

Supporting Information for

Facile preparation of amorphous cobalt phosphate as inorganic carrier for direct separation and immobilization of his-tagged β -glucosidase from cell lysate

Xinnan Ma ^{a,1}, Zhili Chen^{a,1}, Juan Han^{b,*}, Yang Zhou^c, Yanli Mao^d, Chunmei Li^a,

Lei Wang^a, Yun Wang^{a,*}

^aSchool of Chemistry and Chemical Engineering, Jiangsu University, Zhenjiang, Jiangsu Province
212013, China

^bSchool of Food and Biological Engineering, Jiangsu University, Zhenjiang, Jiangsu Province 212
013, China

^cSchool of life sciences, Jiangsu University, Zhenjiang, Jiangsu Province, 212013, China.

^dHenan Province Key Laboratory of Water Pollution Control and Rehabilitation Technology,
Henan University of Urban Construction, Pingdingshan 467036, Henan, China

* Corresponding author. Tel.: +86 0511 88790683; Fax.: +86 0511 88791800;

E-mail: hanjuan@ujs.edu.cn (Juan Han) and yunwang@ujs.edu.cn (Yun Wang)

¹ Xin Nan Ma and Zhi Li Chen contributed equally to this study.

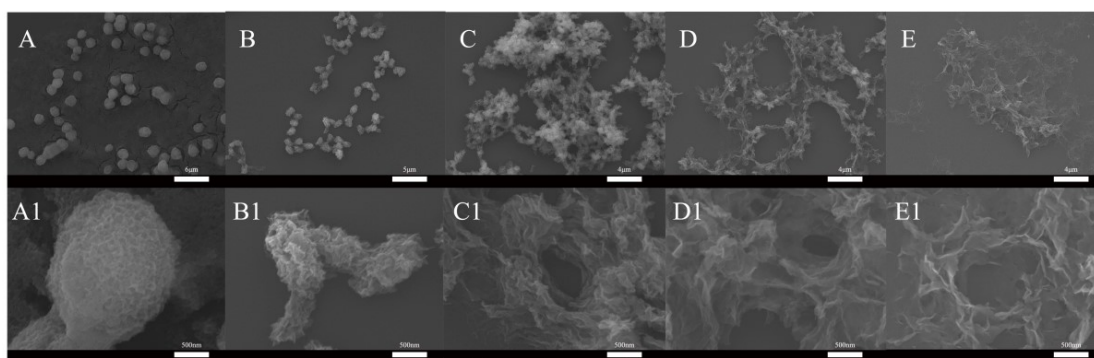


Figure S1. Effect of Ostwald ripening on the morphology of cobalt phosphate prepared at 2.4 mM (A), 4.8 mM (B), 7.2 mM (C), 9.6 mM (D) and 12 mM (E) $\text{Co}(\text{NO}_3)_2$. (A-E): cobalt phosphate obtained by incubating the samples in PBS buffer at 25 °C for 1 h; (A1-E1): magnification of (A-E).

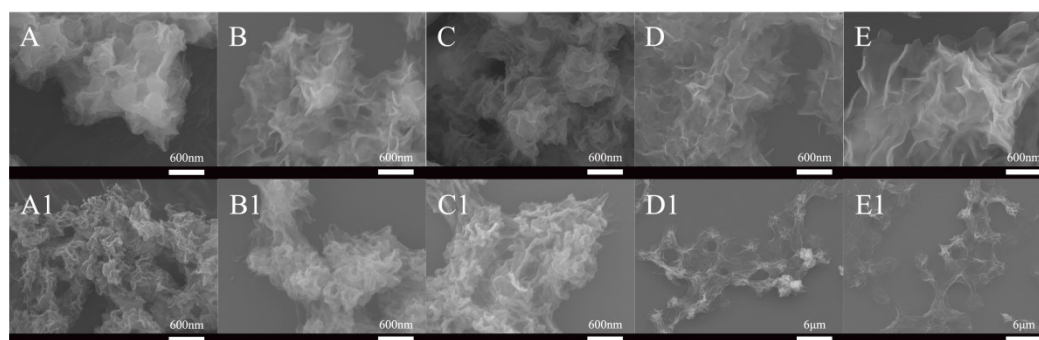


Figure S2. Effect of different preparation temperature of cobalt phosphate on the morphology of cobalt phosphate and $\text{Co}_3(\text{PO}_4)_2@GLH$. (A-E): cobalt phosphate samples synthesized at 15 °C (A), 25 °C (B), 35 °C (C), 45 °C (D) and 55 °C (E); (A1-E1): $\text{Co}_3(\text{PO}_4)_2@GLH$ obtained by incubating the corresponding cobalt phosphate samples in cell lysate (2 mg/mL GLH) at 25 °C for 1 h.

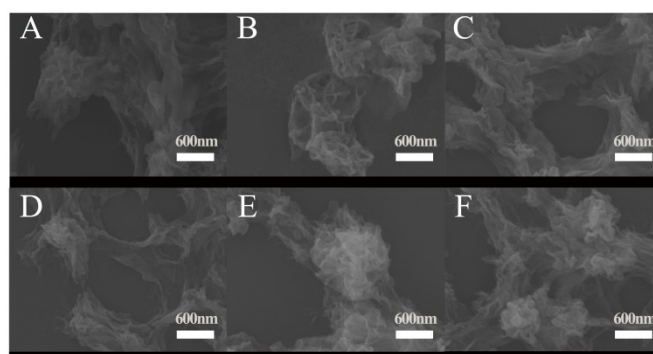


Figure S3. Effect of different immobilization time on the morphology of $\text{Co}_3(\text{PO}_4)_2@GLH$. (A) 0.5 h, (B) 1 h, (C) 4 h, (D) 8 h, (E) 12 h and (F) 24 h. Other conditions: 2000 $\mu\text{g}/\text{mL}$ crude enzyme solution, 7.2 mM Co^{2+} , 3:2 mole ratio of Co^{2+} to PO_4^{3-} :1:9 mass ratio of GLH to $\text{Co}_3(\text{PO}_4)_3$, and reaction at 25 °C for 1 h.

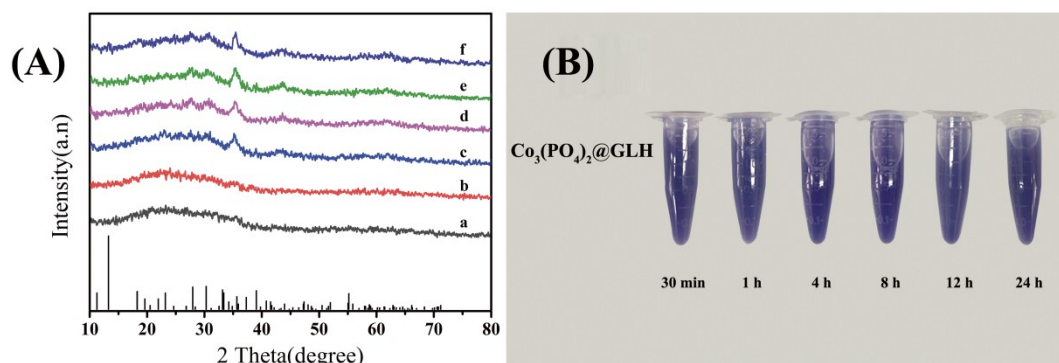


Figure S4. Effect of different immobilization time on XRD patterns (A) and photographs (B) of $\text{Co}_3(\text{PO}_4)_3@GLH$ prepared at 0.5 h (a), 1 h (b), 4 h (c), 8 h (d), 12 h (e) and 24 h (f). Other conditions: 2000 $\mu\text{g}/\text{mL}$ crude enzyme solution, 7.2 mM Co^{2+} , 3:2 mole ratio of Co^{2+} to PO_4^{3-} , 1:9 mass ratio of GLH to $\text{Co}_3(\text{PO}_4)_3$, and reaction at 25 $^\circ\text{C}$.

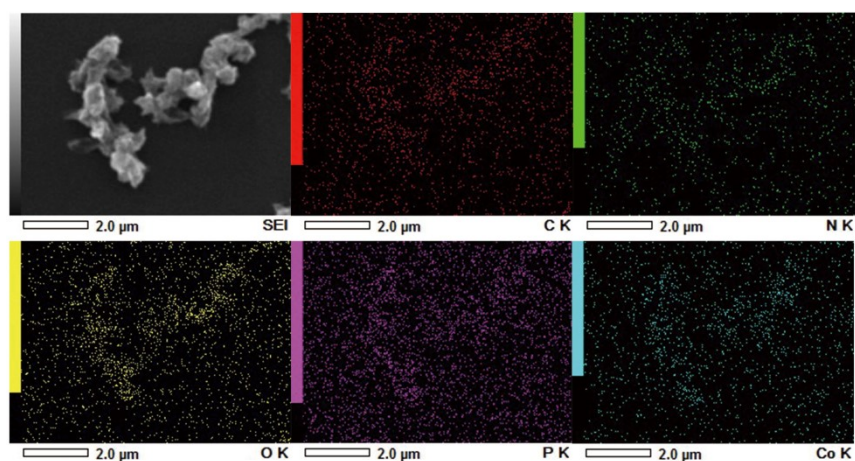


Figure S5. (A) SEM image of $\text{Co}_3(\text{PO}_4)_2@GLH$; (B) EDS element mapping of C, N, O, P, and Co.