

Supporting Information

Hydrophilic carbon monoliths derived from metal-organic frameworks@resorcinol-formaldehyde resin for atmospheric water harvesting

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AWH evaluation:

The adsorbent was dried in a 100 °C vacuum oven for 6 h, and the dried hydrophilic carbon material CuBR1-900-AW was weighed. Then the activated adsorbent was exposed to the environment of 25 °C and 70% RH, which was simulated by saturated salt solution overnight. At the end of the adsorption stage, the mass of the saturated adsorbent increased by 19%.

Install adsorbent in the device and start AWH test under actual sunlight. Two hours later, collect the harvested water and weigh it. The test was carried out from 11:00 to 13:00 on July 10th, 2021. During the experiment, the ambient temperature was 29-31 °C and the solar radiation intensity was about 1100 W·m⁻². After the end of the experiment, the mass change of the adsorbent shows that the desorbed water accounts for 85 wt.% of the absorbed water. The water collected from the condenser for 49 wt.% of the adsorbed water.

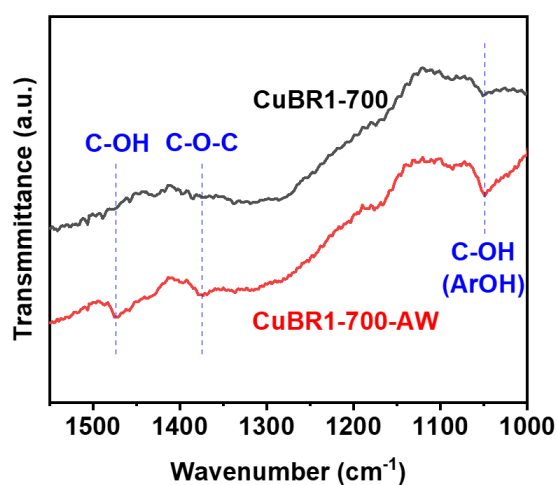


Fig.S1 FTIR patterns of samples.

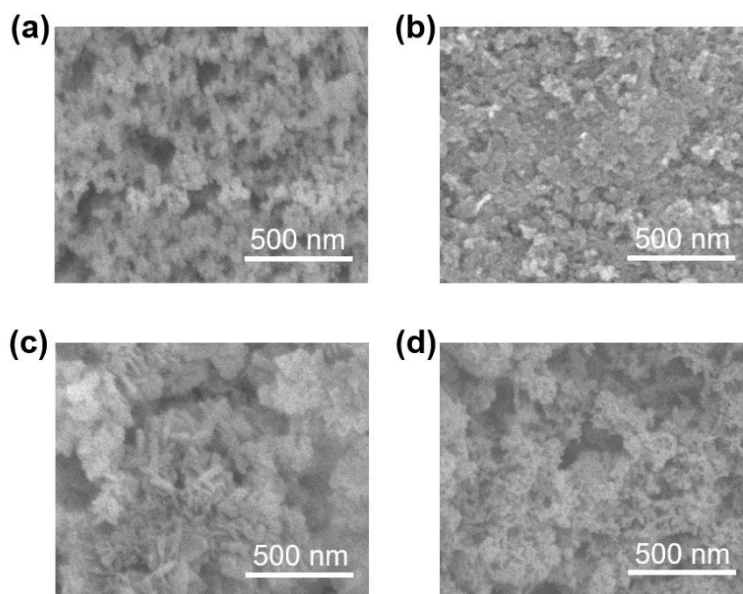


Fig.S2 SEM images of samples (a) CuBR1, (b) CuBR1-700-AW, (c) CuBR4, (d) CuBR4-700.

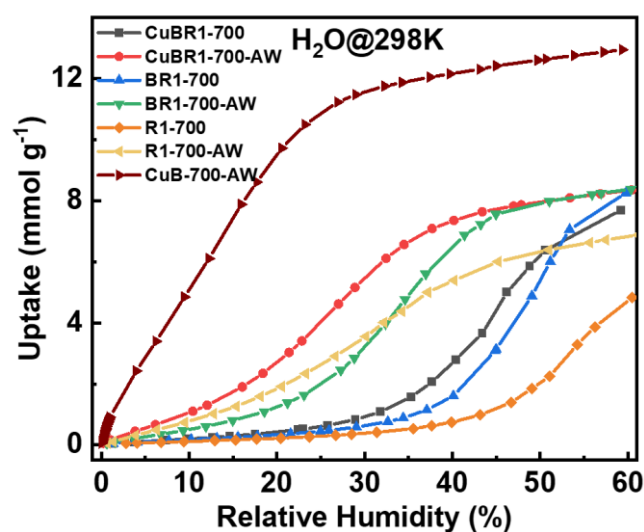


Fig. S3 Carbon materials of different synthesis conditions water vapor adsorption isotherms.

Table S1 Comparison of water vapor uptake in carbons

Sample	Temperature (K)	Water uptake in RH 40% (g·kg ⁻¹)	Water uptake in RH 70% (g·kg ⁻¹)	Ref.
A-5	288	86.4	145.8	[1]
RF-100	288	50.4	140.4	[1]
CMK-1	298	14.5	96.5	[2]
ACF-10	298	20.1	345.6	[2]
MC	298	66.6	156.6	[3]
MC-wiggle	298	106.2	160.2	[3]
CuBR1-900	298	147.6	205.2	This work

References:

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- [2] Thommes M, Morell J, Cychosz K A, et al. Combining nitrogen, argon, and water adsorption for advanced characterization of ordered mesoporous carbons (CMKs) and periodic mesoporous organosilicas (PMOs) [J]. Langmuir, 2013, 29: 14893-14902.
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