Supporting information

Controlled fabrication of the flower-like α-zirconium phosphate for efficient removal of radioactive strontium from acidic nuclear wastewater

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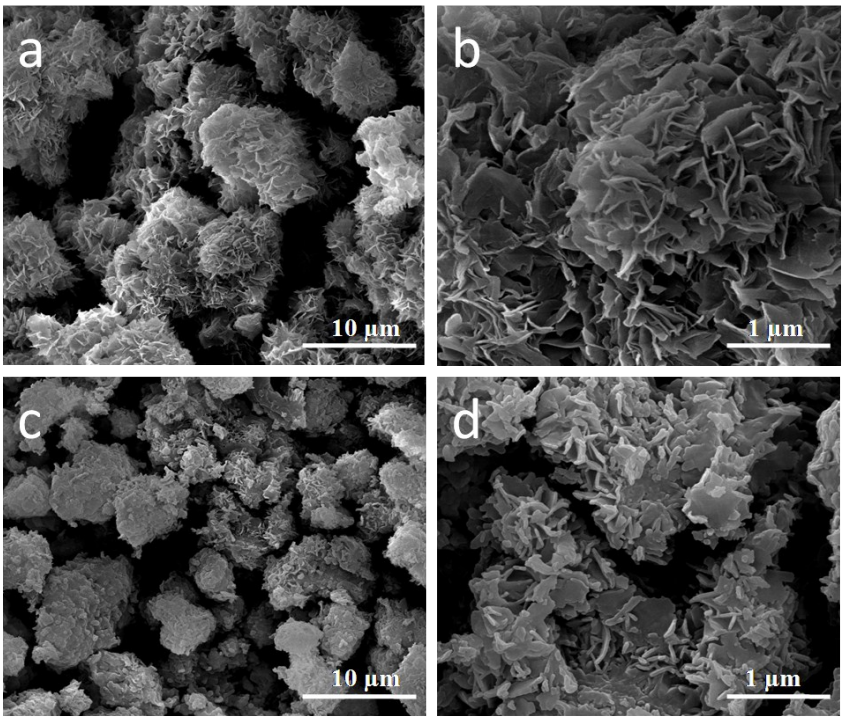

Fig.1 SEM images of as-prepared samples with different time, (a) and (b) 8 4h, (c) and (d) 100 h

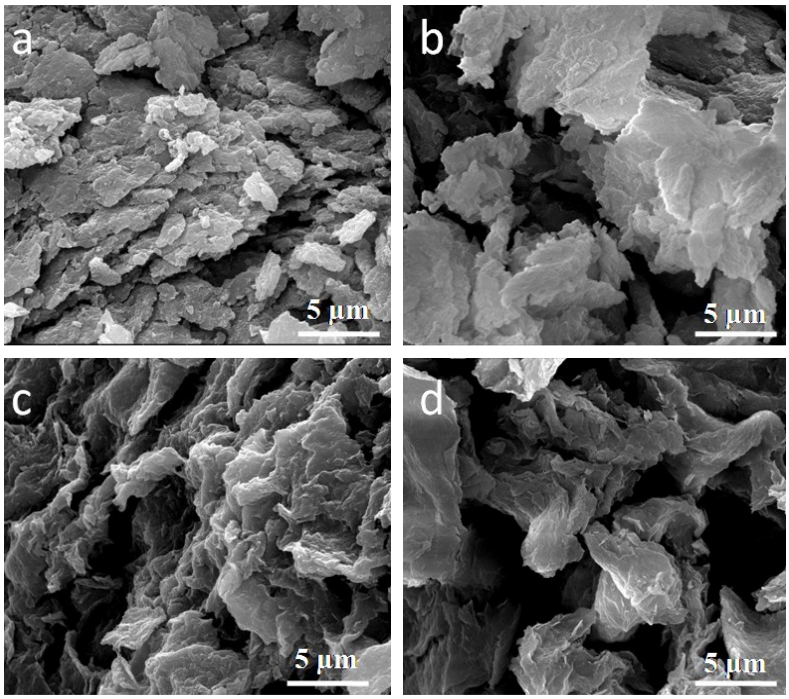

Fig.2 SEM images of as-prepared samples with different temperature, (a) 60 ^{0}C , (b) 70 ^{0}C, (c) 90 ^{0}C ,(d) 100 ^{0}C

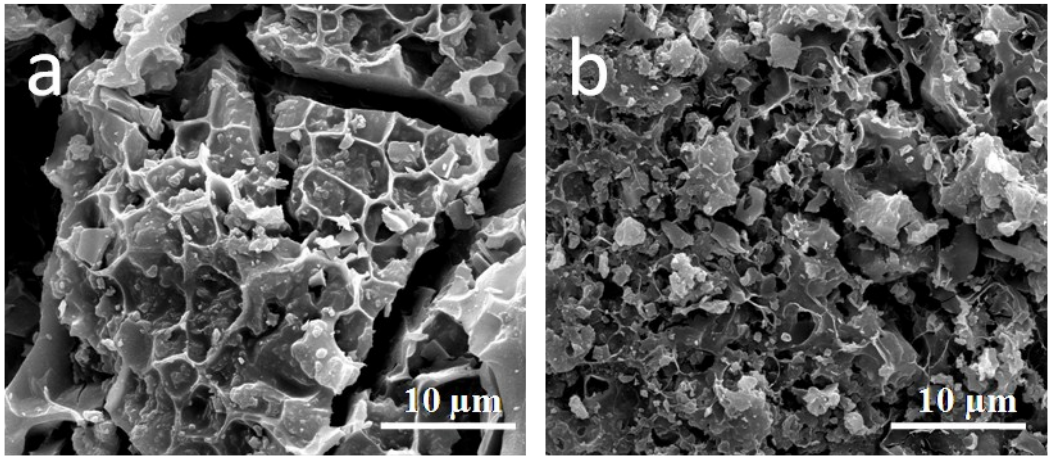

Fig.3 SEM images of as-prepared samples using $(NH_4)_3PO_4$ as P source

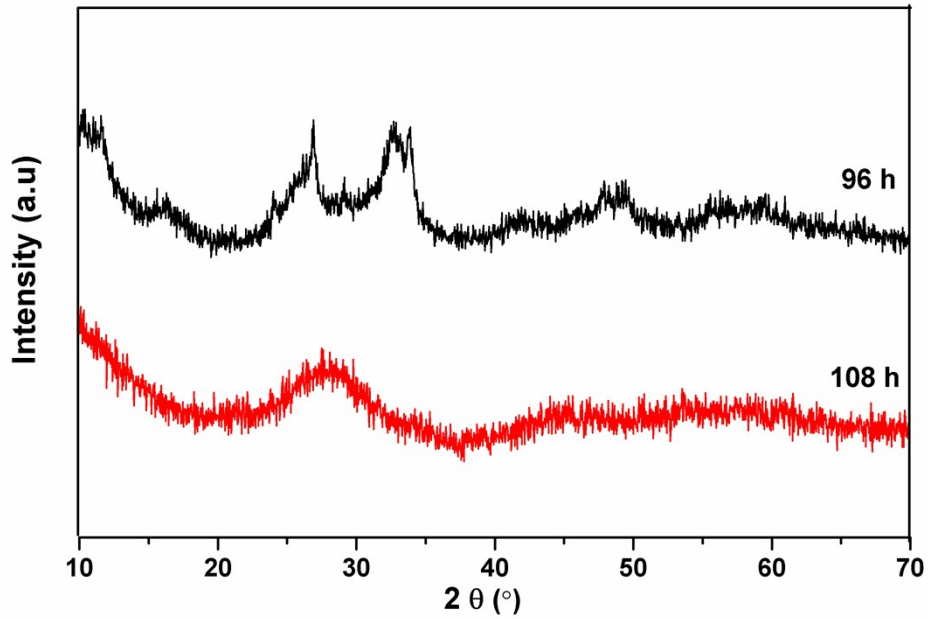

Fig.4 XRD patterns of as-prepared samples using $(NH_4)_3PO_4$ as P source

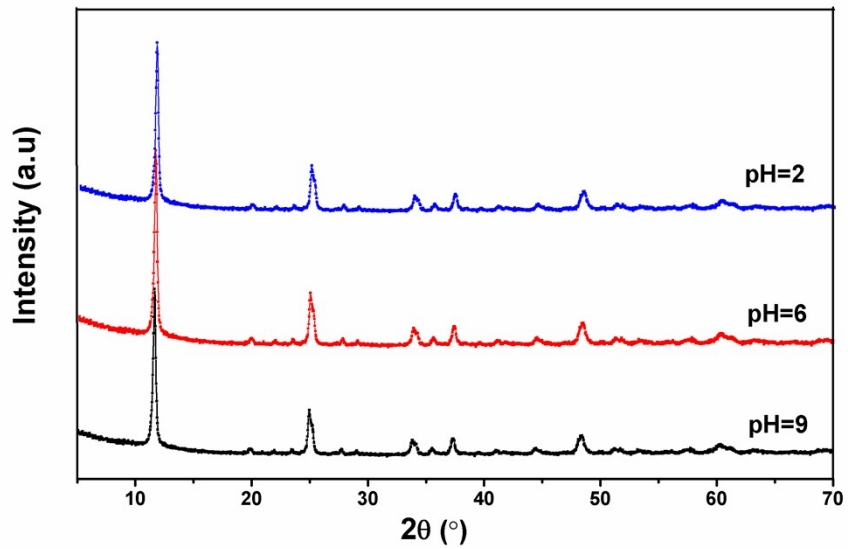

Fig.5 XRD pattern of as prepared α-ZrP immersing in aqueous solution with different pH

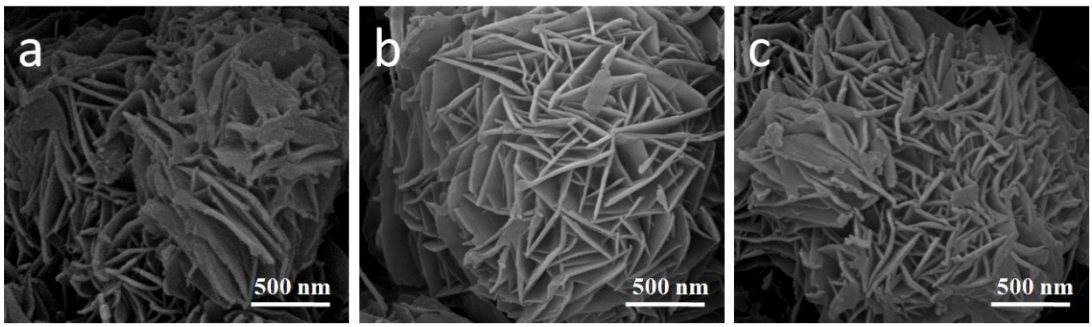

Fig.6 SEM images of the flower-like α-ZrP immersing in aqueous solution with different pH, (a) pH=2, (b) p H=6, (c) pH=9.

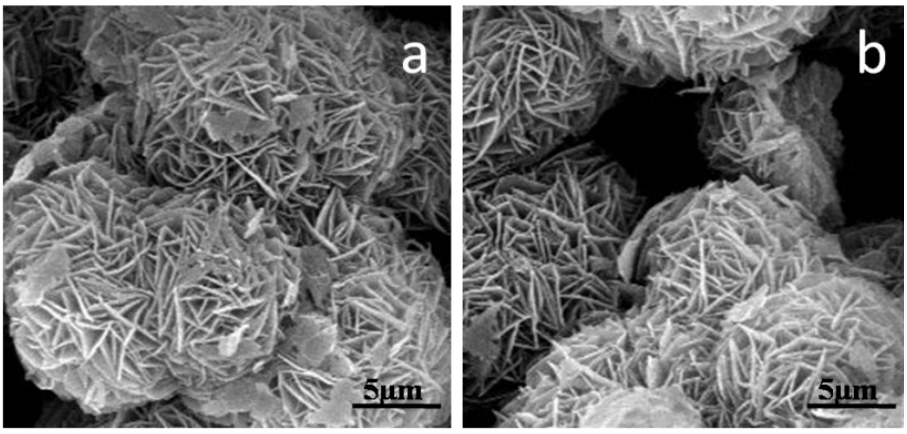

Fig.7 SEM images of the flower-like α-ZrP before (a) and after (b) radiation

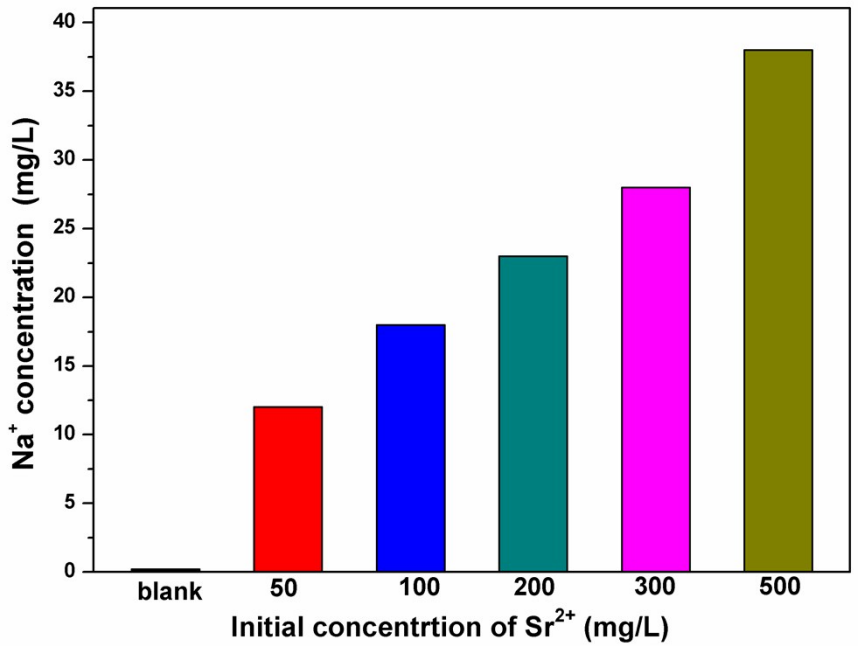

Fig.8 Concentration of Na^+ in aqueous solution after Sr^{2+} adsorption

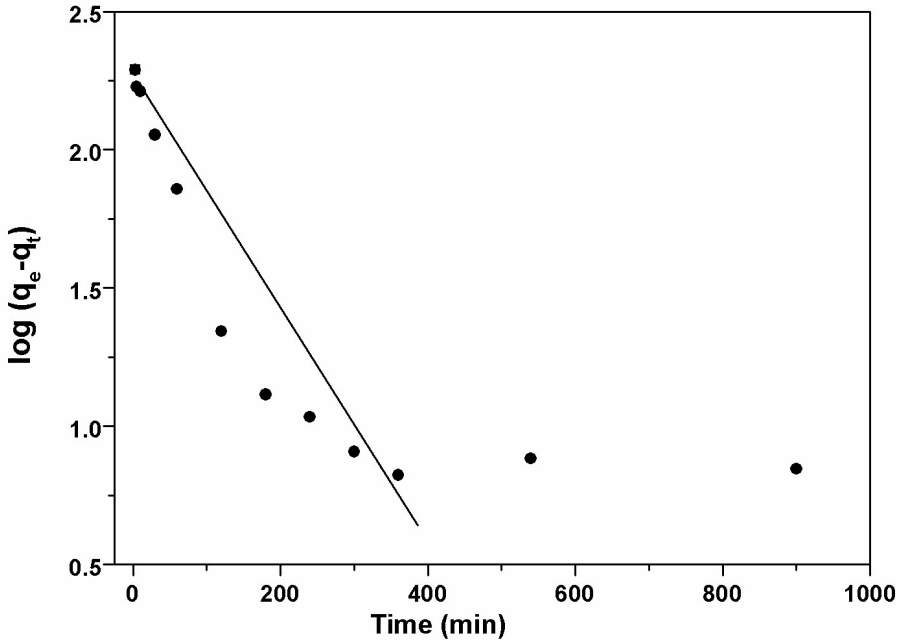

Fig. 9 Adsorption kinetics for Sr^{2+} adsorption on the flower-like α-ZrP fitted with a pseudo-first-order model

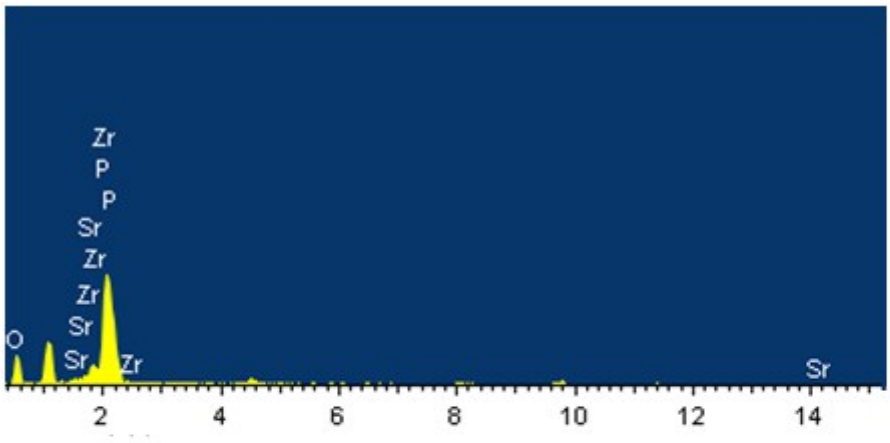

Fig.10 EDS spectra of the flower-like α-ZrP after adsorption of Sr^{2+}

Table Caption

Table 1 Equilibrium isotherm model parameters for Sr^{2+}adsorption on the flower-like α-ZrP （T=293 K）

Temperatur	Langmuir isotherm			Freundlich isotherm		
e	q_m (mg g^{-1})	b (L mg^{-1})	R^2	n	k_f [mg g^{-1}(L/ g)$^{1/n}$]	R^2
293K	293.43	0.34	0.9985	1.231	1.071	0.9654
298K	247.9	0.25	0.9979	2.56	16.59	0.9543
303K	230.7	0.45	0.9984	3.03	21.82	0.9217

Table 2 kinetic parameters for Sr^{2+} sorption onto the flower like α-ZrP （T=293 K）

Model	Parameters	Sr^{2+}
Experiment	q_e (mg g^{-1})	293.43
Pseudo first-order kinetic model	k_1(min^{-1})	0.0242
	q_e^{cal} (mg g^{-1})	312.45
	R^2	0.9643
Pseudo second-order kinetic model	k_2 (g mg^{-1} min^{-1})	0.3015
	q_e^{cal} (mg g^{-1})	412.57
	R^2	0.9998