

Accepted Manuscript

Liquid phase high shear exfoliated graphene nanoplatelets as counter electrode material for Dye-sensitised solar cells

Siva Sankar Nemala, Purnendu Kartikay, Sateesh Prathapani, H.L. Mallika Bohm, Parag Bhargava, Sivasambu Bohm, Sudhanshu Mallick

PII: S0021-9797(17)30353-3
DOI: <http://dx.doi.org/10.1016/j.jcis.2017.03.083>
Reference: YJCIS 22180

To appear in: *Journal of Colloid and Interface Science*

Received Date: 10 January 2017
Revised Date: 17 March 2017
Accepted Date: 20 March 2017

Please cite this article as: S.S. Nemala, P. Kartikay, S. Prathapani, H.L. Mallika Bohm, P. Bhargava, S. Bohm, S. Mallick, Liquid phase high shear exfoliated graphene nanoplatelets as counter electrode material for Dye-sensitised solar cells, *Journal of Colloid and Interface Science* (2017), doi: <http://dx.doi.org/10.1016/j.jcis.2017.03.083>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Liquid phase high shear exfoliated graphene nanoplatelets as counter electrode material for Dye-sensitised solar cells

Siva Sankar Nemala^a, Purnendu Kartikay^a, Sateesh Prathapani^a, H. L. Mallika Bohm^b, Parag Bhargava^a, Sivasambu Bohm^{a,c*} and Sudhanshu Mallick^{a*}

a) Department of Metallurgical Engineering & Materials Science, Indian Institute of Technology-Bombay, Mumbai, India-400076

b) Tata Steel R&D, University of Warwick Science Park, Sir William Lyons Road, Coventry, CV4 7EZ, UK.

c) Talga Advanced Materials GMBH, 25, Prof. -Hermann-Klare-Str. 25, 07407 Rudolstadt, Germany,

corresponding author e-mail address:

*mallick@iitb.ac.in, Telephone number: +9122 2576 7641, Fax: +9122 2572 6975

*sivasambum@gmail.com, Telephone number: +49 3672 4766930

Abstract

Graphene nanoplatelets (GNPs) are prepared from natural graphite by a simple and low-cost liquid phase high shear exfoliation method. The as-prepared GNPs are used as a counter electrode (CE) material for dye-sensitized solar cells (DSSCs). To confirm the Exfoliated GNPs, structural and morphological studies are carried out using X-ray diffraction (XRD), Raman spectroscopy, X-ray photoelectron spectroscopy (XPS), transmission electron microscopy (TEM) and selected area electron diffraction (SAED) studies. The electrochemical behaviour of GNPs as a counter electrode material is evaluated and compared with standard Platinum (Pt) electrode using cyclic-voltammetry (CV) and electrochemical impedance spectroscopy (EIS). These studies indicated that electrocatalytic activity towards Γ/I_3^- redox mediator exhibited by the GNPs based electrode is comparable to

Download English Version:

<https://daneshyari.com/en/article/4984847>

Download Persian Version:

<https://daneshyari.com/article/4984847>

[Daneshyari.com](https://daneshyari.com)