Triboelectric Nanogenerators Based on Multifunctional Materials for Self-Powered Electronics

김상우†
성균관대학교
(kimsw1@skku.edu†)

Low output current represents a critical challenge that has interrupted the use of triboelectric nanogenerators (TENGs) in a wide range of applications as sustainable power sources. Many approaches (e.g., operation at high frequency, parallel stacks of individual devices, and hybridization with other energy harvesters) remain limited in solving the challenge of low output current from TENGs. I will present a nanocomposite material system having a superior surface charge density as a triboelectric active material. The nanocomposite material consists of a high dielectric ceramic material, BTO, showing great charge-trapping capability, together with a ferroelectric copolymer matrix, P(VDF-TrFE), with electrically-manipulated polarization with strong triboelectric charge transfer characteristics. In addtion, a new strategy of adding electrolytes with asymmetric ion pairing to polymer friction layers of TENGs in order to enhance their triboelectric property will be presented.