Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Electrochemically switchable photoluminescence of anionic dye in cationic metallo-supramolecular polymer

Takahiro Suzuki,[a] Takashi Sato,[b] Jian Zhang,[b] Miki Kanao,[b] Masayoshi Higuchi,*[b] Hideyuki Maki*[a]

[a]Department of Applied Physics and Physico-Informatics, Keio University, Yokohama, Kanagawa 223-8522, Japan

[b]Electronic Functional Materials Group, National Institute for Materials Science (NIMS), Tsukuba, Ibaraki 305-0044, Japan

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1. Materials and measurements

Unless otherwise noted, all reagents were reagent grade and were used without purification. The IR spectra were taken on a Shimadzu FTIR 8400S Fourier Transform Infrared Spectrophotometer (400-4000 cm^{-1}) with KBr pellets. ^{1}H-NMR spectra was recorded at 300 MHz on a JEOL AL 300/BZ instrument. Chemical shifts were given relative to TMS.

2. FTIR spectra of polyFe, SRB and polyFe-SRB

FTIR spectra of polyFe, SRB and polyFe-SRB is shown in Fig. S1-S3. In the spectra of polyFe, the bands at 1610, 1584 and 1560 cm^{-1} corresponding to the C=C and C=N bonds stretching vibration in the ligands, and the band at 793 cm^{-1} corresponding to the C-C bond between rings in the ligands were observed.[1-2] The absorption bands in the spectra of SRB were observed as reported in the previous study.[3] In the spectra of SRB, the bands at 1597, 1560, 1527, 1508, 1491 and 1468 cm^{-1} corresponding to aromatic ring vibrations, the bands at 1132 and 669-615 cm^{-1} corresponding to SO_3^-, and the band at 1647 cm^{-1} corresponding to the C-N bond were observed. The spectra of polyFe-SRB was in good agreement with that of SRB because the IR absorption of SRB is stronger than that of polyFe. The noticeable difference of the spectra of polyFe-SRB from that of SRB is the absorption band at 795 cm^{-1} corresponding to the C-C bonds between rings in the ligands.

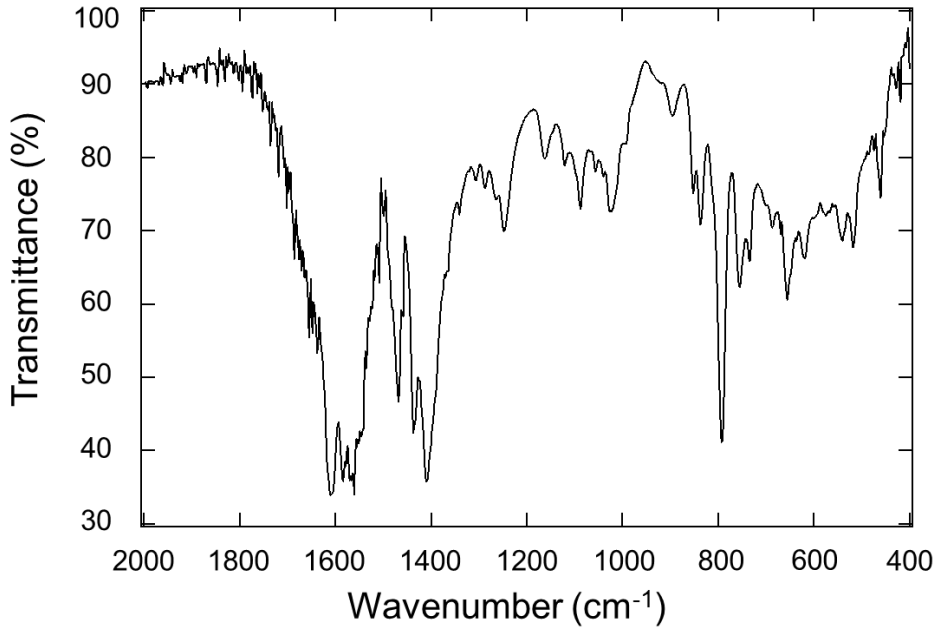

Figure S1. FTIR spectrum of **polyFe**.

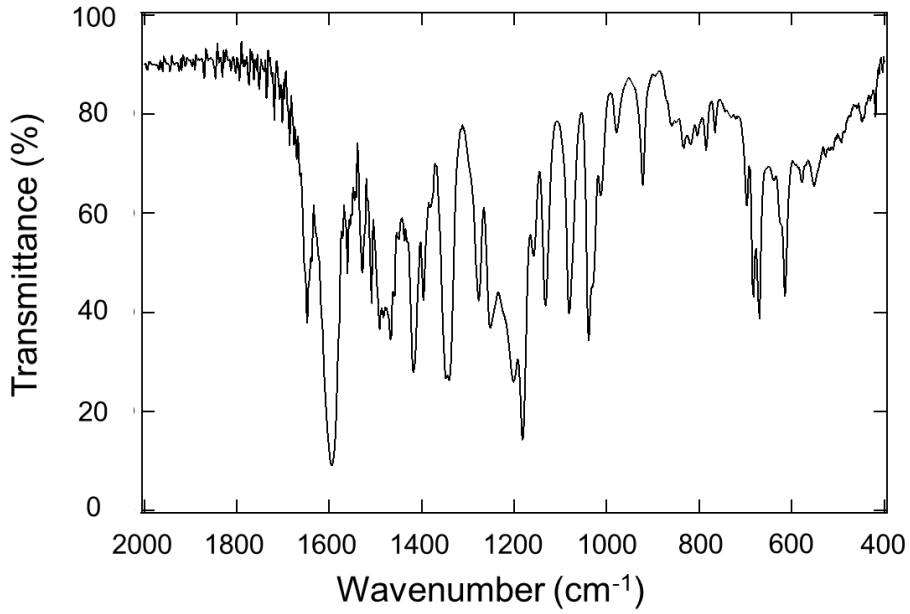

Figure S2. FTIR spectrum of **SRB**.

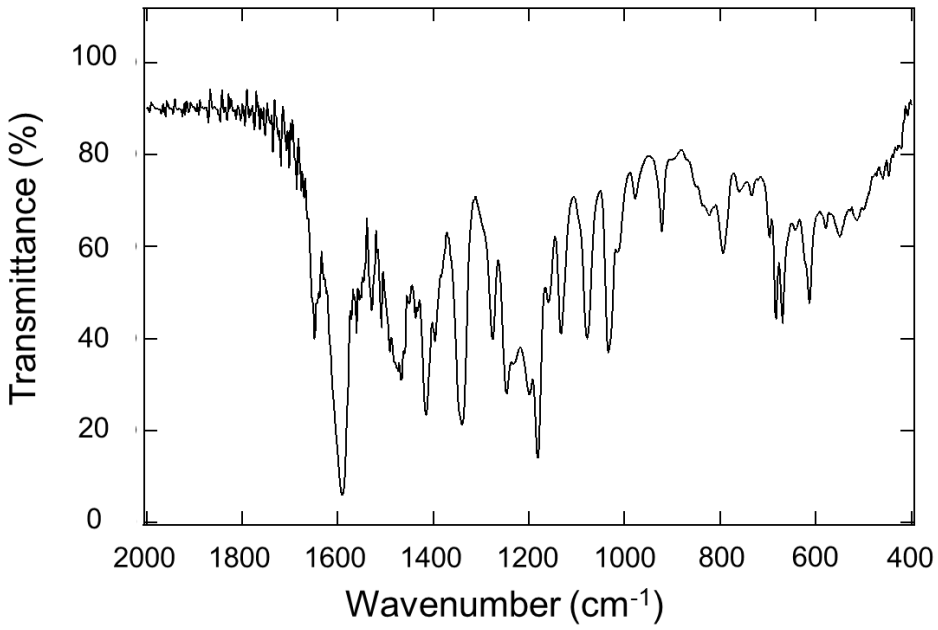

Figure S3. FTIR spectrum of **polyFe-SRB**.

3. ^{1}H-NMR spectra of polyFe, SRB and polyFe-SRB

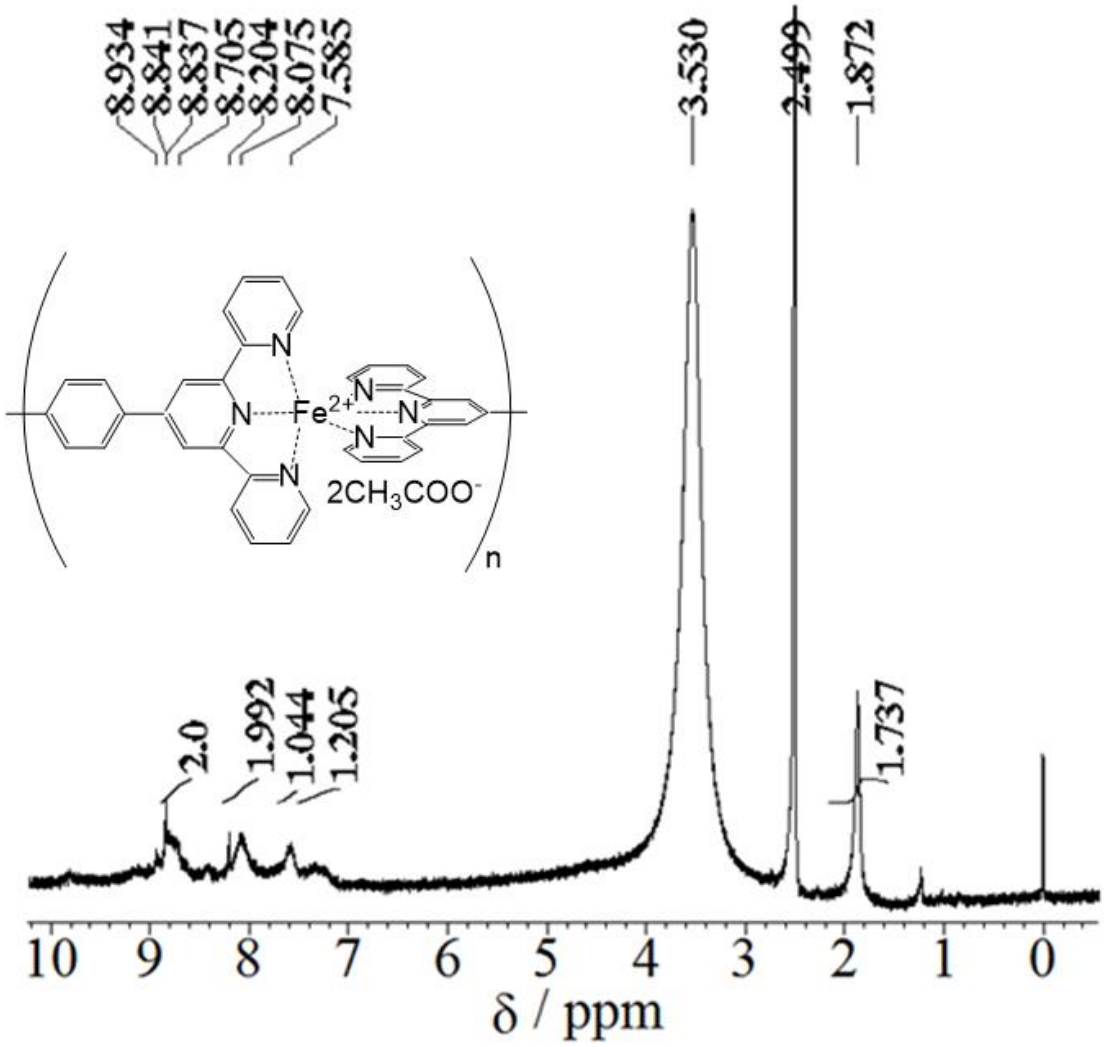

Figure S4. ^{1}H-NMR spectrum of **polyFe**.

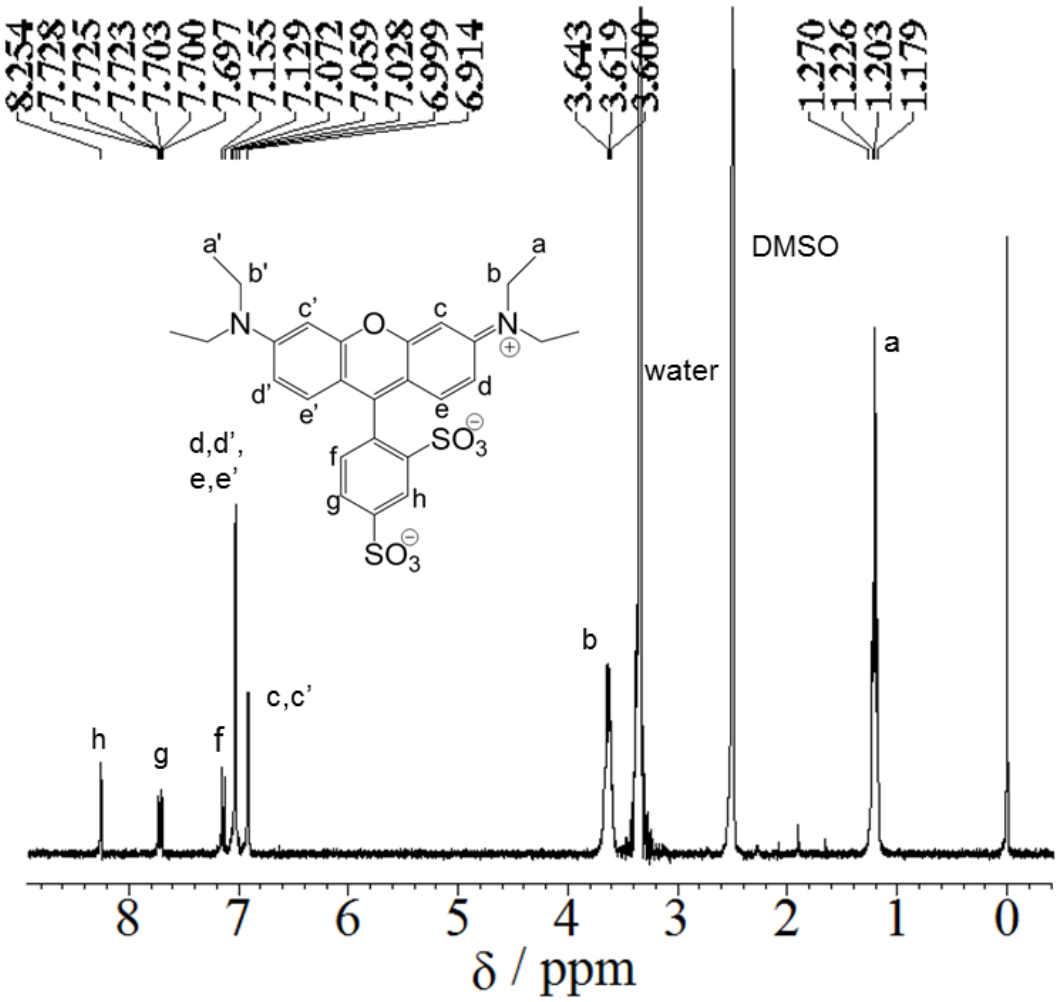

Figure S5. ^{1}H-NMR spectrum of **SRB**.

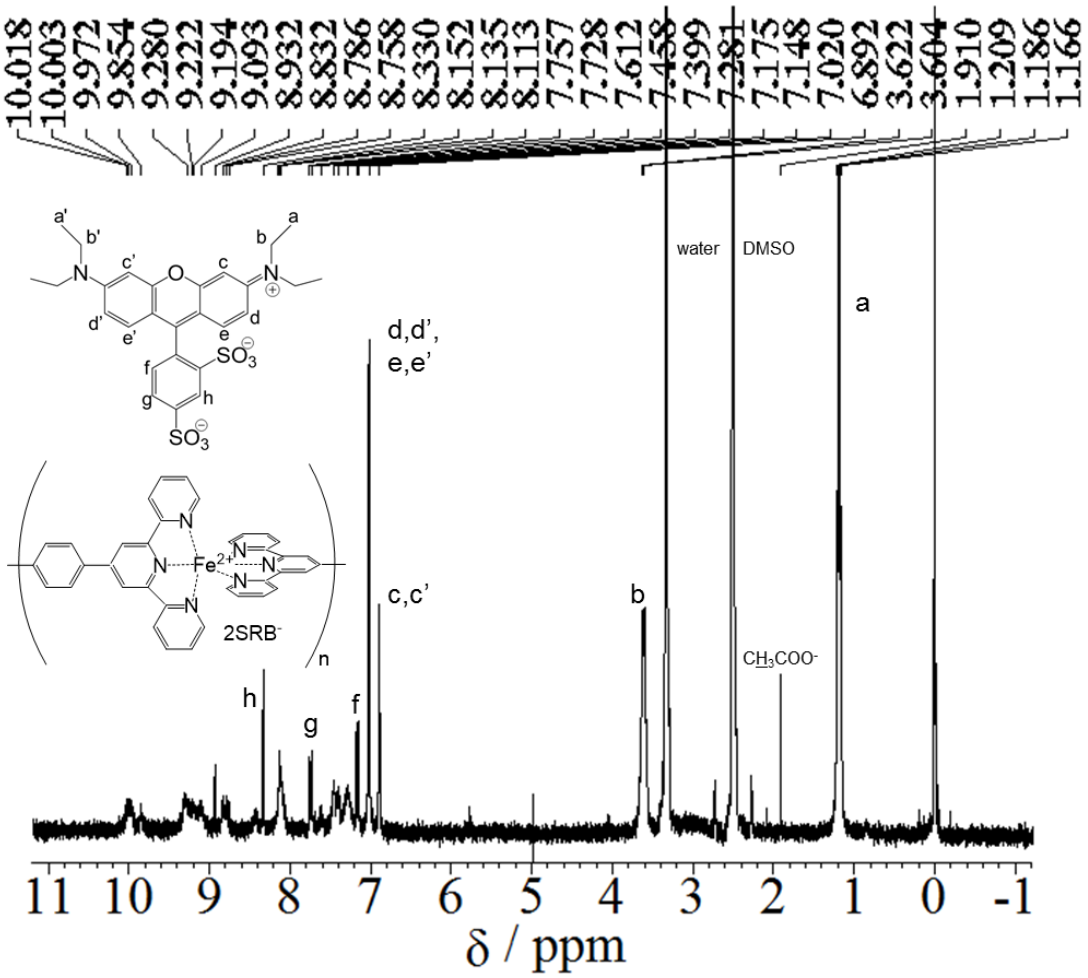

Figure S6. ^{1}H-NMR spectrum of **polyFe-SRB**.

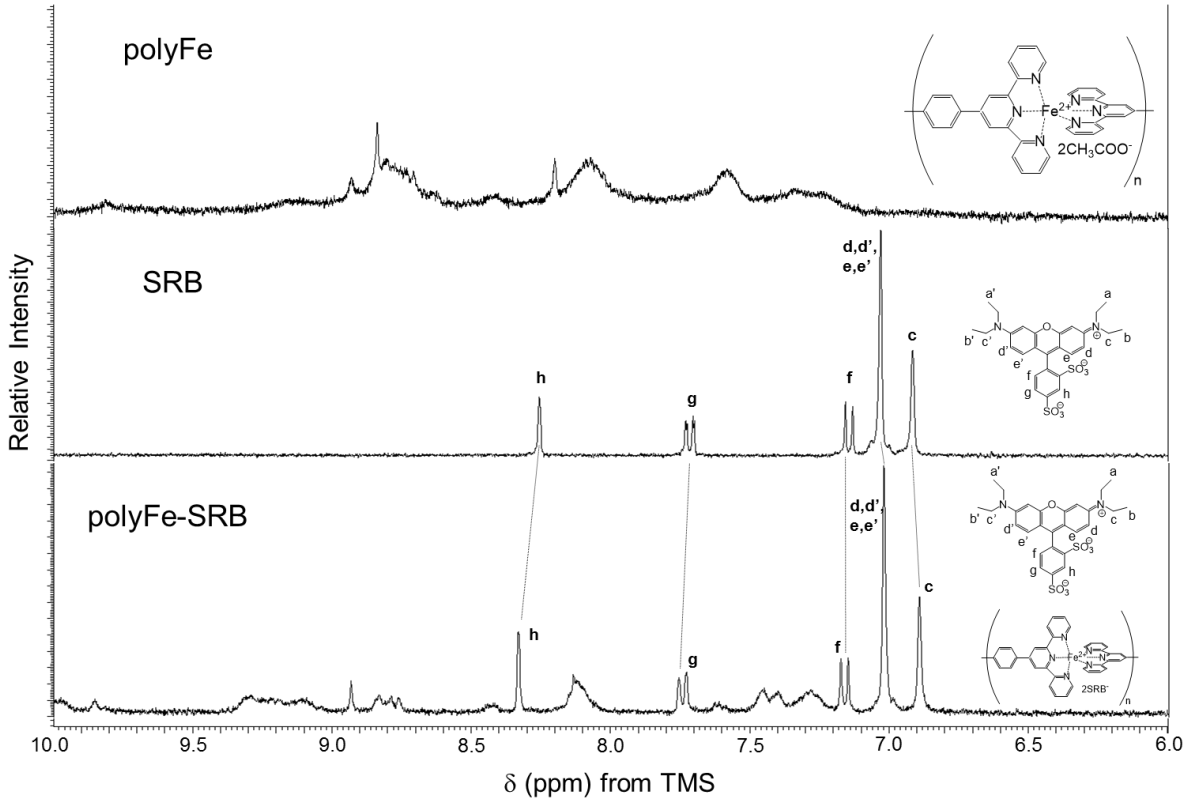

Figure S7. ^{1}H-NMR spectra (only in the aromatic region) of **polyFe**, **SRB** and **polyFe-SRB**.

4. Pictures of a polyFe device

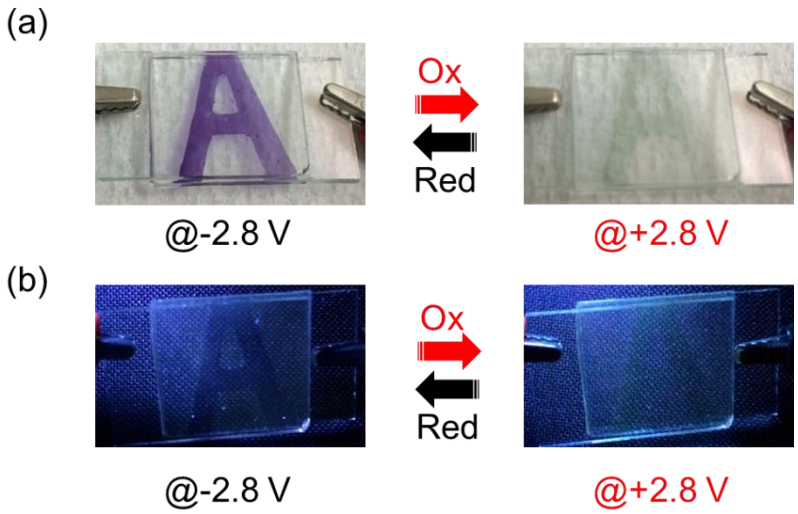

Figure S8. (a) Electrochromic change of a device using **polyFe** bearing acetate anions at -2.8 and 2.8 V and (b) pictures of the device under UV light irradiation.

5. Reference

[1] P. Zhang, Y. Wang, H. Liu and Y. Chen, *J. Mater. Chem*., 2011, **21**, 18462

[2] R. López, D. Villagra, G. Ferraudi and S. A. Moya, J. Guerrero, *Inorg. Chim. Acta*, 2004, **357**, 3525.

[3] G. Liu, X. Li and J. Zhao, *Environ. Sci. Technol*., 2000, **34**, 3982.