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Incorporation of Fmoc-Y nanofiber in Ca-alginate hydrogels for improving mechanical properties and controlled release of small molecules

Jiahui Chen,[‡a] Na Tao,[‡a] Shiqi Fang,[a] Zewen Chen,[a] Li Liang,[b] Xiaoyi Sun,[a] Juan Li,*[a] and You-Nian Liu*[a]

[a] College of Chemistry and Chemical Engineering, Central South University, Changsha, Hunan 410083, P.R. China.

[b] State Key Lab of Food Science and Technology, School of Food Science and Technology, Jiangnan University, Wuxi, Jiangsu 214122, P. R. China

[‡] Both authors contributed equally to this work.

Fluorescence spectra

The emission spectra were tested to determine whether Fmoc-Y is mobile or assembled in the IPN. The excitation wavelength is 275 nm, and the scanning speed is 1200 nm/min with slit width of 2.5 nm.

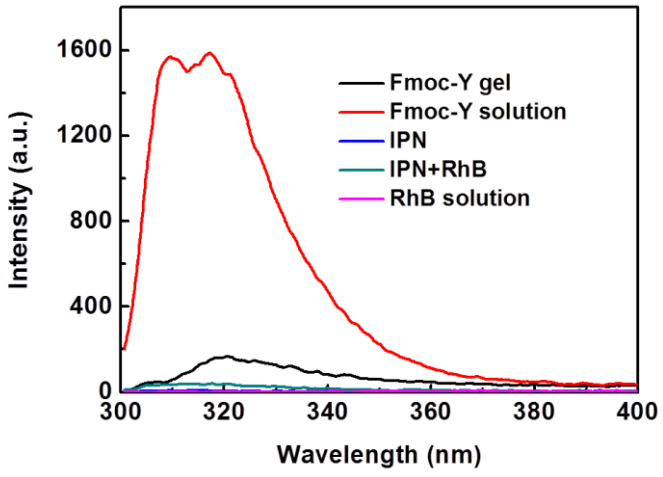

Figure S1. Fluorescence spectra of IPN hydrogels with/without RhB dye. The concentration of RhB in solution and hydrogel is 0.06 mg/mL. The concentration of Fmoc-Y in DMSO solution and hydrogel is 0.3 mg/mL.

Erosion tests

Erosion tests were undertaken in buffer media at pH 2.0 (100 mM glycine-HCl buffer) and at pH 7.4 (100 mM Tris-HCl buffer), respectively. Two milliliter buffer solutions were added to the hydrogels (about 0.5 g) and incubated in a water bath at 37 ^{o}C with continuous shaking at 50 rpm. At scheduled time points (about 0, 0.5, 2, 4, 5, 6, 8, 12, 24, 48, 120 h), the hydrogel samples were photographed using a digital camera. Specifically, small amount of RhB was incorporated into the hydrogels to better probe the erosion behavior of hydrogels.

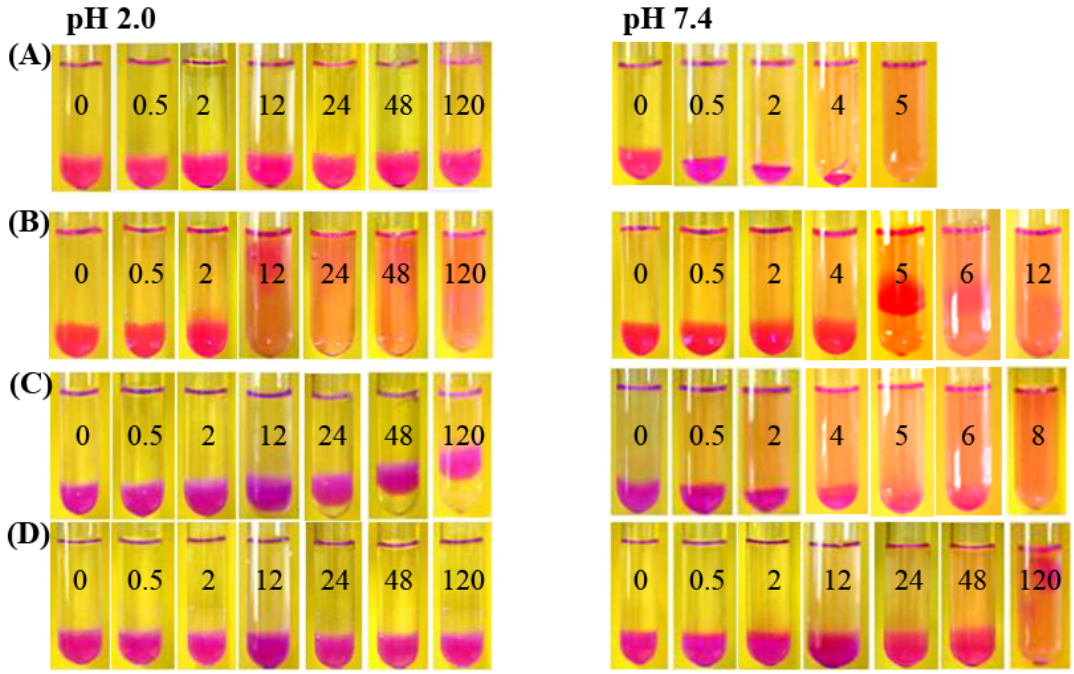

Figure S2. Resistance of hydrogels to erosion at pH 2.0 and 7.4 at 37 ^{o}C. (A) Fmoc-Y; (B) SA; (C) semi-IPN; (D) IPN. The numbers in the picture indicate the incubation time in hours.

Leakage test

The leakage of Fmoc-Y from the hydrogel by exposure to pH 7.4 was undertaken in buffer (pH 7.4, 100 mM Tris-HCl buffer). Buffer medium (10.0 mL) was added into the vial and kept at 37 ^{o}C with continuous shaking at 100 rpm. At certain times (about 8, 24, 120 h), 1.0 mL of buffer medium was drawn out and replenished with 1.0 mL fresh buffer. The absorbance of the taken-out solution was measured by UV-Vis spectroscopy. The absorbances of Fmoc moiety are found at 267, 290 and 301 nm.

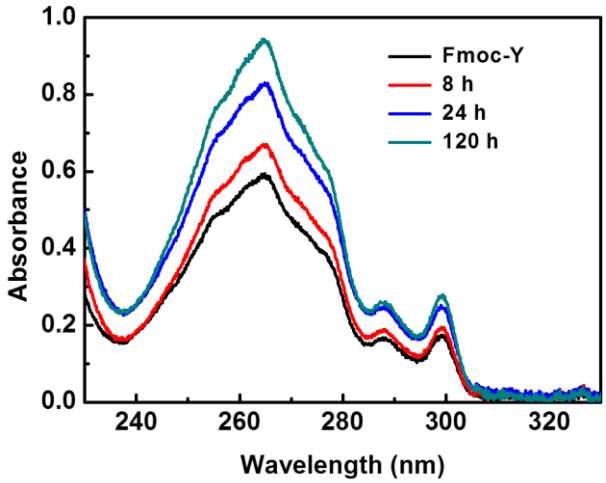

Figure S3. Leakage of Fmoc-Y from IPN hydrogels at pH 7.4 (The spectra of leakage solution after 10-fold dilution were monitored by UV-Vis spectroscopy). The experiments were carried out at 37 ^{o}C, 100 rpm. The concentration of control Fmoc-Y is 15 mg/L.