PSW7B : 국립대 육성 세라믹/융합소재 젊은 과학자 연구 토론 세션

PSW7B-1 | Maracas Triboelectric Generator: Manufacture and Characteristic evaluation

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This study was conducted to create a new structure of triboelectric generator that can produce output that can be used for sensors and toys. We constructed a cylindrical Maracas-structured triboelectric generator (M-TEG) inspired by Maracas, one of the types of instruments. Since the friction area must be increased to improve Triboelectric harvesting performance, we added a separate new tripod frame with aluminum and copper electrodes within the M-TEG. Triboelectric energy occurs due to friction between polypropylene balls and the electrodes showing a large potential difference. Through this new structure, we have an energy harvesting power of 97.9 V and 2.42 μA, which is a result of an increase of 2.5 times in voltage and 6.1 times in current compared to the absence of an internal frame. The triboelectric generator of the cylindrical Maracas structure we developed is small and light in size and making it easy to carry.

PSW7B-2 | 효과적으로 통합된 양면형 구조의 유연한 압전 박막 에너지 하베스터

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Flexible thin film-based energy harvesters are promising for self-powered electronics and sensor systems. However, improving their energy harvesting performance is crucial. One challenge is integrating harvesting signals into a single device configuration without complicated connections or expensive methods. To address this, researchers studied the dual-film structures of flexible PZT film energy harvesters experimentally and theoretically. They used laser lift-off (LLO) processes for fabrication, which is known as the most efficient technology for flexible high-performance energy harvesters. Two device structures were developed: a stacked structure and a bimorph structure. While the stacked structure was inefficient for energy harvesting due to ineffective strain application, the bimorph structure achieved effective integrated performance. This research is a significant step towards developing various structures in flexible energy harvesters for self-powered sensor applications with high efficiency, ultimately creating more sustainable and efficient technology.