Redox-induced Reversible Conformational Switching of Poly(Aniline Sulfonic Acid) with Transition Metals in Aqueous Solution

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Supporting information

General procedure for the experiments of the conformational change

Poly(2-methoxyaniline-5-sulfonic acid) (PMAS), which was kindly provided by Mitsubishi Rayon Co., was deionised through cation-exchange resins before use. Other reagents were used as received. To a disposable UV cell with a stirrer chip, were added Milli-Q water (2640 μL), 10 mM $\text{B}(\text{OH})_3\text{-NaOH}$ buffer solution (300 μL), and 10 mM aqueous PMAS solution (30 μL). Then, an aqueous solution of metal salt (30 μL) was added at 25 $^\circ\text{C}$ under air. The mixture was stirred at 25 $^\circ\text{C}$. The conformational change was monitored by UV-vis-NIR spectroscopy (HITACHI U-3500).

Figure S1. UV-vis-NIR spectra of (ES)PMAS in pH 8.8 buffer solution with various amounts of $\text{Cu}(\text{OAc})_2$ under air at 25 $^\circ\text{C}$ (PMAS: 1.0×10^{-4} M based on the aniline monomer unit, the spectra after 2 h: 3, 1, 0.5, and 0.1 eq. of $\text{Cu}(\text{OAc})_2$, the spectra after 24 h: 0.01 and 0.005 eq. of $\text{Cu}(\text{OAc})_2$).

Figure S2. Time-dependent UV-vis-NIR spectra of (ES)PMAS in pH 8.8 buffer solution with 0.1 eq. of KMnO_4 under air at 25 °C (PMAS: 1.0×10^{-4} M based on the aniline monomer unit, 0 min and 24 h).

Figure S3. Time-dependent UV-vis-NIR spectra of (ES)PMAS compact coil in pH 8.8 buffer solution (prepared by treatment with 1 eq. of $\text{Cu}(\text{OAc})_2$ for 2 h, blue line) with 1 eq. of $\text{N}_2\text{H}_4 \cdot \text{H}_2\text{O}$ under air at 25 °C (PMAS: 1.0×10^{-4} M based on the aniline monomer unit, 0 and 10 min).

Figure S4. UV-vis-NIR spectra of (ES)PMAS compact coil in pH 8.8 buffer solution (prepared by treatment with 1 eq. of $\text{Cu}(\text{OAc})_2$ for 2 h, blue line) with 1 eq. of both EDTA and $\text{N}_2\text{H}_4\cdot\text{H}_2\text{O}$ under air at 25 °C (PMAS: 1.0×10^{-4} M based on the aniline monomer unit, 0 min).