Supplementary Information (SI) for Environmental Science: Processes & Impacts.

Supplemental Materials

Supplemental Materials Caption:

Table S1 Sorption kinetics and sorption thermodynamics models used in this study.

Table S2 Characteristic values of competitive sorption kinetics model for ENR and TYL on loess

Table S1

Sorption kinetics and sorption thermodynamics models used in this study.

	Names	Expression equations		Reference
Sorption kinetics models	Pseudo-first-order	$\frac{1}{q_t}=\frac{1}{q_1}+\frac{k_1}{q_1 t}$	Eq(1)	Ho and McKay, 1998a, b
	Pseudo-second-order	$\frac{t}{q_t}=\frac{1}{k_2 q_2^2}+\frac{t}{q_2}$	Eq(2)	Ho and McKay, 1998c
	Intra-particle diffusion	$q_t = k_p \cdot t^{1/2} + C$	Eq(3)	Weber and Morriss, 1963
Sorption thermodynamics models	Langmuir	$\frac{1}{C_s}=\frac{1}{K_L \times Q_m \times C_e}+\frac{1}{Q_m}$	Eq(4)	Langmuir, 1918
	Freundlich	$\lg C_s = \lg K_F + \frac{1}{n}\lg C_s$	Eq(5)	Freundlich, 1906
	Linear	$C_s = K_d \times C_e$	Eq(6)	

Among these Eq(1)-Eq(9), q_1 and q_2 are the equilibrium sorption capacity (mg/g); q_t is the sorption capacity (mg/g) with the variable t; k_1 and k_2 are respectively the first order sorption kinetic rate constant (min^{-1}) and the quasi-secondary sorption kinetic rate constant[g/ (mg·min)]; K_p is the particle internal diffusion rate constant[mg/ (g· min$^{1/2}$)]. The intercept of the equation yields q_1, k_2, k_1, and C, with the slope of which is q_2, k_p. q_s is the sorption capacity of target pollutants(mg/g); C_e is the mass concentration of target pollutants in liquid phase (mg/L); Q_m is the saturated sorption capacity of target pollutants (mg/g); K_L is the characteristic constant of Langmuir adsorption (L/g); K_F and n is the characteristic constant of Freundlich model. Q_m, K_F can be obtained from the intercept of equation.

Table S2 Characteristic values of competitive sorption kinetics model for ENR and TYL on loess

pollutants		Concentration mg/L	$q_{max,exp}$	Pseudo-first-model			Pseudo-second-model				
Main solute	Co-solute			k_1	$q_{1,model}$	R^2	k_2	$q_{2,model}$	R^2	Kp	R2
ENR (10 mg/L)	TYL	0	414	0.720	417	0.903	1099	421	0.999	0.0010	0.482
		4	494	0.045	497	0.437	274	496	0.999	0.0004	0.224
		16	469	0.077	840	0.445	57.3	469	0.998	0.0008	0.304
		24	449	0.479	1080	0.249	4.55	450	0.999	0.0030	0.792
TYL (16 mg/L)	ENR	0	389	3.062	416	0.900	2.099	394	0.999	0.0060	0.233
		2	790	0.036	365	0.780	10.9	789	0.999	0.0060	0.485
		10	701	0.486	697	0.598	1.81	707	1.000	0.0036	0.792
		18	611	0.239	805	0.865	0.977	613	0.999	0.0060	0.756

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