Electronic Supplementary Information

Molecular-level superhydrophobic external-surface to improve the stability of metal-organic frameworks

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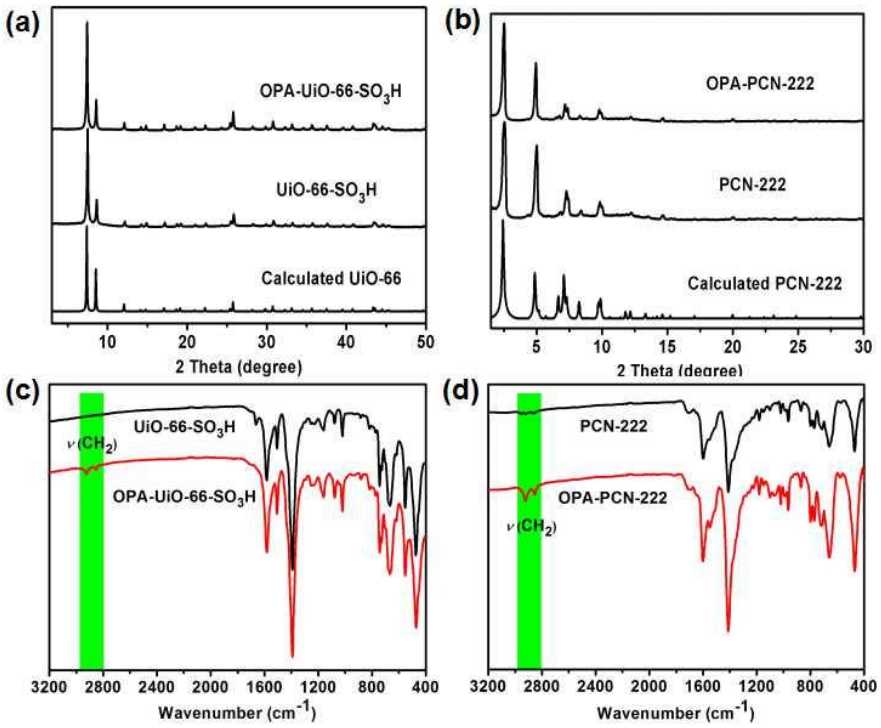

Fig. S1 PXRD patterns and FT-IR spectra of (a,c) UiO-66-SO_3H, (b,d) PCN-222 before and after modification with OPA molecule.

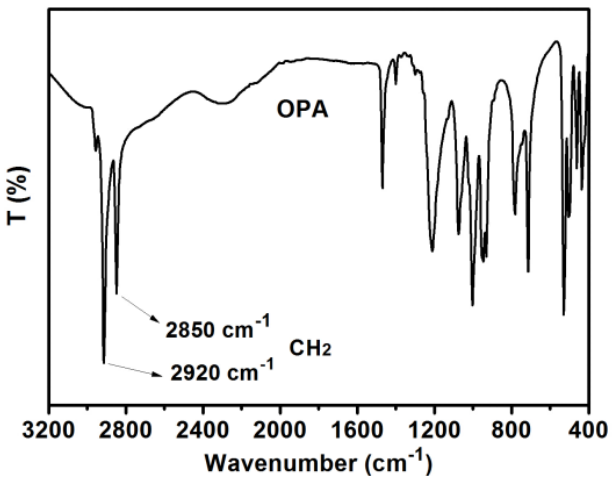

Fig. S2 FT-IR spectrum of OPA molecule.

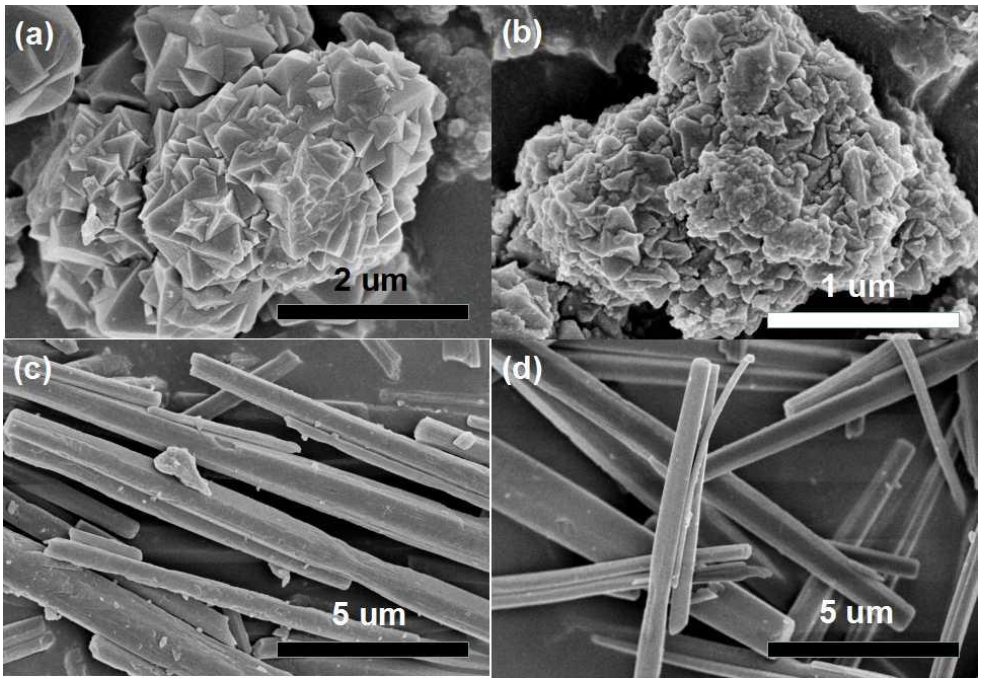

Fig. S3 SEM images of (a) UiO-66-SO_3H, (b) OPA-UiO-66-SO_3H, (c) PCN-222, and (d) OPA-PCN-222

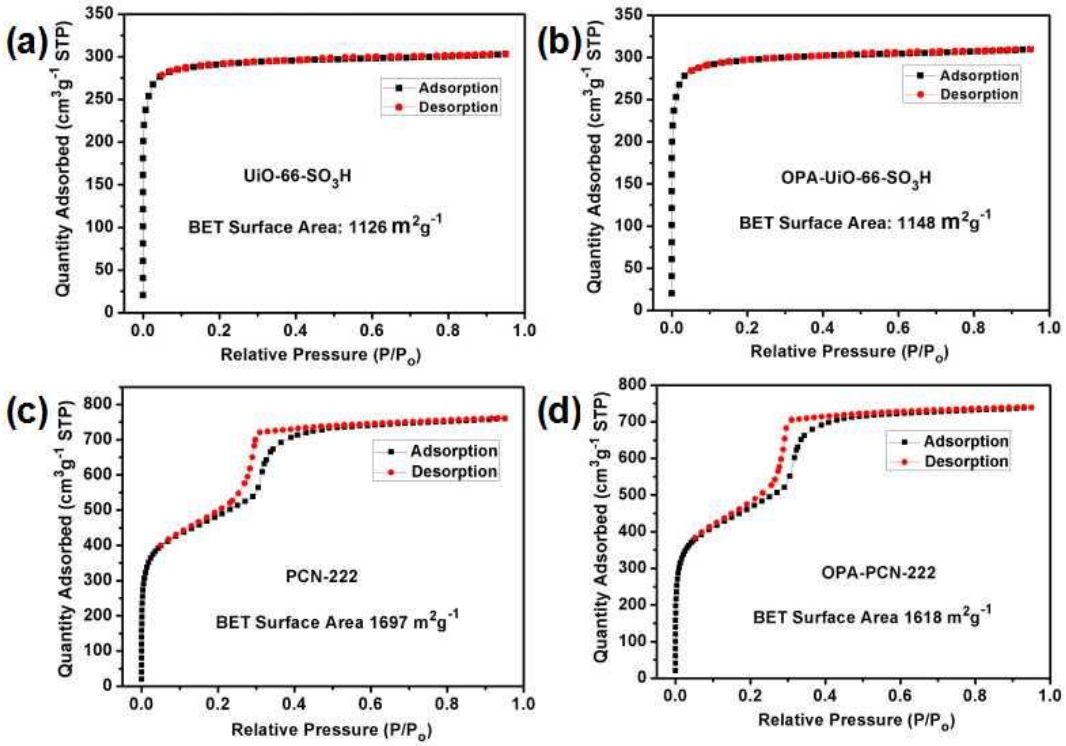

Fig. S4 N_2 sorption isotherms for (a,b) UiO-66-SO_3H, (c,d) PCN-222 before and after OPA modification.

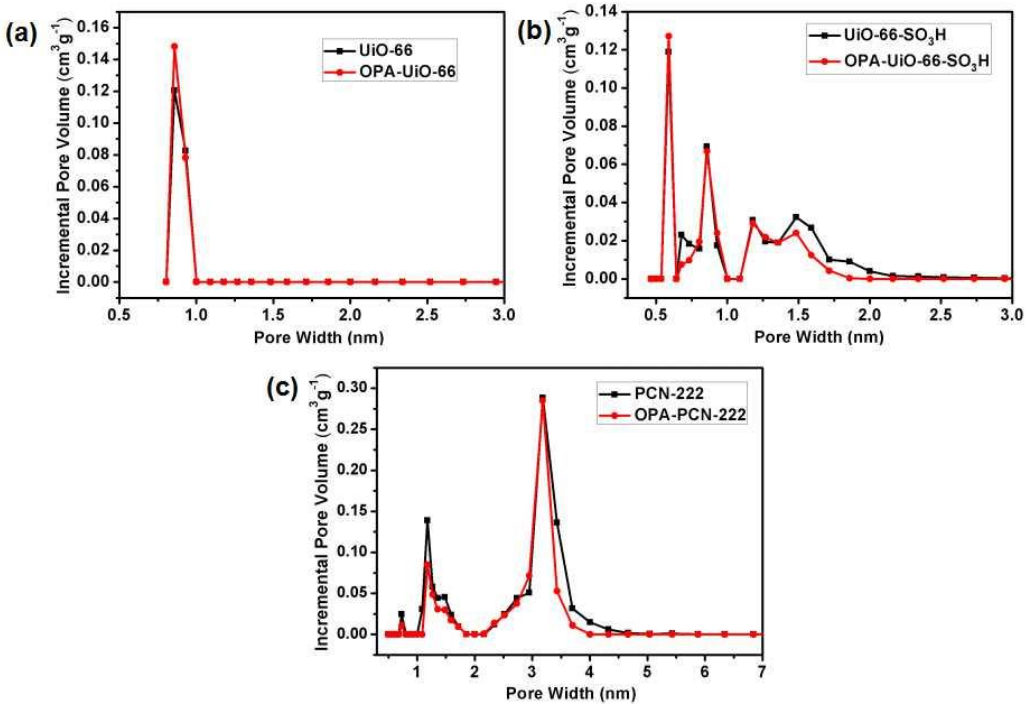

Fig. S5 Pore size distribution for (a) UiO-66, (b) UiO-66-SO_3H, and (c) PCN-222 before and after OPA modification.

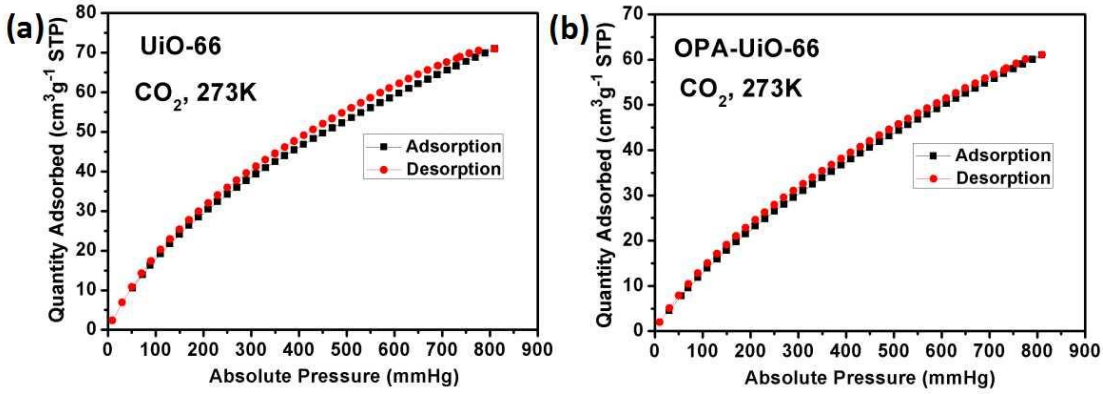

Fig. S6 CO_2 adsorption and desorption isotherms for (a) UiO-66 and (b) OPA-UiO-66 samples at 273K.

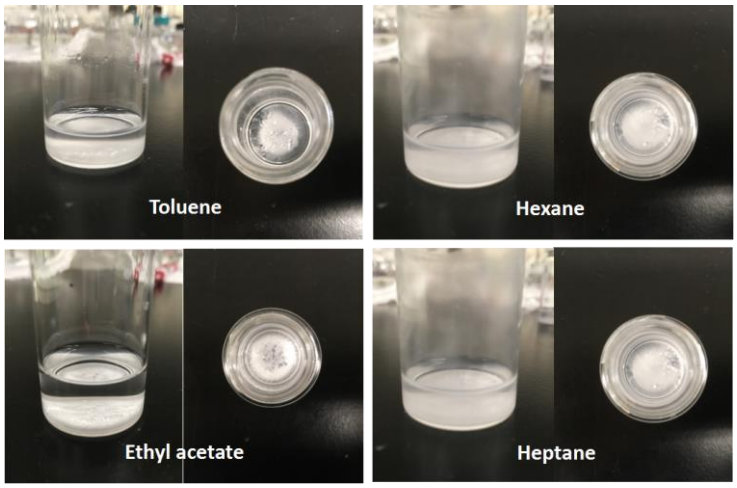

Fig. S7 Photographs of OPA-UiO-66 samples after exposure to different oil solvents.

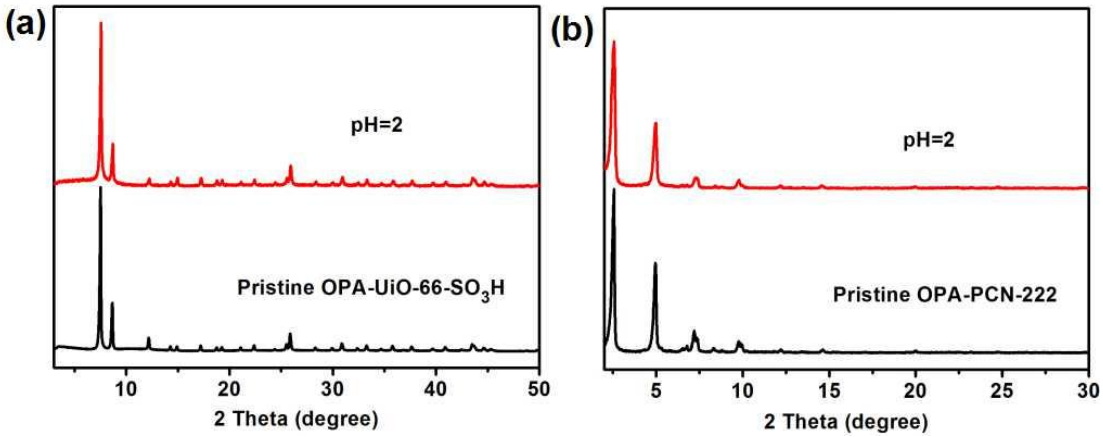

Fig. S8 PXRD patterns of OPA-UiO-66-SO_3H and OPA-PCN-222 sample after exposure to acidic solution for 7 days.

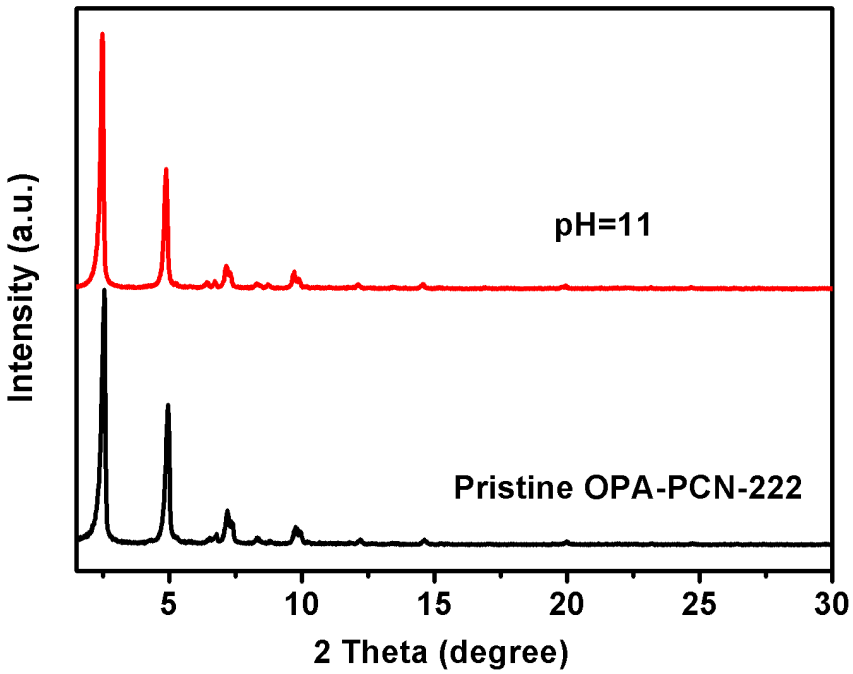

Fig. S9 PXRD patterns of OPA-PCN-222 samples after exposure to basic solutions.

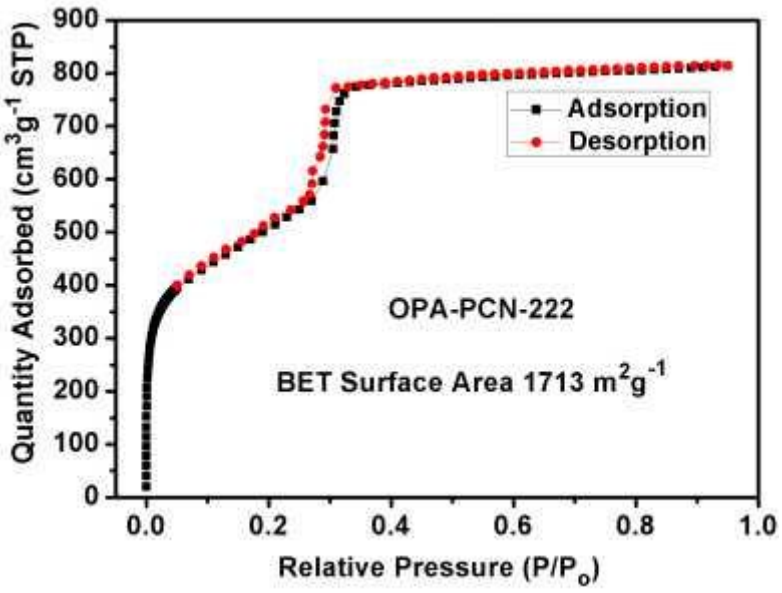

Fig. S10 N_2 sorption isotherms for OPA-PCN-222 after exposure to basic water solutions for 7 days.

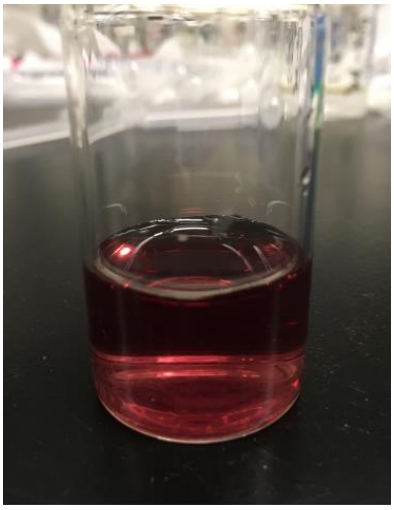

Fig. S11 Digital photograph of PCN-222 upon exposure to basic solution (pH=11).

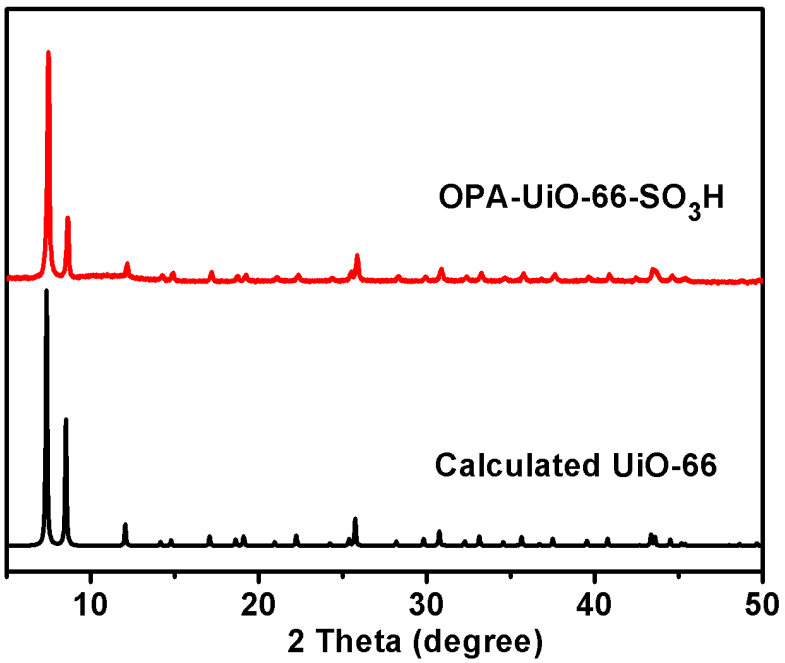

Fig. S12 PXRD patterns of OPA-UiO-66-SO_3H sample after exposure to high ionic solutions for 7 days.

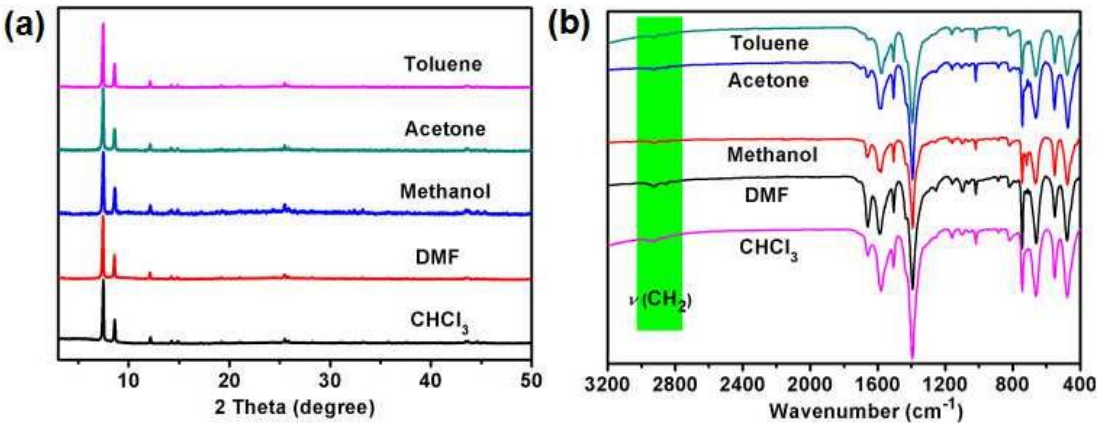

Fig. S13 PXRD patterns and FT-IR spectra of OPA-UiO-66 after absorption of different organic solvents.

Table S1 Water contact angle for OPA-UiO-66 and other hydrophobic MOFs.

Sample	Contact angle	ref
Fluorinated ZIF-90	152.4 °	9
NMOF-1	160-162 °	12
UHMOF-100	176 °	14
SH ZIF-67	146 °	19
UPC-21	145 °	27
Cu_3(NH-AM10-BTC)$_2$	147 °	31
OPA-UiO-66	160 °	This work