



Large Pore Donor-Acceptor Covalent Organic Frameworks and their Charge Transfer and Separation Events

Shangbin Jin, Atsushi Nagai, and Donglin Jiang*

Institute for Molecular Science, Myodaiji, Okazaki 444-8787, Japan

e-mail address: jin@ims.ac.jp

We have previously reported the construction of the donor-acceptor covalent organic frameworks (D-A COFs) with donor and acceptor building blocks. In the D-A COF, the donor and acceptor units are precisely organized into highly ordered segregated columns, which allows the transport of the hole and electron respectively.¹ Recently, we also reported another D-A COF for the photoenergy conversion and revealed the charge dynamics in the framework.² These results indicate the highly potential application of D-A COFs for the optoelectric usage.

Here we report two donor-acceptor COFs that with large pore aperture of 5.3 nm (Figure 1). Nitrogen sorption measurements revealed the highly porosity. Powder X-ray diffraction showed that the COFs are highly crystalline. Time resolved spectroscopies were used to probe the charge transfer and separation events of the large pore D-A COFs.

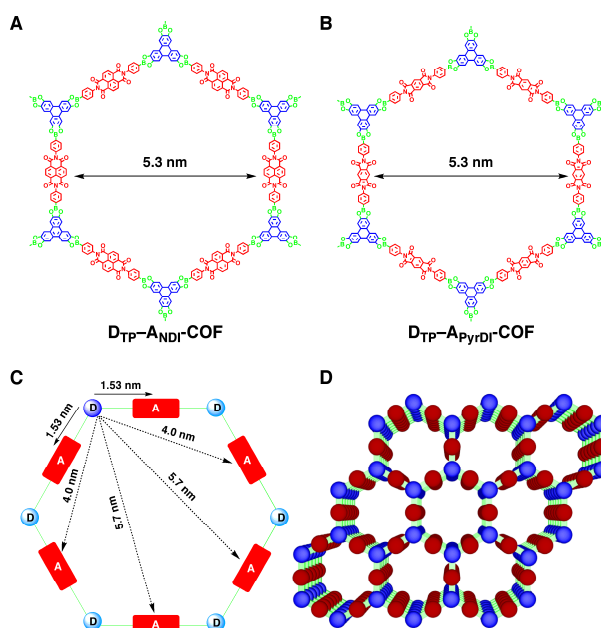


Figure 1 Schematic representation of structures of (A) DTP-ANDI-COF and (B) DTP-APyrDI-COF. Dotted lines at periphery indicate extended structure. (C) Center-to-center distances from a donor to acceptors in the COF. (D) A top view of a 3×3 porous framework

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