Supplementary Information

Selective supramolecular assembly of multifunctional ligands on a Cu(111) surface: metallacycles, propeller trimers and linear chains

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Scanning tunneling spectra on metallacycle

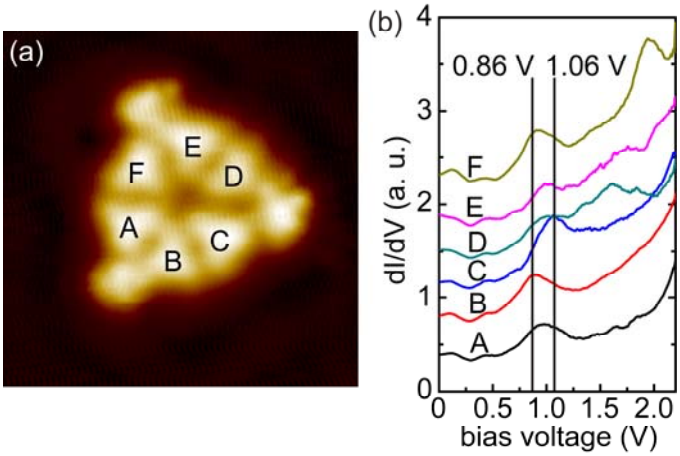

Figure S1 (a) (8 nm × 8 nm, -0.2 V, 0.5 nA) High-resolution STM image of a triangle metallacycle formed by 3 *cis*-BTP-TPE molecules through coordination with Cu adatoms. (b) Scanning tunneling spectra (*dI*/*dV* spectra) measured at *tpy* groups in the triangle metallacycle as marked by A~F in (a). The solid lines indicate the range of the electronic state.

We have conducted scanning tunneling spectroscopy measurements on the terpyridine (*tpy*) groups in the metallacycle shown in Fig. S1(a). Each of the six *tpy* groups has an electronic state in the range of 0.86 V to 1.06 V. Based on our previous work,[1, 2] on Cu(111) surface, non-coordinated *tpy* group has an electronic state at 1.3 V; the *tpy* group coordinated with Cu atom has a down-shifted electronic state at 0.9 V~ 1.0 V. Thus we believe the *cis*-BTP-TPE molecules in the metallacycle are connected by Cu-coordination.

1. W. H. Wang, Y. N. Hong, X. Q. Shi, C. Minot, M. A. Van Hove, B. Z. Tang and N. Lin, *J. Phys. Chem. Lett.*, 2010, **1**, 2295-2298.
2. W. H. Wang, X. Q. Shi, C. S. Lin, R. Q. Zhang, C. Minot, M. A. Van Hove, Y. N. Hong, B. Z. Tang and N. Lin, *Phys. Rev. Lett.*, 2010, **105**, 126801.