PHD POSITION: ORGANIC PLASTIC CRYSTALS: ADDRESSING THE NEXT GENERATION OF TES

Company Description

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Information

Deadline: 2024-01-31
Category: Academia
Province: Araba / Álava
Country: Basque Country
City: Vitoria-Gasteiz

Company

CIC energiGUNE

Main functions, requisites & benefits

Main functions

Solid-solid Phase change materials (PCMs), particularly organic plastic crystals (OPCs), hold great potential for next-gen thermal storage systems. They combine the simplicity and cost of traditional solid materials with the high energy density of PCMs. OPCs, with transitions from 40˚C to 200˚C, suit both building and industrial applications. Nevertheless, further exploration of these materials and their enhancement is necessary to fully unlock their potential and penetrate the energy storage market. The main goal of this PhD thesis is to develop and optimize solid-solid PCMs based on OPCs, aiming to attain superior thermal properties while gaining insights into their underlying mechanisms and assessing their techno-economic feasibility. Key Tasks for Doctoral Candidate: To synthesize coatings with different natures (polymeric, ceramic, hybrid, etc.). To synthesize and process solid-solid PCMs, including their doping with functionalized particles and their combination with other solid-liquid PCMs. To deep materials characterization by, for example, Hot Disk, Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), dilatometer, Helium pycnometer, Dynamic Mechanical Analysis (DMA), Scanning Electron Microscopy (SEM), dilatometry, particle size distribution, XRD, surface area BE, mechanical testing, etc. To assess the techno-economic feasibility of scaling up and manufacturing processes for the material, as well as evaluating its impact on a Thermal Energy Storage (TES) system. Area: Thermal energy storage (TES) Research Group: Phase Transitions and Critical Behaviors

Requisites

Master in Physical, Chemical, Materials science or similar. A good level of spoken and written English. A team player who can collaborate with other researchers, groups. Demonstrated self-motivation and autonomy.

Benefits

3 years predoctoral contract and professional development opportunities. Flexible working hours and with on-site work model with the option to eventually telework. Full access to cutting-edge laboratory facilities and characterization platforms. The incorporation to a top research center in Europe that makes high quality research and impactful contributions to the energy and sustainability fields. Professional and personal development: opportunity to attend seminars, international conferences, trainings, etc. Integrated, enthusiastic, international and multidisciplinary environment. A welcome program that offers help with finding accommodation and addresses other aspects to help you integrate into the local environment (such as free language courses, assistance with the administrative procedures, help with schools for children…). For more information: https://cicenergigune.com/en/work-with-us