Green/Clean Tech

Eco-Friendly Triboelectric Nanogenerator from Used Diapers and PTFE

Technology Domain: Clean Technology

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Status (Patent/TRL): Patent Pending / TRL 4

Technology Summary:

This invention introduces a novel Diaper Waste Based Triboelectric Nanogenerator (D-TENG), addressing critical environmental challenges posed by discarded diapers and PTFE-coated sheets. The key technical solution involves repurposing Super Absorbent Polymer (SAP) gel from used diapers and waste PTFE oven sheets as triboelectric materials. The key inventive feature is the D-TENG's ability to efficiently convert low-frequency mechanical energy (from shaking) into electrical power, with SAP powder acting as the positive and PTFE as the negative triboelectric material.

Results demonstrate impressive electrical performance, achieving up to 110 V open-circuit voltage, 9 µA short-circuit current, and 259.15 µW power at 6 Hz, capable of charging capacitors and powering small electronics. This innovation offers a sustainable use for waste recycling and provides an eco-friendly, self-powered energy source for various applications.