

Electrocatalytic Activity of Sulfamic Acid Doped Polyaniline Nanofiber Counter Electrode for Dye Sensitized Solar Cell

* 조 철기¹⁾, Sadia Ameen¹⁾, M.Shaheer Akhtar²⁾, 김 영순¹⁾, 양 오봉²⁾, **신 형식¹⁾

* Chulgi Jo¹⁾, Sadia Ameen¹⁾, M.Shaheer Akhtar²⁾, Young Soon Kim¹⁾, O-Bong Yang²⁾, **Hyung-Shik Shin¹⁾

Abstract : Uniform polyaniline nanofibers (PANI NFs), and chemically doped sulfamic acid(SFA) PANI NFs, synthesized via template free interfacial polymerization process, were used as new counter electrodes materials for the fabrication of the highly-efficient dyesensitized solar cells (DSSCs). The PANI NFs based fabricated DSSCs exhibited a solarto-electricity conversion efficiency of ~ 4.02% while, the SFA doped PANI NFs based DSSC demonstrated ~ 27% improvement in the solar-to-electricity conversion efficiency. The obtained solar-to-electricity conversion efficiency for SFA doped PANI NFs based DSSC was 5.47% under 100mW/cm²(AM1.5). The enhancement in the conversion efficiency was due to the incorporation of SFA into the PANI NFs which resulted to the higher electrocatalytic activity for the I³⁻/I⁻ redox reaction.

Key words : Polyaniline, Nanofibers, Counter electrode, Dye sensitized solar cells, IPCE.

¹⁾ Energy Materials & Surface Science Laboratory,
School of Chemical Engineering

²⁾ School of Semiconductor and Chemical Engineering &
Solar Energy Research Center, Chonbuk National
University, Chonju-561756, Republic of Korea