

Supplementary Materials

Table S1 Kinetics and isotherm constants for Cu (II) removal by the SC-HA/C composite

| <i>Pseudo-second-order equation</i> | | | | |
|---|--------------------|------------------|---------------|--------|
| Initial Cu (II) concentration (mg/L) | k_2 (g/(mg·min)) | h (g/(mg·min)) | q_e (mg/g) | R^2 |
| 10 | 2.1613 | 2.3491 | 1.04 | 1.0000 |
| 20 | 1.7376 | 7.0771 | 2.02 | 1.0000 |
| 50 | 0.1115 | 2.8843 | 5.09 | 1.0000 |
| <i>Langmuir isotherm</i> | | | | |
| Temperature (°C) | q_m (mg/g) | K_L (L/mg) | R_L | R^2 |
| 25 | 9.27 | 0.6134 | 0.0039~0.2927 | 0.9720 |
| 35 | 10.60 | 0.3944 | 0.0060~0.3916 | 0.9713 |
| 45 | 19.23 | 0.3738 | 0.0063~0.4044 | 0.9956 |

Table S2 Comparison of the copper removal capacities of SC-HA/C with some other materials

| Material | pH | Concentr. (mg/L) | Surface area (m ² /g) | Particle size (mm) | T (°C) | Capacity (mg/g) | Ref. |
|---|-------|------------------|-------------------------------------|--------------------|--------|--------------------|------------|
| SC-HA/C | 5 | 10~100 | 8.52 | >3 | 25 | 1.10~8.77 | This study |
| SC-HA/C | 5 | 10~100 | 28.44 | <0.149 | 25 | 1.10~10.70 | This study |
| SC-HA/C | 5 | 5~350 | 28.44 | <0.149 | 25 | 0.47~11.50 | This study |
| SC-HA/C | 5 | 5~350 | 28.44 | <0.149 | 35 | 0.49~14.65 | This study |
| SC-HA/C | 5 | 5~350 | 28.44 | <0.149 | 45 | 0.50~19.81 | This study |
| SC-Charcoal | 5 | 10~100 | - | <0.149 | 25 | 0.19~0.27 | This study |
| Activated carbon | 5 | 10~100 | - | <0.149 | 25 | 1.10~3.81 | This study |
| HA powder | 5 | 10~100 | - | <0.149 | 25 | 1.09~10.95 | This study |
| SCB | - | 63.546~317.73 | - | 60~80mesh | room | 4.13 | [39] |
| SCB | 6 | 63.55 | - | 0.75 | room | 5.46 | [41] |
| SCB | 5 | 1000 | - | <100mesh | room | 6.87 | [5] |
| SCB | 6.48 | 10 | - | <0.15 | 20 | 9.48 | [6] |
| SCB | 5 | 31.77 | - | <0.1 | room | 6.35 | [12] |
| SCB | 6 | 10~100 | 9.08 | 0.15 | 27 | 9.73 | [40] |
| SCB | 6.48 | 3~300 | - | <0.15 | 20 | 10.64 | [13] |
| SCB | 5 | 5~70 | - | <100mesh | room | 7.63 | [3] |
| SCB AC | 6 | 8~92 | 1502 | - | room | 13.24 | [15] |
| SCB modified with Tetraethylenepentamine | 5 | 5~70 | - | 100mesh | room | 13.34 | [3] |
| SCB modified with NaOH | 5 | 1000 | - | <100mesh | room | 11.87 | [5] |
| Loofa sponge | 6.00 | 10~500 | - | - | 20 ±2 | 5.12 | [14] |
| Sawdust | 4±0.2 | 5~50 | - | 0.45~0.60 | 25 | 6.59 | [4] |
| Banana peel | 6.48 | 10 | - | <0.15 | 20 | 8.24 | [6] |
| Watermelon rind | 6.48 | 10 | - | <0.15 | 20 | 5.73 | [6] |
| Synthetic HA (Merck) | 5 | 63.55 | 66 | <0.025 | 25 | 17.79 | [19] |
| Synthetic HA (Bio-Rad) | 5 | 63.55 | 77 | 0.025~0.25 | 25 | 7.63 | [19] |
| Synthetic HA (Alfa Aesar) | 5.27 | 10~500 | 50 | - | 25 ±2 | 1.02~48.55 | [7] |
| Nano-HA | 6 | 10 | - | 200nm | 30 | 4.7 | [1] |
| Nano-HA/chitin composite | 6 | 10 | - | 200nm | 30 | 5.4 | [1] |

| | | | | | | | |
|----------------------------|---------|--------|------|---------|------|------------|------|
| Nano-HA/chitosan composite | 6 | 10 | - | 200nm | 30 | 6.2 | [1] |
| Carbon nanotube sheets | 7 | 100 | - | 10~40nm | 25 | 10.08 | [21] |
| Phosphate rock | 5.5±0.2 | 38 | - | 0.425 | 25±2 | 7.24 | [16] |
| Phosphate rock | - | 10-100 | - | 105~150 | 25 | 1.998~16.8 | [17] |
| Phosphate rock | 5 | 500 | 13.5 | - | 20 | 9.76 | [18] |
| Activated phosphate rock | 5 | 500 | 22.5 | - | 20 | 13.28 | [18] |

Note: SCB - Sugarcane bagasse; AC- Activated carbon; HA - Hydroxylapatite.