Optical, electrochemical and photovoltaic properties of new asymmetric organic chromophore

압둘라, 신형식†, 사디아, 나 짐, 피자히라미아, 샤바즈
전북대학교
(hsshin@jbnu.ac.kr†)

In this work, a new asymmetric organic chromophore (RTh-BSe-CF) based on benzoselenadiazole central acceptor building blocks containing 3,5-Bis(trifluoromethyl) benzene as acceptor and alkyl bithiophene as the donor unit was designed and synthesized by suzuki cross-coupling reaction in a cost-effective manner. The presence of terminal alky side chain induced the solubility of the molecule in organic solvent while the addition of 3,5-bis(trifluoromethyl) benzene improved its optical and electrochemical properties due to the strong electron acceptor nature of fluorine-based compounds. The maximum absorption of RTh-BSe-CF thin film appeared at ~337 nm and ~508 nm, representing the absorption of visible region. From cyclic voltammetry (CV), HOMO and LUMO energy levels were estimated as -5.41 eV and 3.39 eV respectively and the optical bandgap was calculated as ~2.02 eV. The promising optical and electrochemical properties support that the synthesized RTh-BSe-CF could be possibly applied as an excellent electrode material for the application in organic electronics.