Supplementary Material

Mesoporous hydroxylapatite/activated carbon bead-on-string nanofibers and their sorptions towards Co (II)

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1. Effect of meso-HA/AC nanofibers concentration on sorption of Co (II)

Fig. S1 shows effect of meso-HA/AC nanofibers concentration on sorption of Co(II). The sorption of Co(II) increases with increasing nanofiber concentration, which may be attributed to the increased surface area and availability of more sorption sites. Besides, the K_d value decreases slightly with increasing nanofiber concentration, which may be attributed to the competitions among the functional groups at the surface of nanofibers. Such competitions reduce the effective sites of functional groups and result in the decrease in sorption ability of nanofibers with increasing solid content. Therefore, a concentration of meso-HA/AC nanofibers of 0.8 g/L is determined to be the optimum value to adsorb Co (II).
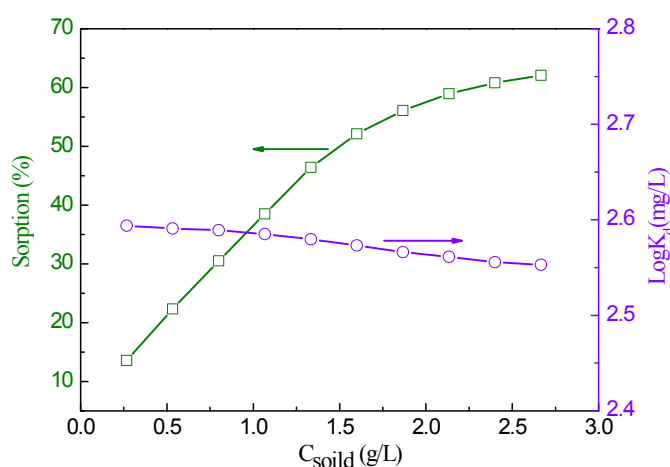

Figure SM1: Effect of meso-HA/AC nanofibers concentration on sorption of Co(II).

2. Standard calibration curve of Co(II) concentration

A calibration curve of Co(II) concentration was established, and the results determined from regression equation of the calibration curve (Fig. S2), were expressed as mg Co(II) ions equivalents per mg of the Co(II) ions in meso-HA/AC nanofibers. In this method, Co(II) solutions (60 mg/mL) were prepared by dissolving 30 mg $CoCl_2 \cdot 6H_2O$ solids in the right amount of distilled water to dissolve completely, then added in a 500 mL volumetric flask to constant volume. A group of the same amount of Co(II) solution was removed in 25 mL volumetric flask respectively. 4.0 mL xylenol orange solution (0.25 mg/mL) and 5.0 mL HAc-NaAc buffer solution were added to the Co(II) solution, shaken thoroughly and diluted to 25 mL by adding distilled water. The

mixture was heated by water bath for 10 min at 50 °C and then cooled to room temperature. Absorbance was measured at 578 nm using a UV-754 PC spectrophotometer (Shanghai Jinghua, China).
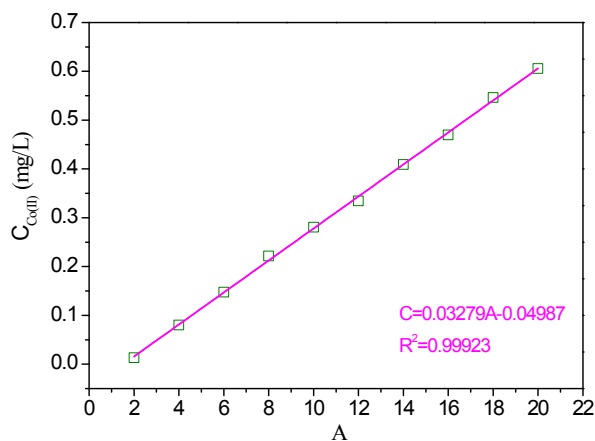

$C = 0.03279A - 0.04987$
$R^2 = 0.99923$

Figure SM2: Standard calibration curve of Co(II) concentration

3. Effect of HA/glucose ratio on the viscosity of electrospinning solution

In order to investigate the relationships between the morphologies of PVA/HA/glucose nanofibers and HA/glucose ratios, the effect of HA/glucose on the viscosity of electrospinning solution was measured by a digital rotation viscometer (NDJ-5S, Shanghai, China). Fig. S3 shows the viscosities of electrospinning solutions increases with increasing glucose contents (*i.e.*, decreasing HA/glucose ratios).
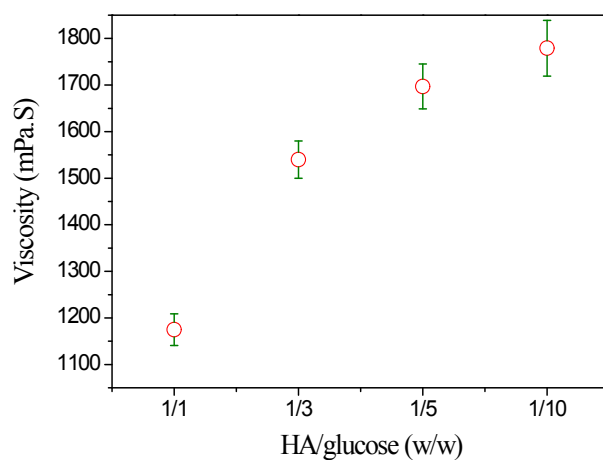

Figure SM3. Effect of HA/glucose ratio on the viscosity of electrospinning solution (25 °C)

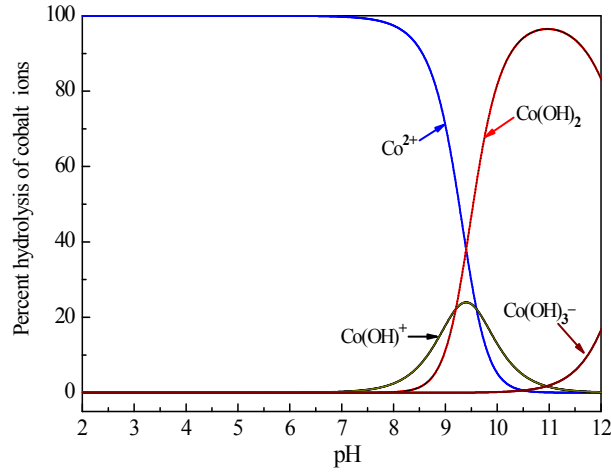**4. Speciation distribution of Co(II) solution at different pH**

Figure SM4. Speciation distribution of Co(II) solution at different pH

5. **Comparison with meso-hydroxylapatite nanofibers prepared via calcination process in our previous work**

Table 1. Comparison with meso-hydroxylapatite nanofibers via calcination process

T (K)	$C_{s\,max}$ (mol/g)	
	References[1]	This work
303.15	1.38×10^{-4}	1.40×10^{-4}
323.15	1.43×10^{-4}	1.44×10^{-4}
343.15	1.47×10^{-4}	1.53×10^{-4}

[1] H. Wang, P. Zhang, X. Ma, S. Jiang, Y. Huang, L. Zhai and S. Jiang., *J. Hazard. Mater.*, 2014, **265**, 158-165.