

Ring fusion and heteroatom effects in low band gap conjugated polymers for OFET applications.

Martin Heeney

Department of Chemistry,

Imperial College London

Exhibition Road, London, SW7 2AZ, UK

The design and optimization of semiconducting polymers for a variety of optoelectronic applications such as field effect transistors and photovoltaic cells relies on the ability to control the polymeric energy levels, principally the HOMO and LUMO levels, as well as the ability of the polymer to pack with good overlap of the delocalized polymer backbones. In this presentation I will discuss our recent work looking at the two main strategies to control these properties, namely changing the chalcogen atom within the polymer backbone and fusing aromatic backbone units together. We report the effects of systematic chemical changes on the thermal, optical and electronic properties of a range of semi crystalline copolymers for transistor applications. We show subtle changes to the backbone chemistry can result in significant changes in polymer crystallinity and electronic performance.