

Supplementary Information

## **O<sub>2</sub>, NO<sub>2</sub> and NH<sub>3</sub> Coordination to Co-porphyrin Studied Using Scanning Tunneling Microscopy on Au(111)**

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### FIGURE CAPTIONS

**Figure S1.** (a) A typical STM image of mixed molecular islands on the Au(111) surface after deposition of CoTPP and H<sub>2</sub>TPP molecules. (b) A high-resolution STM image for a mixed molecular island. The two representative molecules of CoTPP and H<sub>2</sub>TPP are denoted by blue and green marks, respectively. The sizes of STM images: (a) 96 × 96 nm<sup>2</sup> and (b) 7.4 × 7.4 nm<sup>2</sup>. Tunneling current:  $I_T = 0.1$  nA. Sample voltage: (a)  $V_S = -0.3$  V, (b)  $V_S = -0.2$  V.

**Figure S2.** High resolution STM images of (a) O<sub>2</sub>-CoTPP and (c) NO<sub>2</sub>-CoTPP. Line profiles along with the blue, red, green and violet lines depicted in (a) and (c), respectively. Profiles are vertically shifted for clarity. Tunneling current:  $I_T = 0.1$  nA. Sample voltage: (a)  $V_S = -0.3$  V, (b)  $V_S = -0.2$  V.

**Figure S3.** Simulated constant-current STM images of (a) O<sub>2</sub>-CoTPP and (c) NO<sub>2</sub>-CoTPP. Line profiles along with the blue, red, green and violet lines depicted in (a) and (c), respectively. Profiles are vertically shifted for clarity.

**Figure S1**

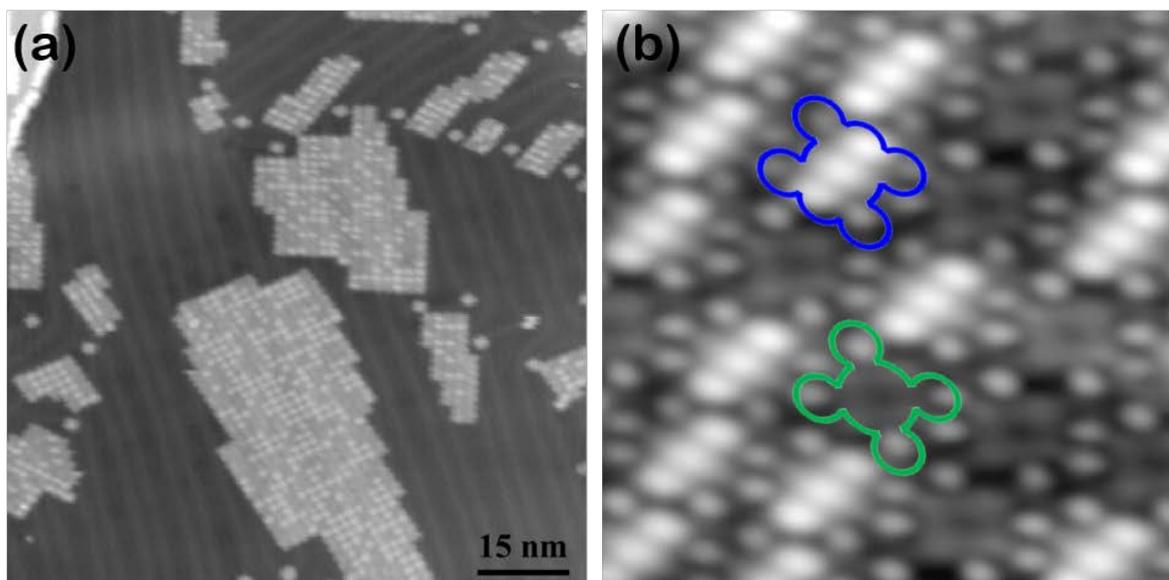


Figure S1. (a) The typical STM image of mixed molecular islands on the Au(111) surface after deposition of CoTPP and H<sub>2</sub>TPP molecules. (b) A high-resolution STM image for a mixed molecular island. The two representative molecules of CoTPP and H<sub>2</sub>TPP are denoted by blue and green marks, respectively. The sizes of STM images: (a)  $96 \times 96 \text{ nm}^2$  and (b)  $7.4 \times 7.4 \text{ nm}^2$ . Tunneling current:  $I_T = 0.1 \text{ nA}$ . Sample voltage: (a)  $V_S = -0.3 \text{ V}$ , (b)  $V_S = -0.2 \text{ V}$ .

Figure S2

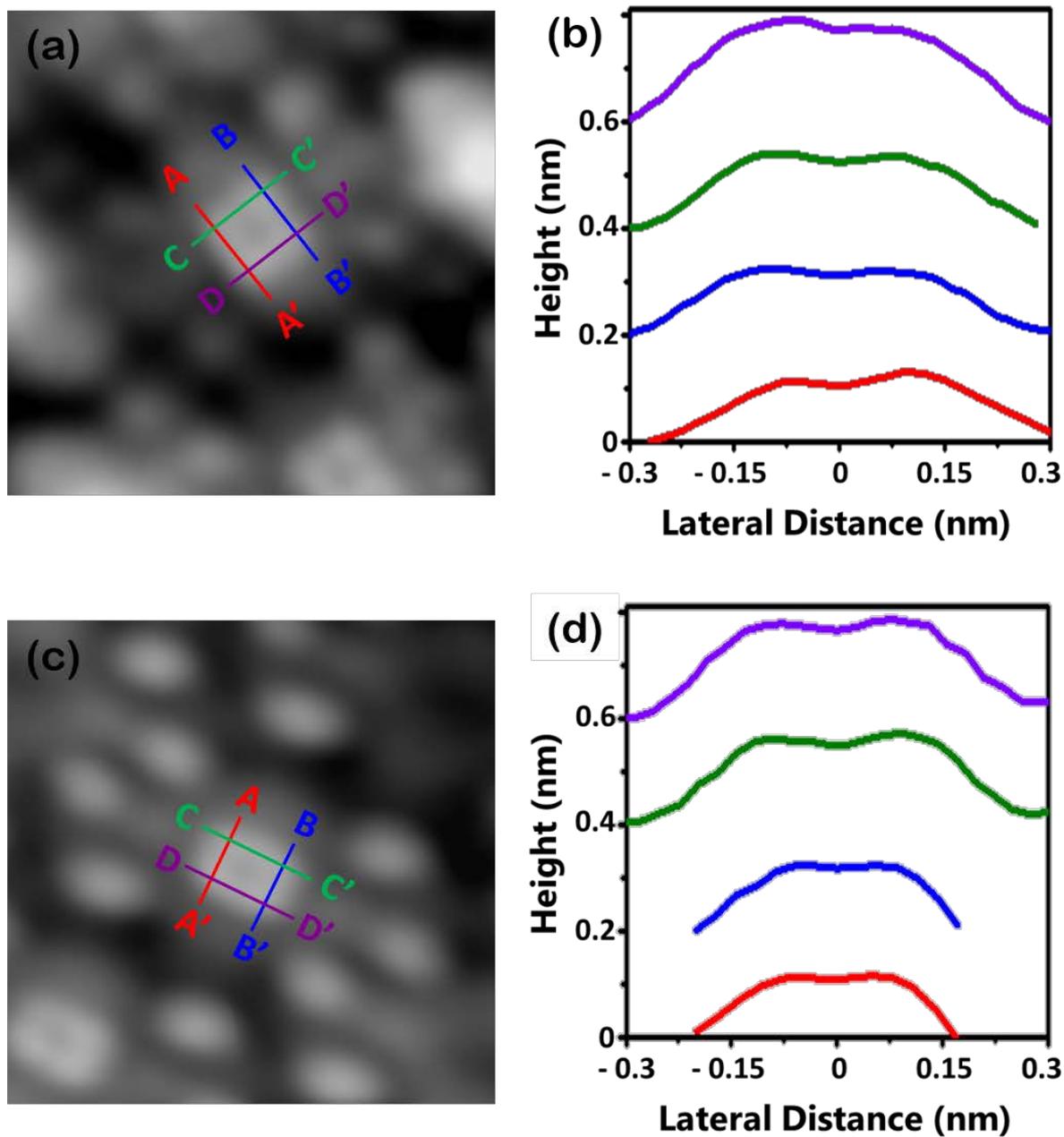


Figure S2. High resolution STM images of (a) O<sub>2</sub>-CoTPP and (c) NO<sub>2</sub>-CoTPP. Line profiles along with the blue, red, green and violet lines depicted in (a) and (c), respectively. Profiles are vertically shifted for clarity. Tunneling current:  $I_T = 0.1$  nA. Sample voltage: (a)  $V_S = -0.3$  V, (b)  $V_S = -0.2$  V.

Figure S3

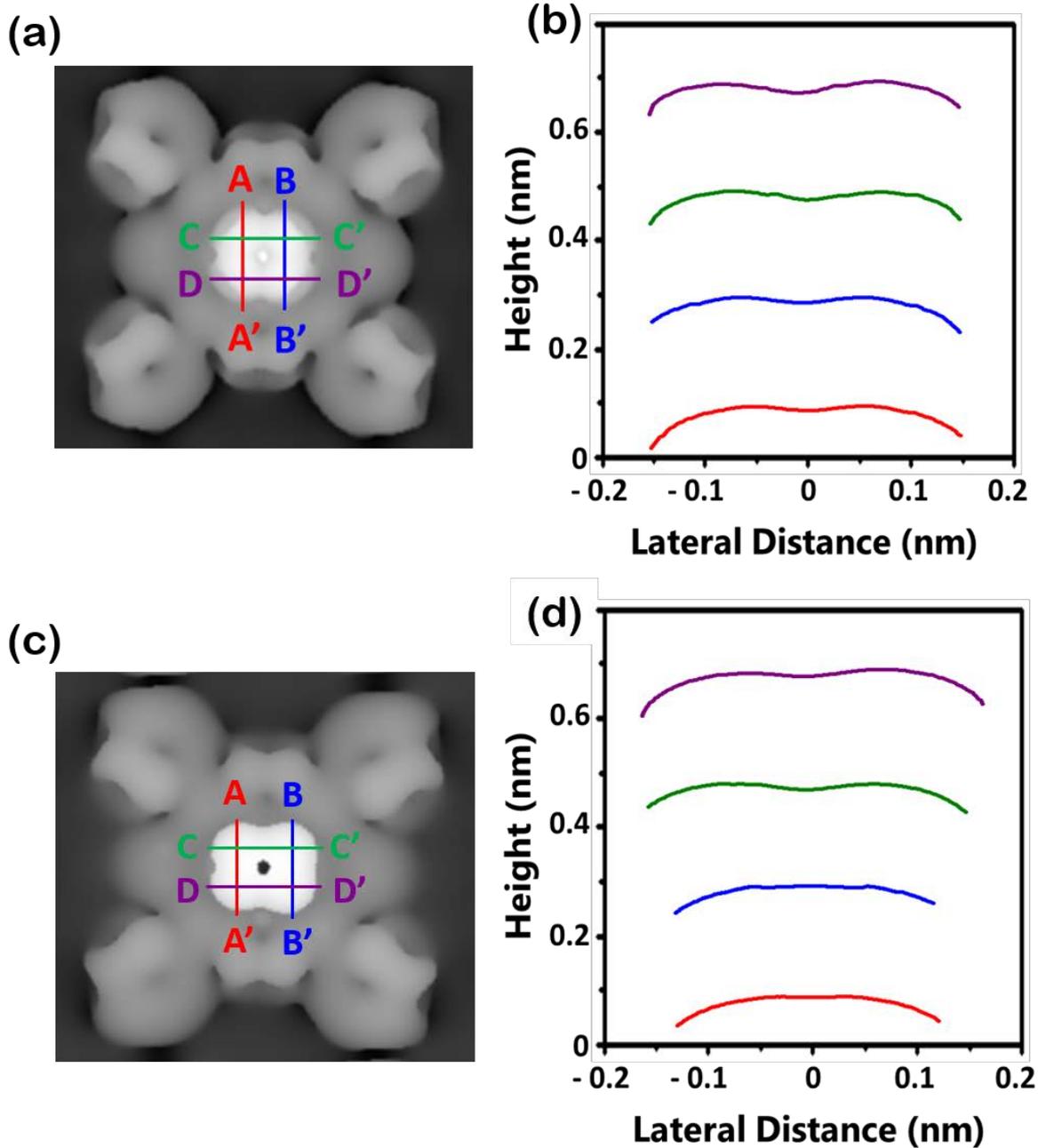


Figure S3. Simulated constant-current STM images of (a)  $O_2$ -CoTPP and (c)  $NO_2$ -CoTPP. Line profiles along with the blue, red, green and violet lines depicted in (a) and (c), respectively. Profiles are vertically shifted for clarity.