

## Electronic Supplementary Information

### **K<sup>+</sup>-sensitive photonic crystal hydrogel sensor for efficient visual monitoring of hyperkalemia/hypokalemia**

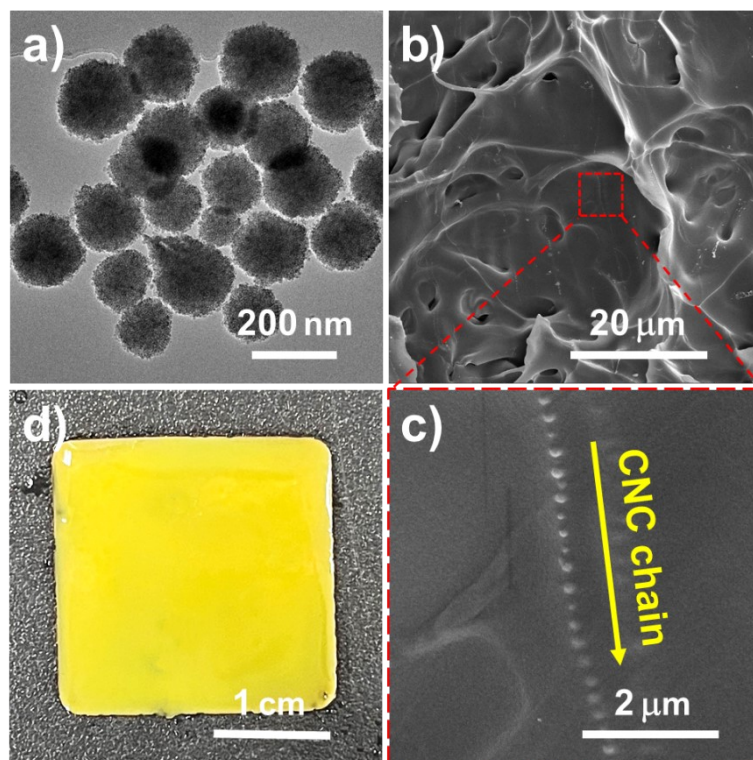
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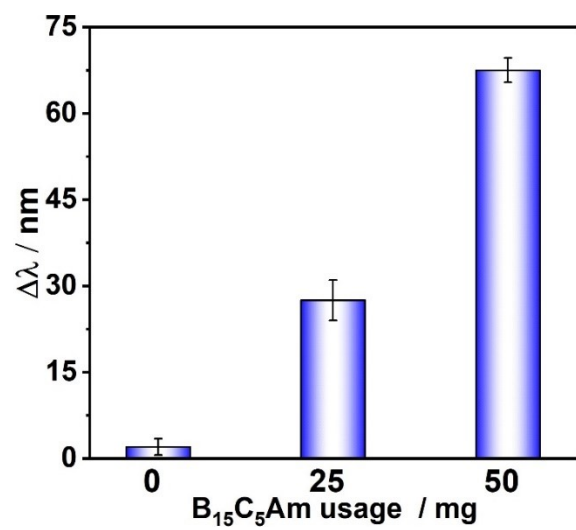
<sup>b</sup> *Key Laboratory of Pollution Control Chemistry and Environmental Functional Materials for Qinghai-Tibet Plateau of the National Ethnic Affairs Commission, College of Chemistry and Environment, Southwest Minzu University, Chengdu, Sichuan 610041, China*

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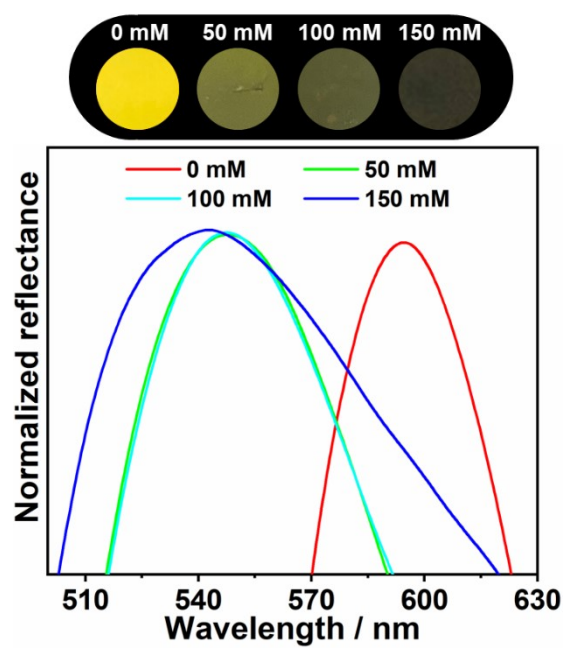
*Email addresses:* chengcj@swun.edu.cn (C.-J. Cheng), yuhr@swun.edu.cn (H.-R. Yu).



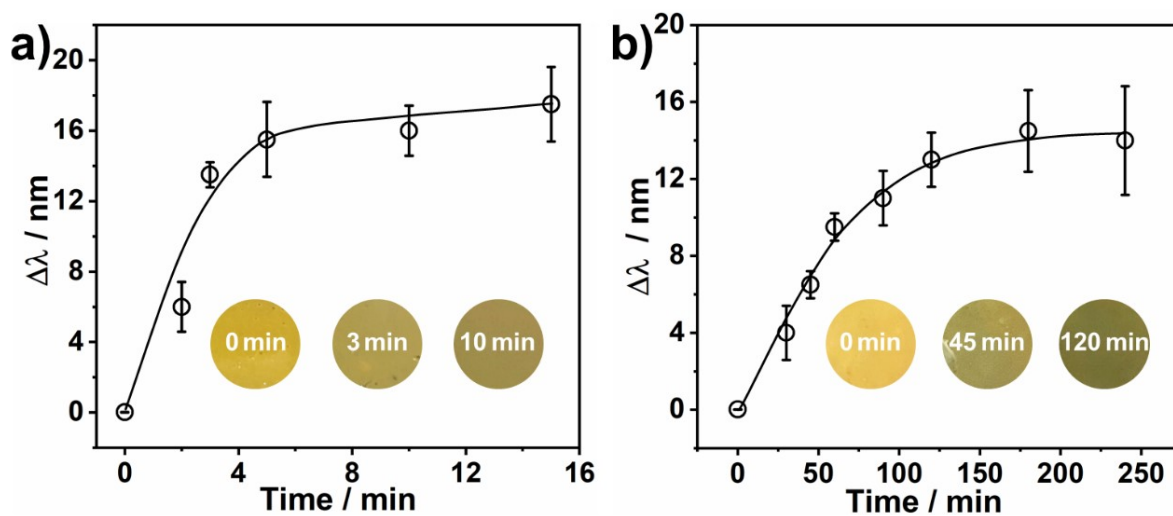
**Fig. S1** (a) Typical TEM image of the superparamagnetic  $\text{Fe}_3\text{O}_4$  NPs with a  $d_H$  of 166 nm. SEM images (b, c), and digital photograph (d) of the PANBC-166.



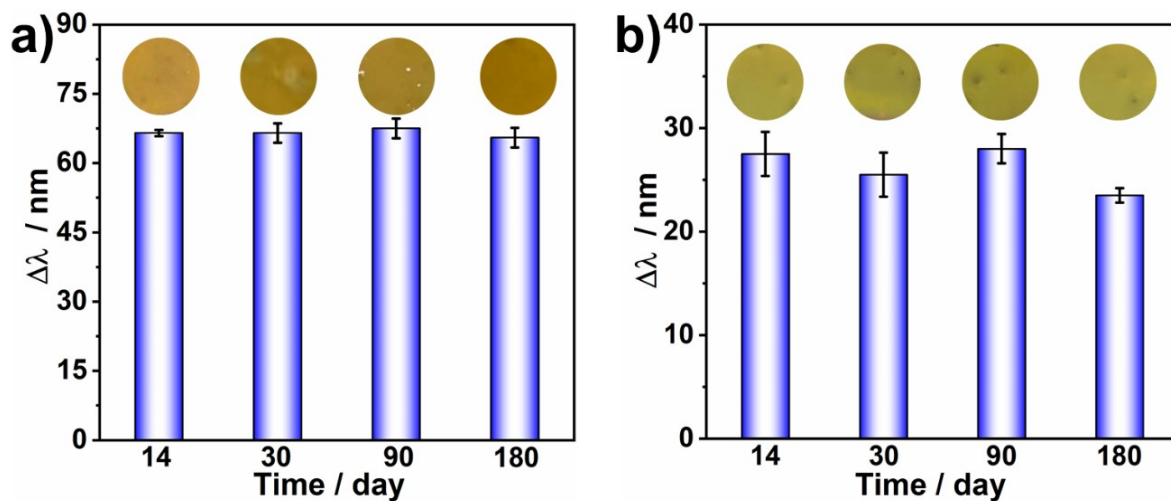
**Fig. S2** Response of the PANBC PCHs synthesized with different B<sub>15</sub>C<sub>5</sub>Am usages ( ) to 150 mM K<sup>+</sup> aqueous solution.



**Fig. S3** Reflection spectra and optical photographs (*top*) of the PANBC-166 in K<sup>+</sup> solutions with high concentrations.



**Fig. S4**  $\Delta\lambda$  value and optical photographs (*inset*) of the PANBC-166 with thicknesses of 250 (a) and 1000  $\mu\text{m}$  (b) in 5 mM  $\text{K}^+$  solutions for different time.



**Fig. S5**  $K^+$ -responsive detection performances of the PANBC sensors after different storage time. (a) PANBC-185 detects 150 mM  $K^+$ , and (b) PANBC-166 detects 5 mM  $K^+$ .