thin films of ~300 nm in thickness). The expansion of the work on fully transparent CuI p-n modules **from glass to flexible substrates** have resulted in the first planar, flexible and transparent p-n thermoelectric generators using gallium-doped Zinc oxide (GZO) as the n-type material.

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