Synthesis of nitrogen/sulfur-rich polyimides and their applications for polymer:nonfullerene solar cells

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For several decades polyimides (PIs) have been widely used in various applications including aerospace industry, military products, foldable smart phones, etc. The reason can be attributable to their high thermal stability and durability. Conventional PIs have been used mainly as an insulator because of their high electrical resistivity and low dielectric constant. In the middle of 1990, semiconducting PIs have been reported by Y. Kim and co-workers and successfully applied for organic light-emitting devices (OLEDs). Very recently, new types of semiconducting PIs have been demonstrated that they could play a crucial role in improving the efficiency of polymer solar cells with an inverted-type device structure. In this presentation, we demonstrate synthesis of brand-new PIs enriched with nitrogen and sulfur atoms and their applications for the inverted-type polymer:nonfullerene solar cells.