

Organic Solar Cells: Materials and Interfaces

Scott E. Watkins, Mark Bown, Giovanni Fanchini, Katalin Hegedus, Peter Kempinen, Th. Birendra Singh, and Kevin Winzenberg.

CSIRO Molecular and Health Technologies, Ian Wark Laboratory, Clayton South, Vic. 3169, Australia.

E-mail: scott.watkins@csiro.au

Plastic solar cells produced from organic semiconductors offer the potential to deliver efficient solar energy conversion with low-cost fabrication. The challenge is to develop materials which enable both efficient charge separation and charge transport. Well-defined block-copolymers consisting of pendant, organic, conjugated chromophores are advantageous as their energy levels can be tuned relatively easily through a structural engineering approach. In this contribution, we will discuss device and characterisation results for new polymers and polymer building blocks including small molecule analogues. We will also present results on a new family of polycyclic aromatic compounds which show power conversion efficiencies in excess of 2% in bulk heterojunction solar cells. Finally, we will present work on the analysis of energy levels and interfaces by Photo Electron Spectroscopy in Air (PESA).