

Title: Recent Advances in Polymer Photovoltaic Technology - Device Engineering and New Material Development

Speaker:

Dr. Gang Li

Solarmer Energy Inc.

Date: Tuesday, 7 December 2010

Time: 11:00 am

Venue: Room 603, Chow Yei Ching Building

Abstract:

Organic solar cell, especially polymer solar cell, has the potential of significantly solar electricity cost, due to the low material cost in the cell, low cost and fast fabrication process (roll-to-roll for example), high material utilization etc. In addition OPV also provides attractive properties like flexibility, colorful, transparency etc, which could open new market opportunities.

Polymer solar cells have very simple device structure and are both solution processable and compatible with large area low cost printing/coating process, therefore easier to realize the cost competitive advantage of the OPV. The low temperature ambient condition fabrication process also provides the lowest energy payback time among all PV technologies. Solar cell efficiency is a key bottleneck for this technology. While ~4% polymer solar cell was demonstrated around 2005 based on poly (3-hexyl thiophene) (P3HT) and fullerene derivative PCBM, Solarmer Energy Inc has successfully push the polymer solar cell efficiency to 8.13% this year, certified by National Renewable Energy lab (NREL).

In this talk, I will discuss the progress in polymer solar cell field in three key areas – morphology control, device/interface engineering & novel device structure like inverted cell, and rational design of low bandgap polymers. I will also present some recent results on polymer solar cell scale-up through coating /printing process.

Biography of the speaker:

Dr. Gang Li's Bachelor's degree is from Wuhan University. He received his MS degree in Electrical Engineering and PhD degree in Condensed Matter Physics in 2003, both from Iowa State University, where his research focused on organic light emitting devices (OLEDs). From 2004 to 2007, he conducted postdoctoral research in Prof. Yang Yang's group in the Dept. of Materials Science and Engineering (MSE) at UCLA, focusing on polymer solar cells and also on polymer light emitting devices (PLEDs). He has published over 40 scientific articles in academic journals such as Nature Materials, Nature Photonics, Advanced Materials, JACS, Physics Review B etc. and several book chapters. His works have been cited over 3500 times. He also filed multiple patent applications in the area of organic electronics. Dr. Li has been with Solarmer Energy Inc. since June 2007, and now is the VP of Engineering.

Organizer: Dr. W.C.H. Choy