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Constructing CO_2-philic PEG domains on UiO-66-NH_2 via amide tethering for highly efficient CO_2 separation

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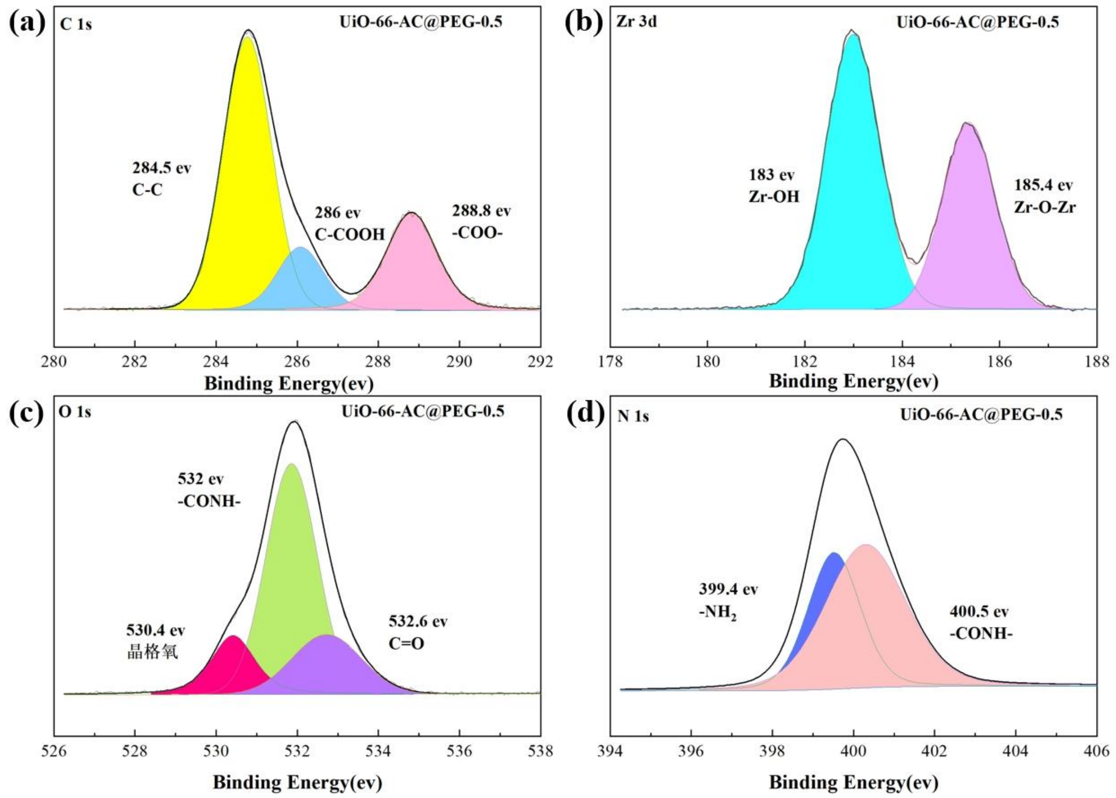

Fig. S1 The XPS spectra of UiO-66-AC@PEG-0.5: (a) C 1s, (b) Zr 3d, (c) O 1s, (d) N 1s.

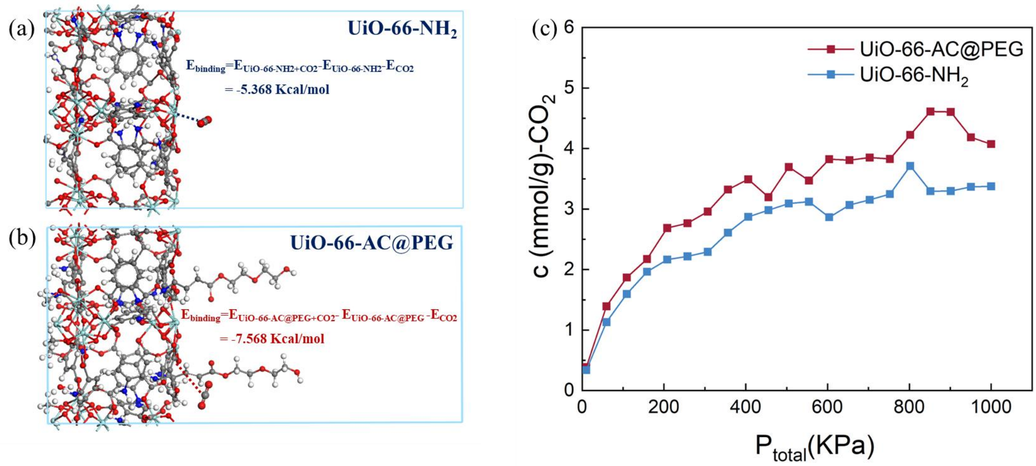

Fig. S2 Correlation between CO_2 binding energy and simulated adsorption isotherms in UiO-66-NH_2 and UiO-66-AC@PEG: (a)-(b) CO_2 binding configurations and adsorption energies; (c) Simulated CO_2 adsorption isotherms.\

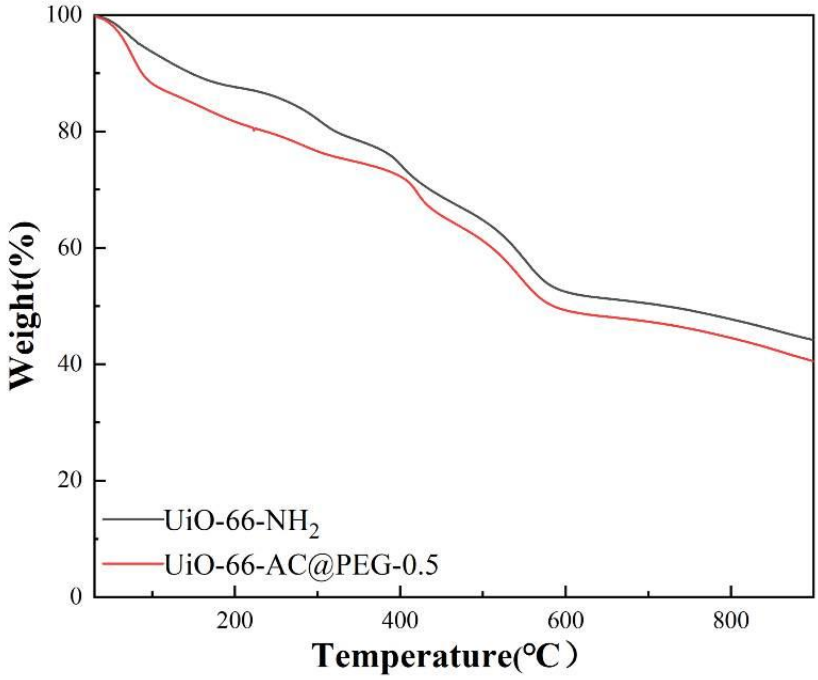

Fig. S3 The TGA curves of UiO-66-NH_2 and UiO-66-AC@PEG-0.5.

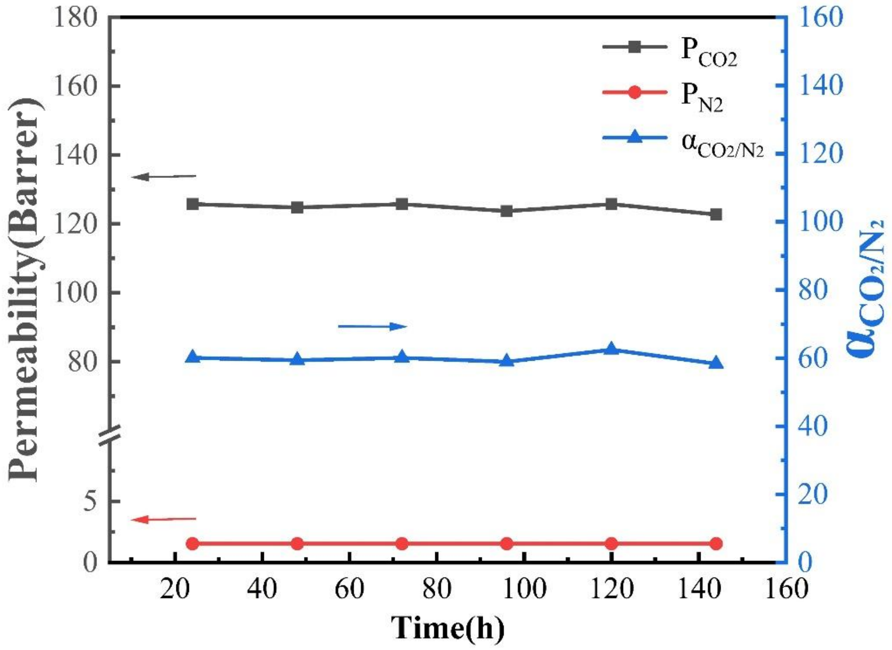

Fig. S4 The long-term stability of the UiO-66-AC@PEG-0.5/Pebax MMM at filler loading of 5 wt.%.

Table S1 Comparison of CO_2 permeability and selectivity with other reported membranes.

Filler	Polymer	CO_2 permeability (Barrer)	CO_2/N_2 selectivity	Ref.
UiO-66-NH_2	Pebax	130	72	[1]
UiO-66-NH_2@GO	PI	7.28	52	[2]
UiO-66-NH_2	6FDA Durene	1370	15.7	[3]
PSM/UiO-66-NH_2	6FDA-Durene	1890	17.4	[3]
UiO-66-NH_2	PSF	45.2	39	[4]
UiO-66-NH_2	Matrimid	28	36.3	[5]
UiO-66-NH_2	BPPO	125.6	50.2	[6]
UiO-66-NH_2	Polynorbornene	31.2	3.6	[7]
UiO-66-NH_2	Polysulfone	45	27	[8]
KH560-UiO-66 NH_2	Pebax	111.5	92.1	[9]
UiO-66-NH_2	6FDA-durene	973.90	12.71	[10]
PEG-grafted UiO-66-NH_2	6FDA-durene	1671.00	18.86	[10]
M2070-UiO-66-OH@[BMim][PF_6]	Pebax	104.07	92.37	[11]

UiO-67 (bpdc100)	6FDA-DAM	944.26	35.17	[12]
H-UiO-S	Pebax	809.26	43.48	[13]
MXene/UiO-66	Pebax	214.6	102	[14]
UiO-66-NH_2	CA	168.8	40.2	[15]
UiO-TF36	PEGDA	470	41	[16]

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