

Supporting Information

Autofluorescence of Hydrogels without Fluorophore

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Results and Discussion

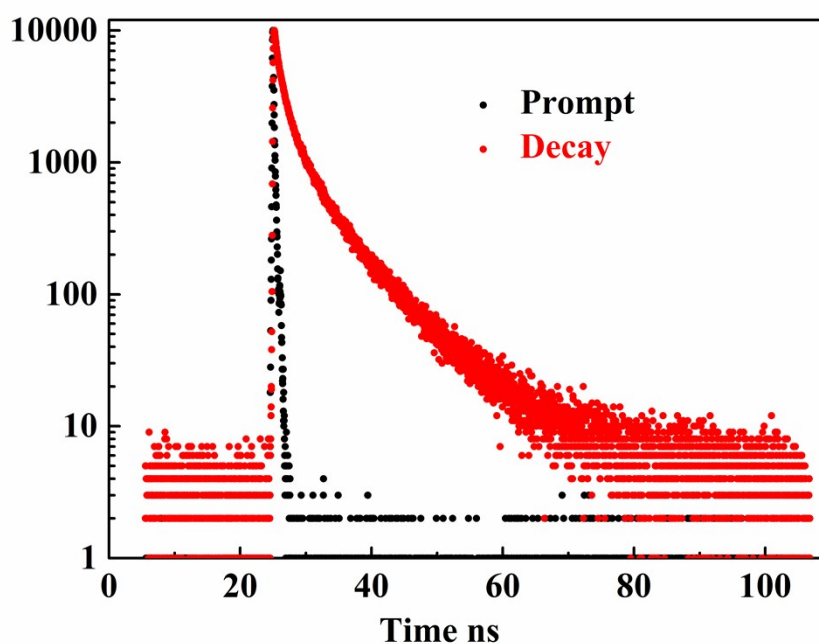


Figure S1 Time-resolved fluorescence of PAM gel

(prompt is for Lamp spectrum as background and decay is for PAM gel)

By curve fitting, we can get the following results:

$$\tau_1 = 1.6263 \text{ ns (35\%); } \tau_2 = 7.1813 \text{ ns (8\%); } \tau_3 = 0.2360 \text{ ns (57\%)}$$

So we can get average life time $\tau = 1.28$ ns

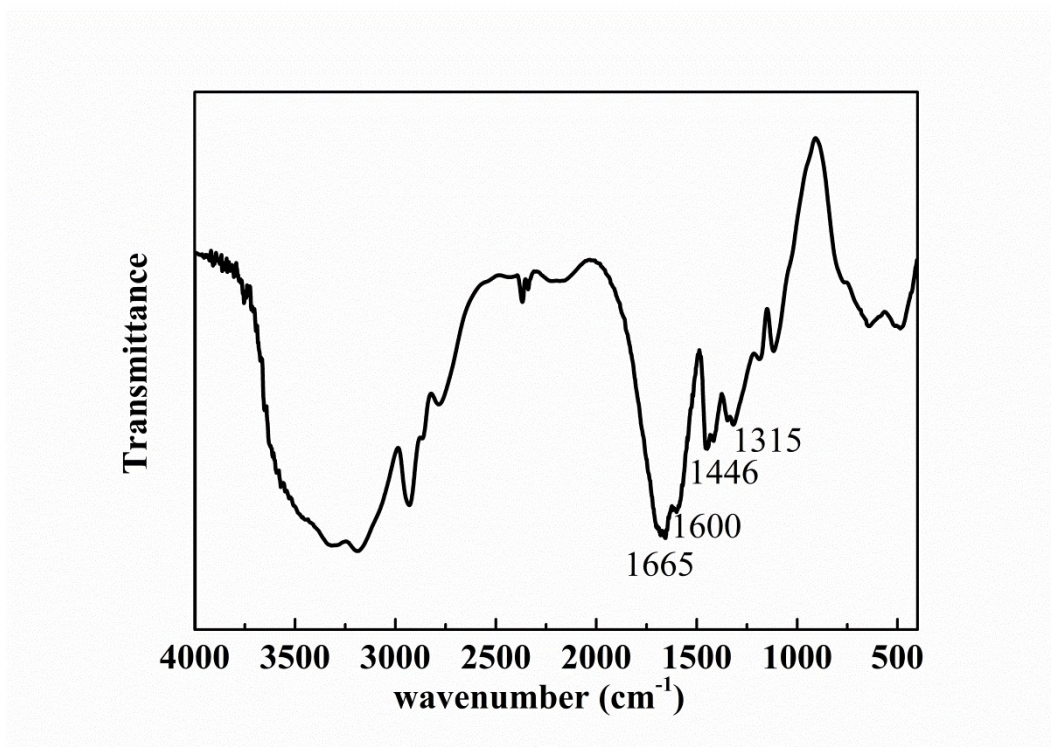


Figure S2 FITR spectra of chemically cross-linked PAM gel

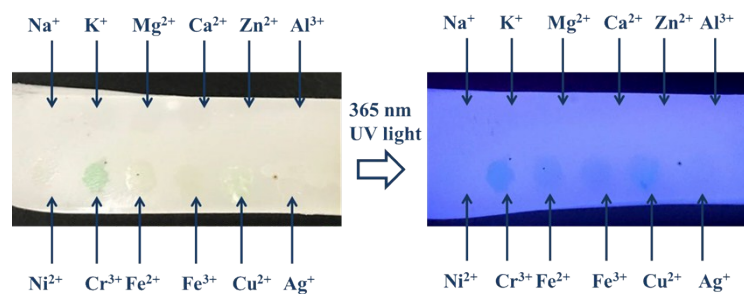


Figure S3 Effect of some metal ions on the fluorescence of PAM gel

It can be seen that Fe^{2+} , Fe^{3+} , Cu^{2+} and Cr^{3+} quench the fluorescence of the PAM gel. We used UV-Vis spectrophotometer to detect the absorption of light by Fe^{3+} , Ag^+ and Ni^{2+} ions. The experimental results show that Fe^{3+} , Ag^+ and Ni^{2+} ions absorb UV light (Figure S4), whereas Fe^{3+} can quench fluorescence, while Ag^+ and Ni^{2+} cannot. So the absorption of ultraviolet light by Fe^{3+} is not the main reason for its quenching fluorescence. And a large amount of literature also tends to support the viewpoint that the interaction between Fe^{3+} and matrix is the main cause of fluorescence quenching¹⁻⁴. The interaction of Fe^{3+} with $-\text{C}=\text{O}$ in the PAM gel is confirmed in Figure S5. Besides, the filter effect is also one of probable reasons for the decreased fluorescence intensity.

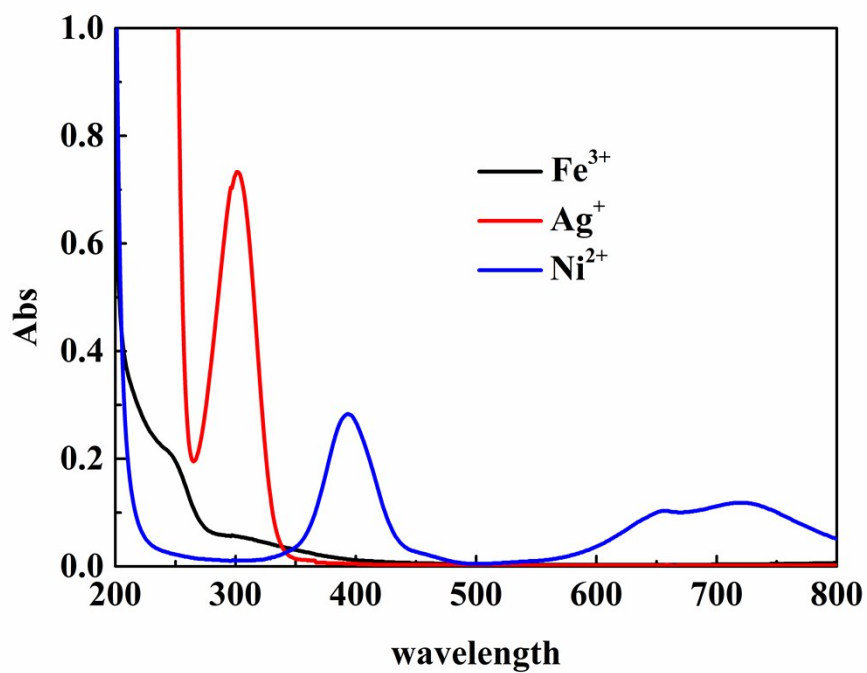


Figure R4 UV-Vis absorption spectrum of Fe³⁺, Ag⁺ and Ni²⁺ ions

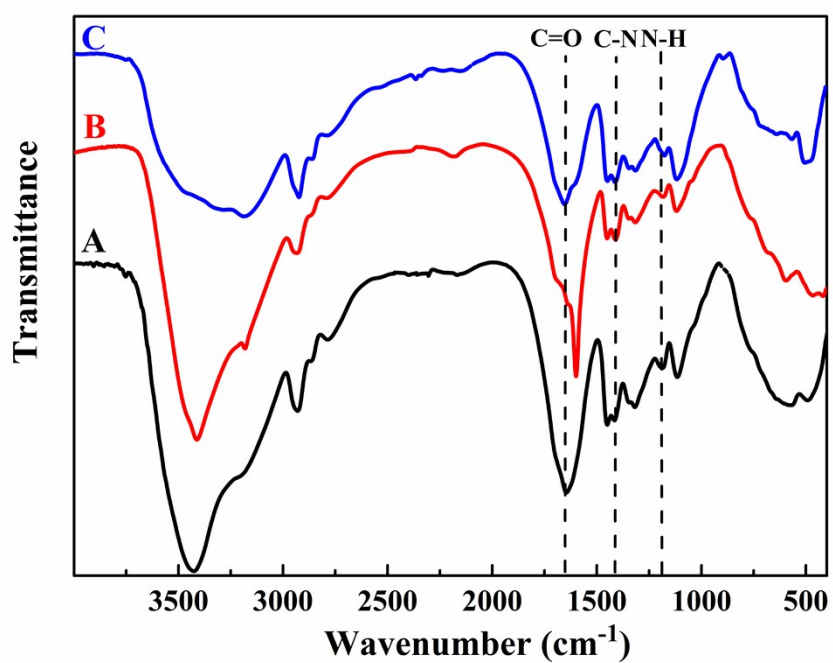


Figure S5 FTIR spectra of PAM gel without Fe³⁺ (A); PAM gel with Fe³⁺ (B); PAM gel with Fe³⁺ after scrubbing (C).

1. Z. Gu, W. Lei, W. Shi, Q. Hao, W. Si, X. Xia and F. Wang, *Spectrochim. Acta A*, 2014, **132**, 361-368.
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3. L. L. Zhao, X. Xin, P. Ding, A. X. Song, Z. C. Xie, J. L. Shen and G. Y. Xu, *Anal. Chim. Acta*, 2016, **926**, 99-106.
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