

Supplementary Materials: Fabrication and Optimization of Stable, Optically Transparent, and Reusable pH-Responsive Silk Membranes

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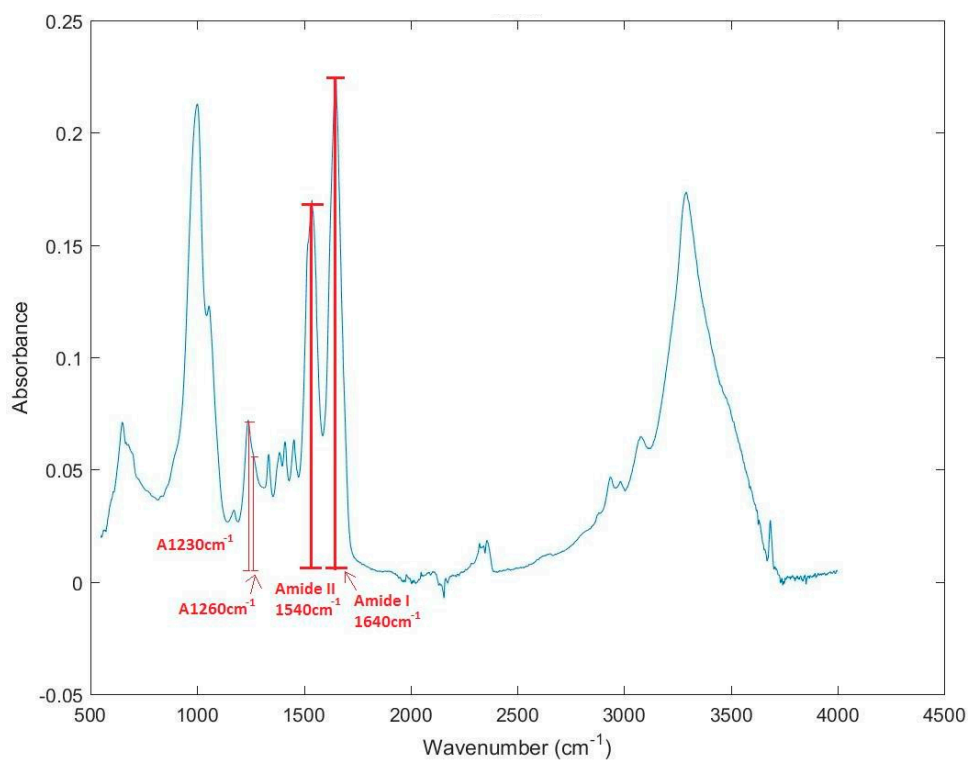
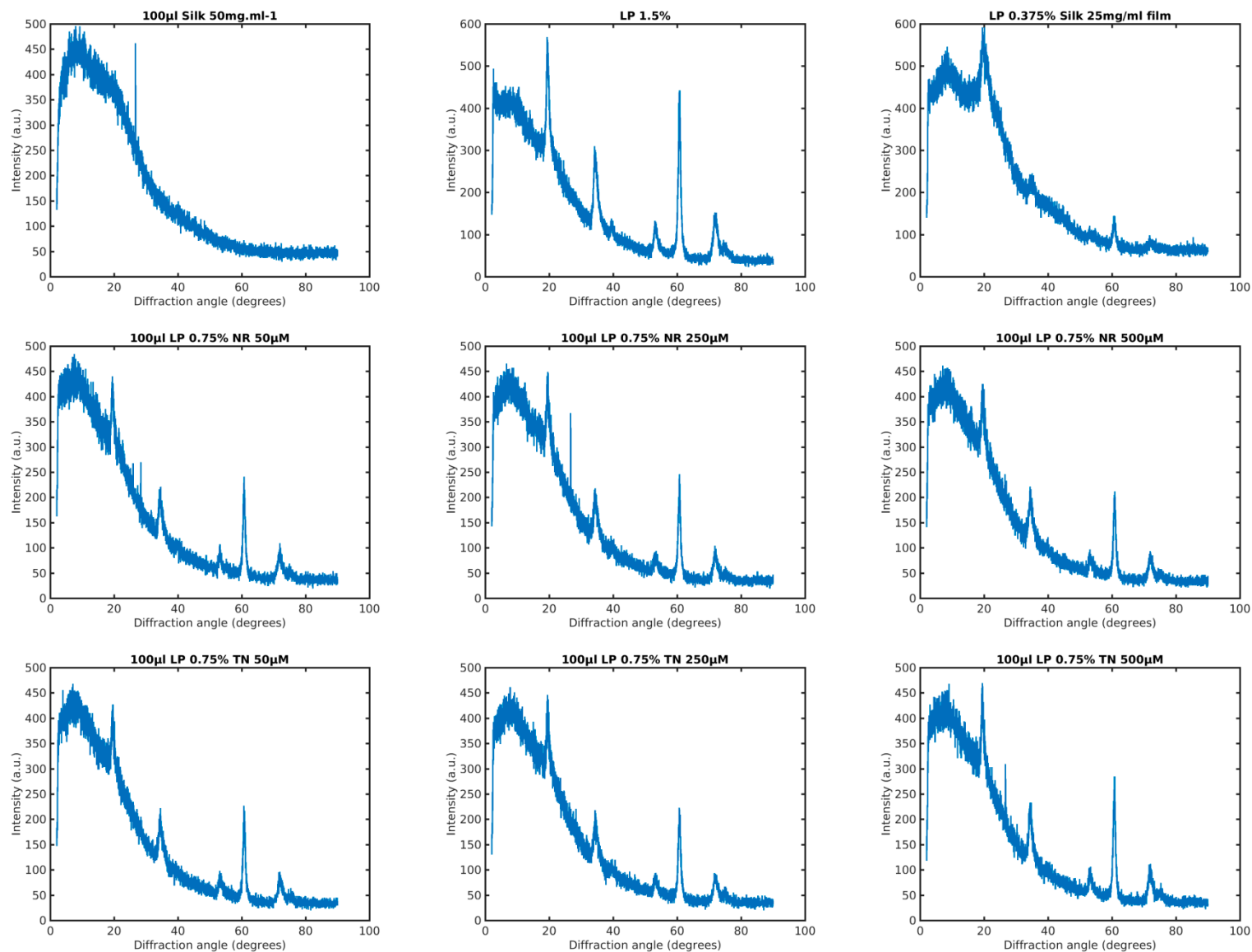


Figure S1. FTIR-ATR of sample 6 (see Table 1) silk-laponite-dye patch and regions of interest for crystallinity and amide I/II ratio.



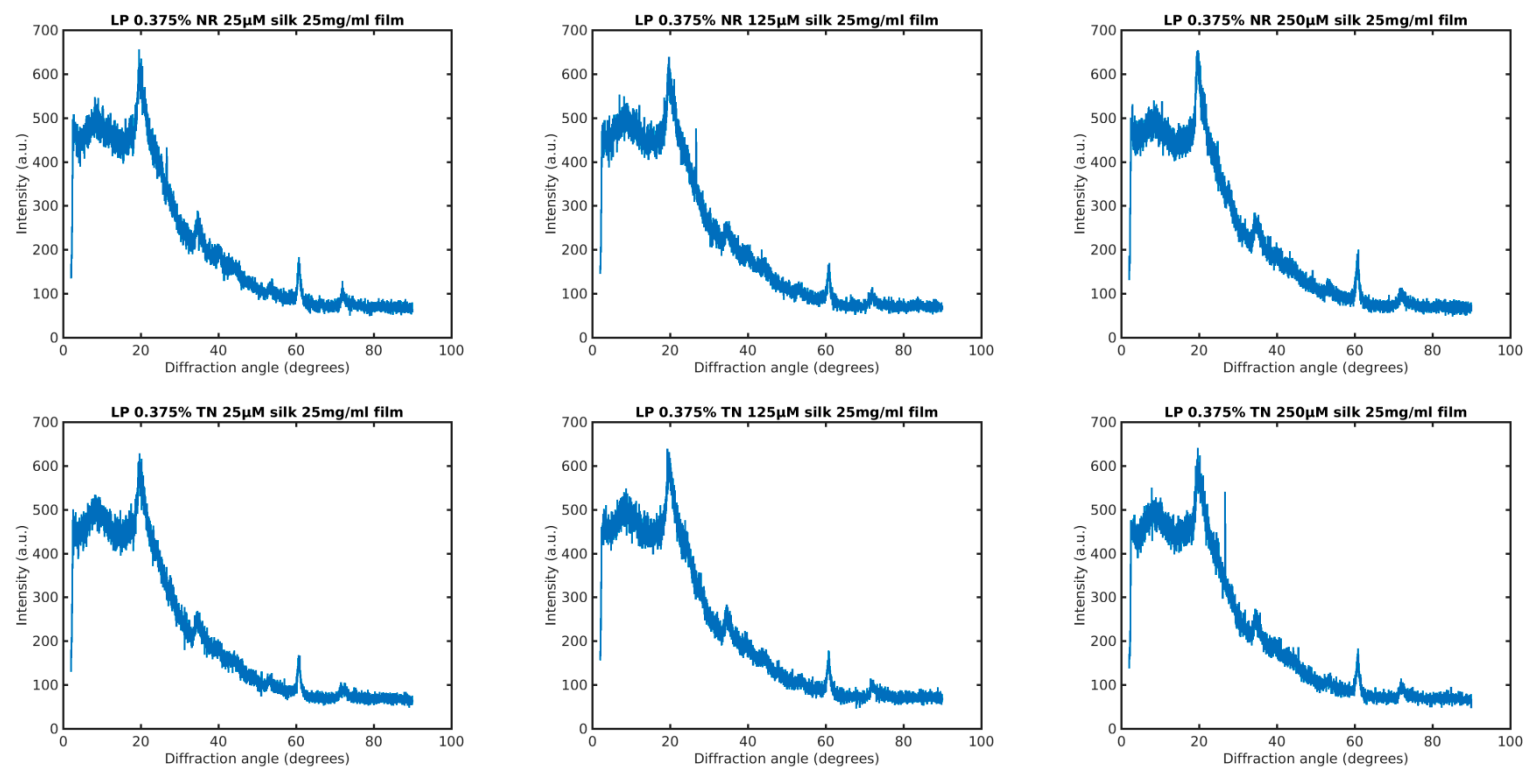


Figure S2. XRD diffractogram of samples from Table 1, except the 5 mg/mL silk patches.

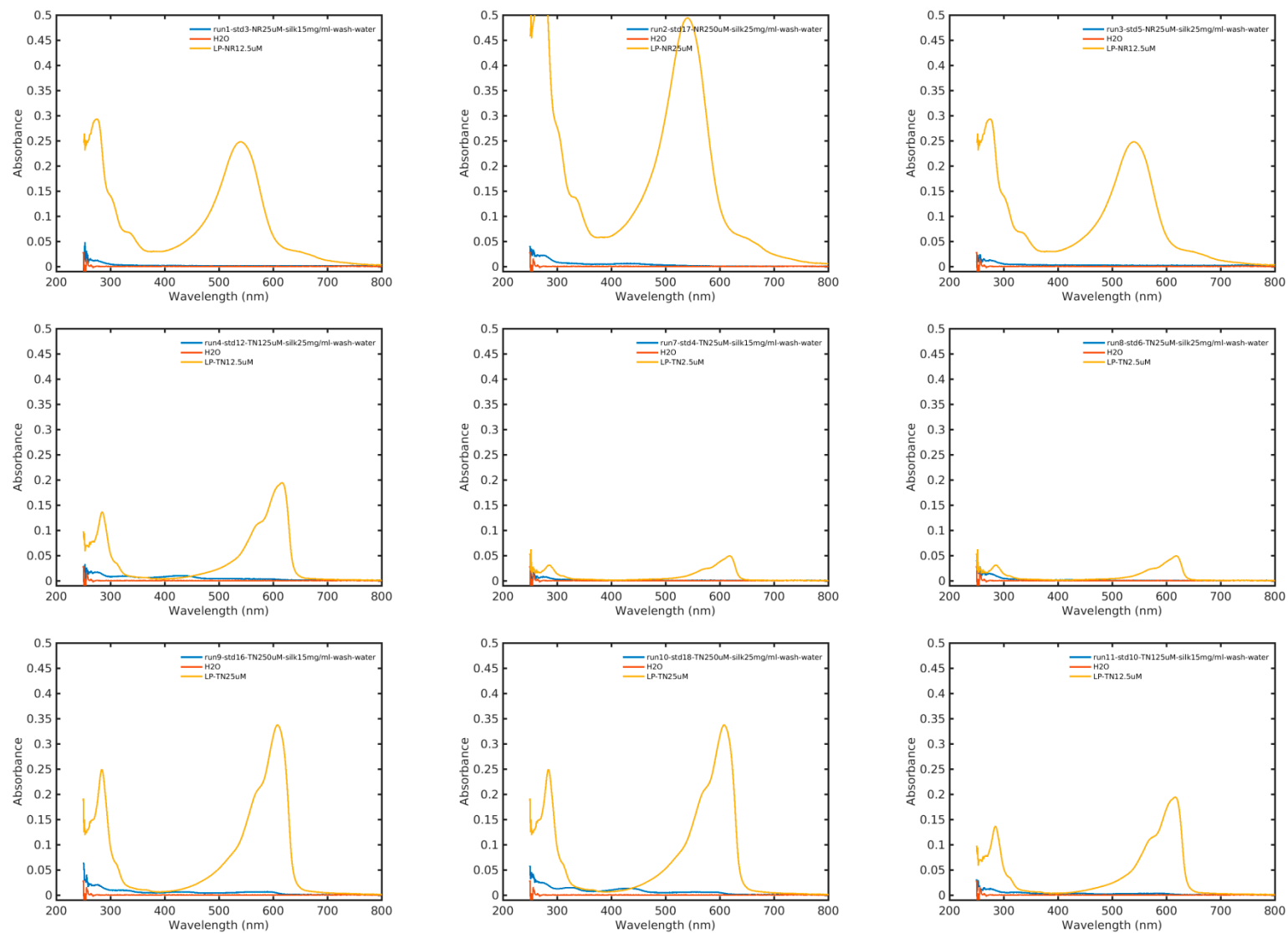


Figure S3. Cont.

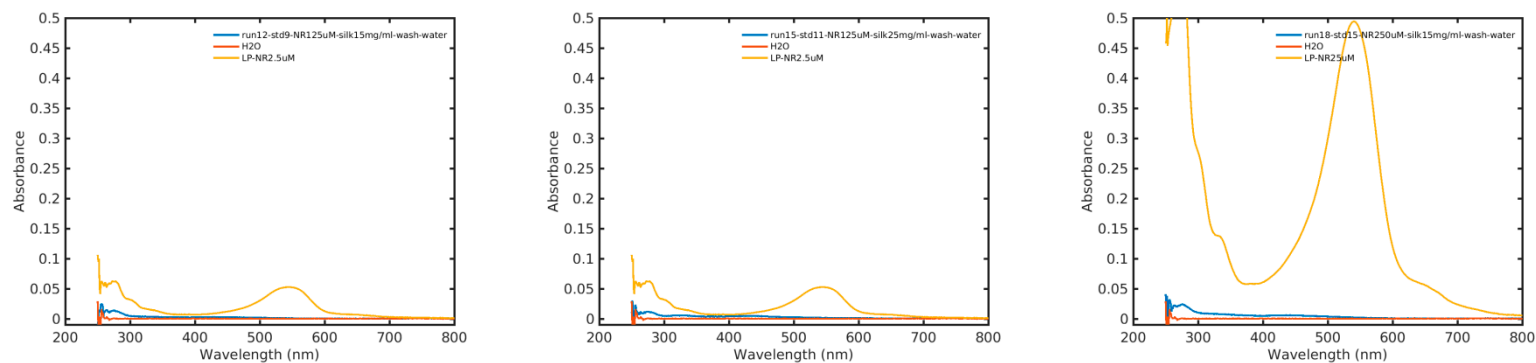


Figure S3. Leakage evaluation by absorbance.

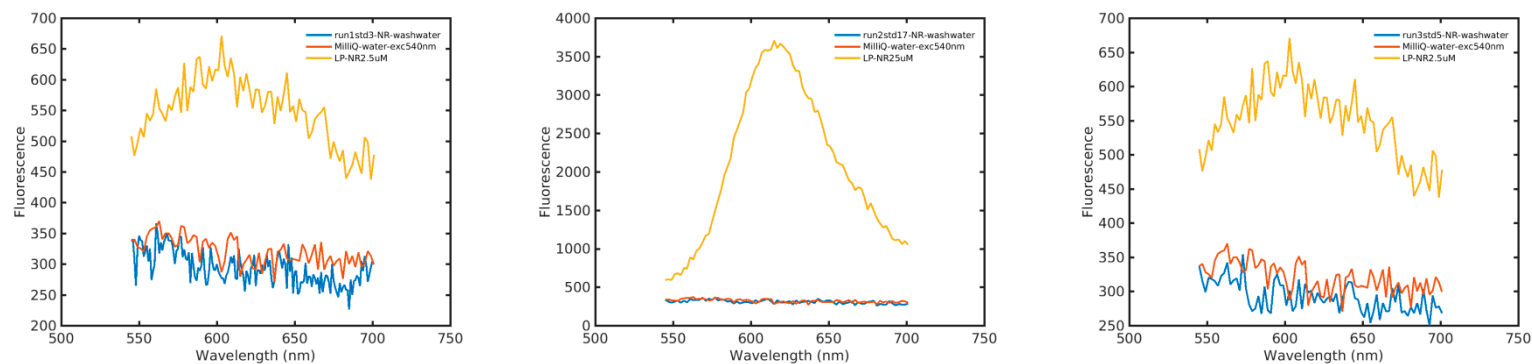
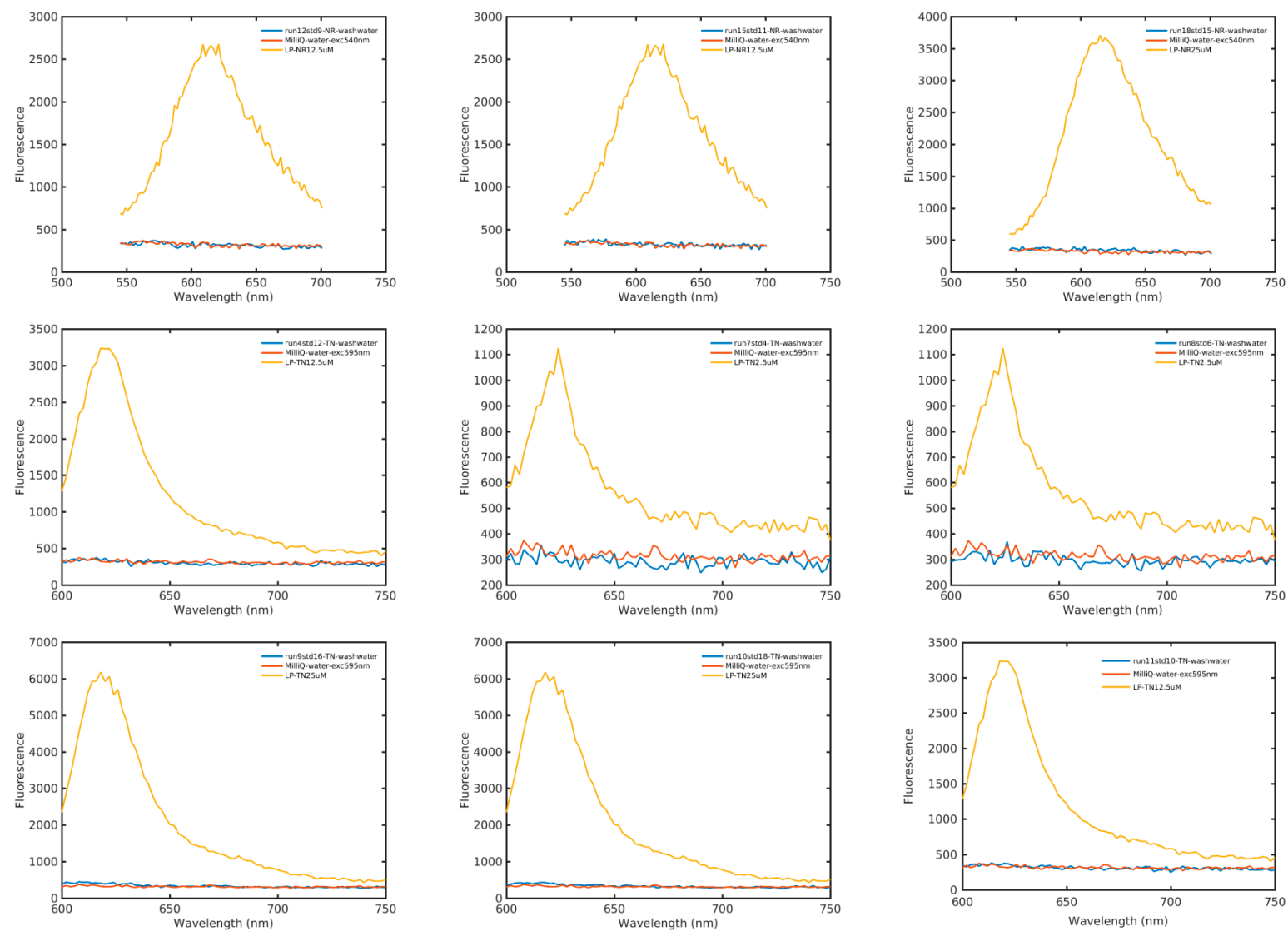


Figure S4. Cont.

**Figure S4.** Leakage evaluation by fluorescence.

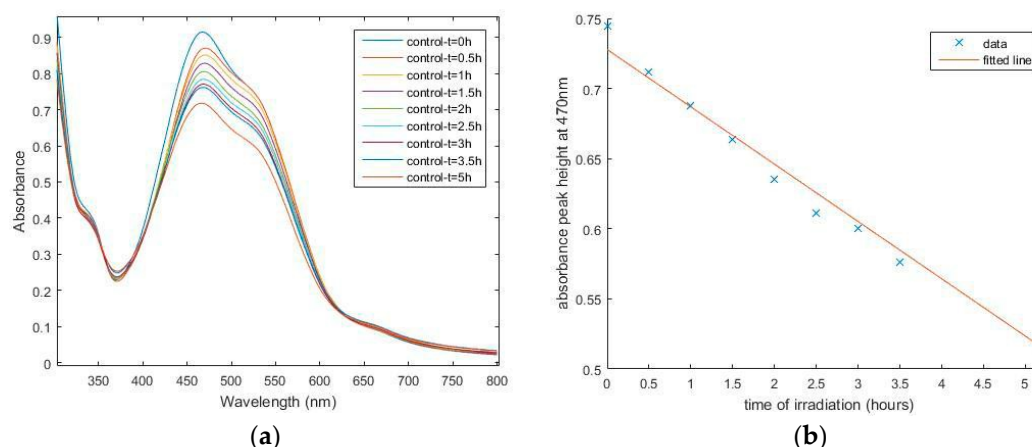


Figure S5. Photostability test for NR: (a) Absorbance spectra of 1.5 mL potassium phosphate buffer, 10 mM, pH 7, with 125 μ M Neutral red at different times of light irradiation; (b) Baseline corrected peak height at 470 nm absorbance peak from the top figure plotted against time of light irradiation. The slope of the fitted line is -0.041 absorbance/h.

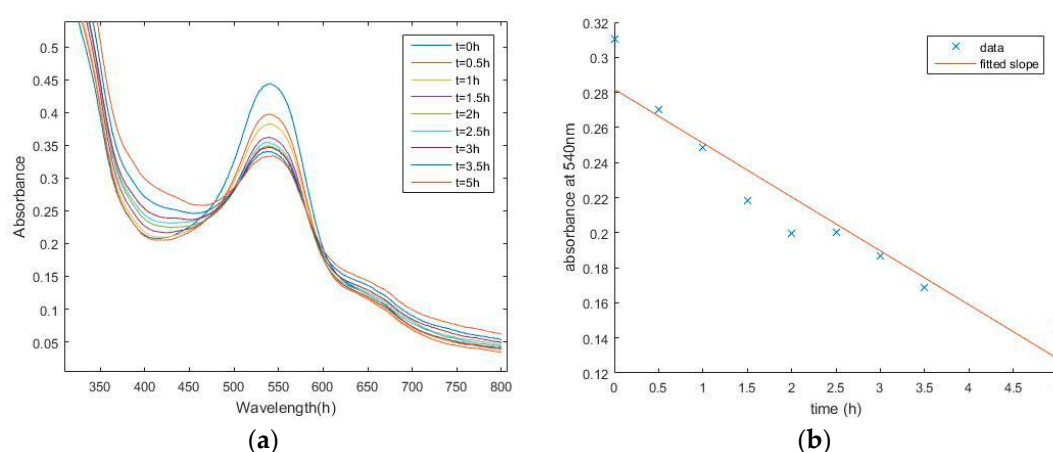


Figure S6. Photostability test for NR patch: (a) Absorbance spectra of Laponite-Neutral red silk patch in 2 mL potassium phosphate buffer, 10 mM, pH 7 at different times of light irradiation; (b) Baseline corrected peak height at 540 nm absorbance peak from the top figure plotted against time of light irradiation. The slope of the fitted line is -0.031 absorbance/h.

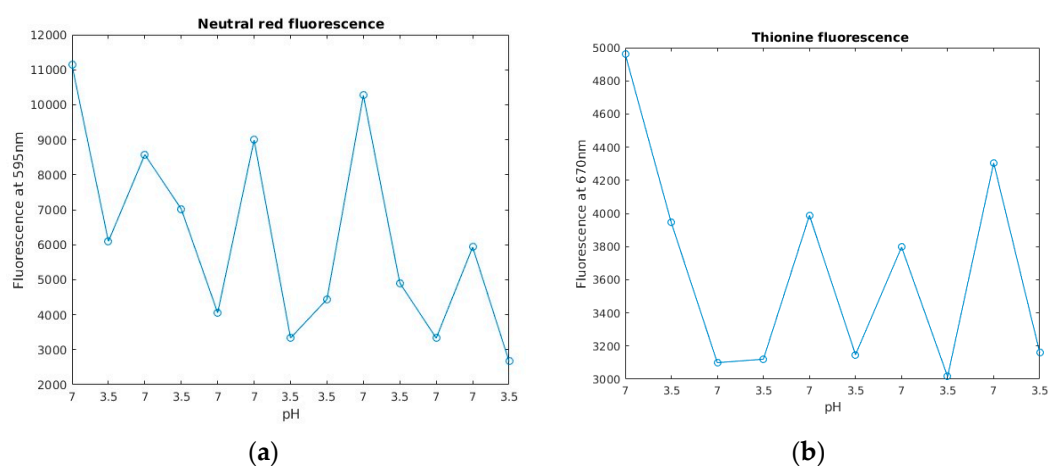


Figure S7. Operational stability using fluorescence emission of NR (a) and Th (b). The x-axis is the successive run's pH values for both plots. Plotted are the maximum fluorescence at 595 nm for NR and 670 nm for Th.