Solution Processing of Thermoelectric Materials, Devices and Systems

Andreu Cabot

Max Planck for Intelligent Systems, Stuttgart, Germany,
Institute for Bioengineering of Catalonia (IBEC), Barcelona, Spain
Institut Català de Recerca i Estudis Avancats (ICREA), Barcelona, Spain

Breakthroughs in materials hold the key to new generations of products. This breakthrough will be reached through the control over material properties and the understanding of mechanisms and phenomena at the atomic scale. At the same time, industrial innovation will be supported on cost-effective technologies able to transform this control and understanding into optimized and new products.

In this scenario, solution-based methods allow production of nanomaterials with unmatched degree of control over size, shape, phase and composition of the crystalline domains. At the same time, the availability of materials in solution or as nano-inks enables the large volume and high yield fabrication of devices and even systems over a variety of substrates by cost-effective printing and coating technologies.

I will talk about the potential of solution-based synthesis routes and solution-processing technologies to produce high-efficiency thermoelectric nanocomposites, low-cost thermoelectric devices and autonomous thermoelectric-enabled sensing systems.