Electronic Supplementary Material (ESI) for RSC Advances.

Reversible four-color electrochromism triggered by the electrochemical multi-step redox of Cr-based metallo-supramolecular polymers

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1. EXAFS oscillation and Fourier transform of EXAFS for polyCr

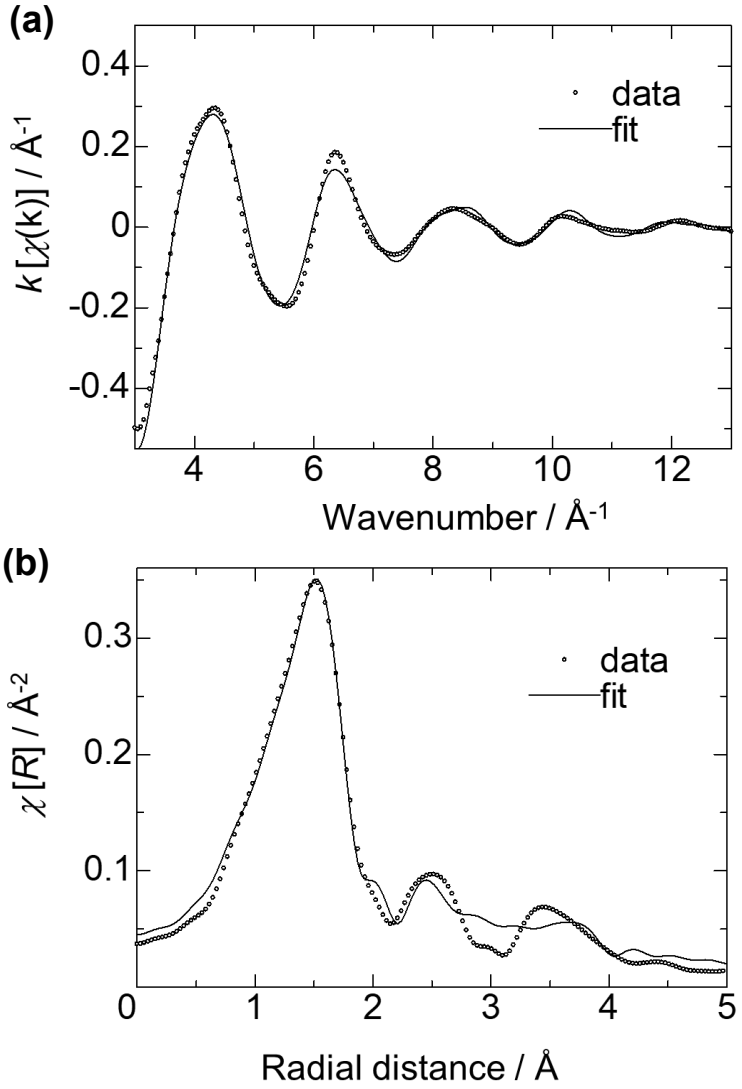

Fig. S1. (a) EXAFS oscillation and (b) Fourier transform of EXAFS for **polyCr.**

2. XPS spectra of polyCr

The peaks of C 1s, N 1s, O 1s, Cl 2s, Cr 2p were observed at ~285, ~400, ~530, ~270, ~580 eV. These results confirmed the presence of each atoms.

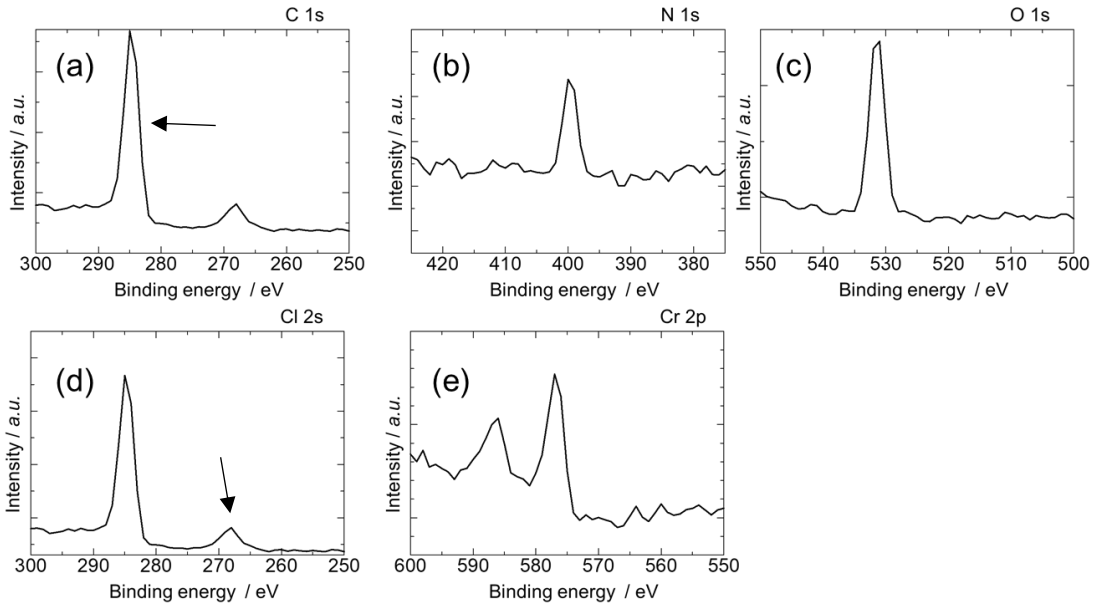

Fig. S2. XPS of **polyCr**.

3. Emission spectrum of polyCr

At room temperature (RT), upon excitation at 380 nm assigned to ILCT of **polyCr**, the characteristic luminescence of Cr(III) ions was observed at 820 nm (Fig. S3).

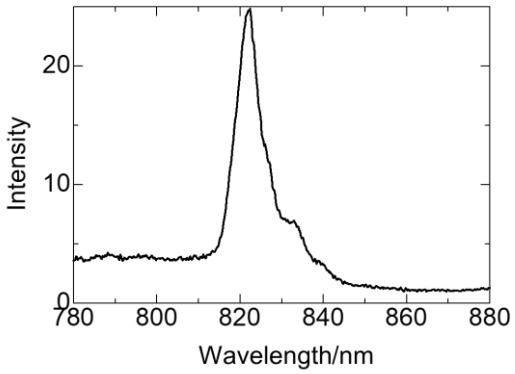

Fig. S3. An emission spectrum of **polyCr**.

4. Cyclic voltammetry

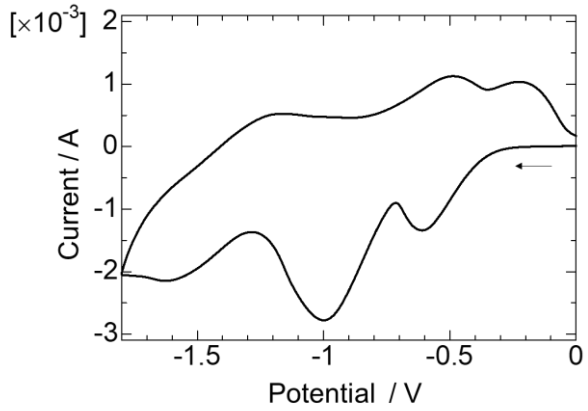

Fig. S4. Cyclic voltammogram (CV) of a film of **polyCr** on an ITO glass with a 0.1M MeCN solution of $LiClO_4$ as electrolyte at a scan rate of 0.1 V/s.

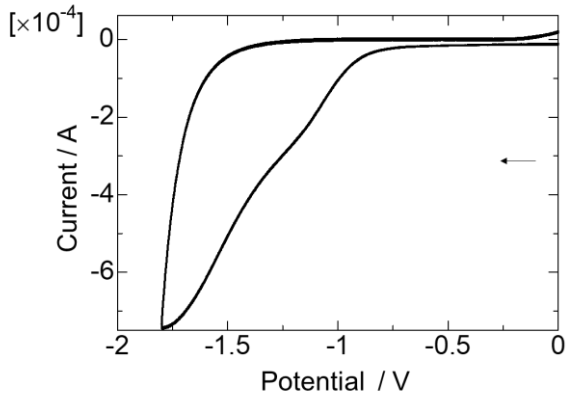

Fig. S5 CV of a bear ITO glass with 0.1M MeCN solution of $LiClO_4$ as electrolyte at a scan rate of 0.1 V/s.

5. HR-MS and IR spectra

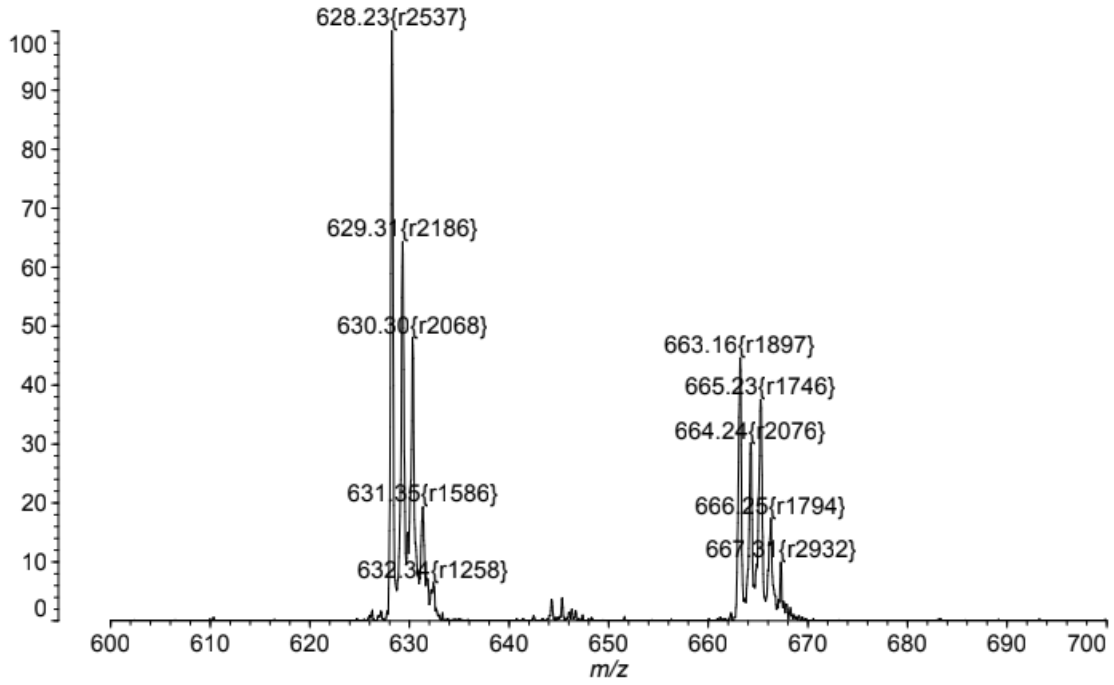

Fig. S6. HR-MS spectrum of **polyCr**.

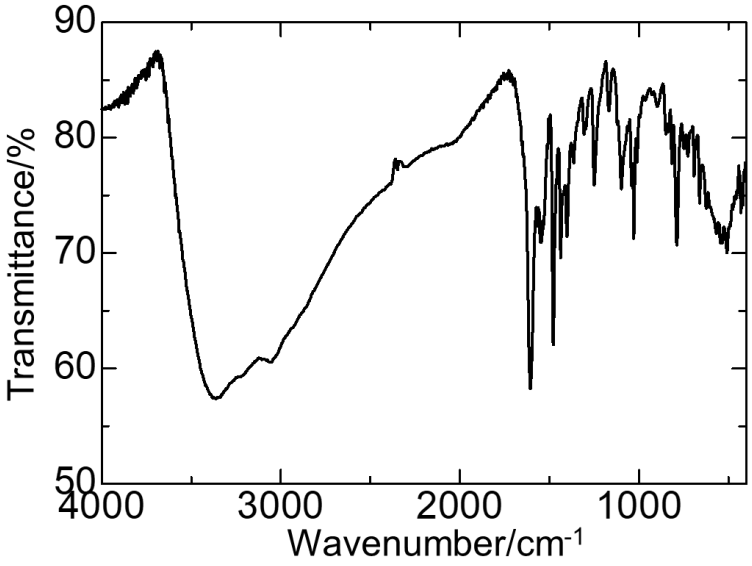

Fig. S7. IR spectrum of **polyCr**.

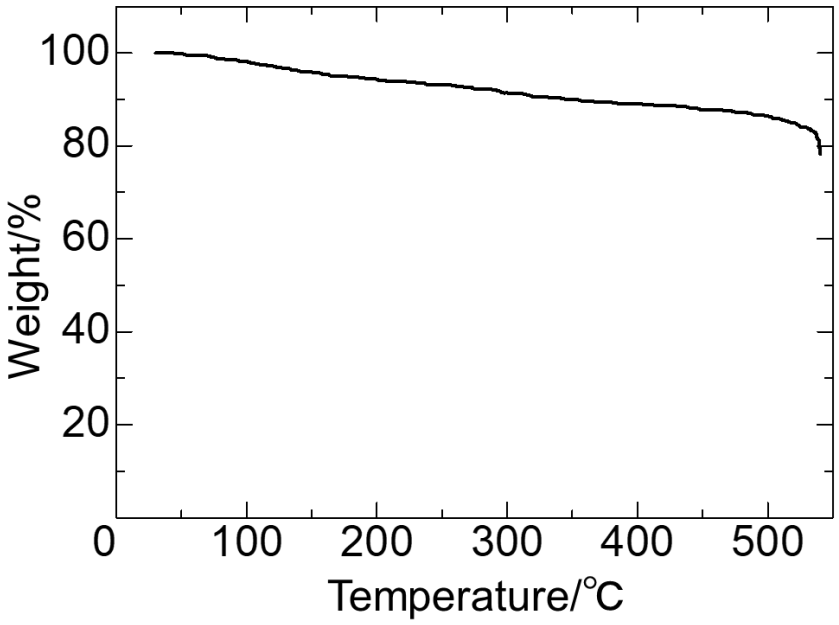

Fig. S8. A TGA curve of **polyCr**.