

Schiff-base crosslinked hydrogels based on properly synthesized poly(ether urethane)s as potential drug delivery vehicles in the biomedical field: design and characterization.

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SUPPORTING INFORMATION

Evaluation of gelation time of formulation with different -NH₂:-CHO molar ratio

Table S1. SHE3350 – AHE1500_20% Y formulations investigated by tube inverting test at 37 °C. Y defines the considered -NH₂:-CHO molar ratios ranging between 3:1 and 1:3.

Sample	-NH ₂ :-CHO molar ratio
SHE3350 – AHE1500_20% 3:1	3:1
SHE3350 – AHE1500_20% 2:1	2:1
SHE3350 – AHE1500_20% 1:1	1:1
SHE3350 – AHE1500_20% 1:2	1:2
SHE3350 – AHE1500_20% 1:3	1:3

Chemical characterization of the synthesized poly(ether urethane)s

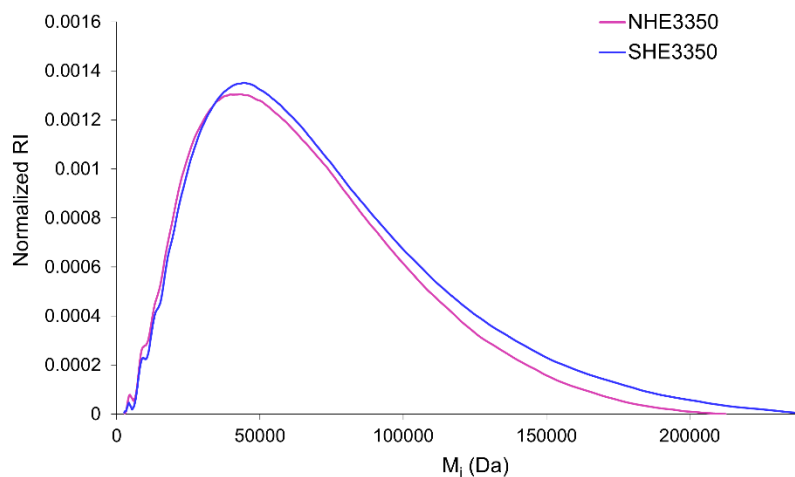


Figure S1. Molecular weight distribution profiles measured for NHE3350 (pink line) and SHE3350 (blue line).

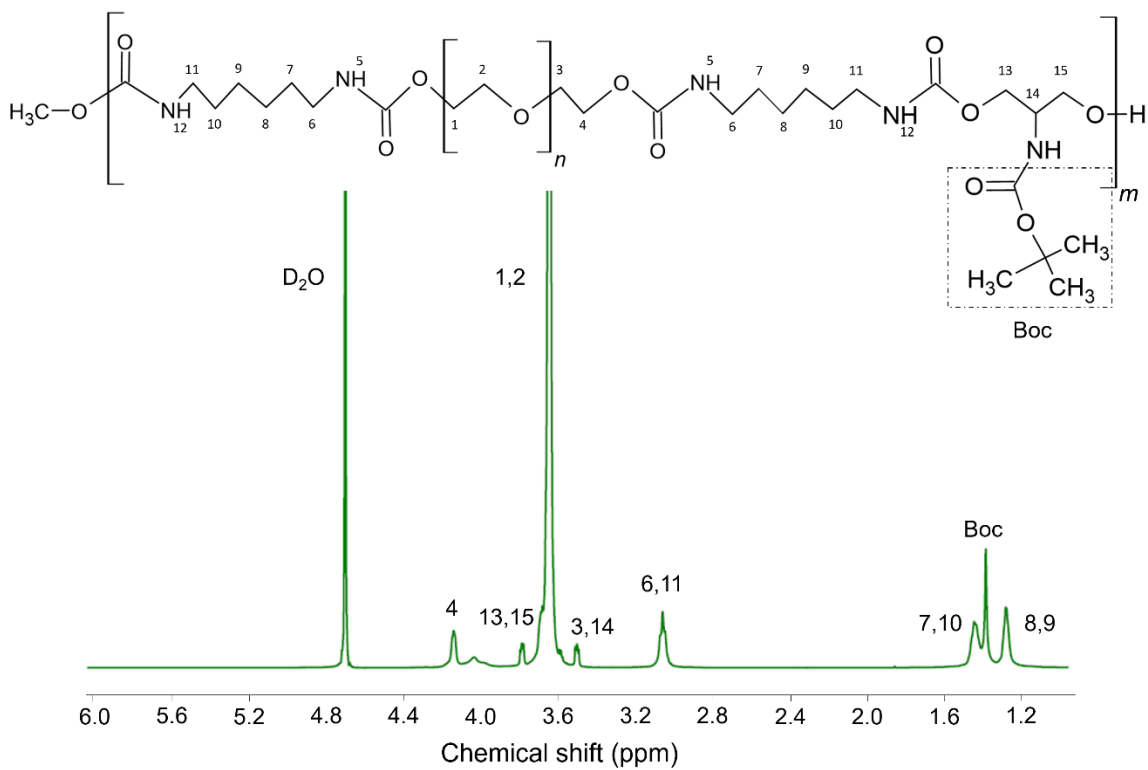


Figure S2. ¹H NMR spectrum of NHE3350 with detailed signal assignment to corresponding protons.

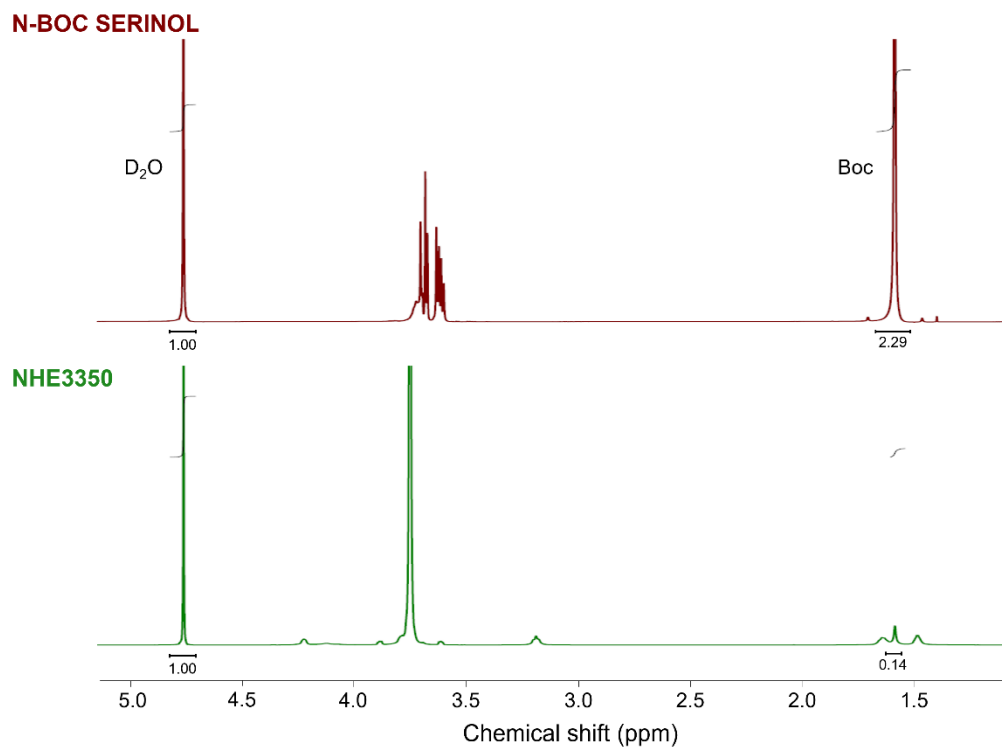


Figure S3. ¹H NMR spectra of N-Boc serinol and NHE3350 with integration values.

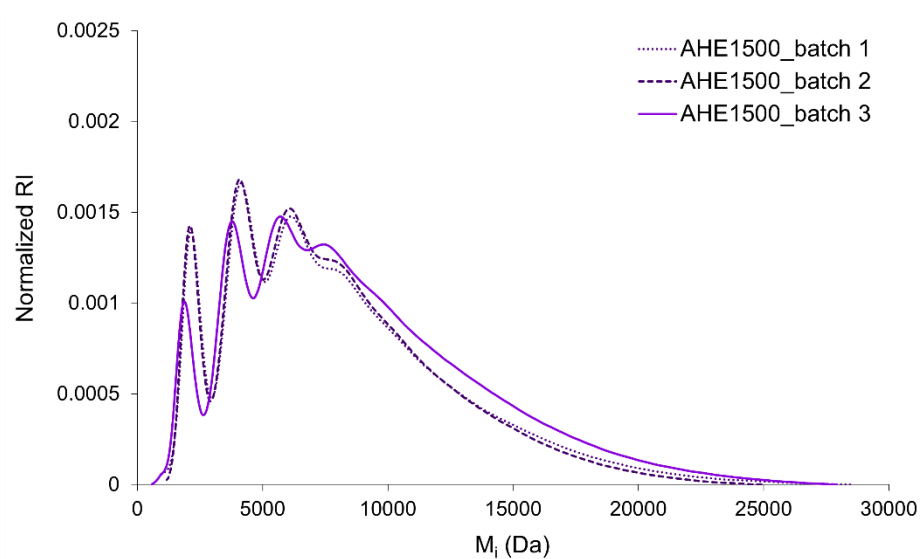


Figure S4. Molecular weight distribution profiles measured for three AHE1500 batches.

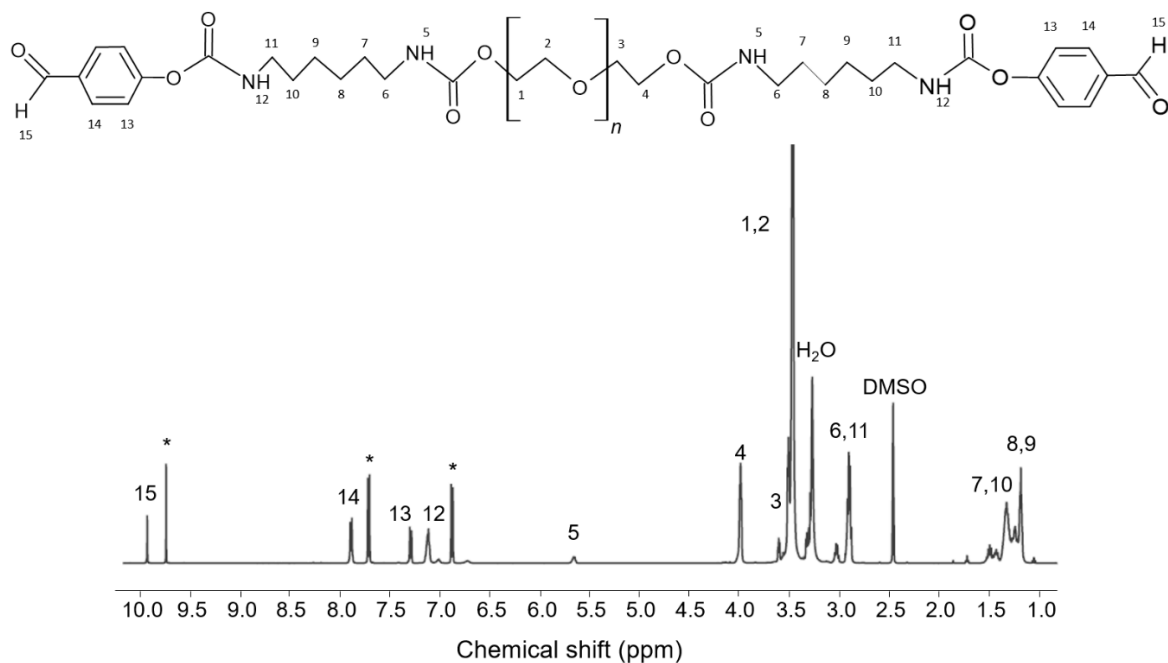


Figure S5. ^1H NMR spectrum of AHE1500 with detailed signal assignment to corresponding protons. * mark indicates peaks ascribed to unreacted BA molecules.

Hydrogel mixing procedure and sol-to-gel transition

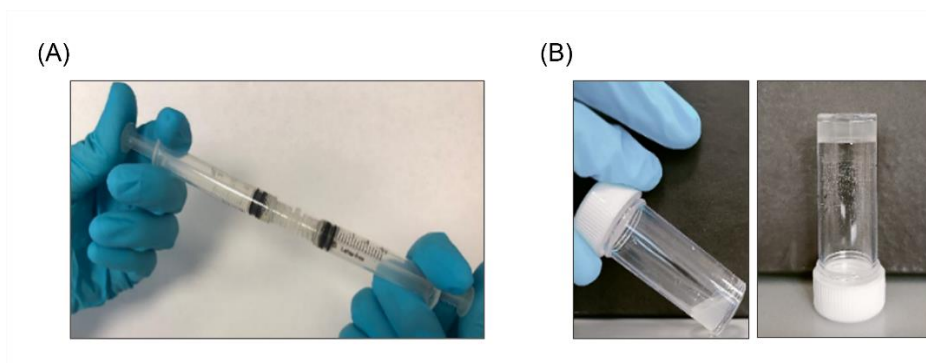


Figure S6. A) Hydrogel preparation by mixing SHE3350 and AHE1500 aqueous solutions at RT through two syringes with luer-lock connection, and B) qualitative evaluation of the sol-to-gel transition through qualitative tube inverting test.

Schematic illustration of the hydrogel formation mechanism based on the -NH₂:-CHO molar ratio

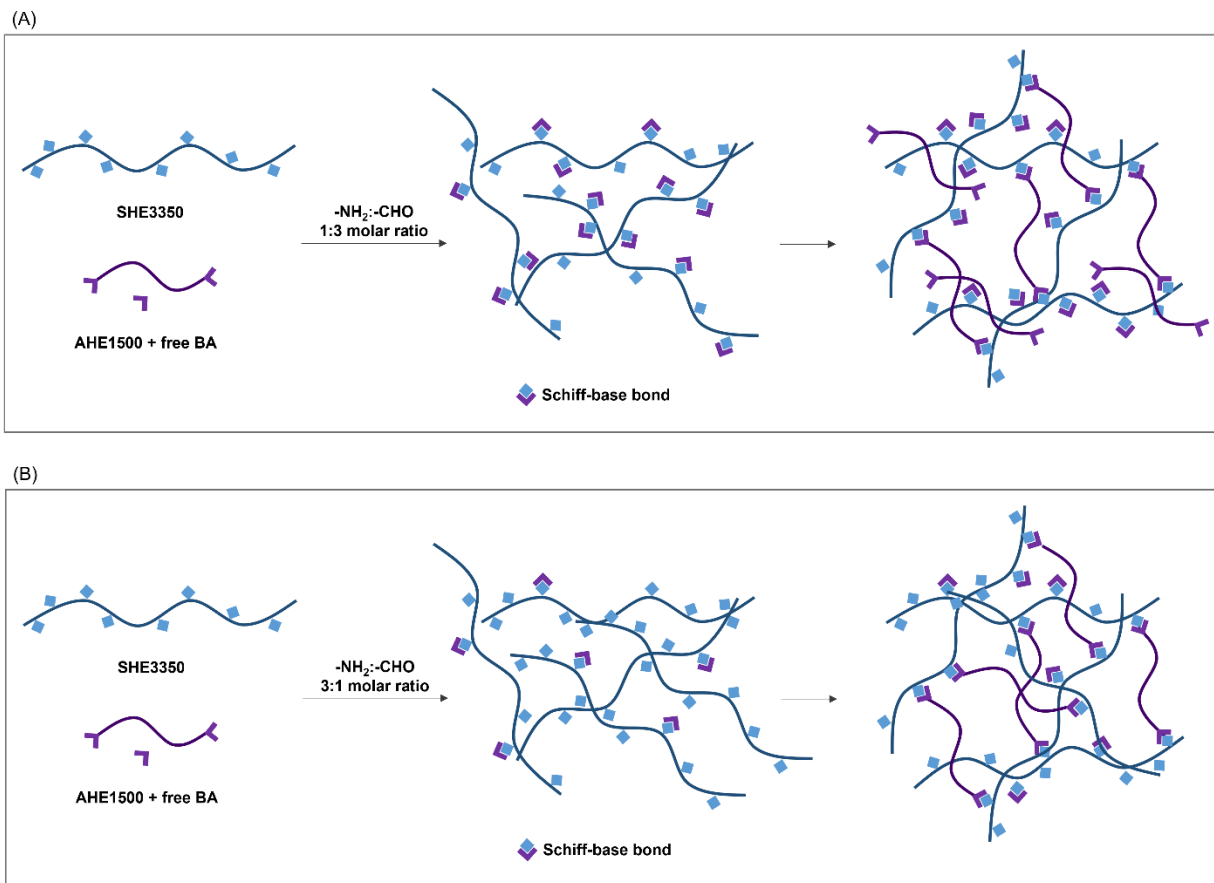


Figure S7. Schematic illustration of the hydrogel formation starting from SHE3350 and AHE1500 counterparts at A) -NH₂:-CHO 1:3 molar ratio and B) -NH₂:-CHO 3:1 molar ratio.

Chemical characterization of the hydrogel based on Schiff-base crosslinking

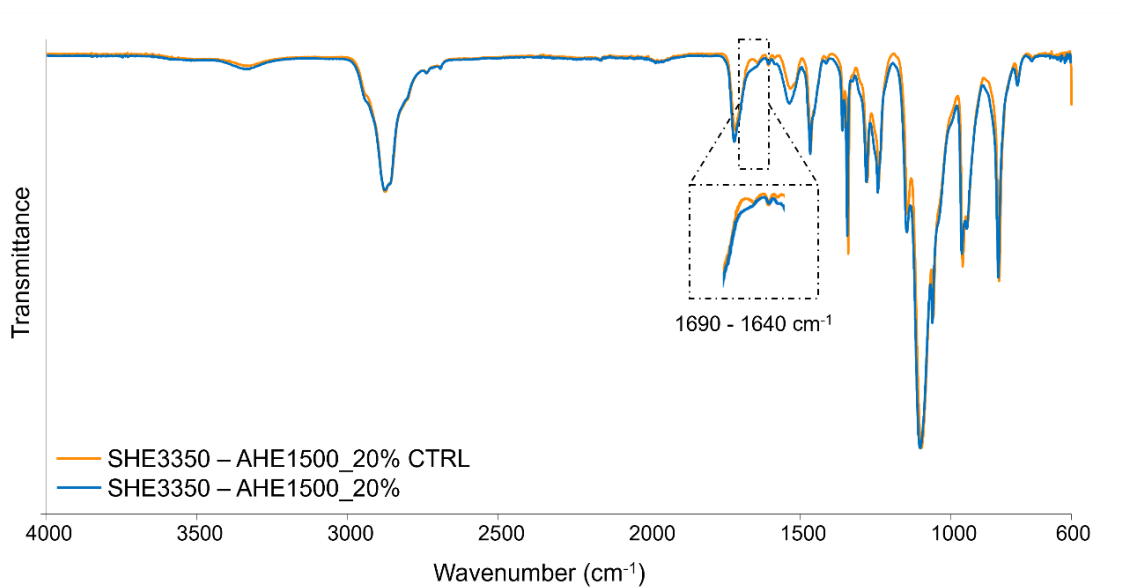


Figure S8. ATR-FTIR spectra of SHE3350 – AHE1500_20% mixture (light orange line) and hydrogel (blue line). The appearance of a new absorption band at 1690-1640 cm^{-1} in SHE3350 – AHE1500_20% spectrum can be ascribed to the C=N stretching vibration.

Schematic view of model molecule loading and release mechanism

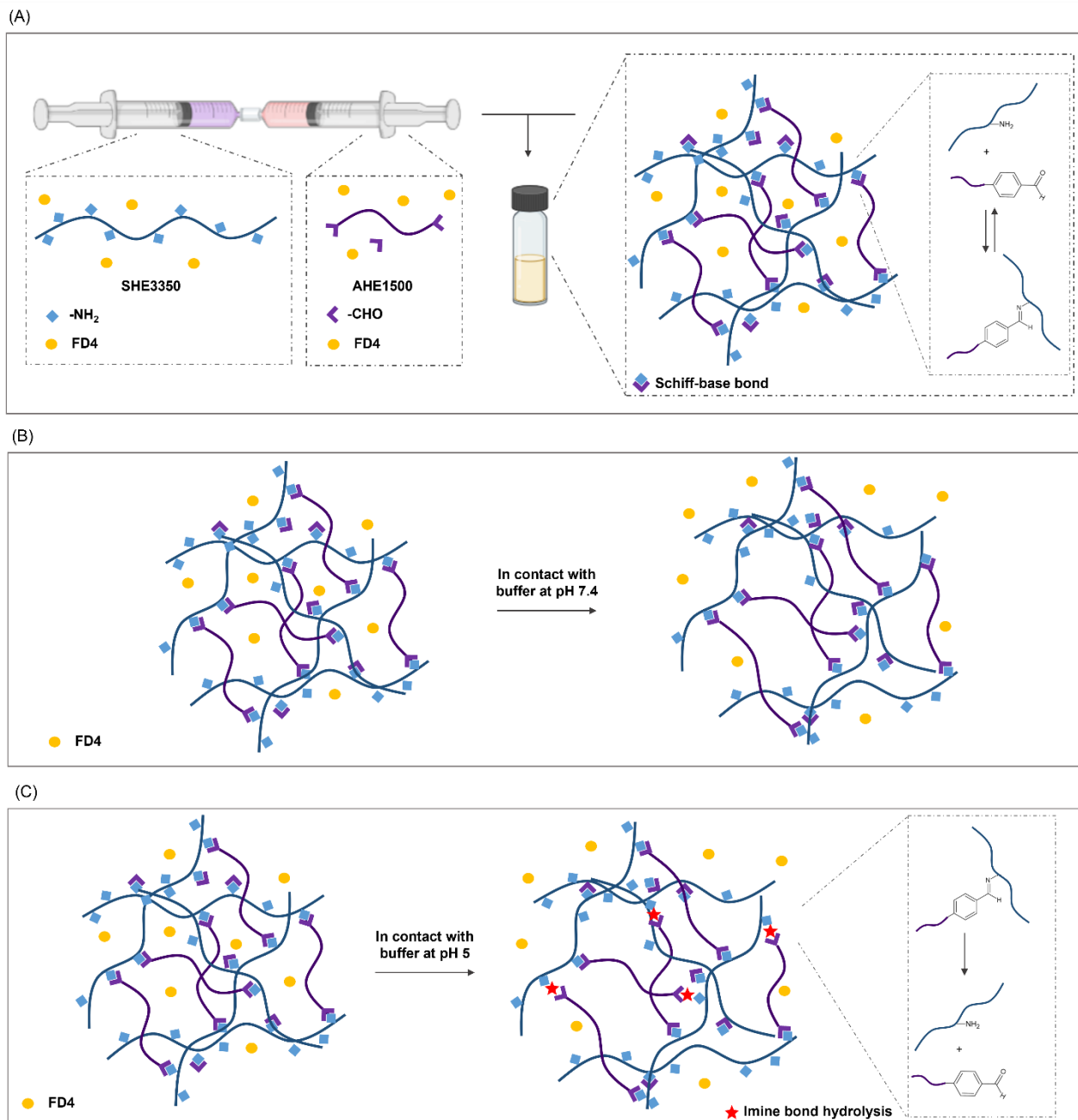


Figure S9. Schematic illustration of A) hydrogel loading with a model molecule; B) model molecule release mechanism in physiological-like condition; C) model molecule release mechanism in acidic condition.

pH-triggered FD4 release from the developed hydrogels

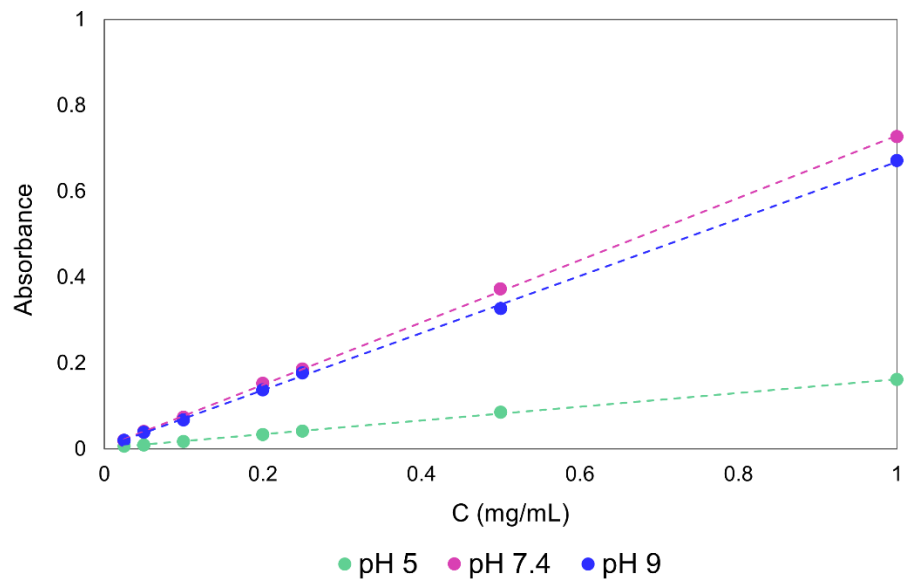


Figure S10. Calibration curve of FD4 model molecule with concentration ranging between 0.025 mg/mL and 1 mg/mL at pH 5 (green dots), pH 7.4 (pink dots) and pH 9 (blue dots).