Abstract Submitted
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Silk-polypyrrole biocompatible actuator performance under biologically relevant conditions[1] JO'ELEN HAGLER, BEN PETERSON, Department of Physics and Astronomy, Western Washington University, AMANDA MURPHY, Department of Chemistry, Western Washington University, JANELLE LEGER, Department of Physics and Astronomy, Western Washington University — Biocompatible actuators that are capable of controlled movement and can function under biologically relevant conditions are of significant interest in biomedical fields. Previously, we have demonstrated that a composite material of silk biopolymer and the conducting polymer polypyrrole (PPy) can be formed into a bilayer device that can bend under applied voltage. Further, these silk-PPy composites can generate forces comparable to human muscle (>0.1 MPa) making them ideal candidates for interfacing with biological tissues. Here silk-PPy composite films are tested for performance under biologically relevant conditions including exposure to a complex protein serum and biologically relevant temperatures. Free-end bending actuation performance, current response, force generation and, mass degradation were investigated . Preliminary results show that when exposed to proteins and biologically relevant temperatures, these silk-PPy composites show minimal degradation and are able to generate forces and conduct currents comparable to devices tested under standard conditions.

[1]NSF

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