Abstract

Conjugated polymers have garnered significant attention in recent years due to their delocalization of electrons that results in semi-conducting or conducting properties, making them valuable materials that have diverse range of applications in electronics, optoelectronics, high efficiency polymer solar cells and energy storage devices. Among these, Benzotriaozle based conjugated polymers have emerged as most promising due to the electron rich nature, extended conjugation and low energy band-gap of Benzotriaozle. The incorporation of Benzotriaozle into the polymer backbone allows for the formation of conjugated system that results in polymers showing electrical conductivity, light absorption and fluorescence. BTA was synthesized by using o-phenylenediamine as a starting reagent. Alkyl group on C-2 of BTAincreases the solubility of polymers. The synthetic process involves the design and fabrication of the conjugated polymers 2-octyl-4,7-di (thiophen-2-yl) Benzotriaozle and 2-octyl-4,7-di (5- bromo-thiophen-2-yl) through various facile and economic synthetic routes i.e., Suzuki-Miyara coupling and Stile coupling. The impact of molecular structure, side-chain modifications, purityand characterization were examined by FTIR, GC-MS, PL analysis and UV-visible spectroscopy.