

Thiazolo [5,4-d]thiazole based D1-A-D2 type chromophore for small molecule organic solar cells

모흐드 나집, 아민 사디아, 서형기, 송민우, 박두리, 신형식\*

전북대학교

(hsshin@jbnu.ac.kr\*)

Thiazolo[5,4-d]thiazole containing organic chromophores have received much attention due to the presence of C=N- backbone and fused heterocyclic ring system and shows good electron-accepting tendency with high stability. In the present work, organic chromophore (TPTzR) featuring thiazolo[5,4-d]thiazole core along with triphenylamine (TPA) and terminal alkylated bithiophene was synthesized in a four step synthetic route and utilized in solution-processed small molecule organic solar cells. The alkyl chain induced the solubility and co-planarity and therefore, exhibited self-assembly behavior in different D-A-D or A-D-A type organic chromophores. Herein, the incorporation of TPA donor increased the absorption in the visible region of the solar spectrum. The active layer film morphology of the blend played a decisive role in solution-processed fabrication and affected the performance of the device. The fabricated bulk-heterojunction (BHJ) solar cell device exhibited a good power conversion efficiency of ~2.43 % with high photocurrent density of ~12.05 mA/cm<sup>2</sup>.