# Supplementary data

# A highly sensitive and reusable cyanide anion sensor based on the spiropyran functionalized polydiacetylene vesicular receptors

**Hongyan Xia,[a] Jingguo Li,[a] Gang Zou,[a]* Qijin Zhang,[a] Chong Jia [b]**

[a] CAS Key Laboratory of Soft Matter Chemistry, Department of Polymer Science and Engineering, Key Laboratory of Optoelectronic Science and Technology in Anhui Province, University of Science and Technology of China, Hefei, Anhui 230026, P. R. China

*Corresponding author: gangzou@ustc.edu.cn

Tel: 86-551-63601698 Fax:86-551-63601704

[b] School Materials of Science and Engineering, Hefei University ofTechnology, Hefei, Anhui 230009, P. R. China

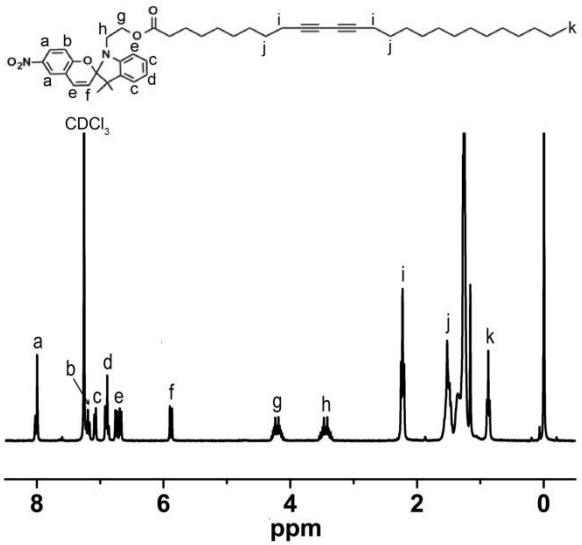


**Figure S1** Molecular structure and $^1$H NMR spectrum of SPDA recorded in $CDCl_3$.

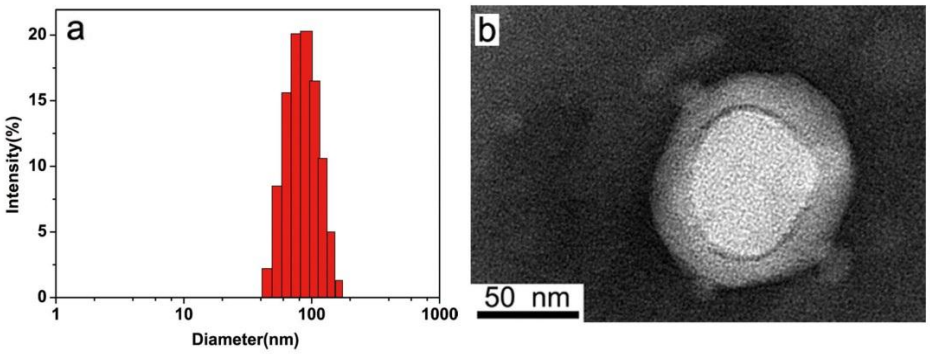


**Figure S2** (a) DLS and (b) Negatively staining TEM image of SPFPDA vesicles.

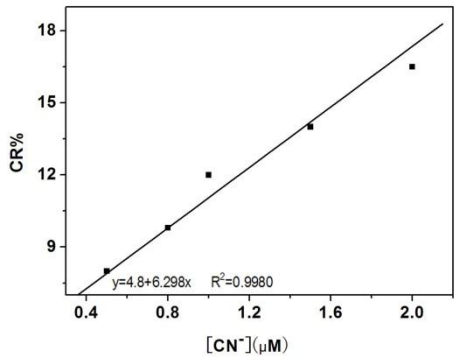


**Figure S3** The linear changes in the colorimetric response of the SPFPDA vesicles with the increasing $CN^-$ concentration from $5\times10^{-7}$ M to $2\times10^{-6}$ M.

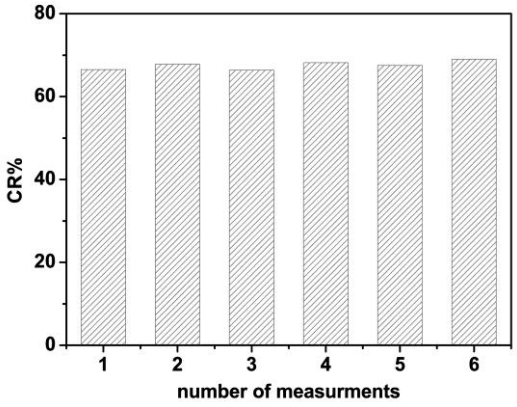


**Figure S4** Reproducibility of the colorimetric response of the SPFPDA vesicles in the presence of $CN^-$ with the same concentration of $5\times10^{-5}$ M.

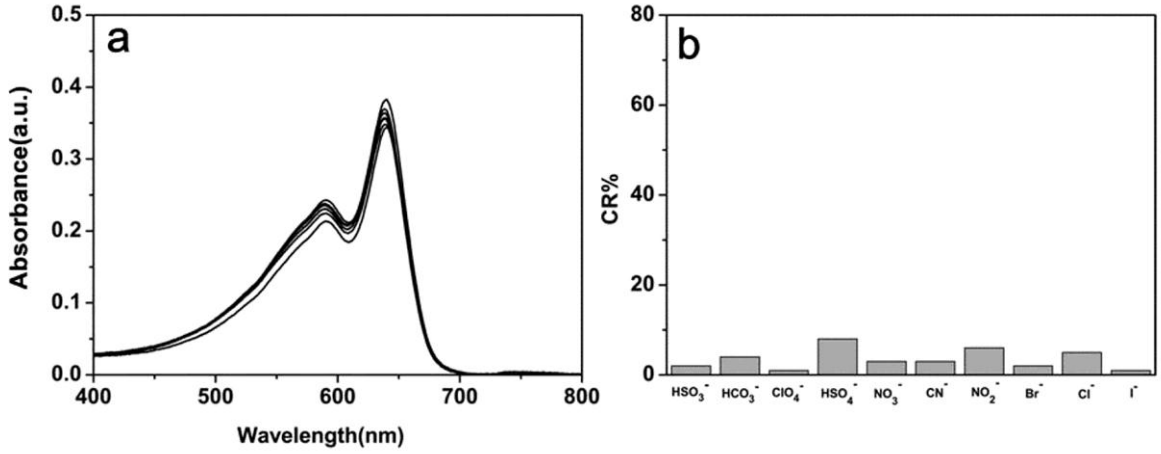


**Figure S5** (a) UV-visible absorption spectra and (b) the colorimetric response of the pure PDA vesicles in the presence of different anions with the same concentration of $1\times10^{-3}$ M in buffered aqueous solution (HEPES 10 mM, pH=7.2) at room temperature. The response time was 12 min.

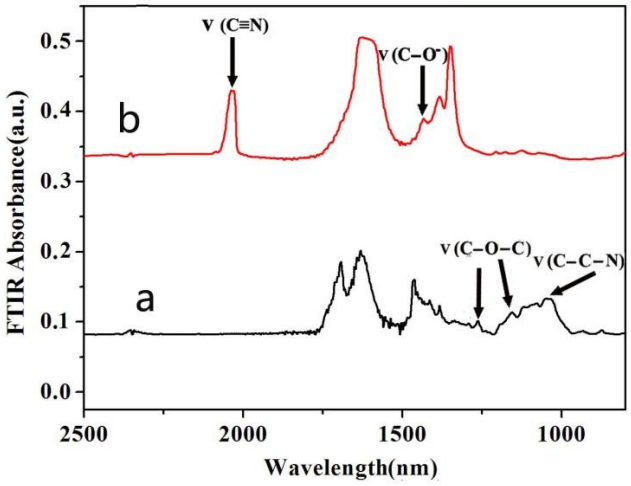


**Figure S6** FTIR spectra of the SPFPDA vesicles: (a) before and (b) after addition of $5\times10^{-5}$ M $CN^-$.

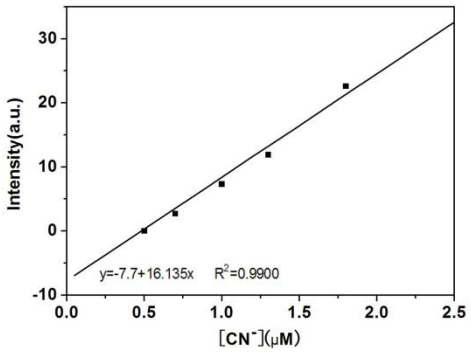


**Figure S7** The linear changes in the fluorescence intensity of the SPFPDA vesicles with the increasing $CN^-$ concentration of from $5\times10^{-7}$ M to $2\times10^{-6}$ M.

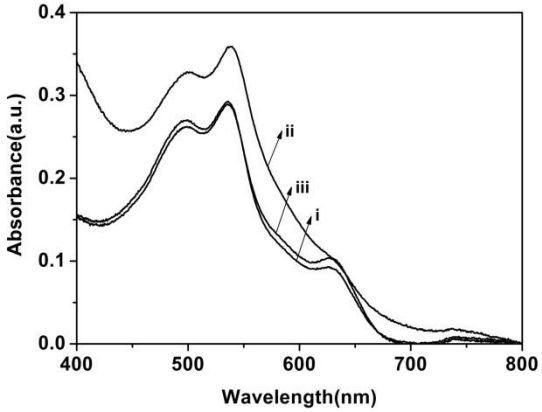


**Figure S8** UV-vis absorption spectra of (i) the SPFPDA vesicles upon addition of $5\times10^{-5}$ M $CN^-$ in buffered aqueous solution (HEPES 10 mM, pH=7.2); (ii) the recovered sample after subsequent addition of $HClO_4$ aqueous solution (0.1 M), and (iii) the sample after subsequent addition of $5\times10^{-5}$ M $CN^-$ again.