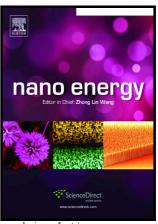
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Acceptor–Donor–Acceptor Type Ionic Molecule Materials for Efficient Perovskite Solar Cells and Organic Solar Cells

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ACCEPTED MANUSCRIPT

Acceptor-Donor-Acceptor Type Ionic Molecule Materials for Efficient

Perovskite Solar Cells and Organic Solar Cells

Ming Cheng^a, Kerttu Aitola^b, Cheng Chen^c, Fuguo Zhang^d, Peng Liu^c, Kári Sveinbjörnsson^b, Yong Hua^a, Lars Kloo^c, Gerrit Boschloo^b, Licheng Sun^{a, d*}

^aDepartment of Chemistry, Organic Chemistry, KTH Royal Institute of Technology, SE-10044 Stockholm, Sweden.

^bUppsala University, Department of Chemistry – Ångström Laboratory, Physical Chemistry, Box 523, 751 20 Uppsala, Sweden

^cDepartment of Chemistry, Applied Physical Chemistry, KTH Royal Institute of Technology, SE-10044 Stockholm, Sweden

^dState Key Laboratory of Fine Chemicals, Institute of Artificial Photosynthesis, DUT–KTH Joint Education and Research Centre on Molecular Devices, Dalian University of Technology (DUT), 116024 Dalian, China

lichengs@kth.se

Abstract

Perovskite solar cells (PSCs) have attracted significant interest and hole transporting materials (HTMs) play important roles in achieving high efficiency. Here, we report additive free ionic type HTMs that are based on 2-ethylhexyloxy substituted benzodithiophene (BDT) core unit. With the ionization of end-capping pyridine units, the hole mobility and conductivity of molecular materials are greatly improved. Applied in PSCs, ionic molecular material M7-TFSI exhibits the highest efficiency of 17.4% in the absence of additives [lithium bis(trifluoromethanesulfonyl)imide and 4-tert-butylpyridine]. The high efficiency is attributed to a deep highest occupied molecular orbital (HOMO) energy level, high hole mobility and high conductivity of M7-TFSI. Moreover, due to the higher hydrophobicity of M7-TFSI, the corresponding PSCs showed better stability than that of Spiro-OMeTAD based ones. In

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