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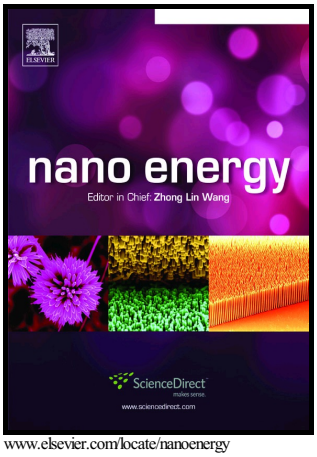

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ABSTRACT

Dopant-free silicon (Si)/organic heterojunction solar cells (HSCs) have drawn much attention due to their immense potential in achieving high power conversion efficiencies (PCEs) with simple device architectures and fabrication procedures. However, unsatisfied rear-contacts severely hinder further improvement in PCEs for these promising HSCs. Exploring effective cathodic interfacial materials with low temperature fabrication to replace conventional diffusion layer shows the extremely importance of technical innovation. Here, poly[4,8-bis(2-ethylhexyloxyl)benzo[1,2-b:4,5-b']dithiophene-2,6-diyl-alt-ethylhexyl -3-fluorothieno[3,4-b]thiophene-2-carboxylate-4,6-diyl] (PTB7)-based narrow