Electronic Supplementary Material (ESI) for ChemComm.

Supplementary Information

Phase separation and selective guest-host binding in multi-component supramolecular self-assembly on Au(111)

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We firs deposited BTB on the Au(111) surface to form BTB networks. Then we deposited TMA onto this sample held at around 200 K. As shown here, TMA molecules are trapped in the BTB network pores. TMA dimers, trimers, teramers and pentamers are found, as well as some hexamers as defect areas. After annealed to room temperature, TMA and BTB undergo phase separation to form mono-component networks.

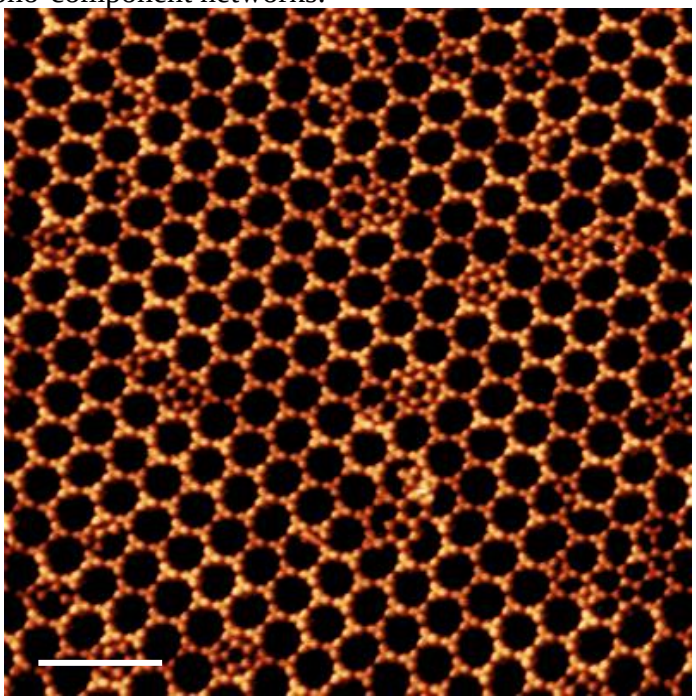

Fig. S1 TMA deposited on the pre-formed BTB network at 200 K. Scale bar: 5 nm. The scanning parameter is -1 V, 0.1 nA.

We sequentially deposited TMA and BTB on Au(111) surface and annealed the sample to 100°C. Hetero-molecular linkage only occurs at the boundary of the two mono-component structures.

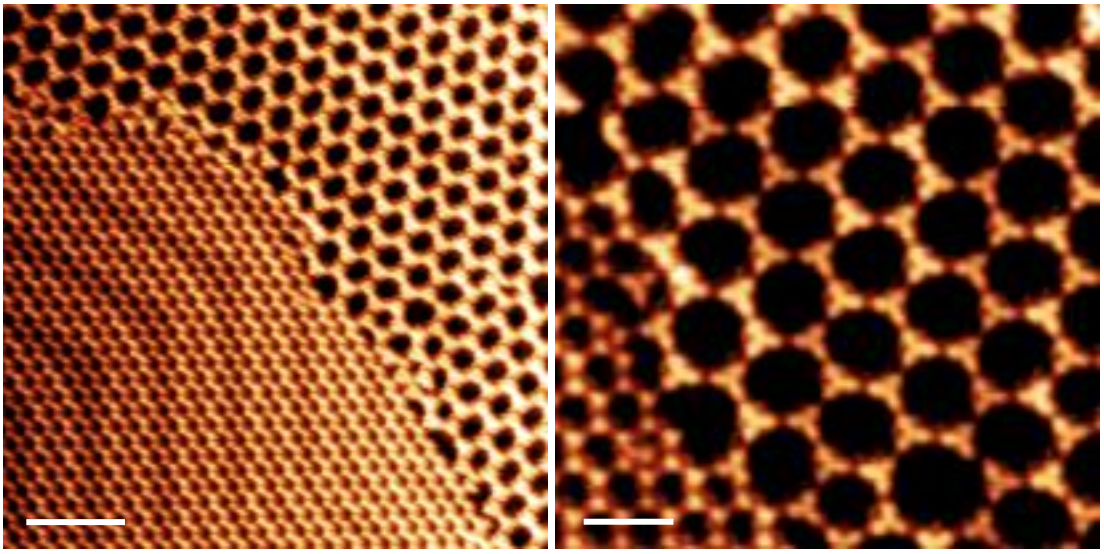

Fig. S2 STM images showing the boundary of the two mono-component networks. Scale bars: (a) 6nm, (b) 3 nm. The scanning parameters are -1 V, 0.1 nA.

We evaporated COR onto the co-existing TMA and BTB networks and annealed the sample to 100°C. The COR molecules are only trapped in the TMA pores while all BTB pores are empty. Apparently, COR molecules only bind with the TMA pores, indicating that a highly selective host-guest binding is at work.

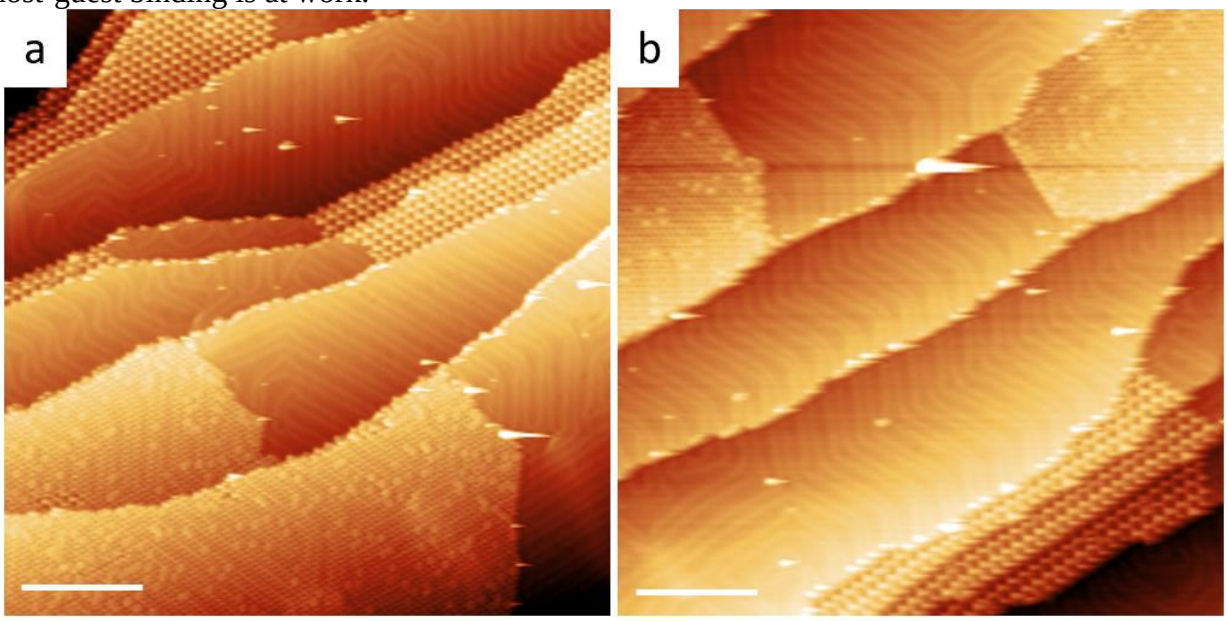

Fig. S3 Additional overview images of COR deposited on TMA + BTB after annealing at 100°C. Scale bars: (a) 20 nm, (b) 16 nm. The scanning parameters are -1 V, 0.1 nA.