



Contribution ID: 65

Type: **Poster**

Hybrid Energy Harvester based on the Combination of Triboelectric Nanogenerator and Solar Cell

Friday 9 December 2022 15:30 (1h 30m)

Developing clean energy lies in the heart of sustainable development of human society. Triboelectric nanogenerator (TENG) originating from Maxwell's displacement current is a new type of energy harvester for harnessing ambient mechanical energy based on the coupling effect of triboelectrification and electrostatic induction. Compared with other counterparts, owing to the light-weight, low-cost, and easy fabrication, TENG has become one of the most promising candidates in replacement of conventional fossil fuels and attracted worldwide attentions in the past years. However, to further increase the energy harvesting efficiency and broaden application fields, integrating the TENG with other kinds of energy harvesters in one device is a possible way to meet these needs. In our work, a TENG based hybrid energy harvester is designed and fabricated on the flexible polyethylene terephthalate (PET) substrate. This hybrid device consists of a single-electrode mode TENG component and a PbS quantum dots (QDs) based solar cell component, which can harness both, mechanical and solar energy from ambient environment to directly generate electricity.

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Session Classification: Poster Session

Track Classification: Material Science