# Electronic Supplementary Information (ESI)

# Ozonolysis–oxidation-driven top-down strategy for target preparation of ultrathin 2D metal–organic framework monolayers

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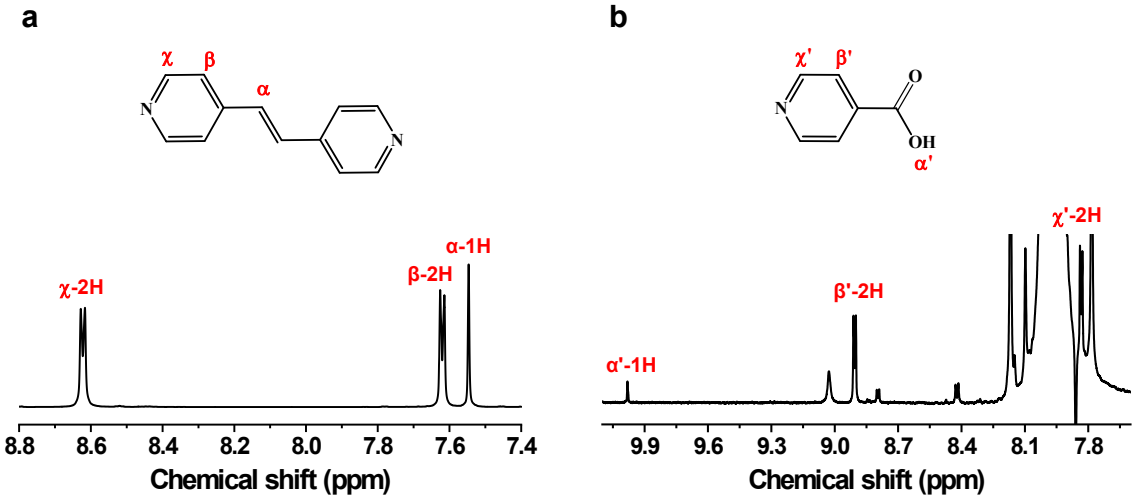


**Fig. S1** (a) The $^{1}$H NMR spectra of the trans-1, 2-bis(4pyridyl)ethylene; (b) The $^{1}$H NMR spectra of the trans-1, 2-bis(4pyridyl)ethylene after ozone treatment in DMF at 0 $^{o}$C.

The $^{1}$H nuclear magnetic resonance (NMR) spectroscopy is employed to charaterize the structure of the trans-1, 2-bis(4pyridyl)ethylene before and after ozone treatment. It can be seem from Fig. S2b that the chemical shifts at δ = 10.12 ppm, 8.91 ppm , 8.90 ppm, 7.84 ppm ppm and 7.83ppm, which are consistent with the theoretical $^{1}$H NMR spectra of the isonicotinic acid. These result confirming the breakage of the olefin group in the *trans*-1, 2-bis(4pyridyl)ethylene.

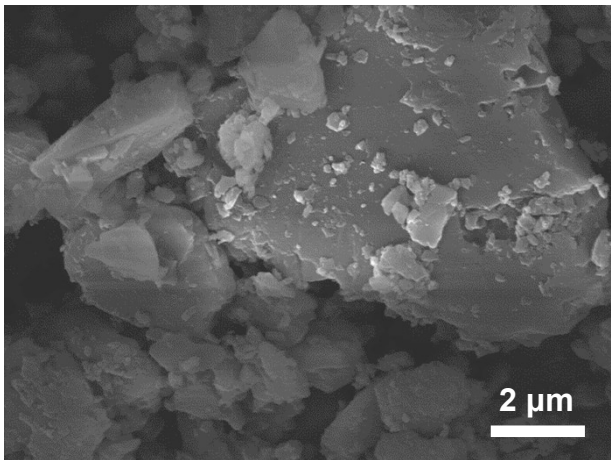


**Fig. S2** SEM image of the 3D pillar-layered Co-MOF precursor.

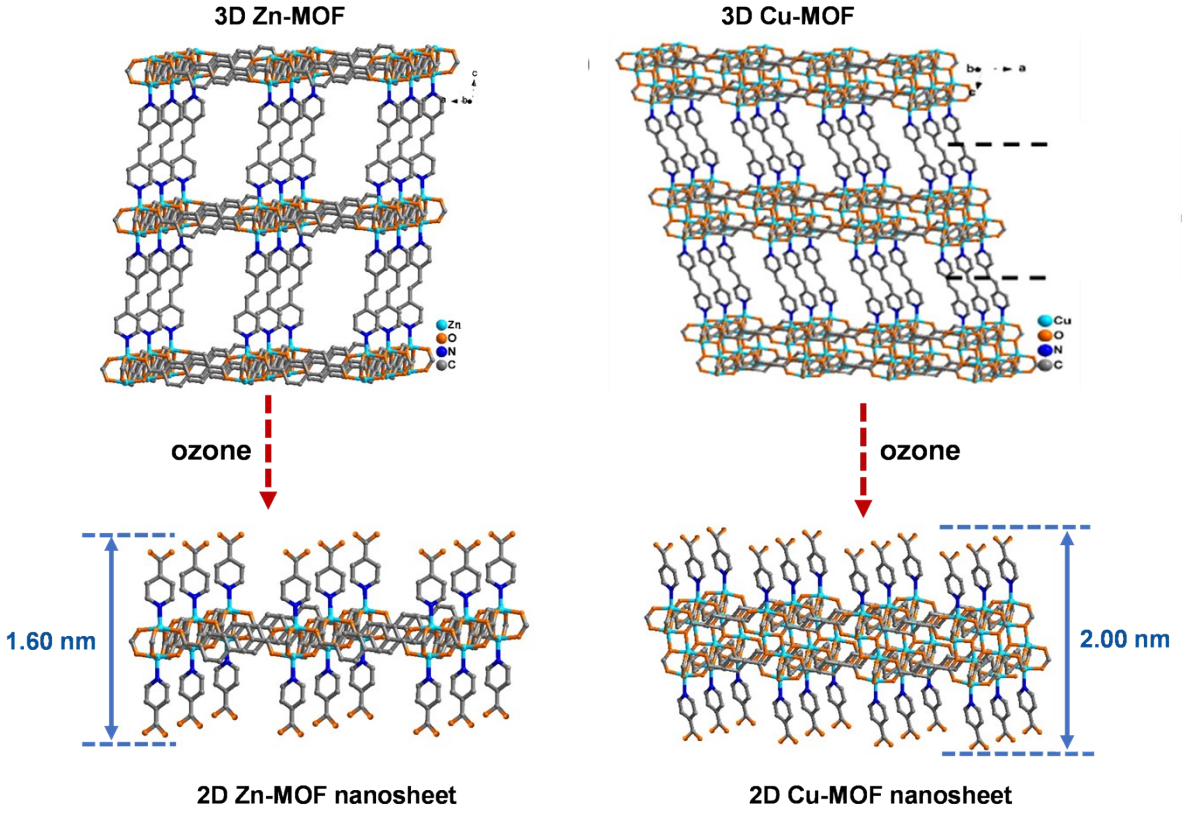


**Fig. S3** The 3D pillar-layered structure of the Zn-MOF and Cu-MOF and the corresponding structure of the 2D Zn-MOF nanosheet and 2D Zn-MOF nanosheet.

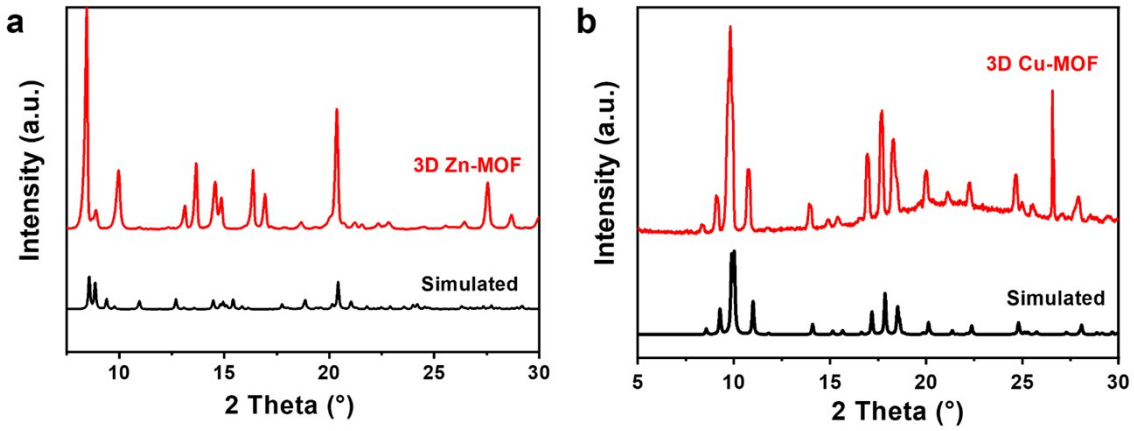


**Fig. S4** The simulated XRD patterns of the 3D Zn-MOF and 3D Cu-MOF

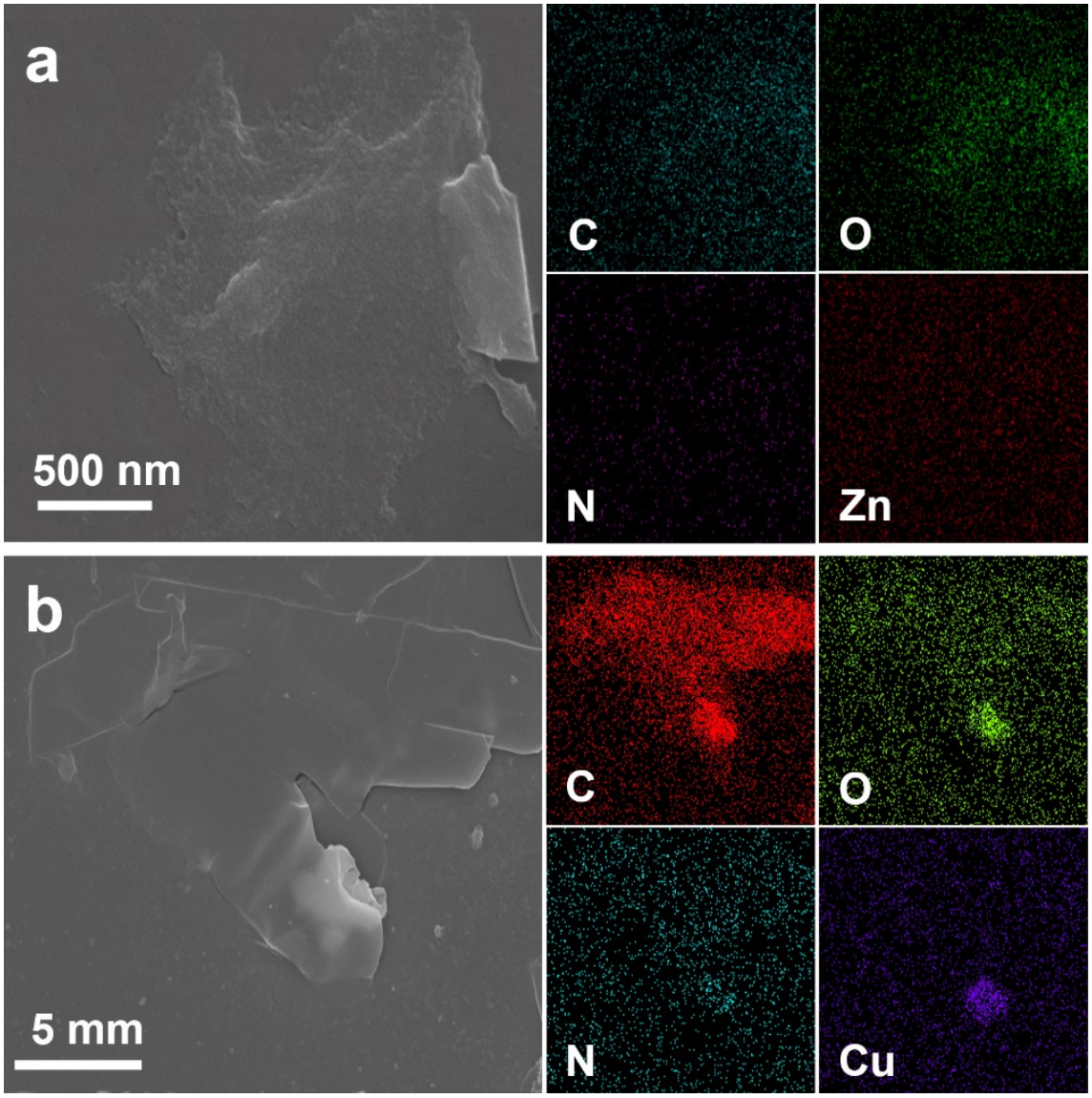


**Fig. S5** (a) SEM images of 2D Zn-MOF and corresponding elemental maps; b) SEM images of 2D Cu-MOF and corresponding elemental maps.

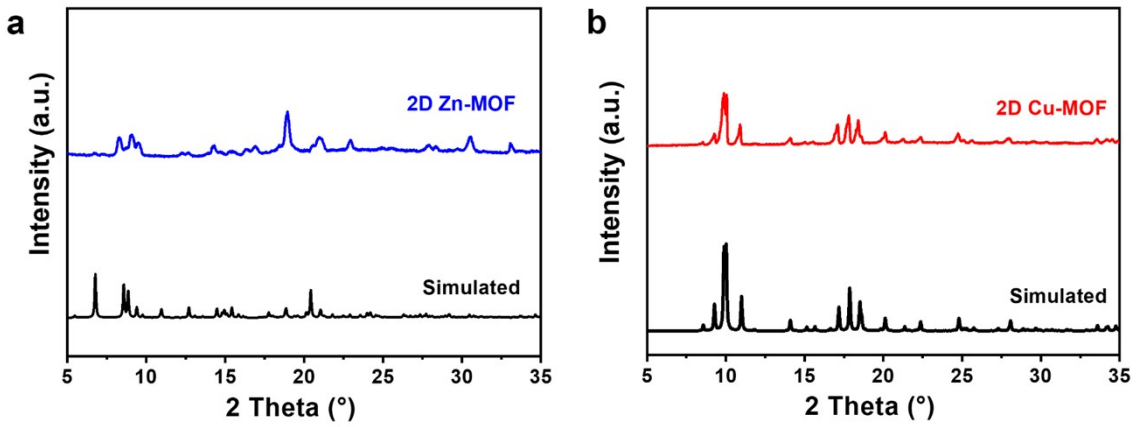


**Fig. S6** The simulated XRD patterns of the 2D Zn-MOF and 2D Cu-MOF.

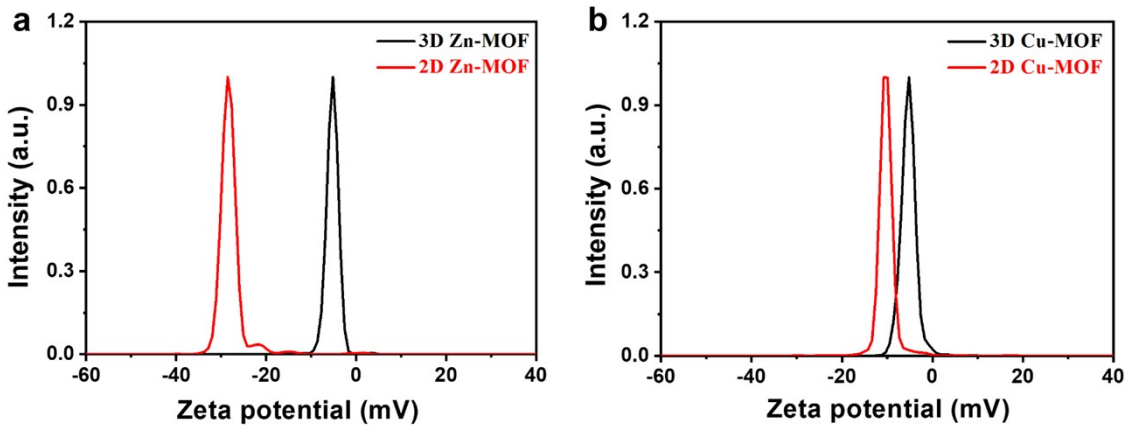


**Fig. S7** Zeta potential of the (a) 3D Zn-MOF precursor, 2D Zn-MOF nanosheets and the (b) 3D Cu-MOF precursor, 2DCu-MOF nanosheet.