



Organic Based Nanocomposite Solar Cells

Cooperative Research and Development Final Report

CRADA Number: CRD-04-145

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In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

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CRADA Title: Organic Based Nanocomposite Solar Cells

Parties to the Agreement: Konarka Technologies, Inc.

Joint Work Statement Funding Table showing DOE commitment:

Estimated Costs	NREL Shared Resources
Year 1	\$ 384,715.00
Year 2	\$ 399,795.00
Year 3	\$ 415,490.00
Year 4	\$ 550,000.00
TOTALS	\$ 1,750,000.00

Abstract of CRADA work:

This CRADA will focus on the development of organic-based solar cells. Key interfacial issues in these cells will be investigated. In this rapidly emerging technology, it is increasingly clear that cell architecture will need to be at the nanoscale and the interfacial issues between organic elements (small molecule and polymer), transparent conducting oxides, and contact metallizations are critical. Thus this work will focus on the development of high surface area and nanostructured nanocarpet of inorganic oxides, the development of appropriate surface binding/acceptor molecules for the inorganic/organic interface, and the development of next-generation organic materials. Work will be performed in all three areas jointly at NREL and Konarka (with their partner in the third area of the University of Delaware). Results should be more rapid progress toward cheap large-area photovoltaic cells.

Summary of Research Results:

We developed solution-deposited metal oxide thin films for water vapor barrier layer applications. These thin films were characterized by and demonstrated marked improvement in water vapor barrier performance relative to the plastic substrates alone. These systems were deposited via slot die coating and subsequent thermal processing. Additionally, an electrical measurement device was developed to determine the permeability of flexible barrier materials.

Subject Inventions Listing:

US Application Number: 13/048,251 entitled, "Multilayer Heterostructures and Their Manufacture"

Report Date: 12/8/2012

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