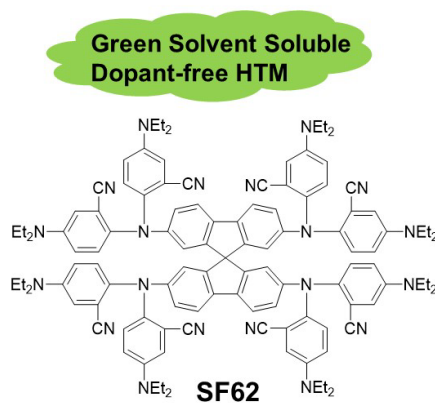
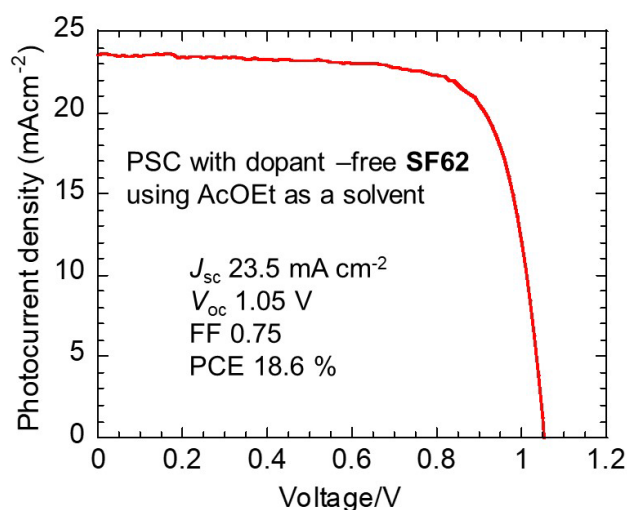


Green-Solvent-Soluble, Highly Efficient Dopant-Free Hole-Transporting Material for Perovskite Solar Cells

(¹National Institute of Advanced Industrial Science and Technology (AIST), ²Nippon Fine Chemical Co., Ltd.) ○Nobuko Onozawa-Komatsuzaki,¹ Daisuke Tsuchiya,² Shinichi Inoue,² Atsushi Kogo,¹ Toshiya Ueno,² Takuro N. Murakami¹

Keywords: Perovskite solar cell; hole-transporting material; dopant free; green solvent; green solvent

At present, dopant-free hole-transporting materials (HTMs) have been largely explored to improve the performance and stability of perovskite solar cells (PSCs), and significant progresses have been made. In current reports, halogenated solvents (e.g., chlorobenzene and chloroform) are commonly used for HTMs in PSCs since there are very few solvents for HTMs in PSCs that do not damage the perovskite layer; however, their use should be avoided as they are known to be hazardous to the environment. Herein, we synthesized a nonhalogenated-solvent-soluble, dopant-free HTM, **SF62**.¹ When depositing HTMs for PSCs, **SF62** could be dissolved with a nonhalogenated and green solvent, ethyl acetate (AcOEt). It is one of the most common organic solvents and is known to have a low environmental impact. Non-doped-**SF62**-based PSCs exhibited higher power-conversion efficiency (18.6%) than doped 2,2',7,7'-tetrakis(*N,N*-di-*p*-methoxyphenylamino)-9,9'-spirobifluorene (**Spiro-OMeTAD**)-based ones (18.3%), with enhanced stability.



1) N. Onozawa-Komatsuzaki, D. Tsuchiya, S. Inoue, A. Kogo, T. Ueno, T. N. Murakami, *Appl. Phys. Express* **2023**, *16*, 0165202.