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DRIVING FORCE OF PUSH-PULL MOLECULES IN PHOTOSYSTEM APPLICATION

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Building artificial photosystems of comparable complexity to nature ones with similar function is a big challenge for scientists. It is important to transfer charge carrier efficiently in the system. Here I will present how the driving force of push-pull molecules worked in our photosystem work. In traditional dye sensitized solar cells (DSSC), we used dipyranylidene electron donors as a push part and cyanoacetic acid electron acceptor as a pull part in the molecular structure. The driving force can be tuned through introducing halogen functional group in the para position of phenyl group in the donating part. In originally developed ordered/oriented self-organizing surface-initiated polymerization (SOSIP) photosystem, we used templated stack exchange (TSE) strategy to introduce fullerene acceptors. The different lowest unoccupied molecular orbitals (LUMO) energy level of fullerenes was obtained by synthesizing

varied multi-adduction structures, which lead to different driving forces during the charge transfer. Finally, dipolar amino-perylenemonoimides and amino-naphthalimides are used in SOSIP-TSE photosystem to further investigate the influence of parallel dipoles or push-pull direction to photocurrent generation in the system.

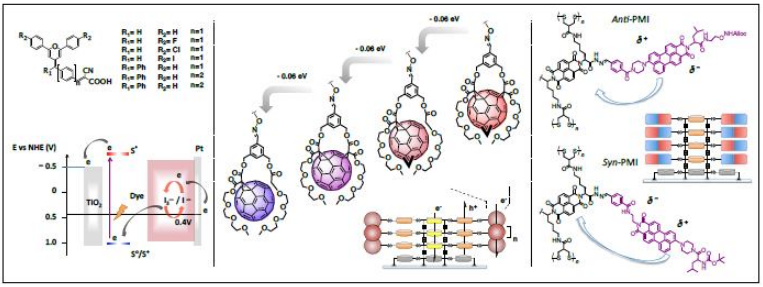

Figure 1: Push-pull molecular structure and their photosystem application

References

1. Altan Bolag, Jun-ichi Nishida, Kohjiro Hara, Yoshiro Yamashita. *Organic Electronics*,
2012, 13, 425-431.

2. Altan Bolag, Javier López-Andarias, Santiago Lascano, Saeideh Soleimanpour, Carmen
Atienza, Naomi Sakai, Nazario Martín, Stefan Matile. *Angew. Chem. Int. Ed.* 2014, 53,
4890-4895.

3. Altan Bolag, Naomi Sakai, Stefan Matile, *Chem. Eur. J.* 2016, in press.