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Highly durable Ti-Mesh sased triboelectric nanogenerator for self-powered device applications

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We describe a highly durable Ti-mesh based triboelectric nanogenerator (Ti-TENG) with a sandwich structure that harvests electrical energy from contact electrification. The electrical output from the fabricated Ti-TENG by compressing and releasing strain was measured under different applied loads and frequencies. The Ti-TENG generated a peak voltage and current up to ~1.1 V and ~14 nA at an applied force of 30 N and frequency of 1.1 Hz. The obtained potentials were used to charge a capacitor and power a commercially available light emitting diode (LED). In particular, the Ti-TENG, which exhibited high electrical stability, can be used in applications requiring high levels of robustness and durability. For example, the Ti-TENG was applied as step counter while walking and running, demonstrating its capability to self-power devices. We believe that the device provides a highly promising, robust and durable platform for self-powered applications that effectively harnesses energy from mechanical movements.

Biography:

Ermias Libnedengel Tsege was born in Addis Ababa, Ethiopia, in 1985. He received his BS degree (2005) from Jimma University and MS degree (2007) from Addis Ababa University (Ethiopia). He also got additional joint masters degree from Ecole normale supere de Lyon and La Sapieza university di roma. Since then he has been a PhD student under the supervision of Prof. Yoon-Hwae Hwang in Pusan National University, Busan, Republic of Korea. His current research interests focus on nano-materials synthesis, optical spectroscopy and energy harvesting nano-materials.