

How solar energy stuffs fluorine into containers





Overview

Does fluorination improve photoelectric properties of organic solar cells?

Introducing two fluorine atoms enhances hole mobility and improves JSC. The fluorination in organic solar cells (OSCs) impacts the photoelectric properties of conjugated polymers. Here, two benzo [1,2-c:4,5-c'] dithiophene-4,8-dione (T1) based donor polymers with different numbers of fluorine substitutions (F1 and F2) have been investigated.

How do solar cells generate photocurrent?

According to the working principle of solar cells, photocurrent generation should go through those processes. (Guldi and Prato, 2000) Firstly, the active layer absorbs photons and generates excitons. Secondly, the excitons diffuse to the donor-acceptor interface, where they separate to form free charges.

How does fluorination affect optoelectronic properties?

(Zou et al., 2022, Chen et al., 2021) The strong electronegativity of the fluorine element may reduce the HOMO energy level of the molecule, which in turn affects the open-circuit voltage (VOC); the fluorination effect has a significant impact on the optoelectronic properties of the copolymer.

Do fluorine atoms affect benzene bond length?

It can be found that F1 and F2 were very close in bond length, indicating that the introduction of two fluorine atoms or four fluorine atoms to the benzene ring had a similar negligible effect on the bond length connecting the parts of the molecule.



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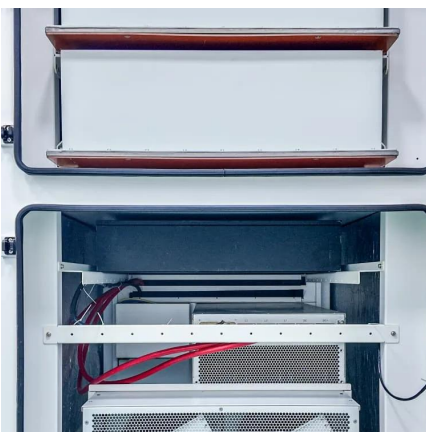


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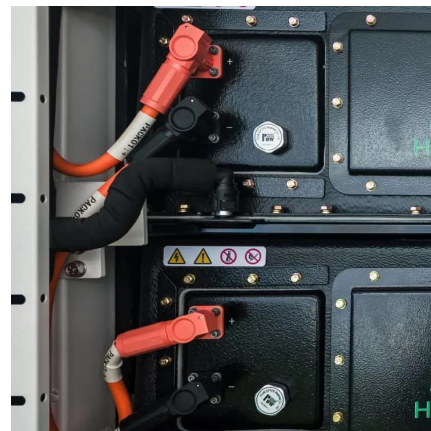
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Conclusion The trifluoromethyl group's triumph in PBZ-m-CF3 exemplifies molecular design's power in renewable energy. By strategically placing fluorine atoms, scientists transformed a ...



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