Doping of donor-acceptor polymers *via* solution mixing for organic thermoelectric devices

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Organic thermoelectric materials have attracted great interest as a promising candidate for waste heat harvesting because of their advantages including material abundance, mechanical flexibility, and solution processability. Although the doping *via* solution mixing is preferred due to easy processability, doped polymer solutions usually lose the solubility upon doping. This has often hindered the fabrication of high quality doped polymer films, which has been an obstacle to achieving high thermoelectric performances. Here, we demonstrate organic thermoelectrics based on donor-acceptor type polymers (D-A polymers). Their shallow HOMO levels allowed efficient charge transfer with the dopant. In addition, their long alkyl chains enabled to preserve both the solubility in the solution state and the crystallinity in the thin-film state upon doping. Moreover, the planar backbones of the D-A polymers facilitated charge transport, resulting in a maximum power factor of 31.45 $\mu W/mK^2$.