

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Biocompatible Ionic Liquid-Derived Conducting Polymers¹ MIL-
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tional Laboratory — A significant and frequently encountered challenge when mak-
ing an electrical connection to a protein is that its electron-transfer sites are buried
within the polypeptide matrix and thus, are not readily accessible to bulk metal
electrodes. A further complicating factor is that inorganic (i.e., metallic) electrodes
are often incompatible with biological samples. These obstacles might be overcome
by the use of conducting oligomers and / or polymers, which are flexible, offering a
means to access remote redox centers. These oligomers can be readily modified to
include chemical moieties that can connect covalently to sites near redox centers. In
addition, conducting polymers can be made to be environmentally responsive (dy-
namic), processable (conformal coating, soluble) and mechanically durable, thus en-
abling them to function as an electrical conduit (wire or electrode) to biomolecules.
In this work, we describe the design, synthesis and electrochemical properties of
thiophene-based ionic liquid monomers and their bulk polymerization by chemical
oxidation to yield cationic, aqueous-soluble polymers. Preliminary studies evaluat-
ing the electropolymerization of these monomers into nanostructured thin films will
also be presented.

¹This work was performed under the auspices of the Office of BES, DMS, US-DOE,
under contract No. DE-AC02-06CH11357.

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Date submitted: 18 Nov 2008

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