

CONDUCTING POLYMER-CARBON BASED COMPOSITE IONIC ELECTROACTIVE MATERIALS

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Ionic electroactive polymers in their doped state conduct electricity, these materials can transfer electrical energy in mechanical movement. Actuators made of conducting polymers or carbon based materials are appealing due to low potentials needed for producing movement.

Conducting polymer and carbon-based material actuators have been made before, mostly as coating yet not as a composite material. It has been shown, that developing such hybrid material is possible [1]. Developing composite material made of polypyrrole and interpenetrating carbide-derived carbon electrochemically has led to higher linear actuation properties – stress and strain [2]. Developed hybrid material was examined with scanning electron microscope to observe if carbon particles were embedded in the polymer network and the material has been tested for linear actuation – stress and strain performance.

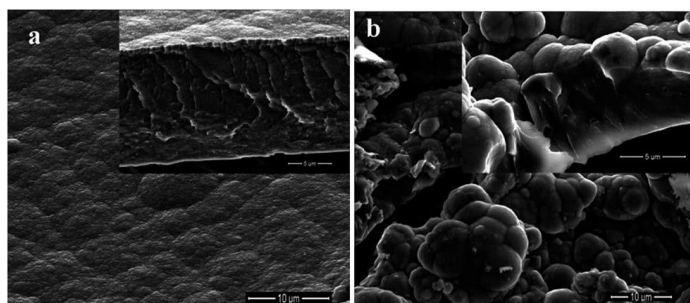
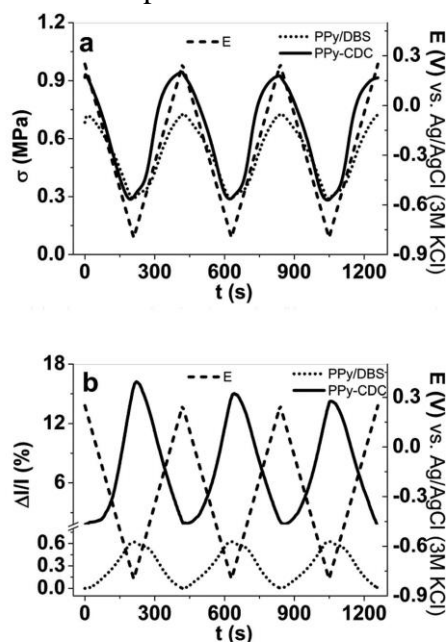


Fig. 1 scanning electron microscopy images of (a) PPy/DBS and (b) PPy-CDC surface and cross-section of the films. Fig. 2 a) stress vs. time and b) strain vs time of polypyrrole and composite material [2].



References

1. J. Torop, A. Aabloo and E. W. H. Jager, 2014, *Carbon N. Y.*, 80, 387–395.
2. Z. Zondaka, R. Valner, T. Tamm, A. Aabloo, R. Kiefer, 2016, *RSC Adv.*, 6, 26380-26385.

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