Supporting information to

Enhanced CO_2 adsorption on Al-MIL-53 by introducing hydroxyl groups into the framework

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Table S1 The calculation of amounts of hydroxyl groups by IR spectra.

Sample	A_1[a] (1200-1270 cm^{-1})	A_2[b] (1550-1680 cm^{-1})	A_1/A_2	$(A_1/A_2)/0.541$[c]
Al-MIL-53	0	8	0	0
Al-MIL-53-OH_{25}	2.1	18.1	0.116	0.214
Al-MIL-53-OH_{50}	3.9	18.6	0.210	0.387
Al-MIL-53-OH_{75}	7.9	18.9	0.418	0.772
Al-MIL-53-OH_{100}	10.5	19.4	0.541	1

a. Area of IR band due to the vibration of Ar-OH (1200-1270 cm^{-1});

b. Area of IR band due to the vibration of Ar-COO^- (1550-1680 cm^{-1});

c. The ratio of 2,5-dihydroxyl terephathalic acid in the framework calculated referring to the A_1/A_2 (0.541) of Al-MIL-53-OH_{100}.

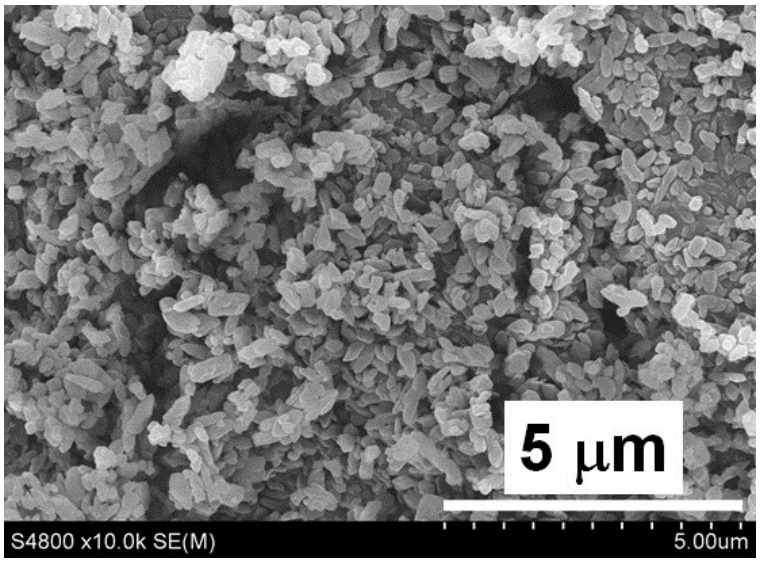

Figure S1. The SEM image of Al-MIL-OH_{25} after reuse for 3 times.

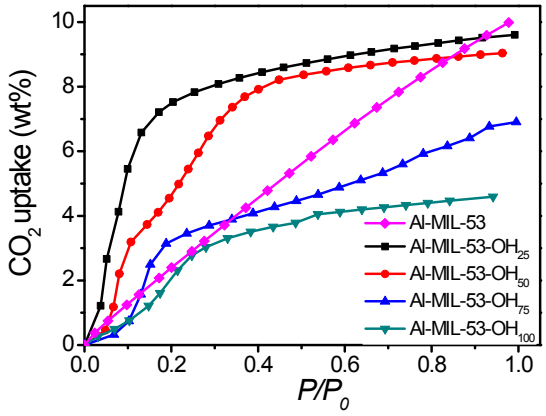

Figure S2 CO_2 adsorption isotherms of hydroxyl modified Al-MIL-53s and Al-MIL-53 at 8 ^oC.