**Flexible thermoelectric materials based on conducting polymers**

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With the recent development of wearable technology, the interest in flexible electronics, Internet of things (IoT), and self-powered electronic devices has increased, with the aim of achieving energy autonomy using portable and flexible power generation modules. In this sense, thermoelectric materials based on conductive polymers can be very good candidates for applications in wearable self-powered electronics due to their low thermal conductivity, low cost, eco-friendly, processing versatility, and mechanical flexibility.

There are several ways to process flexible materials. In this work, we present three ways of depositing flexible thermoelectric materials based on conductive polymers; they use different deposition techniques on different substrates, highlighting the great versatility of these materials. First, by using the layer-by-layer technique, successive layers of PEDOT nanoparticles and carbon nanotubes are deposited on a flexible PET substrate.[1](#_ENREF_1) In the second work, by combining layer-by-layer techniques and electrochemical deposition, highly flexible fabrics coated with carbon nanotubes and PEDOT: ClO4 are obtained.[2](#_ENREF_2) Finally, by means of the spin coating technique, it has been possible to embed polythiophene (PTP) within a thermoplastic polyurethane matrix by means of chemical oxidation in the presence of different oxidizing metal salts.

1. Serrano-Claumarchirant, J. F.; Culebras, M.; Cantarero, A.; Gómez, C. M.; Muñoz-Espí, R., Poly(3,4-Ethylenedioxythiophene) Nanoparticles as Building Blocks for Hybrid Thermoelectric Flexible Films. *Coatings* **2019,** *10* (1), 22.

2. Serrano-Claumarchirant, J. F.; Brotons-Alcázar, I.; Culebras, M.; Sanchis, M. J.; Cantarero, A.; Muñoz-Espí, R.; Gómez, C. M., Electrochemical Synthesis of an Organic Thermoelectric Power Generator. *ACS Appl. Mater. Interfaces* **2020**.