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Flexible nanofiber for triboelectric nanogenerator

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Abstract

The importance of driving the replacement of traditional fossil fuels with sustainable and renewable energy sources has grown rapidly in the past decade due to the emerging energy crisis and higher standards for environmental protection. In consequence, natural and green energy sources such as solar, wind and water have attracted much research interest in pursuit of finding a sustainable and renewable source of energy.1 Since its first invention in 2012, the Triboelectric nanogenerator (TENGs) is a type of energy harvesting device that transforms mechanical energy into effective electricity. Besides the many other advantages of TENGs including a low fabrication cost, being light weight, and a high energy efficiency, there is a wide range of materials and structures to choose from when designing a TENG device,2, leading to a rather large variety of viable device setups.3 Among other factors, the contact area between the triboelectric layers plays a major role in determining the TENG's properties.4 Recent progress of nanofiber based TENGs has been achieved for unobtrusive biomechanical energy harvesting, as well as continuous, real time, and noninvasive health monitoring. Electrospun membranes with superior breathability, great flexibility, controllable thickness and ease of manufacturing, show great potential for wearable devices. Since nanofibers with good softness and high specific surface area are excellent choices for wearable TENGs, we are going to focus on nanofiber based TENGs in this talk.

Keywords: Synthesis of organic, inorganic and hybrid materials nanocomposites

Biography

Prof. Lin received her Ph.D. degree from Nanyang Technological University of Singapore in 2013. She joined the department of materials engineering, Ming Chi University of Technology as an assistance professor in 2019. Her current research interests focus on high energy density capacitor, pressure sensor, actuator and triboelectric energy harvesting.

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