Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Semiconducting block copolymers as nano-structuring agents for high-efficiency and annealing-free bulk hetero-junction organic solar cells
GEORGES HADZIIOANNOU, SÉBASTIEN-JUN MOUGNIER, CEDRIC RENAUD, CYRIL BROCHON, GUILLAUME FLEURY, DARGIE DERIBEW, ERIC CLOUTET, University of Bordeaux, LAURENCE VIGNAU, ENSCBP, LCPO UMR 5629 CNRS TEAM, IMS UMR 5218 CNRS TEAM — Three main requirements for the industrial development of the polymer solar cells have to be addressed in order to obtain a competitive technology: a fabrication process compatible with common polymer printing technologies, an enhanced life time stability and an improved power conversion efficiency (*PCE*). The active layer nano-structure in bulk heterojunction organic solar cells plays a key role on the properties of charge transfer, transport and consequently on the *PCE*. Ideally a bi-continuous network of donor-acceptor domains with a length scale comparable to the exciton diffusion length is required. To obtain an optimized nano-structured active layer, an annealing process (thermal and/or solvent) is commonly performed leading to an increase of the photovoltaic performance. Currently, the implementation of common printing technologies for the fabrication of polymer solar cells on a mechanically flexible polymer substrate is impeded by this annealing step. In order to overcome the limitations above a novel approach based on an annealing-free fabrication process will be presented making use of a block copolymer as a nano-structuring agent for the polymer/fullerene derivative blend.

Georges Hadziioannou
University of Bordeaux

Date submitted: 02 Nov 2011 Electronic form version 1.4