

Supporting Information

Harvesting Water in the Classroom

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Section S1. General Methods and Materials

Chemicals:

All chemicals were purchased from commercial sources and used without prior purification.

Methods:

Powder X-ray diffraction (PXRD) patterns were recorded using a Rigaku MiniFlex 6G equipped with a HyPix-400MF Hybrid Pixel Array detector and a normal focus X-ray tube with a Cu-source ($\lambda = 1.54178 \text{ \AA}$).

Water vapor sorption experiments were carried out on a Micromeritics 3Flex Surface Characterization Analyzer. The water vapor source was degassed through five freeze-pump-thaw cycles before the analysis. An isothermal water bath was employed to keep the temperature during the measurements.

Section S2. Characterization

Characterization of the MOF was not part of the activity and only serves to underscore the robustness and viability of the simplified synthesis.

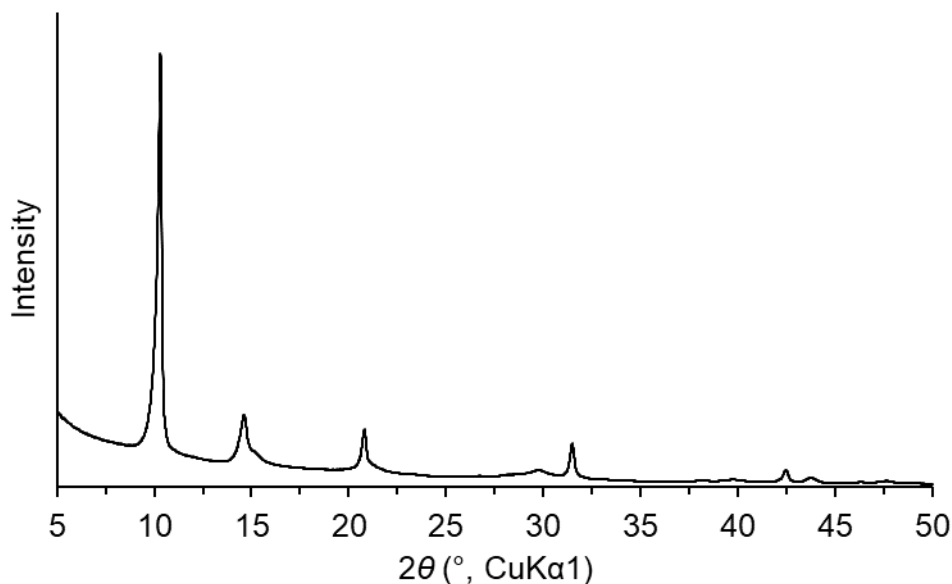


Figure S1. PXRD spectrum of aluminum fumarate. The crystallinity of the synthesized MOF is comparable to that of reported research-grade materials.¹⁻³

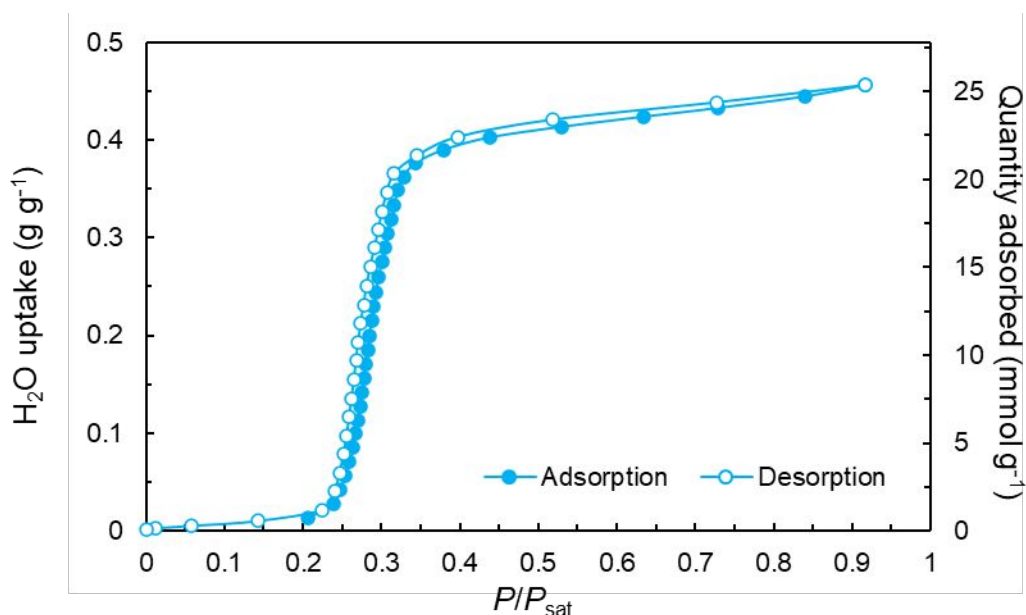


Figure S2. Water isotherm of aluminum fumarate at 25 °C. The synthesized MOF exhibits a step-shaped water isotherm comparable to that of reported research-grade materials.¹⁻³

Section S3. Exemplary Student Data

Table S1. Observed mass change for aluminum fumarate at different relative humidities. (Experiment 3)

Salt	KOAc	K ₂ SO ₄	NaOH	NaCl	LiCl	K ₂ CO ₃
Relative Humidity (Reported, 298K)	22.5%	97.3%	8.2%	75.2%	11.3%	43.1%
Time Point (min)	Mass of MOF (g)	Mass of MOF (g)	Mass of MOF (g)	Mass of MOF (g)	Mass of MOF (g)	Mass of MOF (g)
0	0.523	0.57	0.764	0.69	0.625	0.5
5	0.533	0.589	0.77	0.698	0.629	0.513
10	0.529	0.592	0.762	0.706	0.641	0.5
15	0.532	0.591	0.768	0.708	0.639	0.525
20	0.554	0.59	0.767	0.716	0.64	0.525
25	0.551	0.591	0.762	0.718	0.64	0.527
40	0.577	0.599	0.764	0.72	0.63	0.523
1440	0.524	0.708	0.665	0.867	0.573	0.589
Absolute Change in Mass (g)	0.001	0.138	-0.099	0.177	-0.052	0.089
Change in mass / g of MOF	0.001912	0.242105	-0.12958	0.256522	-0.0832	0.178

References

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- (3) Hanikel, N.; Prévot, M. S.; Fathieh, F.; Kapustin, E. A.; Lyu, H.; Wang, H.; Diercks, N. J.; Glover, T. G.; Yaghi, O. M. Rapid Cycling and Exceptional Yield in a Metal-Organic Framework Water Harvester. *ACS Central Science* **2019**, *5* (10), 1699-1706. DOI: 10.1021/acscentsci.9b00745.