PSW7A : 국립대 육성 세라믹/융합소재 젊은 과학자 연구 토론 세션

PSW7A-1 | Conformable flexible adhesive piezoelectric patches for physical energy amplification with bioinspired hierarchically arranged microsuckers

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Here, we report a Stretchable skin-adherent piezoelectric patch with a hierarchically designed octopus-beetle inspired array (HOBA). HOBA adhesion layer has high normal adhesion and shear adhesions in rough skin. We fabricated hierarchical patterns inspired by suction cups of diving beetles and octopuses. The piezoelectric patch with hierarchical patterns is highly adhesive on dry, wet and underwater environments on silicon and skin replicas. Our energy device has a flexible polymer-based monolithic structure and has excellent interlayer stability. In addition, it can be used directly on the body by applying a lead-free piezoelectric material, and it is possible to implement a system that can effectively amplify the body's mechanical energy and convert it into an electrical signal. Furthermore, it has high responsiveness to external mechanical signals, stretchable energy device has a power density of 1.52 $\mu W/cm^3$ and generates constant energy even in repeated bending (150°).