Electronic Supplementary Material (ESI) for Analytical Methods.

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TiO_2@MOF-919(Fe-Cu) as a sorbent for extraction of benzoylurea pesticides from irrigation water and fruit juices

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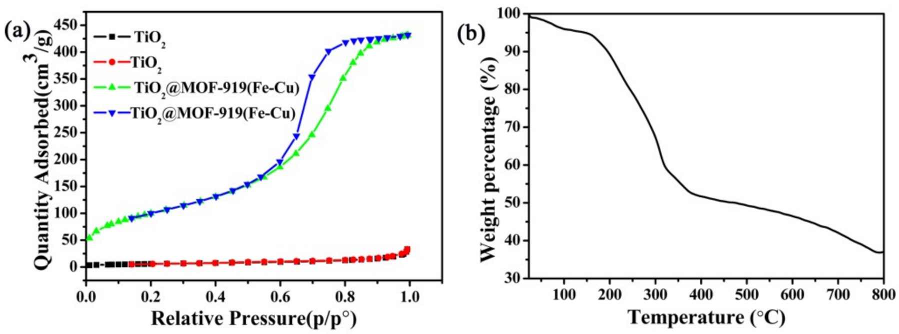

Fig. S1 Characterization of the prepared materials: (a) The N_2 adsorption–desorption isotherms of TiO_2, TiO_2@MOF–919(Fe-Cu); (b)TGA spectra of TiO_2@MOF–919(Fe-Cu).

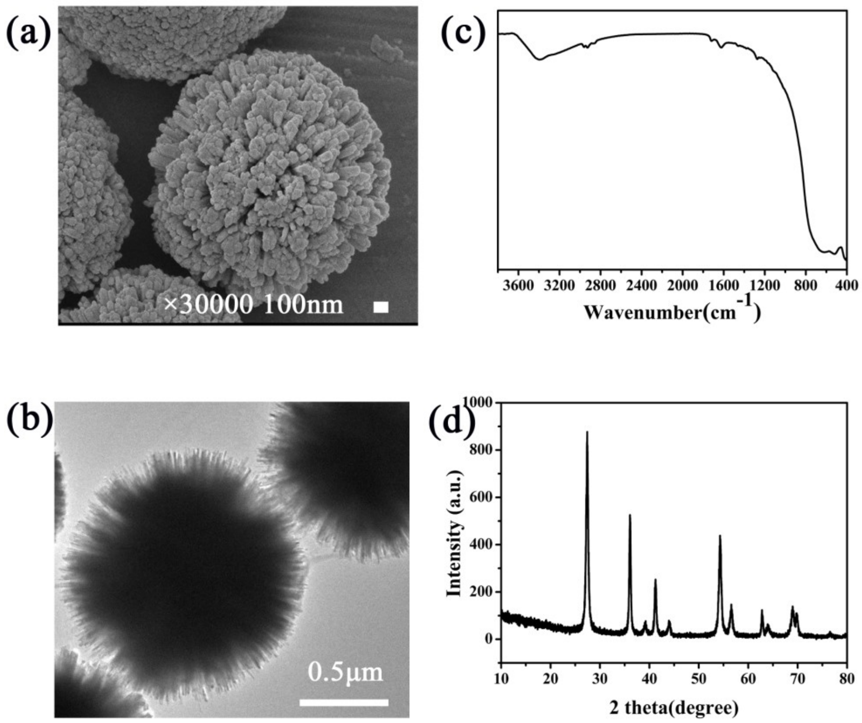

Fig. S2 Characterization of 3D radial TiO_2 bare spheres: (a) SEM spectra; (b) TEM spectra; (c) FTIR spectra; (d) XRD spectra.

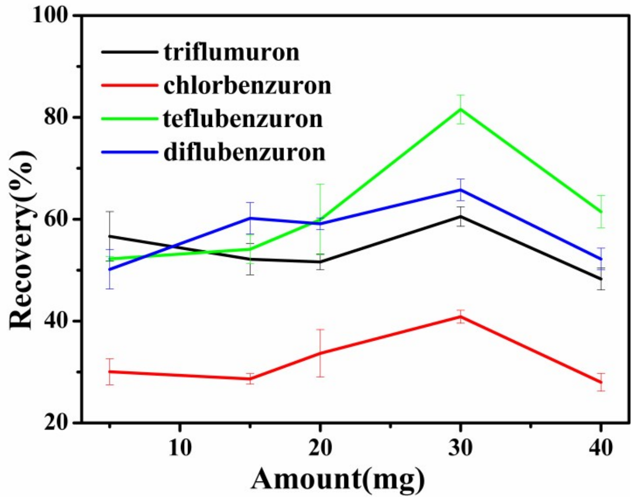

Fig. S3 Effect of the amount of 3D radial TiO_2 bare spheres.

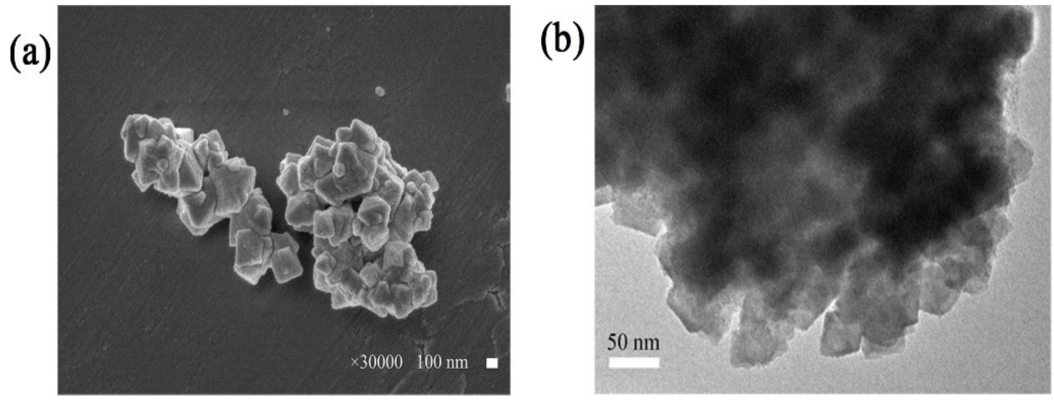

Fig. S4 Characterization of MOF-919(Fe-Cu): (a) SEM spectra; (b) TEM spectra.

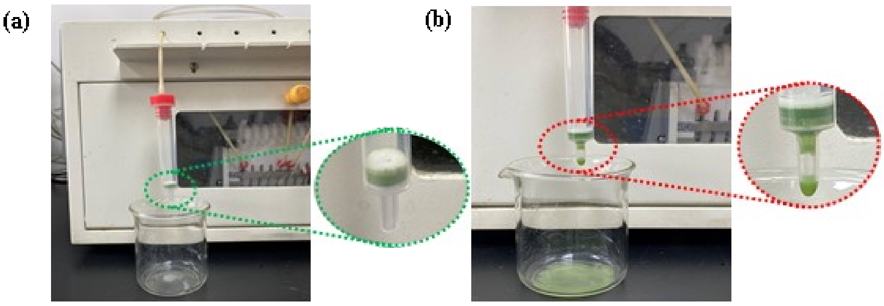

Fig. S5 The state of TiO_2@MOF-919(Fe-Cu) before and after loading.

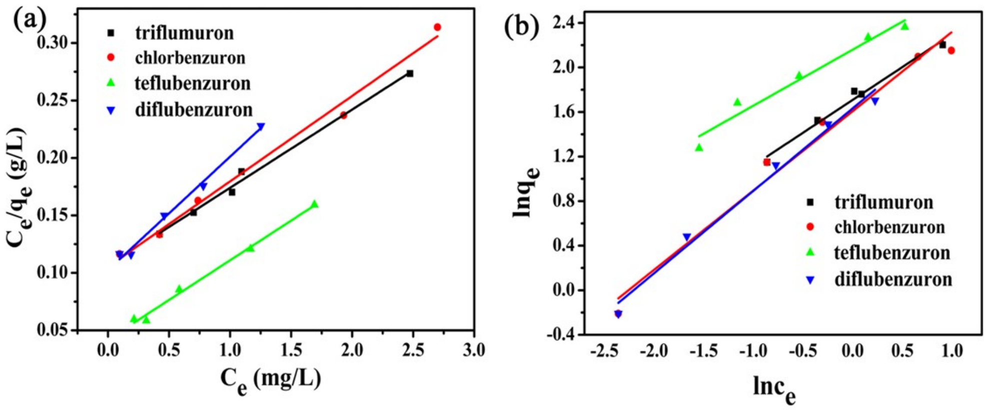

Fig. S6 (a) Langmuir plots and (b) Freundlich plots for the adsorption of BUs on TiO_2@MOF-919(Fe-Cu).

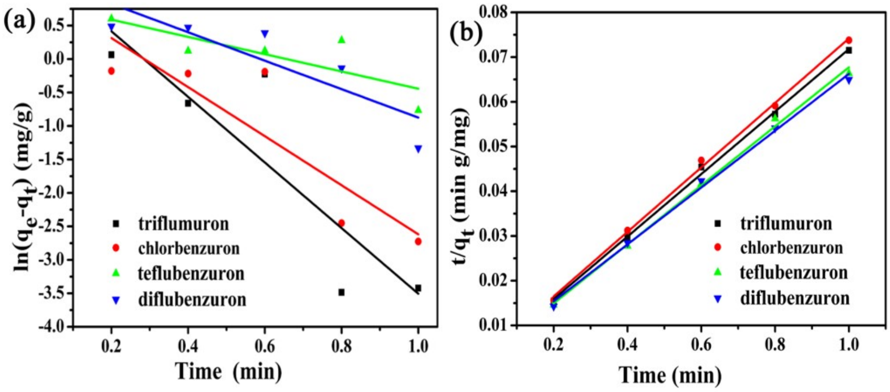

Fig. S7 The adsorption kinetic models of BUs on TiO_2@MOF-919(Fe-Cu). (a) pseudo-first-order model; (b) pseudo-second-order model.

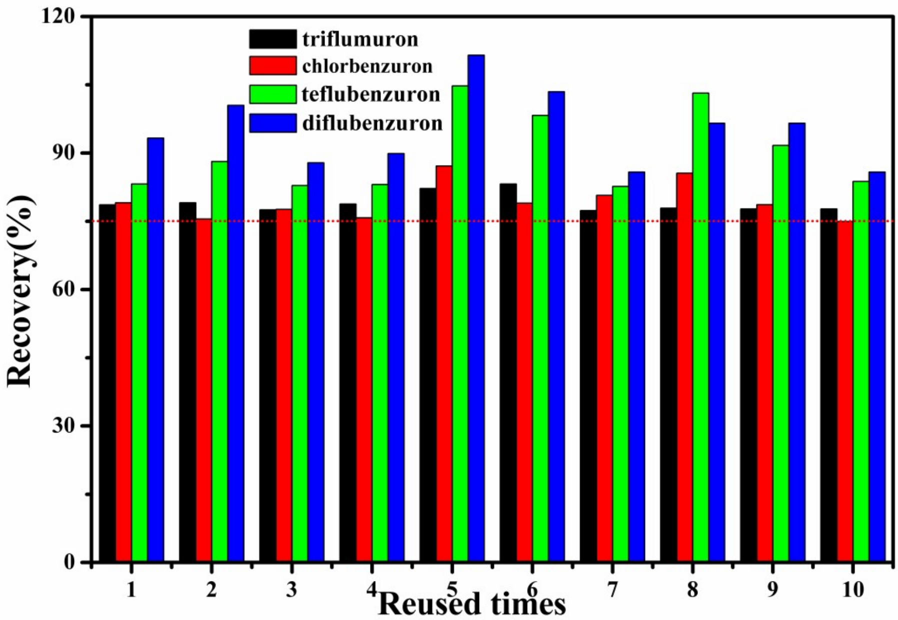

Fig. S8 The reusability of TiO_2@ MOF-919(Fe-Cu) on adsorption of BUs.

Table S1 The fitting results of Langmuir model and Freundlich model.

Analyte	Langmuir model			Freundlich model		
	q_m (mg g^{-1})	K_L (L mg^{-1})	R^2	K_F (mg g^{-1})	1/n	R^2
triflumuron	14.68	0.643	0.9927	1.80	0.589	0.983
chlorbenzuron	13.46	0.706	0.9914	2.04	1.601	0.977
teflubenzuron	14.49	1.647	0.9934	1.65	2.160	0.963
diflubenzuron	10.14	0.962	0.9922	2.10	1.633	0.987

Table S2 The fitting results of adsorption kinetics for BUs.

Analyte	Pseudo-first-order kinetic			Pseudo-second-order kinetic		
	k_1 (min^{-1})	q_e (mg g^{-1})	R^2	k_2 (g mg^{-1} min^{-1})	q_e (mg g^{-1})	R^2
triflumuron	4.901	4.035	0.774	2.562	14.306	0.998
chlorbenzuron	3.366	2.850	0.777	2.475	13.870	0.998
teflubenzuron	1.338	2.346	0.778	2.390	15.244	0.999
diflubenzuron	2.125	3.493	0.752	1.493	15.748	0.996

Table S3 Analytical data for the determination of BUs by the method.

Analytes	Linear range (μg L^{-1})	Calibration curve	Correlation coefficient (R^2)	Limits of detection (μg L^{-1})	RSDs (%) (n = 7)	
					Intraday	Interday
triflumuron	1-400	y = 0.5338x - 2.0326	0.9994	0.53	1.78	4.27
chlorbenzuron	1-400	y = 0.5599x + 2.1653	0.9995	0.56	3.24	5.08
teflubenzuron	1-400	y = 0.4826x - 0.7781	0.9997	0.48	2.36	4.50
diflubenzuron	1-400	y = 0.399x + 0.2646	0.9998	0.40	2.21	4.07

Table S4 Comparison of the methods for the determination of BUs.

Method	Extraction sorbent	Sample	Reused times	Analytical ranges (μg L^{-1})	LODs (μg L^{-1})	Recovery (%)	Ref
MSPE[a]	ATP@Fe_3O_4@ZIF-8[b]	Tea	5	2.5–500	0.36–0.66	78.9–114.0	[1]
DSPE[c]	[C_{16}MIM]Br-AL[d]	Water, tea beverages	1	1–500	0.14-0.23	72.8–89.3	[27]
DLLME[e]	[N_{8881}][PF_6]	Water, tea beverages	/	2–500	0.29–0.59	85.93–90.52	[28]
SPE	TiO_2@MOF-919(Fe)	Tap water, juices	10	1-400	0.40-0.56	72.3–108.4	This work

[a]MSPE: magnetic solid-phase extraction ; [b]ATP@Fe_3O_4@ZIF–8: attapulgite–modified magnetic metal–organic frameworks; [c]DSPE: dispersive solid-phase adsorbent; [d][C_{16}MIM]Br–AL: ionic liquid 1–hexadecyl–3–methylimidazolium–alkalized luffa sponge fibers bromide–alkalized luffa sponge fibers; [e]DLLME: dispersive liquid–liquid microextraction