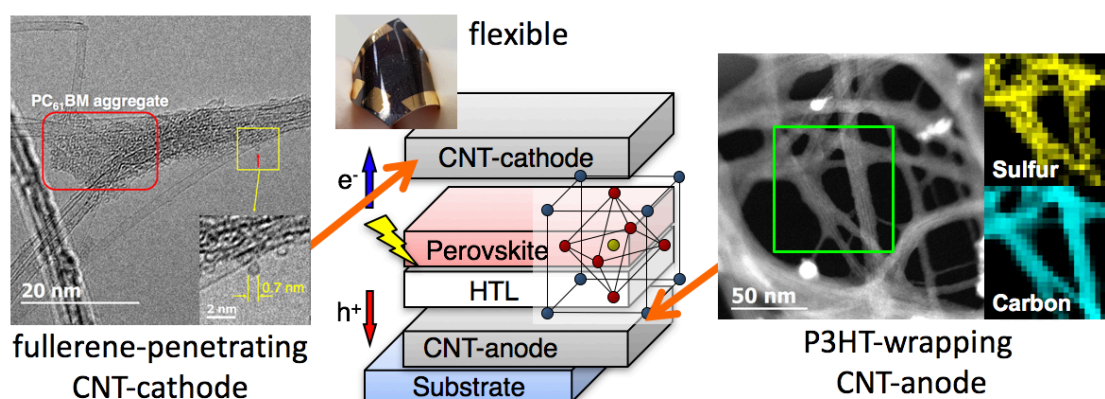


Use of Carbon Nanotubes in Organic and Perovskite Solar Cells

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Carbon nanotubes (CNTs) have excellent charge carrier transport property and facilitates high flexibility of organic solar cells devices. In order to realize the use of CNTs in solar cells, we need to consider quality and electronic property of CNTs. We employ CNT transparent films made from aerosol CNTs which can be produced with floating iron catalysts prepared by thermal deposition of sublimated ferrocene. To obtain high electronic property of CNTs, we investigated Brønsted acid, Lewis acid, and electrophilic fullerenes for electronics application. We report CNTs-electrode-based flexible organic and perovskite solar cells. With replacing metal or metal oxide electrodes by CNT transparent electrodes, rare or expensive metal-free, highly flexible, potentially low cost, low hysteresis solar cells are realized. CNT electrodes can usually become hole-collecting electrode with acid doping, while we also developed electron-collecting CNT electrodes with penetration of fullerene derivatives into CNTs spatial networks. Both CNT cathode and anode electrodes can also be possible to be fabricated by fully solution process without vacuum deposition.



References

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