

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Direct Enzymatic Oxidation of Glucose with a Poly(Ionic Liquid) - Gold-Nanoparticle Composite MILLICENT FIRESTONE, SUNGWON LEE, SOENKE SEIFERT, Argonne National Laboratory — In this work we describe the synthesis, fabrication and characterization of a gold nanoparticle - ionic liquid-derived polymer composite for conversion of biofuels into electricity. Glucose oxidase (GOx) electrostatically adsorbed on an ionic liquid-derived polymer containing internally organized columns of Au nanoparticles exhibits bioelectrocatalytic properties in the oxidation of glucose. The cationic poly(ionic liquid) provides an ideal substrate for the immobilization of GOx. The encapsulated Au nanoparticles serve two roles: promoting direct electron transfer with the recessed enzyme redox centers, and imparting electronic conduction to the composite, thereby allowing it to function as an electrode for electrochemical detection.

Millicent Firestone
Argonne National Laboratory

Date submitted: 16 Nov 2010

Electronic form version 1.4