

Article

Controlling the Structural Robustness of Zirconium-Based Metal Organic Frameworks for Efficient Adsorption on Tetracycline Antibiotics

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Supplementary Material

Table S1. Studies for the removal of TCs by adsorption.

Reference	MOF	TC initial conc. (mg/L)	MOF dosage (g)	Contact time (min)	Removal capacity
11	CoUiO-66	50	0.2	180	71.3%
2	ZIF-8	50	25	120	90.7%
50	Fe-MIL-101	50	2.5	60	55.1 mg/g
	Fe-MIL-53				10.5%
	Fe-MIL-100				44.1%
S1	ZIF-8	50	0.3	1440	137 mg/g
29	UiO-66	20	0.3	1440	12.2 mg/g
	MnUiO-66				72.5 mg/g

Table S2. Profiles of MOFs for experimental synthesis.

Sample	ZrCl ₄ (g)	BDC (g)	HCl (mL)	DMF (mL)
UiO-66	0.125	0.134	1	15
UiO-66-NH ₂	0.125	0.134	1	15

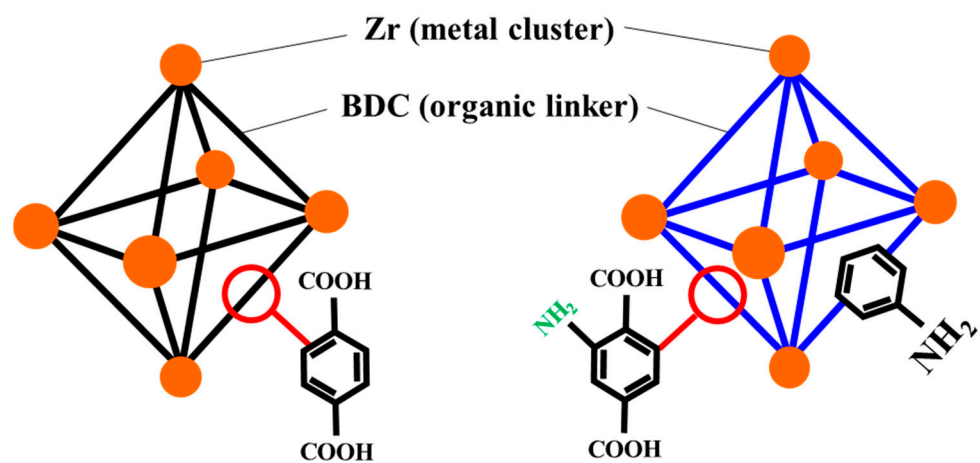


Figure S1. Chemical structures of UiO-66 and UiO-66-NH₂.

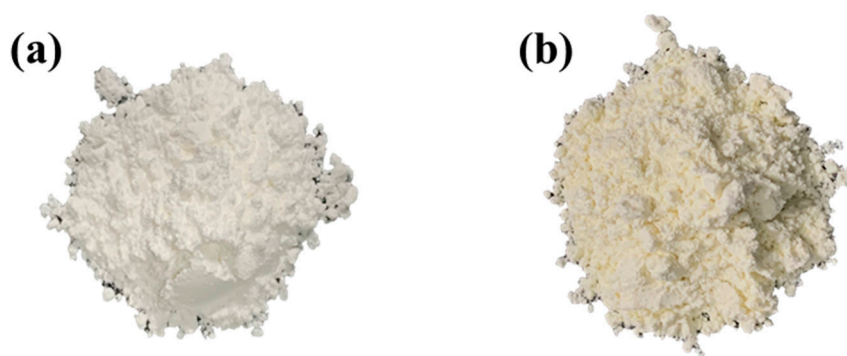


Figure S2. Photographs of (a) UiO-66 and (b) UiO-66-NH₂ powders.

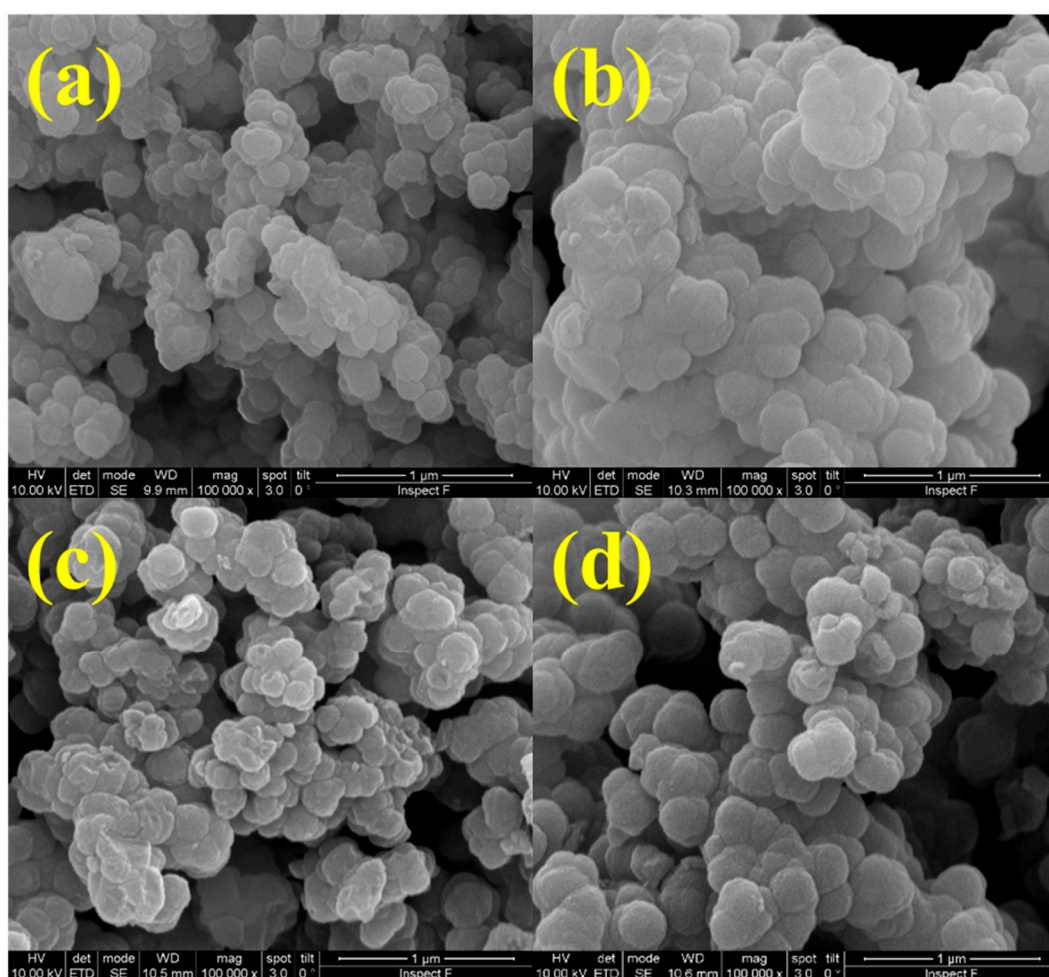


Figure S3. FE-SEM images of UiO-66 (a) before and (b) after adsorption, and UiO-66-NH₂ (c) before and (d) after adsorption.

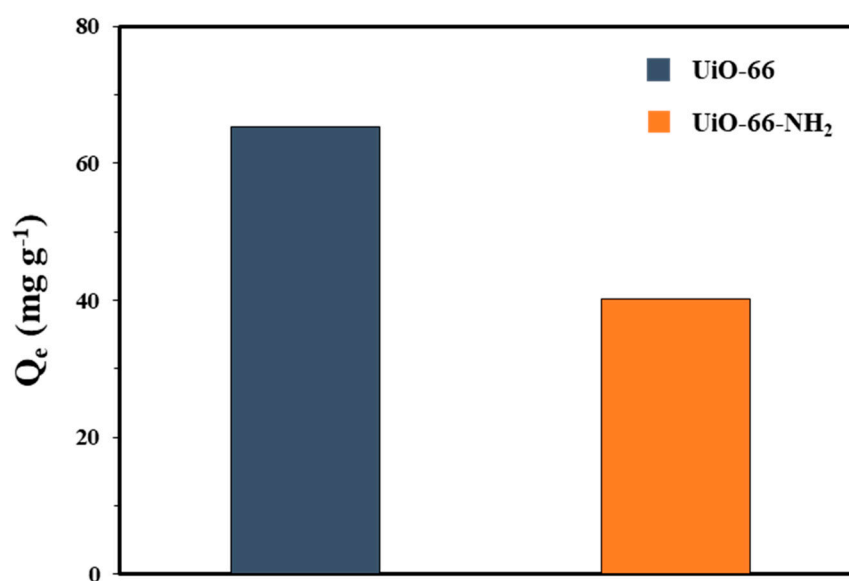


Figure S4. Adsorption capacity of TCs by UiO-66 and UiO-66-NH₂.

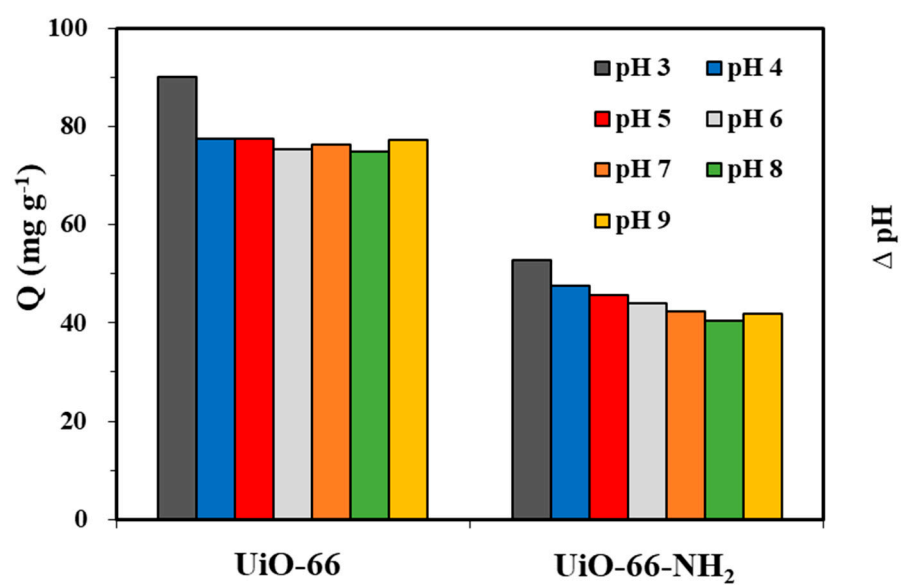


Figure S5. Effect of pH on the adsorption capacity of TCs.

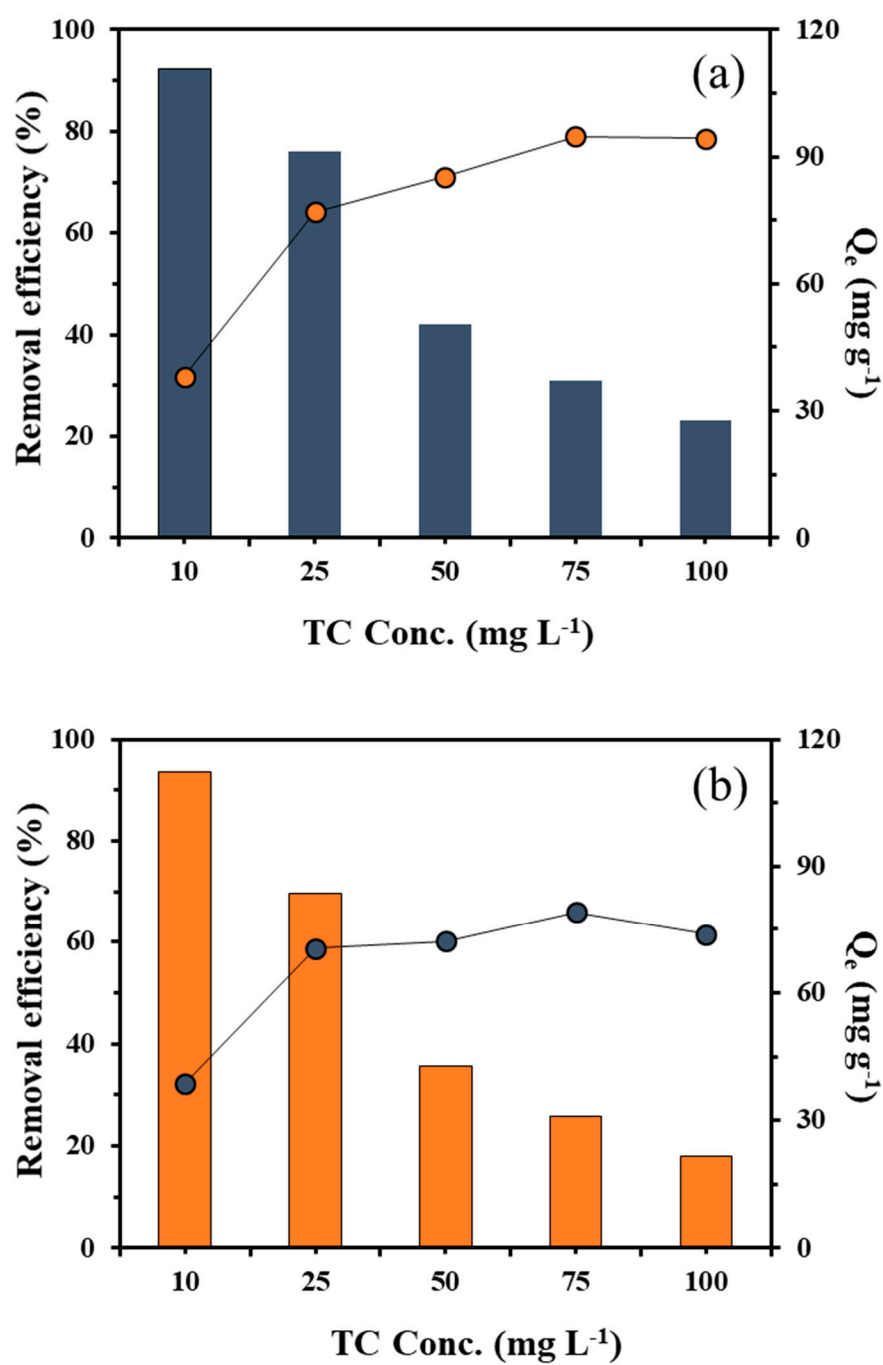


Figure S6. Effect of different initial TC concentrations on (a) UiO-66 and (b) UiO-66-NH₂.

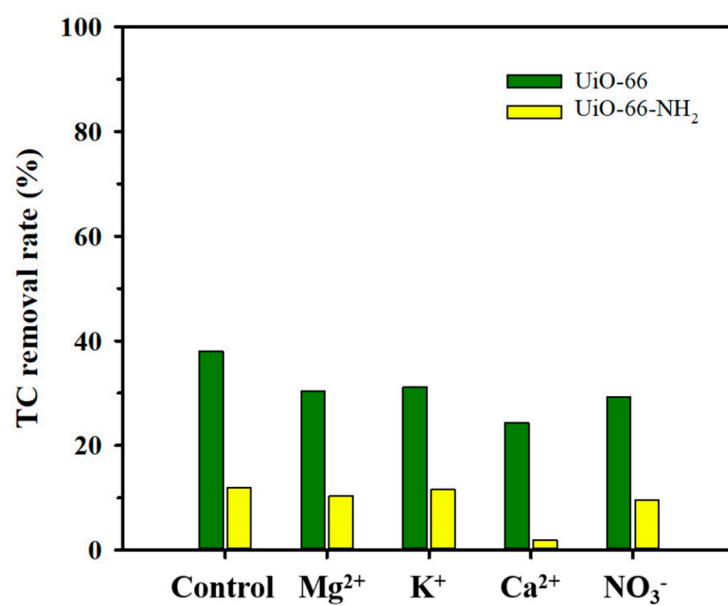


Figure S7. Comparison of the effect of ionic strength on TC adsorption at concentration condition.

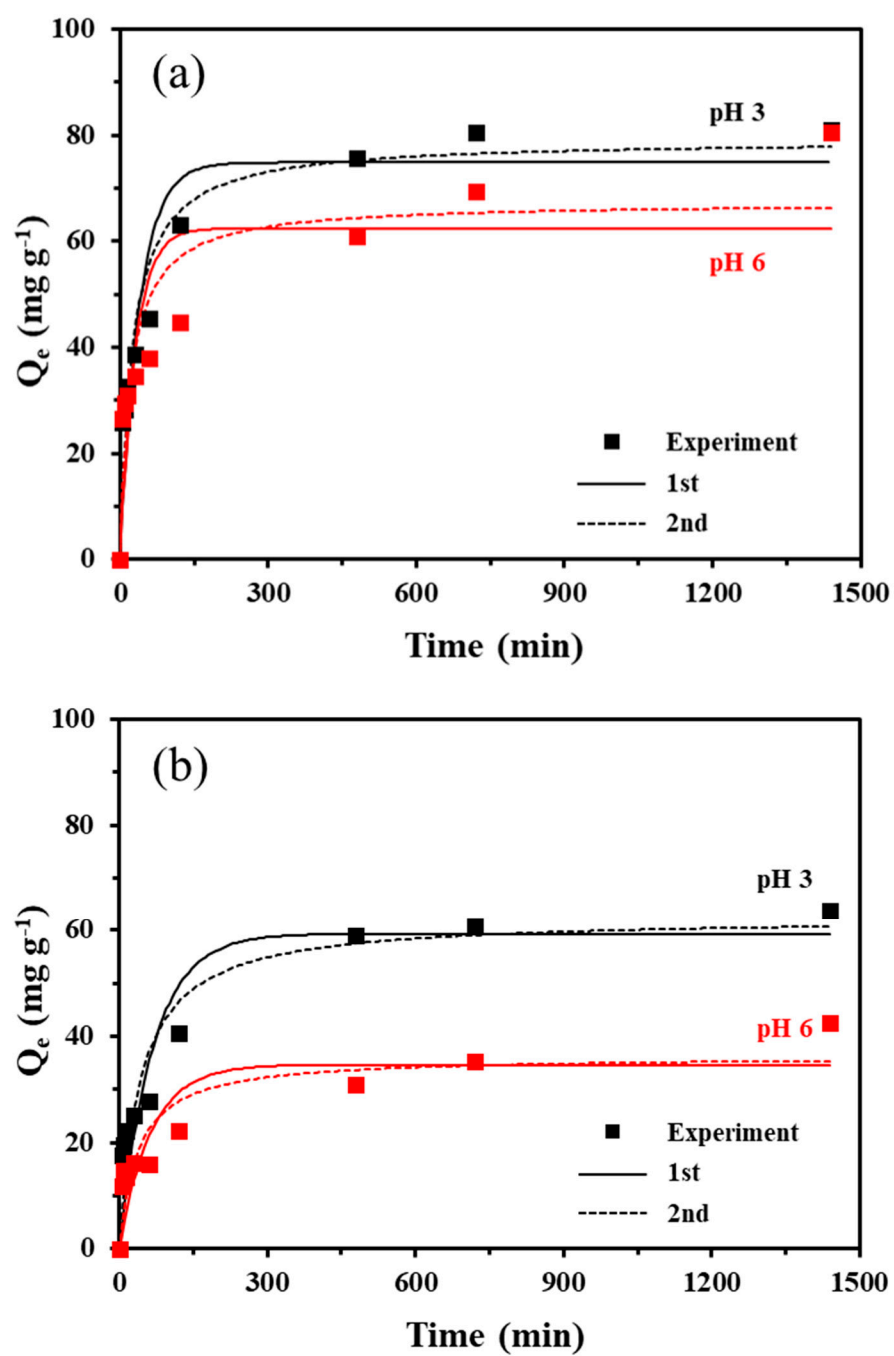


Figure S8. Adsorption kinetics corresponding to the pseudo-first- and pseudo-second-order models of TCs on (a) UiO-66 and (b) UiO-66-NH₂ at different pH values.

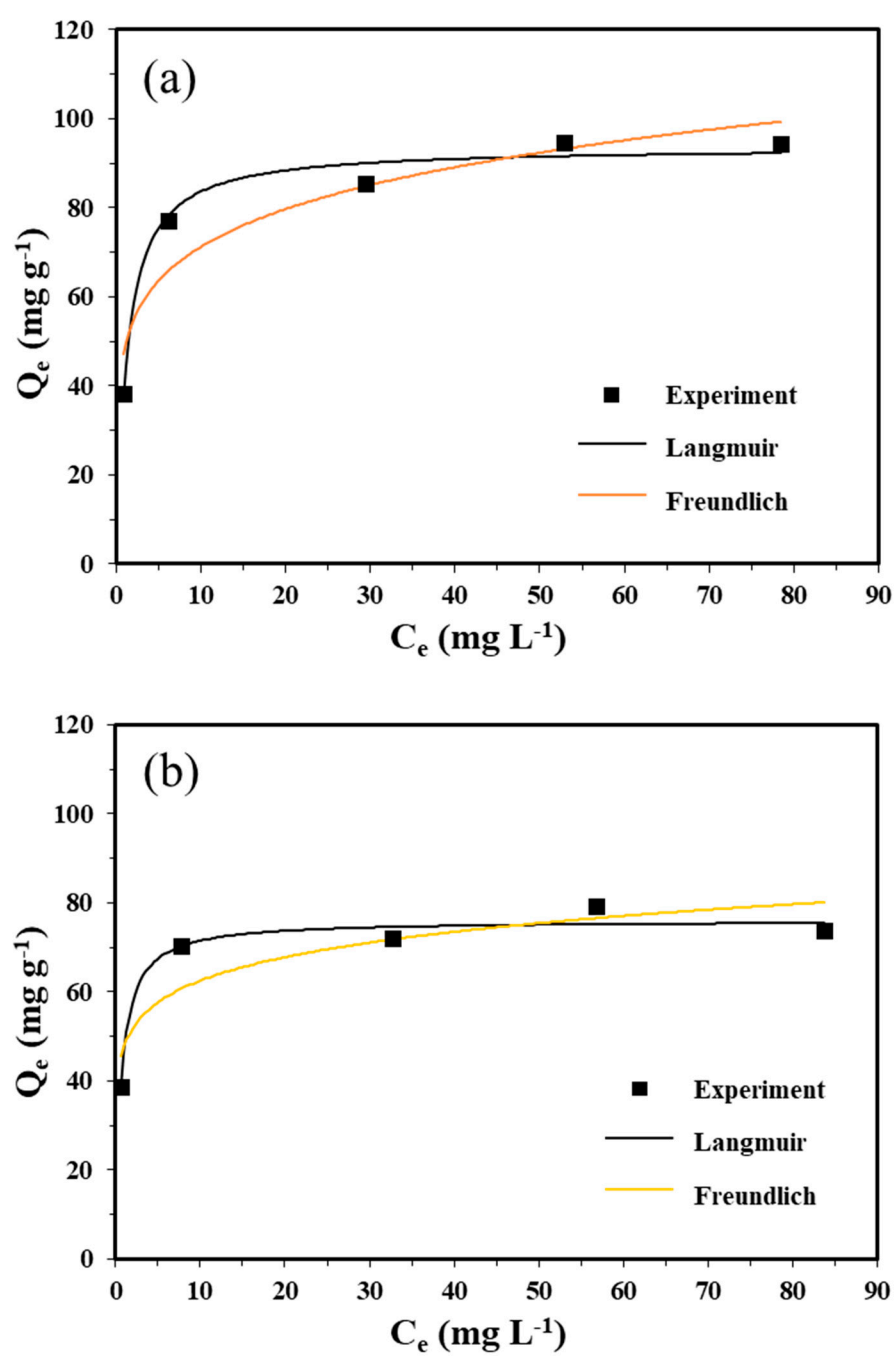


Figure S9. Adsorption isotherms corresponding to the Langmuir and Freundlich models of TCs on (a) UiO-66 and (b) UiO-66-NH₂.

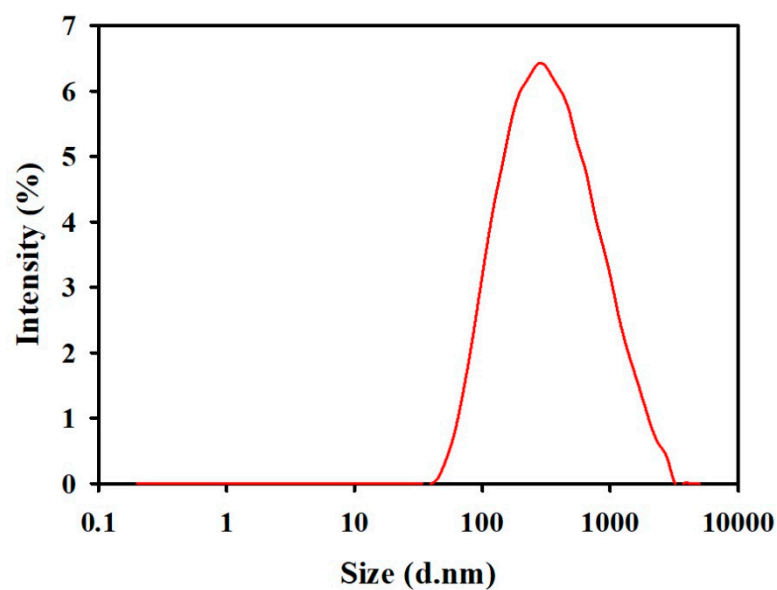


Figure S10. Particle size distribution of TC.

Reference

- S1. C.S. Wu, Z.H. Xiong, C. Li, J.M. Zhang, Zeolitic imidazolate metal organic framework ZIF-8 with ultra-high adsorption capacity bound tetracycline in aqueous solution, RSC. Adv. 5 (2015) 82127-82137.