Polymer Nanocomposites for Energy Harvesting Application

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Energy management is a crucial problem of this time and a lot of solutions to this problem are being investigated. Harvesters based on polymers and nanomaterials have utmost significance in terms of solar cells, piezoelectric and pyroelectric materials. Many polymers are reported for their use in electronics and technology for a variety of applications. The polymer nanocomposites integrate the properties of polymers as well as the filler particles added to the system and finally lead to a wide variety of applications. Polyvinylidene fluoride (PVDF) is a well-known semi-crystalline thermoplastic polymer for its energy harvesting property. The presence of the beta phase within the polymer structure is the main point that is responsible for its energy harvesting property. The electrical energy generation upon the application of mechanical force is called piezoelectricity, and a large number of PVDF nanocomposites are reported for this particular property. In order to prepare the piezoelectric nanocomposite, metal nanoparticles are added to the PVDF and the final composite is structurally aligned. This is very important for generating electric charges. In short, this project is the need of the hour. Lightweight and eco-friendly polymer is the base material used in the study. The developed energy-generating materials are of lightweight and low cost capable of replacing the conventional sources of energy.