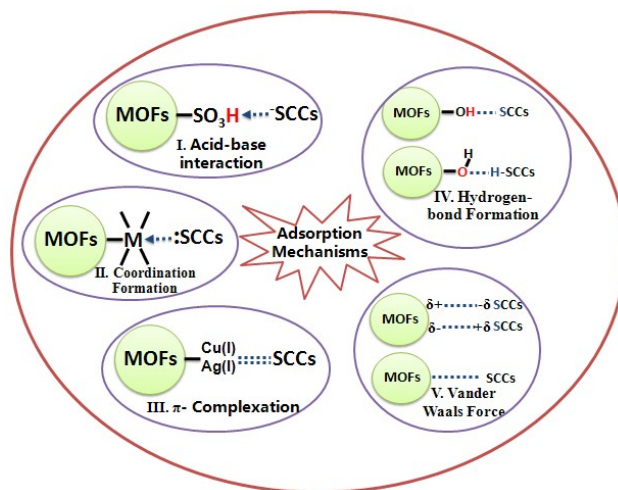


*Supporting information for*

**Remarkable Adsorption Capacity of Zinc/Nickel/Copper-Based  
Metal-Organic Frameworks for Thiophenic Compounds**

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**Scheme S.I.1.** Summary of the main adsorption mechanisms

**Figure S.I. captions:**

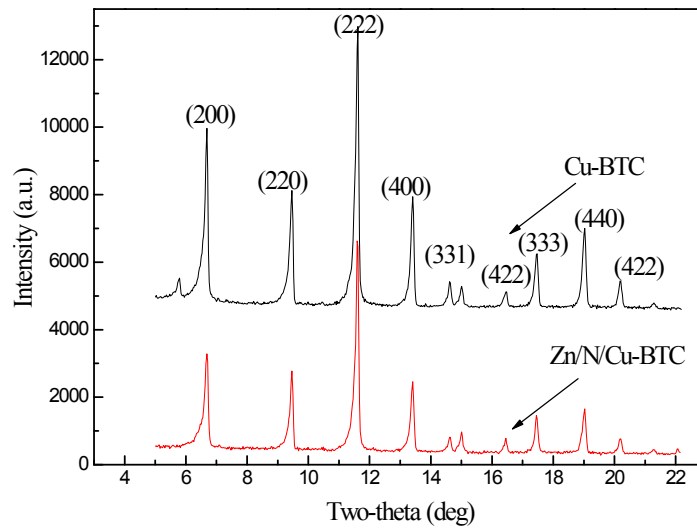
**Fig. S.I.1** XRD analysis for Zn/Ni/Cu-BTC sample

**Fig. S.I.2** SEM image of Zn/Ni/Cu-BTC sample

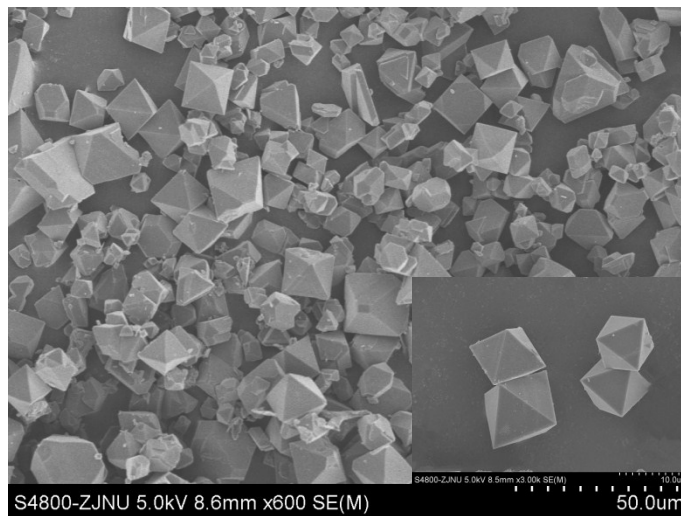
**Fig. S.I.3** TGA of Zn/Ni/Cu-BTC sample under nitrogen atmosphere

**Fig. S.I.4** XRD patterns of Zn/Ni/Cu-BTC before and after 24h.

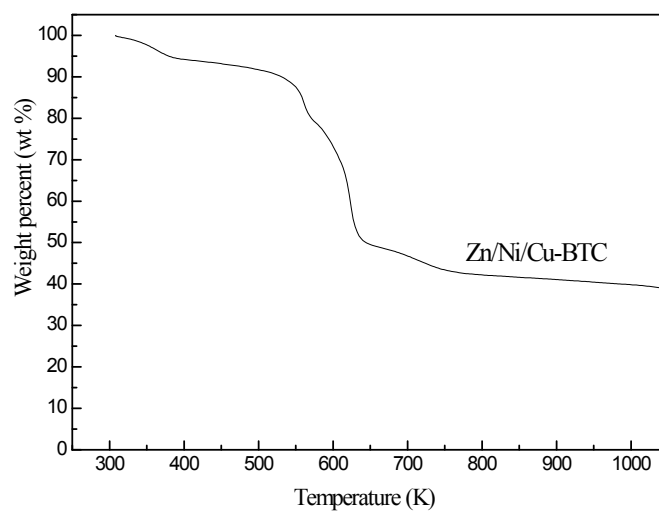
**Fig. S.I.5** N<sub>2</sub> adsorption–desorption isotherms of Zn/Ni/Cu-BTC before and after 24h.



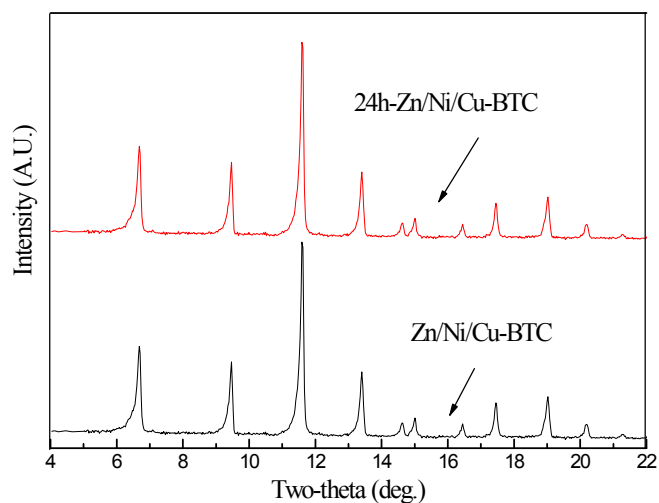
**Fig. S.I.1** XRD analysis for Cu-BTC and Zn/Ni/Cu-BTC sample



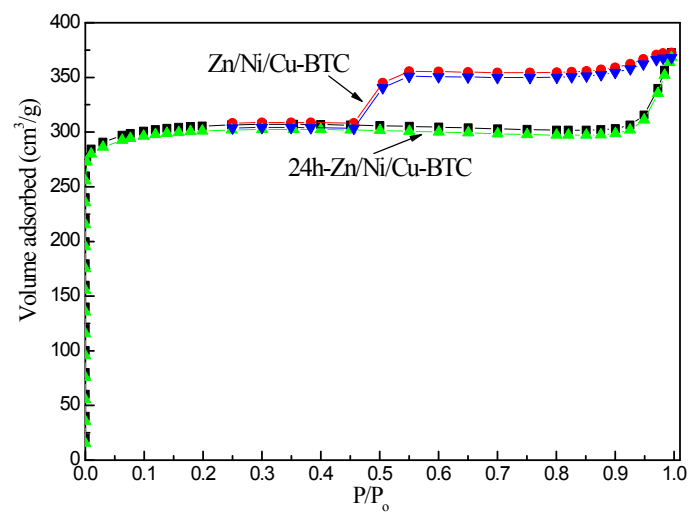
**Fig. S.I.2** SEM image of Zn/Ni/Cu-BTC sample



**Fig. S.I.3** TGA of Zn/Ni/Cu-BTC sample under nitrogen atmosphere



**Fig. S.I.4** XRD patterns of Zn/Ni/Cu-BTC before and after 24h.



**Fig. S.I.5** N<sub>2</sub> adsorption–desorption isotherms of Zn/Ni/Cu-BTC before and after 24h.

**Table S.I. captions:**

**Table S.I.1** Textural properties of Cu-BTC, Zn/Cu-BTC and Zn/Ni/Cu-BTC

**Table S.I.2** Chemical composition of Zn/Ni/Cu-BTC by ICP

**Table S.I.3** Sulfur capacity of different adsorbents at ambient temperature and pressure

**Table S.I.1** Textural properties of Cu-BTC, Zn/Cu-BTC and Zn/Ni/Cu-BTC

Samples	BET surface area (m <sup>2</sup> /g)	Pore volume (cm <sup>3</sup> /g)	Reference
Cu-BTC	1386	0.62	[2]
Zn/Cu-BTC	1103	0.57	[2]
Ni/Cu-BTC	1047	0.45	[a]
Zn/Ni/Cu-BTC	1229	0.53	This work

**Table S.I.2** Chemical composition of Zn/Ni/Cu-BTC by ICP

Elements	Mole (%)
C	26.45
Zn	1.45
Ni	1.51
Cu	3.37
H	27.78
N	10.81
O	28.63

**Table S.I.3** Sulfur capacity of different adsorbents at ambient temperature and pressure

Adsorbent	Adsorbate	ALO		ARO		MIO		Reference
		B.C., wt %	S.C., wt %	B.C., wt %	S.C., wt %	B.C., wt %	S.C., wt %	
Cu-BTC	DBT	3.21	6.15	2.68	3.85	2.97	4.82	[2]
	BT	2.25	4.45	1.88	2.70	2.08	3.37	This work
	Th	2.01	3.99	1.74	2.45	1.93	3.12	This work
Zn/Cu-BTC	DBT	9.93	11.89	4.98	5.92	7.21	7.93	[2]
	BT	6.95	8.54	3.49	4.15	5.01	5.56	This work
	Th	6.25	7.71	3.23	3.85	4.68	5.16	This work
MOF-5/Cu(I)	DBT	9.42	10.94	3.96	4.84	6.16	6.82	[4]
Zeolite-Y/Cu(I)	Th	5.50	7.54	0.61	1.73	0.70	1.41	[32]
A.C./Cu(I)	Th	2.65	6.15	1.12	3.91	1.61	2.06	[31]
SBA-15/Cu(I)	Th	6.48	8.52	1.14	3.92	0.95	2.11	[31]
	DBT	10.92	13.08	5.48	7.11	7.93	9.61	This work
	BT	7.46	10.58	4.86	5.74	6.17	6.94	This work
Zn/Ni/Cu-BTC	Th	6.34	8.99	4.13	4.88	5.24	5.97	This work

B.C.: Breakthrough capacity, wt %; S.C.: Saturation capacity, wt %.

Reference [a]: J. Hu, H. J. Yu, W. Dai, X.Y. Yan, X. Hu and H. Huang, *RSC Adv.*,



2014, 4, 35124.