

NOVEL ELECTROMECHANICALLY RESPONSIVE MATERIALS - TRIBOELECTRIC LAMINATES

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Piezoelectric fluoropolymers are critical electromechanically responsive materials for flexible energy harvesting and sensors. However, their production results in the release of significant amounts of toxic substances into the environment, and these fluoropolymers are at risk of being banned [1]. For this reason, alternative flexible electromechanically responsive materials have to be developed. Here, I will present novel electromechanically responsive materials – triboelectric laminates.

Triboelectric laminates are multilayered materials made from polymer bilayers with asymmetric triboelectric charging tendencies [2-5]. The triboelectric charge forms on interfaces of bilayers in response to mechanical deformation. The bilayer structure ensures parallel alignment of dipoles forming between positive and negative charges. Laminates can be integrated into many device configurations for waste energy harvesting, thus enabling mechanical to electrical energy conversion and paving the way for the effective replacement of fluoropolymers in future flexible energy harvesting devices.

References

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