

# **Chapter 6: Actuator Operation Outside a Liquid Environment**

The actuators shown to date operate in a liquid environment. In order to operate in air and other dry environments either a solid must replace the liquid electrolyte, or the device must be encapsulated. The paper that follows\* describes a method for encapsulating conducting polymer actuators. Clearly operation outside of a liquid environment is an important development, which will enable a much broader range of applications for conducting polymer actuator technology.

In the original thesis a copy of the article appearing in Synthetic Metals appears.

(Madden; Cush; Kanigan; Brennan, and Hunter 1999)

## Reference List

1. Madden, John D.; Cush, Ryan A.; Kanigan, Tanya S.; Brennan, Colin J., and Hunter, Ian W.  
Encapsulated polypyrrole actuators. *Synthetic Metals*. 1999; 105:61-64.

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\* Part of the evaluation of a thesis involves determining the contributions of the thesis author. The paper that follows has multiple authors, each of which made important contributions to the work. The actuator design is John Madden's contribution. John Madden and Ryan Cush together implemented and tested the actuator performance. John Madden wrote the article.