Electronic Supplementary Material (ESI) for RSC Advances.

Appendix 1

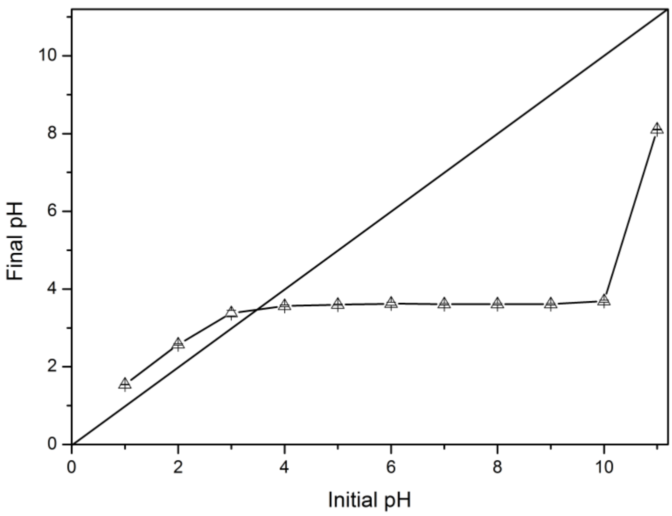

Fig. S1 The pH_{pzc} of SSA by pH drift method

Appendix 2

Nomenclature

SMP	Sulfonated methyl phenol resin
SSA	Sewage sludge-derived adsorbent
WRB	Wheat straw biochar
WEB	Walnut shell biochar
TOC	Total organic carbon
COD	Chemical oxygen demand
C_0	Initial concentration of SMP solution, (mg L^{-1})
C_e	Residual SMP concentration at equilibrium, (mg L^{-1})
m	SSA dosage, (g L^{-1})
t	Adsorption time (h)
q_t	Adsorption quality of SMP on SSA at various time t (mg g^{-1})
q_1	Adsorption quality of SMP on SSA at equilibrium (mg g^{-1}) for pseudo-first-order kinetic model
k_1	The pseudo-first-order rate constant (h^{-1})
q_2	Adsorption quality of SMP on SSA at equilibrium for the pseudo-second-order kinetic model (mg g^{-1})
k_2	Pseudo-second-order rate constant (g mg^{-1} h^{-1})
k_i	The intra-particle diffusion rate constant (mg g^{-1} $h^{-0.5}$)
I	Intercept for the intra-particle diffusion kinetic model (mg g^{-1})
q_m	Monolayer adsorption capacity of SMP on SSA estimated by Langmuir model (mg g^{-1})
b	Langmuir constant (L mg^{-1})
K_F	Freundlich constant (mg g^{-1}(mg L^{-1})$^{-1/n}$)
n	Heterogeneity factor of the Freundlich isotherm model
E_a	Adsorption activation energy in the SMP-SSA system (kj mol^{-1})
R	Gas constant (8.31 J (mol K)$^{-1}$)
A	Pre-exponential factor
ΔG^0	Gibb's free energy change (kj mol^{-1})
ΔH^0	Enthalpy change (kj mol^{-1})
ΔS^0	Entropy changes (J mol^{-1} K^{-1})

Appendix 3

$$q_e = \frac{(C_0 - C_e)}{m}$$ Eq. (1)

$$ln(q_1 - q_t) = lnq_1 - k_1 t$$ Eq. (2)

$$\frac{t}{q_t} = \frac{1}{q_2^2 k_2} + \frac{t}{q_2}$$ Eq. (3)

$$q_t = k_i t^{0.5} + I$$ Eq. (4)

$$q_e = \frac{q_m C_e b}{1 + bC_e}$$ Eq. (5)

$$q_e = K_F C_e^{1/n}$$ Eq. (6)

$$k = Ae^{-\frac{E_a}{RT}}$$ Eq. (7)

$$ln\frac{k_1}{k_2} = \frac{E_a(T_1 - T_2)}{RT_1T_2}$$ Eq.

(8)

$$\Delta G^0 = \Delta H^0 - T\Delta S^0$$ Eq. (9)

$$ln\frac{q_e m}{C_e} = \frac{\Delta S^0}{R} - \frac{\Delta H^0}{R\,T}$$ Eq. (10)