

Thiazolothiazole-derivative for solution-processed fabrication of small molecule organic photovoltaics

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The energy production from renewable energy sources has been attracting wide attention in scientific and technological areas. The solar power is widely recognized as a future energy resource to fulfil the increasing energy demand. Organic photovoltaics (OPVs) have showed an explosive growth over the last two decades as an alternative to conventional inorganic semiconductors. The organic photovoltaic devices have shown many advantages as definite molecular weight, easy synthesis conversion, relatively low cost synthesis. In this work, novel thiazolothiazole-based organic molecule was synthesized and applied as electron-donor materials for the solution-processed fabrication of organic photovoltaics. The synthesized small molecule exhibited suitable band gap and HOMO/LUMO values of  $-5.33$  eV/ $-3.15$  eV respectively. The fabricated devices obtained  $>3\%$  efficiency with high  $J_{SC}$  of  $\sim 10.56$  mA/cm<sup>2</sup> and  $V_{OC}$  of  $\sim 0.64$  V.