Invited Speaker Biography

Name: Professor O-Bong Yang
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Department: School of Semiconductor and Chemical Engineering
Country: Republic of Korea
Topic: Nano Energy

Biography

EDUCATION

1985.3 - 1987.2: Dept. of Chem. Eng., Korea Advanced Institute of Science and Technology (KAIST), Seoul, Korea (MS)
1987.3 - 1991.2: Dept. of Chem. Eng., Korea Advanced Institute of Science and Technology (KAIST), Seoul, Korea (PhD)

PROFESIONAL EXPERIENCE

2011~2013: The head of technical support department Chonbuk National University, New & Renewable Energy material development center (NEWREC).
2011~2013: Chair of Solar Energy Research Center, Chonbuk National University.
2011: Director of the Korean solar energy society

RESEARCH EXPERIENCE

2009.6 – 2009.7: Visiting Professor, Instituto de Tecnología Química, Universidad Politecnica De Valencia, Spain
2004.8 – 2006.8: Visiting Scientist, Basic Science Center National Renewable Energy Laboratory, Golden, CO 80401-3393
2003.6 – 2003.8: Visiting Professor, Institute of Chemical Technology University of Stuttgart, Germany
Presentation Title

Influence of steam treatment on electrocatalytic properties of activated carbon based counter electrode: Dye sensitized solar cells

Abstract (200-words)

In DSSCs technology, the counter electrode (CE) is composed of Pt thin layer coated a TCO substrate, but Pt cost is very expensive. Thus, a new cost effective materials and methods are required to replace the expensive Pt in CEs. Recently, the carbon nanomaterials such as carbon black, carbon nanotubes etc. have used as promising electrocatalytic materials for the reduction of tri-iodide ion in DSSC. In this work, the steam treated activated carbon (AC) powder was used to prepare effective CE for the fabrication of DSSCs. Well ordered and uniform AC thin film electrode was achieved by the mixing of AC and binder solution of nafion:ethanol (1:10, v/v%). Cyclovoltametry analysis revealed that AC CE displayed the high redox current density, representing the better reduction of triiodide ions to iodide ions in redox electrolyte via better electrocatalytic surface of steam-treated AC CE. The electrochemical impedance spectroscopy (EIS) showed the low charge transfer resistance at the interface of CE and electrolyte layer. The steam-treated AC CE based DSSC accomplished reasonable overall conversion efficiency of 3.91% with high short circuit current density of 8.56 mA/cm² and open circuit voltage of 0.773 V. The improved photovoltaic performance and high photocurrent were attributed to its high electrocatalytic activity towards the reduction of I₃⁻ ions and low charge transfer resistance at the interface of CE and electrolyte.