

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Charge transport and absorption study of metal nanoparticle plasmonics for organic photovoltaics¹ MEI XUE, JINFENG ZHU, HUAJUN SHEN, SEONGKU KIM, JACK J. HO, UCLA, HUSSAM ALDEEN S. QASEM, ZAID S. AL OTAIBI, KANG L. WANG, DEVICE RESEARCH LABORATORY, UCLA TEAM, KACST/CALIFORNIA INSTITUTE OF EXCELLENCE ON GREEN NANOTECHNOLOGY TEAM — A hybrid plasmonic nanostructure of an optically sensitive heterojunction organic film incorporating metal nanoparticles is fabricated. From the Charge Extraction in Linearly Increasing Voltage (CELIV) measurements, the mobility of this hybrid plasmonic nanostructure has been experimentally extracted to be at least one order of the magnitude higher than that of the organic film without metal nanoparticles. The measured absorption spectrum also shows the increasing of the intensity by around 28% as well as the broadening of the spectrum. The theoretical calculation confirms this broadband optical absorption enhancement results from localized surface plasmon resonance. The optimization of the density of the metal nanoparticles has been done to achieve the best performance for the photovoltaic devices.

¹This work is supported in part by KACST/California Institute of Excellence on Green Nanotechnology.

Mei Xue
UCLA

Date submitted: 23 Dec 2010

Electronic form version 1.4