# Porphyrin MOF nanosheets used for light-mediated multilevel memristive switching

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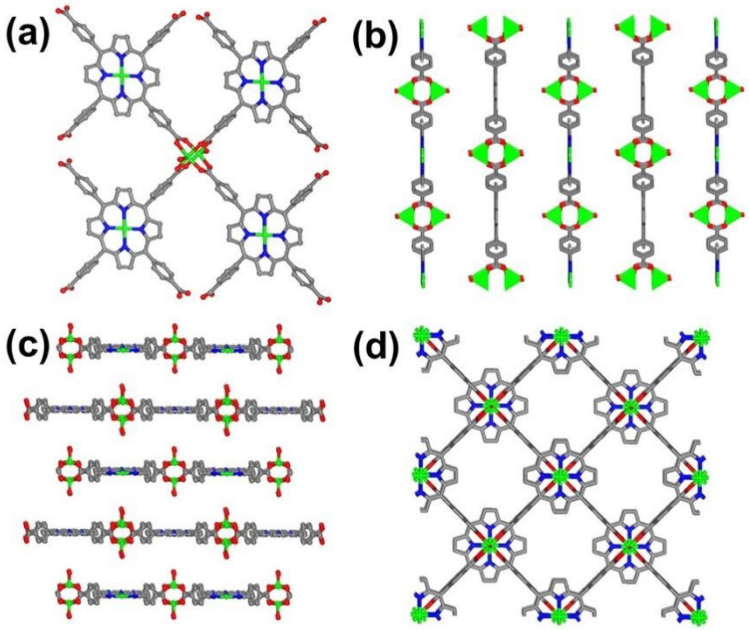


Figure S1. The structures of Zn-TCPP

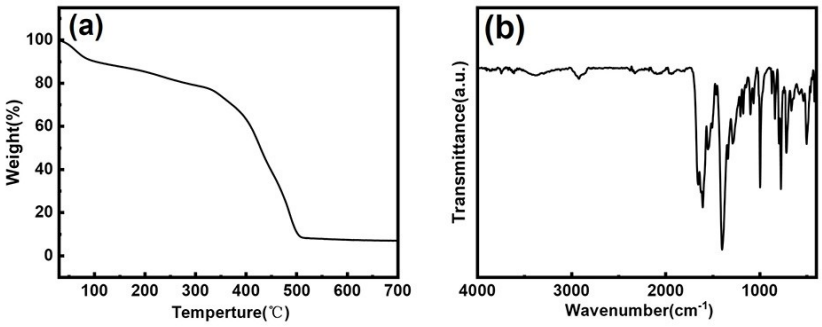


Figure S2. The TG and FTIR curves of Zn-TCPP

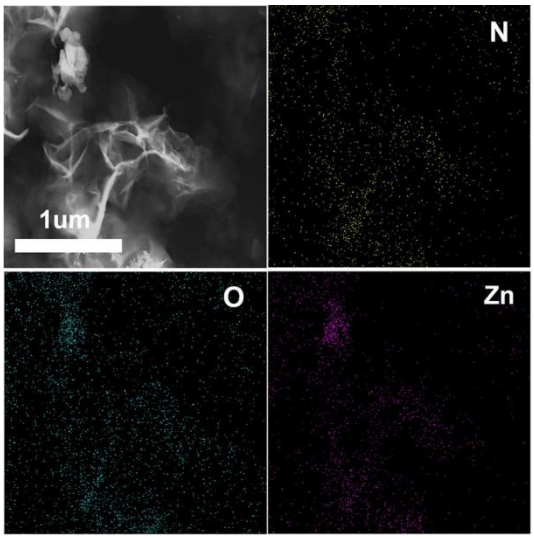


Figure S3. The elemental mapping iamges of Zn-TCPP

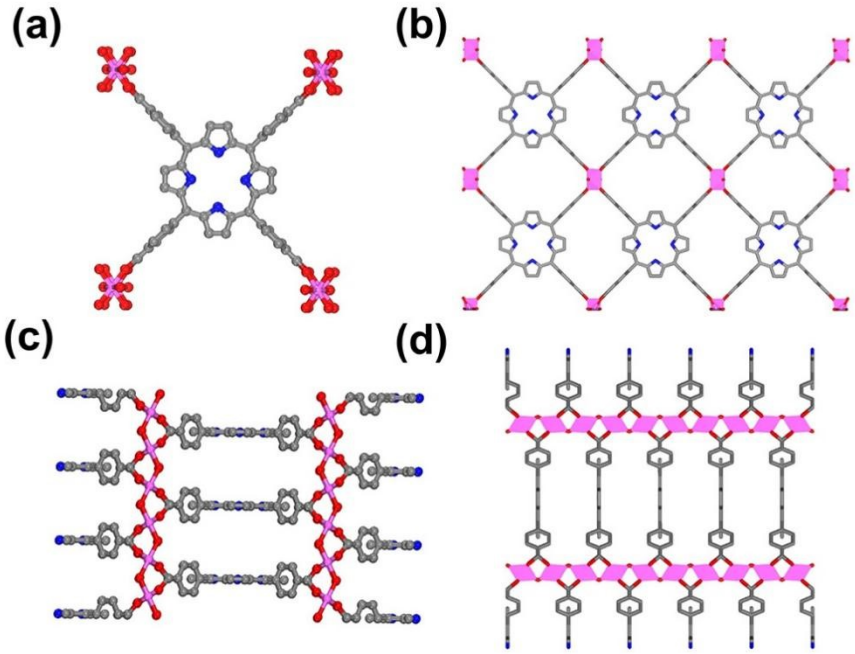


Figure S4. The structures of Al-TCPP

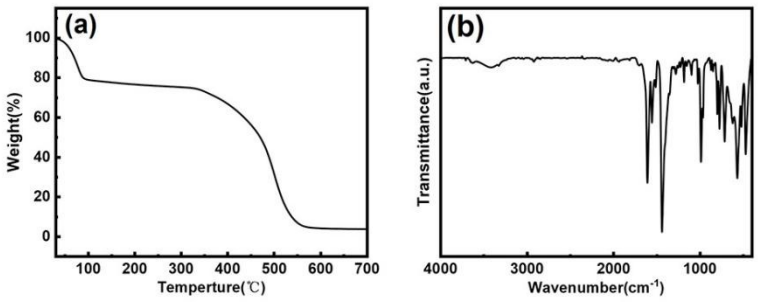


Figure S5. The TG and FTIR curves of Zn-TCPP

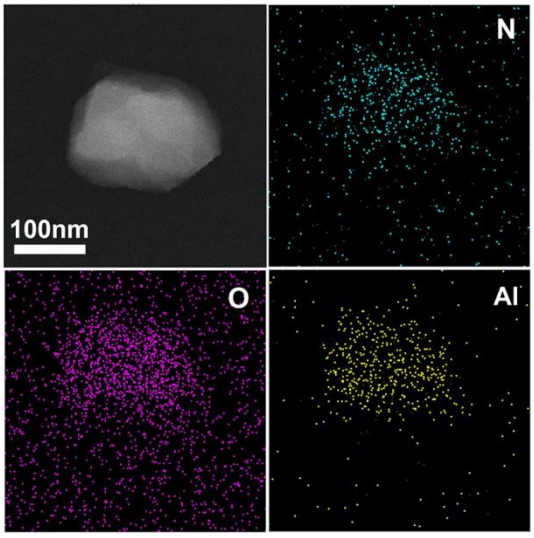


Figure S6. The elemental mapping iamges of Al-TCPP

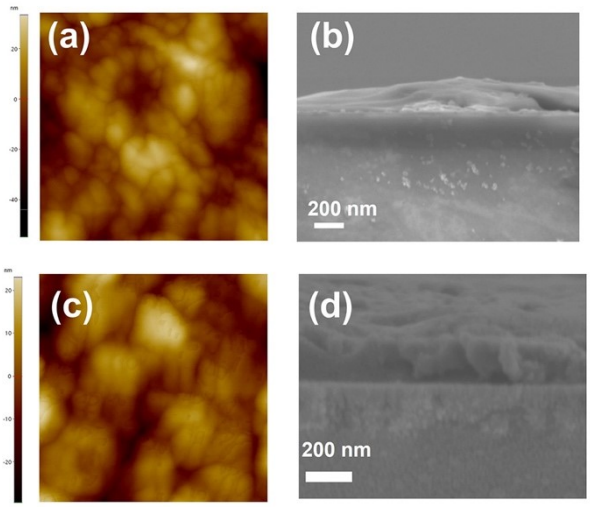


Figure S7. The roughness of the surface and the thickness of Zn-TCPP (a-b) and Al-TCPP (c-d)

**Motto-Schottky plots**

Mott-Schottky plots were obtained from the flat band potential measurements of M-TCPP (M=Zn or Al). Generally, the Lowest Unoccupied Molecular Orbital (LOMO) in many n-type semiconductors is more negative than the flat band potential by 0.1-0.2 eV[1-2]. Herein, we set the voltage differences between the LOMO value and the flat band potential value to be 0.1 eV. Bandgap ($E_g$) is the optical bandgap calculated from the onset of the UV-vis spectra. Highest Occupied Molecular Orbital (HOMO) and LUMO energy levels were calculated from the following equations:

$$E_{HOMO} = E_{LUMO} - E_g.$$

$$E_g = 1240/\lambda_b$$

**Table S1. Band gap and energy band potentials of as-assembled samples**

| Material | Semiconductor type | Bandgap (eV) | Flat band (eV) | LOMO (eV) | HOMO (eV) |
|---|---|---|---|---|---|
| Zn-TCPP | n-type | 1.95 | −0.21 | −0.31 | 1.64 |
| Al-TCPP | | 1.82 | −0.75 | −0.85 | 0.97 |

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1. 2D Metal–Organic Framework Nanosheets with Time-Dependent and Multilevel Memristive Switching. Adv. Funct. Mater., DOI: 10.1002/adfm.201806637
2. Supramolecular Zinc Porphyrin Photocatalyst with Strong Reduction Ability and Robust Built-In Electric Field for Highly Efficient Hydrogen Production. Adv. Energy Mater., DOI: 10.1002/aenm.202101392