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Supplementary Material

Organo-montmorillonites for efficient and rapid water remediation: sequential and simultaneous adsorption of lead and bisphenol A

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Table S1 The surface chemical constituents of Mt

Elements	Mt	
	Mass ratio (wt.%)	Atomic ratio (wt.%)
C	9.73	15.5
N	0.36	0.5
O	45.14	53.99
Na	0.43	0.36
Mg	2.85	2.25
Al	7.69	5.46
Si	29.83	20.32
K	0.21	0.10
Ca	1.78	0.85
Fe	1.98	0.68

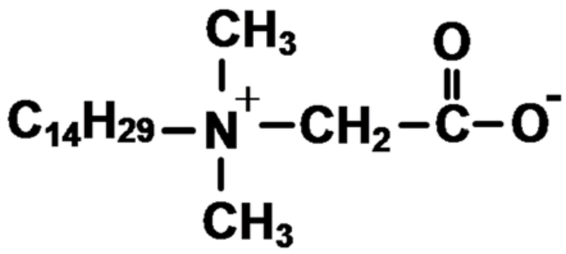

Fig. S1. The molecular structural formula of BS-14.

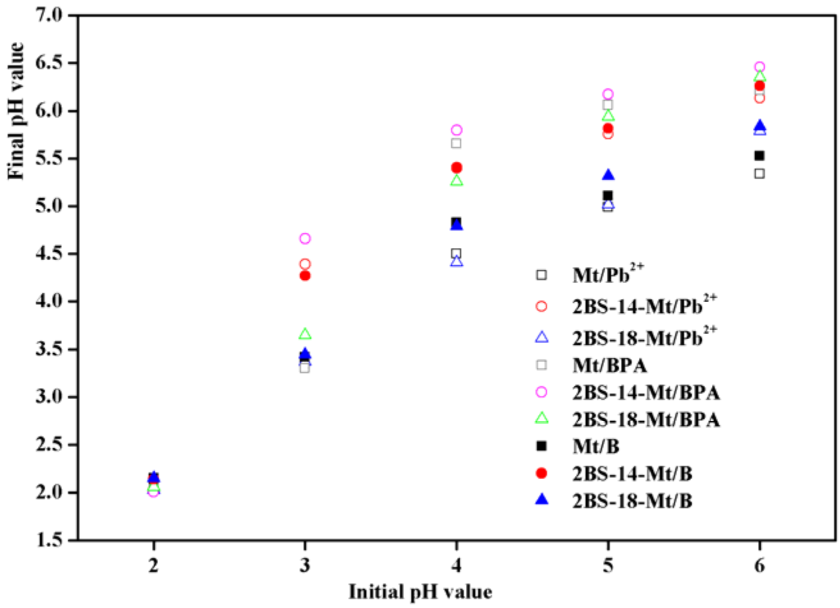

Fig. S2. Final pH value of the solution after the adsorption process.

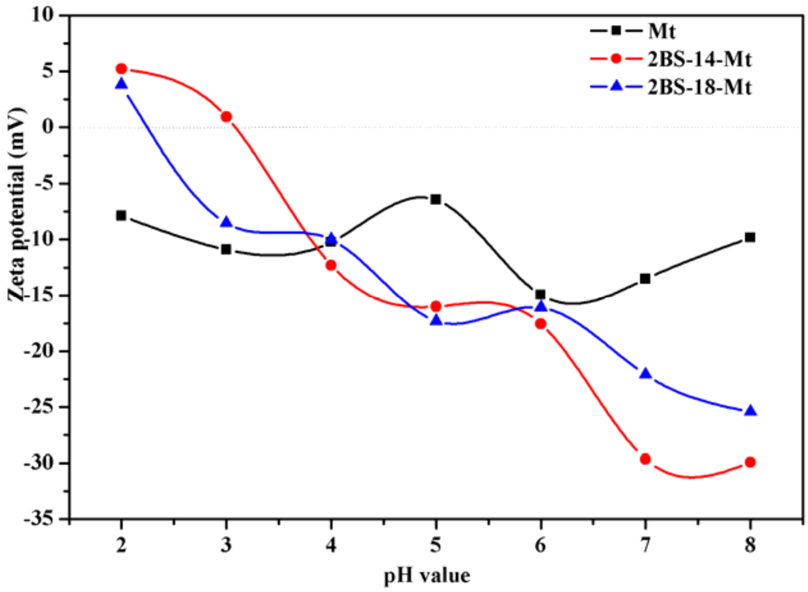

Fig. S3. Zeta potentials of Mt and OMts.

Table S2. The BET surface areas and mass contents of nitrogen and carbon elements in Mt and OMts.

Sample	$S_{BET}(m^2\,g^{-1})$	C(%)	N(%)
Mt	48.58	0.05	0
2 BS-14-Mt	8.27	10.43	0.80
2 BS-18-Mt	4.06	27.97	1.54

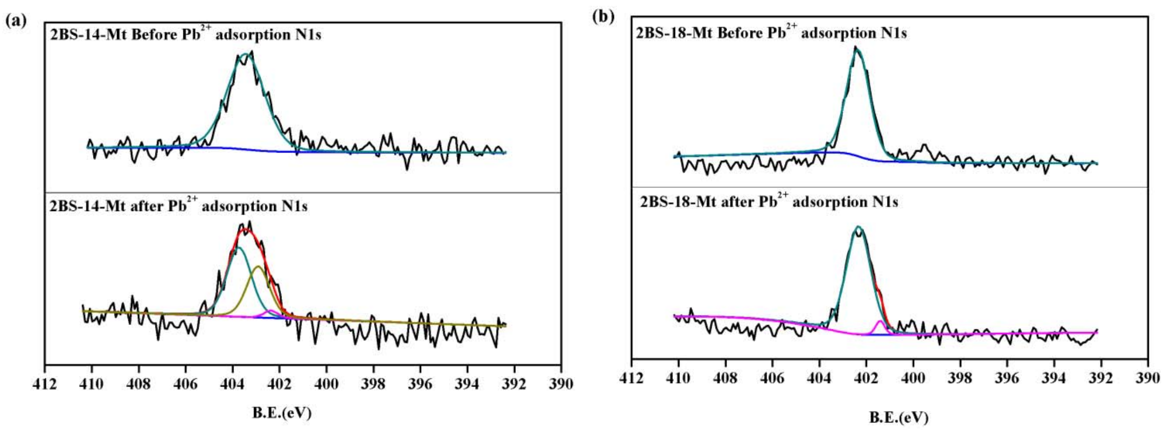

Fig. S4. N1s narrow XPS scan for 2BS-14-Mt (a) and 2BS-18-Mt (b) before and after Pb^{2+} adsorption

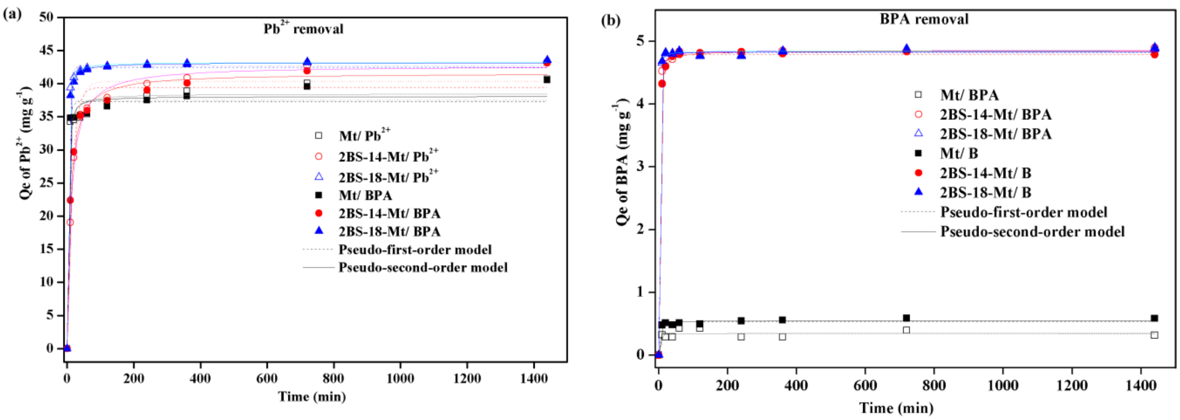

Fig. S5. Effect of kinetic study of Pb^{2+} (a) and BPA(b) adsorption onto Mt, 2BS-14-Mt and 2BS-18-Mt (10 mg L^{-1} BPA and 100 mg L^{-1} Pb^{2+}, Temperature 30℃, Adsorbent dose 2 g L^{-1}, pH: 5.0)

The rate equations of pseudo-first-order model and pseudo-second-order model were used for kinetic study.

The rate equation of pseudo-first-order model is expressed as follows:

$$\ln(\mathrm{Q_e} - Q_t) = \mathrm{lnqQ_e} - \mathrm{k_1} t \qquad (1)$$

where Where Q_e (mg g^{-1}) and Q_t (mg g^{-1}) stand for the amount of BPA and Pb^{2+} adsorbed at equilibriumequilibriumis and at any time t, respectively. The constants of k_1 (min^{-1}) is the rate constant of pseudo-first order adsorption.

The rate equation of pseudo-first-order model can be expressed as:

$$\frac{\mathrm{t}}{\mathrm{Q_t}} = \frac{1}{\mathrm{k_2 Q_e^2}} + \frac{\mathrm{t}}{\mathrm{Q_e}} \qquad (2)$$

Where Q_e (mg g^{-1}) and Q_t (mg g^{-1}) stand for the amount of BPA and Pb^{2+} adsorbed at equilibriumequilibriumis and at any time t, respectively. The constants of k_2 (g·mL·min^{-1}) is the rate constant of pseudo-second-order adsorption.

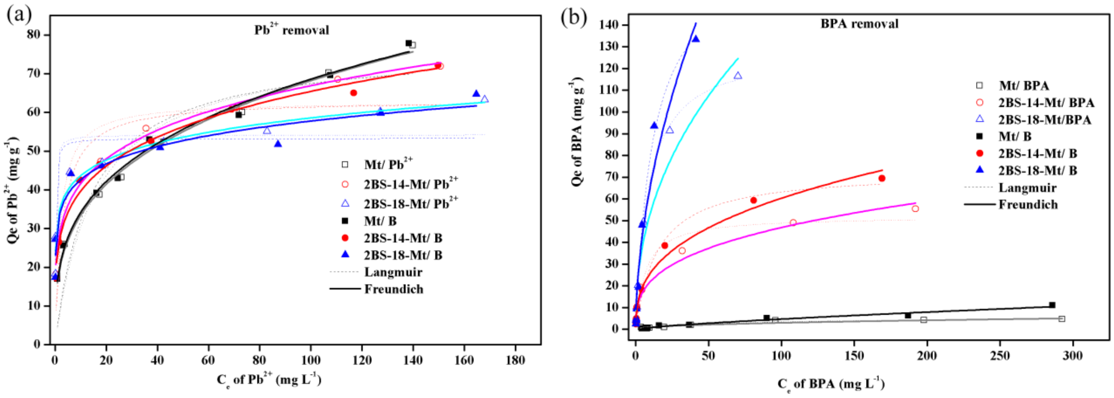

Fig. S6 Effect of initial concentration and adsorption isotherms of Pb^{2+} (a) and BPA (b) in single and the binary systems onto Mt, 2BS-14-Mt and 2BS-18-Mt, respectively (contact time: 24h; temperature: 30℃; adsorbent dose: 2.0 g L^{-1}; pH: 5.0).

The equation of Langmuir and Freundlich isotherm

Langmuir isotherm model can be calculated as:

$$\frac{C_e}{q_{eq}} = \frac{1}{K_L q_m} + \frac{C_e}{q_m} \qquad (5)$$

Where C_e ($mg \cdot L^{-1}$) is the concentrations of BPA at equilibrium and q_{eq} ($mg \cdot g^{-1}$) is adsorbed amount of BPA and Pb^{2+} at equilibrium. q_m ($mg \cdot g^{-1}$) is the maximum adsorption capacity of the adsorbent. K_L ($L \cdot mg^{-1}$) stands for the Langmuir adsorption constant and related to saturated monolayer.

The Freundlich adsorption model is shown as:

$$\ln q_{eq} = \ln K_F + \left(\frac{1}{n}\right) \ln C_e \qquad (6)$$

Where C_e ($mg \cdot L^{-1}$) is the concentrations of BPA and Pb^{2+} at equilibrium and q_{eq} ($mg \cdot g^{-1}$) is adsorbed amount of BPA at equilibrium. K_F and n are the Freundlich constant related to the sorption energy and adsorption intensity, respectively.