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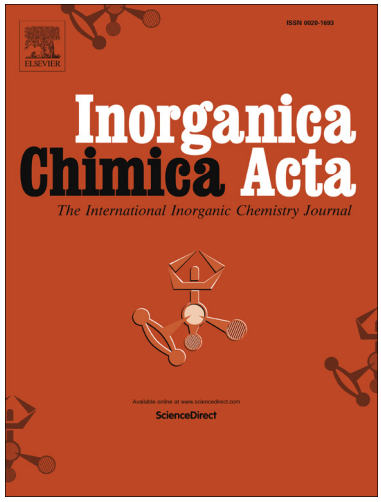

Research paper

Two cyclohexanofullerenes used as electron transport materials in perovskite solar cells

Si-Min Dai, Lin-Long Deng, Mei-Lin Zhang, Wei-Yi Chen, Pei Zhu, Xin Wang, Cong Li, Zhan'ao Tan, Su-Yuan Xie, Rong-Bin Huang, Lan-Sun Zheng

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Two cyclohexanofullerenes used as electron transport materials in perovskite solar cells

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ABSTRACT

Two fullerene C_{60} derivatives, 2-(3-ethoxycarbonylpropyloxy)-(5,8)-dihydronaphthyl-(6,7)-[6,6]- C_{60} (EDNC) and 2-benzyloxy-(5,8)-dihydronaphthyl-(6,7)-[6,6]-C_{60} (BDNC), are introduced into p-i-n type planar heterojunction perovskite solar cells as electron transport materials (ETMs) to investigate electrochemical, charge-transporting, and film-forming properties of fullerene ETMs and the resulting photovoltaic performance in comparison with [6,6]-phenyl-C_{61}-butyric acid methyl ester ($PC_{61}BM$). Due to better surface morphology, the EDNC-involving device shows better performance (12.64%) than that of BDNC-based device (7.36%) despite of their similar LUMO energy level, electron mobility, optical properties, and electrochemical properties. Higher power

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