

Supporting Information

Cobalt Cross-Linked Redox-Responsive PEG-Hydrogels: From Viscoelastic Liquids to Elastic Solids

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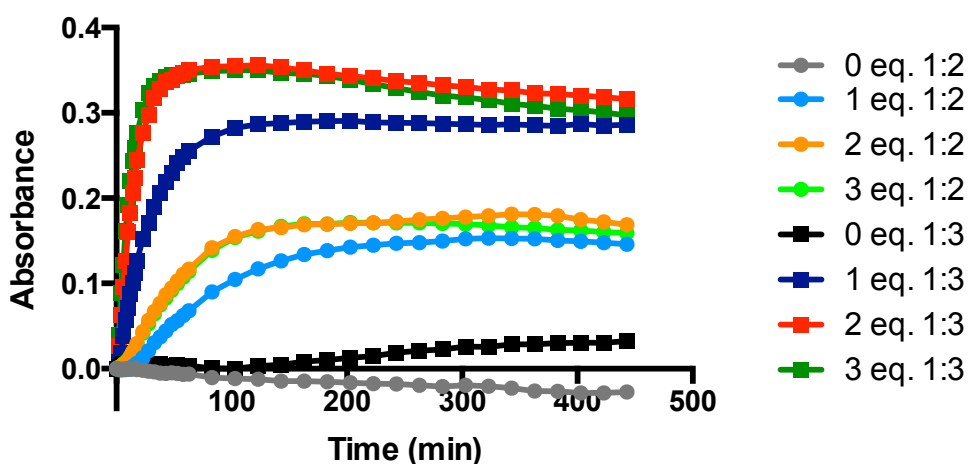


Figure S1. Oxidation kinetics of Co^{2+} centers to Co^{3+} . 75 mM mPEG-His and 37.5 or 25 mM CoCl_2 are mixed in 100 mM HEPES buffer pH 7 to yield 1:2 or 1:3 cobalt to end-group ratios respectively. Then 0, 1, 2 or 3 eq. H_2O_2 per Co^{2+} ion are added to the solutions and the absorbance at 550 nm is monitored overtime.

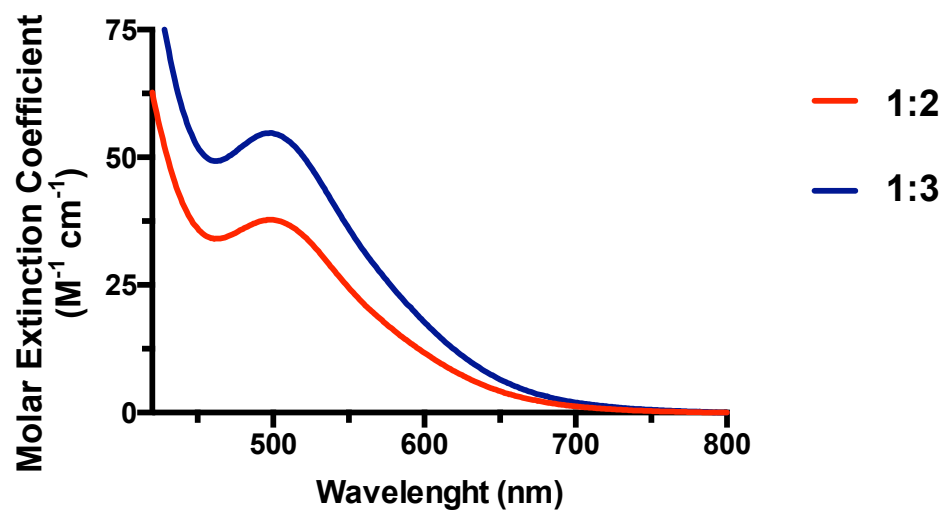


Figure S2. UV-Vis absorption spectrum of Co³⁺-mPEG complexes. 12 mM mPEG-His with 6 mM (1:2) or 4 mM (1:3) CoCl₂ is treated with 2 equivalents of H₂O₂ for 2 hours before the spectra were recorded.

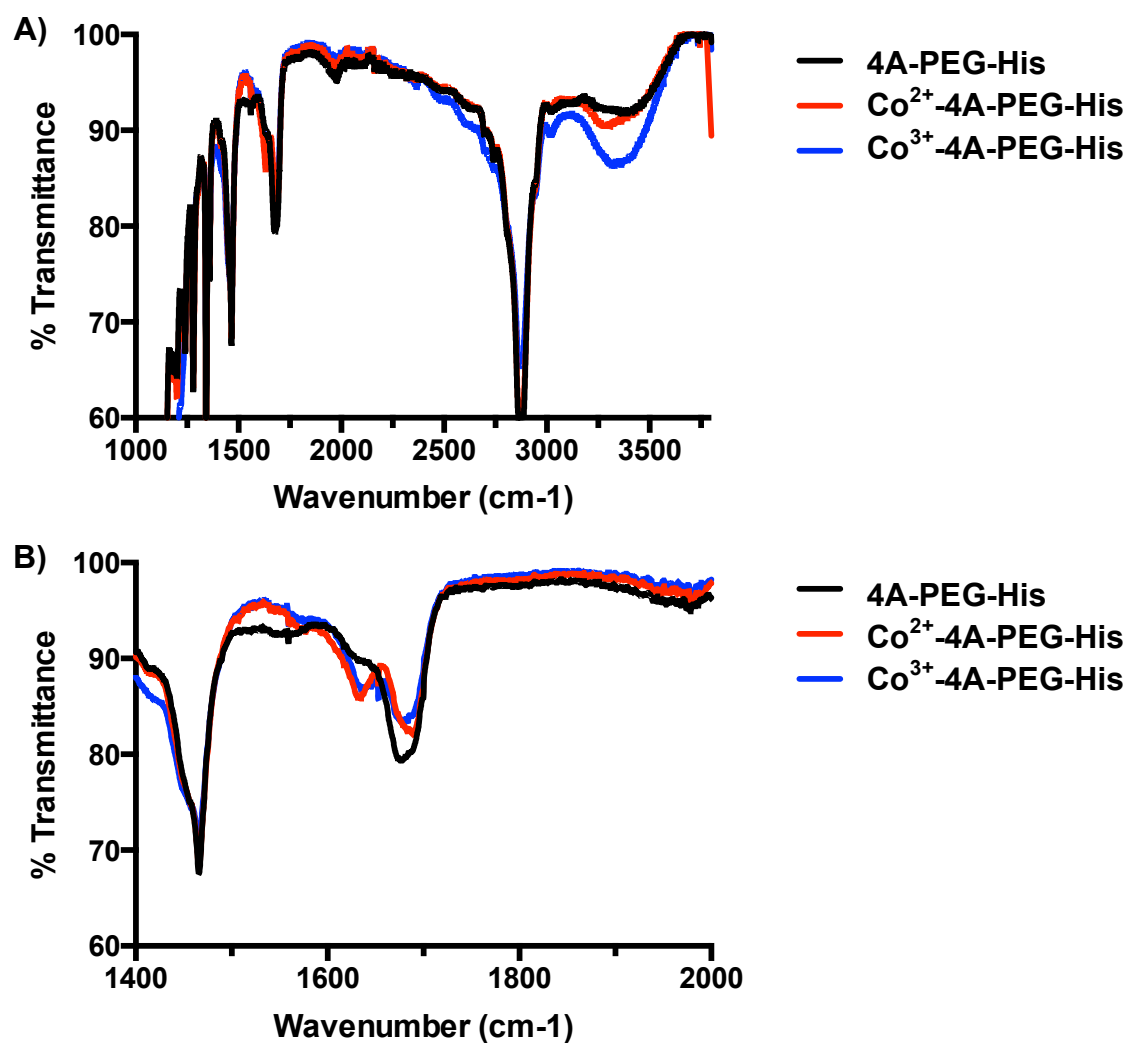


Figure S3. IR spectra of 4A-PEG-His, Co^{2+} -crosslinked 4A-PEG-His and Co^{3+} -crosslinked 4A-PEG-His. A) Overview and B) enlarged.

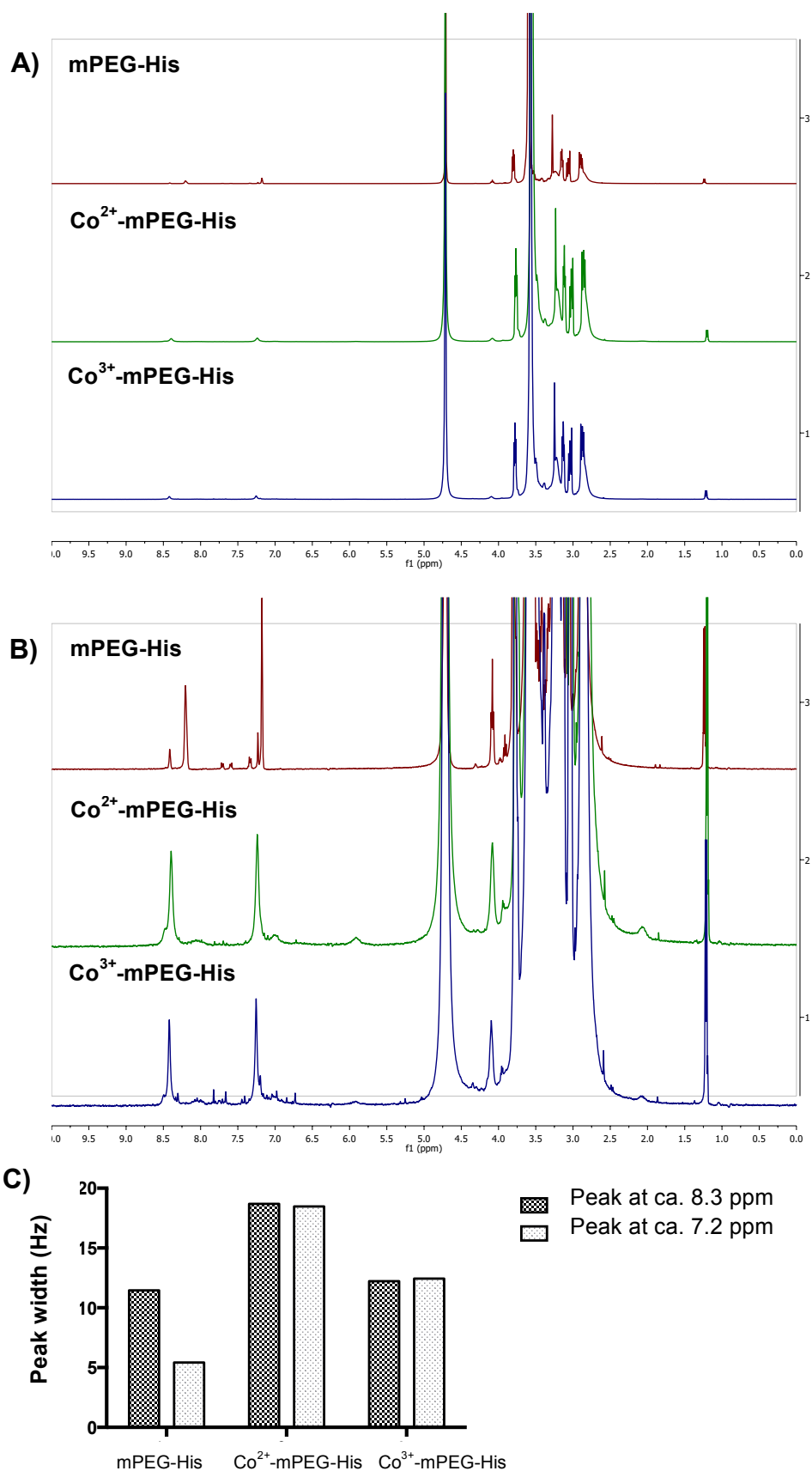


Figure S4. ¹H-NMR of mPEG, Co²⁺-mPEG and Co³⁺-mPEG. 30 mM mPEG is dissolved in D₂O with 100 mM HEPES and the pH is adjusted to 7 with NaOH. 10 mM CoCl₂ is used to form the complexes and 30 mM H₂O₂ are used for oxidation for 3 hours. A) Overview and B) enlarged C) Full width at half maximum of imidazole peaks.

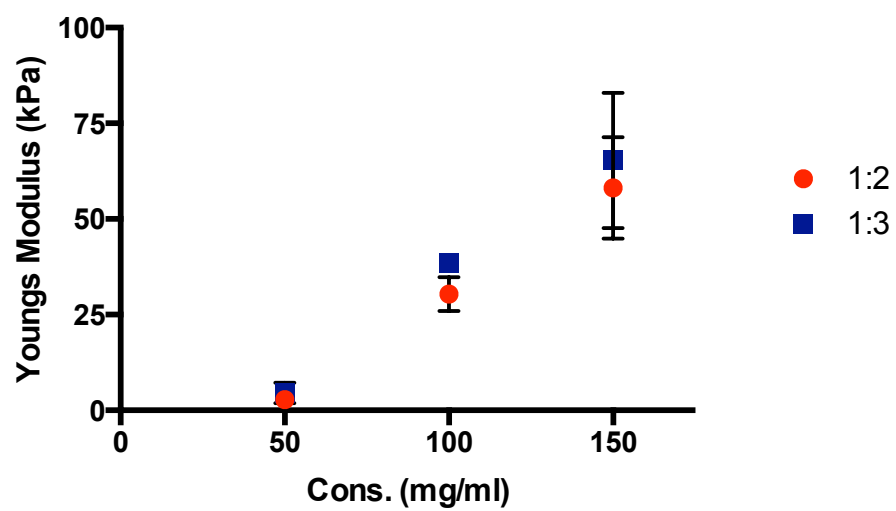


Figure S5. The Young's moduli of Co^{3+} cross-linked 4A-PEG-His hydrogels.

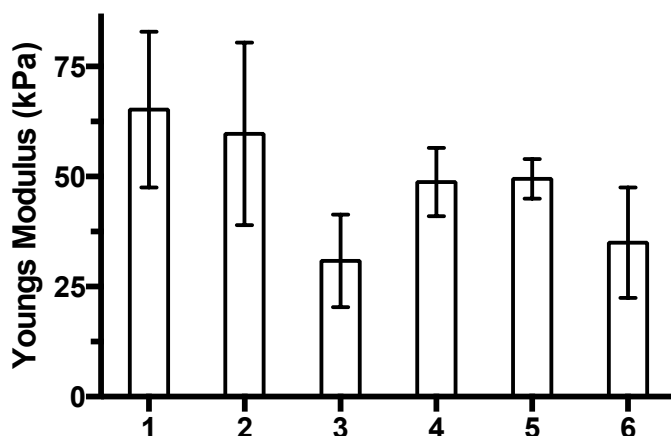


Figure S6. The Young's moduli of Co^{3+} cross-linked 4A-PEG-His hydrogels (150 mg/ml with a 1:3 cobalt to end-group ratio). 1) unswollen, 2) swollen for 1 day in 100 mM HEPES pH 7, 3) swollen for 2 day in 100 mM HEPES pH 7, 4) swollen for 1 day in 100 mM HEPES pH 2, 5) swollen for 1 day in 100 mM HEPES pH 10 and 6) swollen for 1 day in 50 mM EDTA, 100 mM HEPES pH 7. The values are the average of 2 independent experiments and the errors are gives as the standard deviation.