Supporting Information

Microporous Polyimides with Functional Groups for Adsorption of Carbon Dioxide and Organic Vapors

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Table S1. Elemental analysis data of microporous polyimides

Sample	Theoretical value			Measured value		
	C	H	N	C	H	N
MPI-6FA	63.11	2.52	4.67	62.54	2.73	4.29
API-6FA	65.56	3.21	4.25	64.98	3.22	4.11
MPI-BPA	75.99	3.58	6.22	73.52	3.76	5.39
MPI-BTA	74.21	3.17	5.87	72.49	3.72	5.29

Table S2 K_H, A_o and A_1 values of CO_2 adsorption in the microporous polyimides.

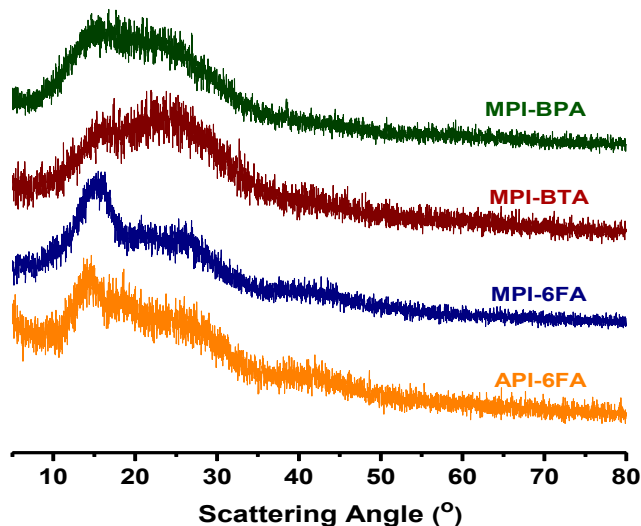| Sample	T/K	K_H / mol/(g Pa)	A_0 / ln(mol/(g Pa)	A_1 / g/mol
MPI-6FA	273	1.481×10^{-7}	-15.508	-798.404
	298	5.102×10^{-8}	-16.791	-666.895
API-6FA	273	1.113×10^{-7}	-16.011	-717.668
	298	3.592×10^{-8}	-17.142	-373.790
MPI-BPA	273	1.388×10^{-7}	-15.790	-904.057
	298	4.140×10^{-8}	-17.000	-673.458
MPI-BTA	273	1.866×10^{-7}	-15.494	-1063.009
	298	5.237×10^{-8}	-16.765	-876.878

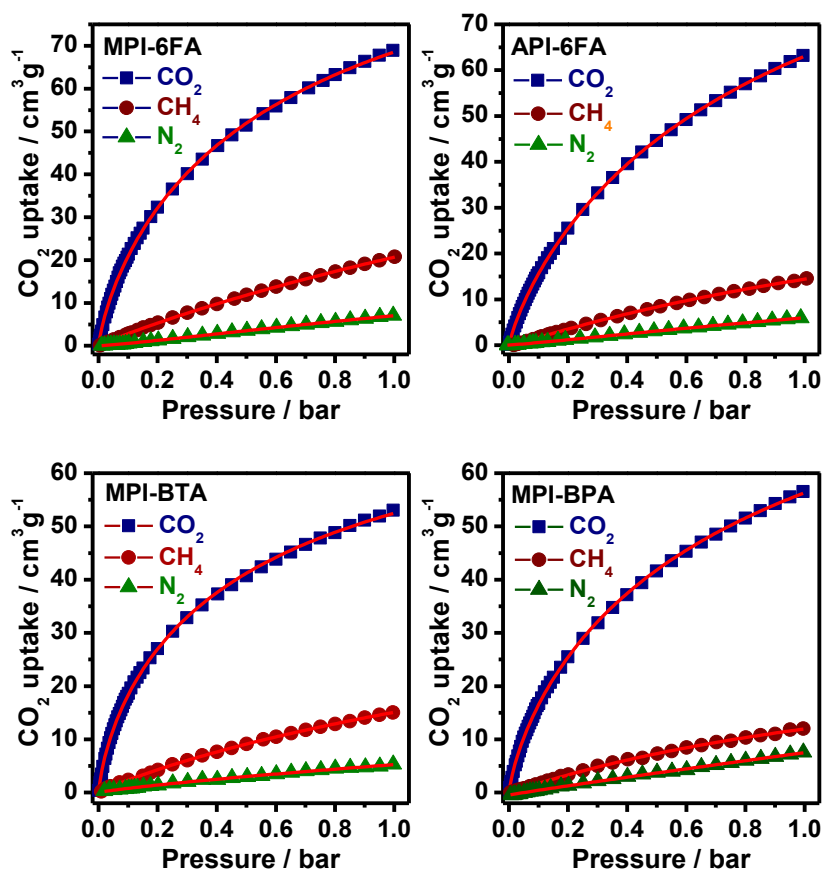**Figure S1**. X-ray diffractions of the four polyimide networks.

Figure S2. Experimental pure component isotherms for CO_2, CH_4 and N_2 at 273 K (dot), and their single-site Langmuir-Freundlich fitting curves for CO_2, CH_4 and N_2 (solid) for microporous polyimides.
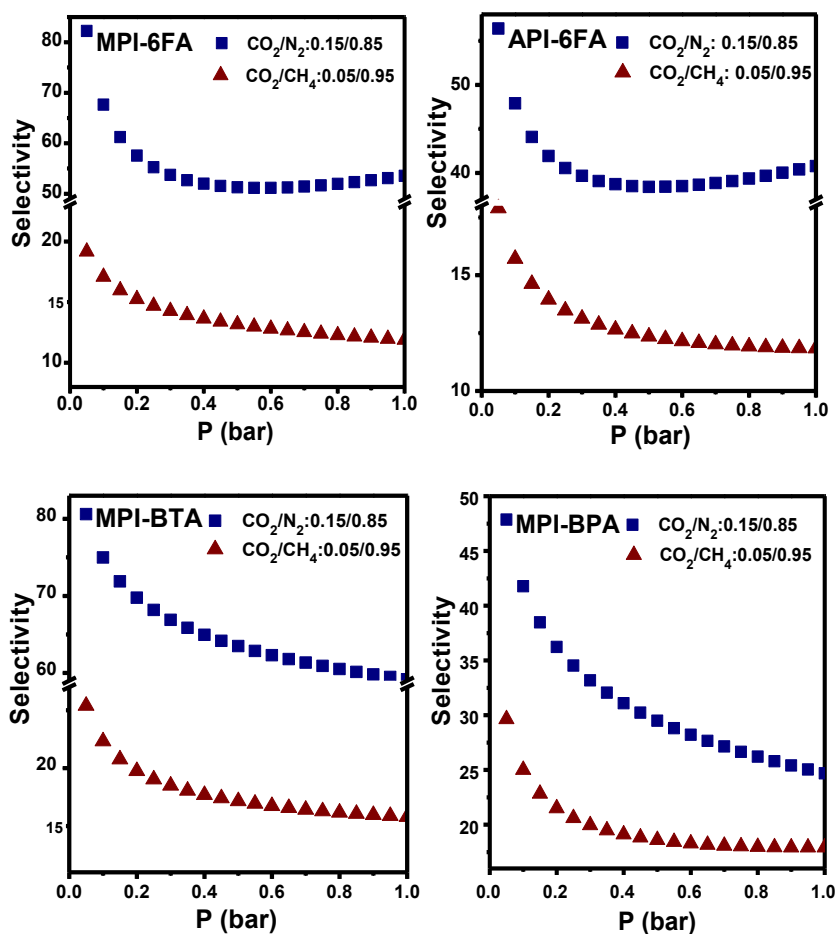
Figure S3. IAST selectivities for 0.15/0.85 CO_2/N_2 mixture (■, blue) and 0.05/0.95 CO_2/CH_4 mixture (▲, red) for the four microporous polyimides.
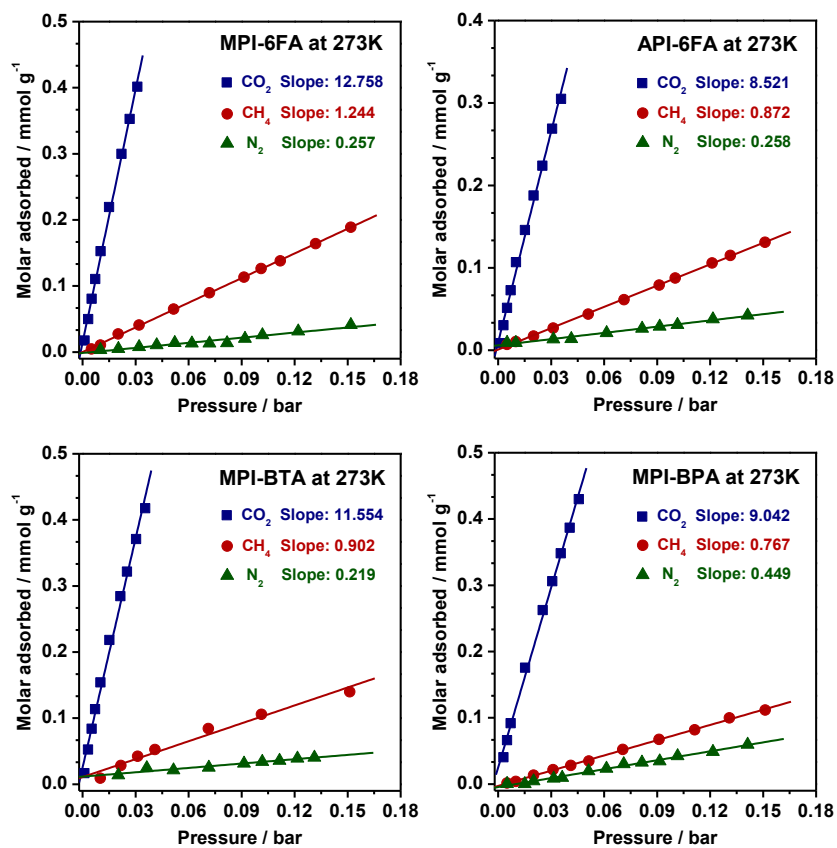
Figure S4. Adsorption selectivities of CO_2 over CH_4 and N_2 for MPI-6FA, API-6FA, MPI-BTA and MPI-BPA from initial slope calculated according to their adsorption isotherms of CO_2 (blue), CH_4 (red) and N_2 (green) at 273 K.
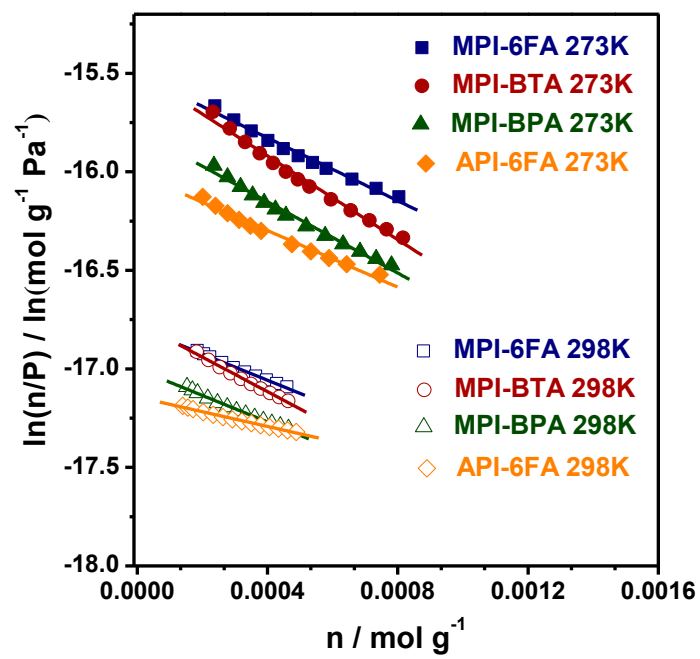
Figure S5. Virial plots of CO_2 adsorption in microporous polyimides at 273 and 298 K.