## Supporting Information

# Zwitterionic Poly(vinylidene fluoride) Graft Copolymer with Unexpected Fluorescence Property 

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Figure S1. APC traces in DMF of PVDM and PVDM-1 using PMMA standard, Flow rate: $0.5 \mathrm{ml} / \mathrm{min}$.


Figure S2. FT-IR spectra of PVDF, PVDM-1 and PVDMS.


Figure S3. PL intensity versus wavelength plot of PVDMS ( $0.25 \% \mathrm{w} / \mathrm{v}, 2 \mathrm{~mL}$ solution) in aqueous solution with increasing amounts of (a) CTAB (as indicated) and (b) SDBS (as indicated) at excitation 390 nm .


Figure S4. PL intensity versus wavelength plot of PVDMS ( $0.25 \% \mathrm{w} / \mathrm{v}, 2 \mathrm{~mL}$ solution) in aqueous solution with increasing amounts of TRITON X-100 (as indicated) at excitation 390 nm .


Figure S5. Molecular orbitals (associated with the electronic transition in the absorption spectrum of polymer PVDM-1) in the optimized structure of its trimeric model (isolobal value $=0.03$ ).


HOMO -8


LUMO+1

Figure S6. Molecular orbitals (associated with the electronic transition in the absorption spectrum of polymer PVDMS) in the optimized structure of its trimeric model (isolobal value=0.03).


Figure S7. Energy diagrams of selected DFT calculated molecular orbitals for model PVDM-1 (red lines) and PVDMS (blue lines) both having three repeating units.

Table S1. Electronic spectral transitions with TD-DFT (B3LYP/CPCM/ $\mathrm{H}_{2} \mathrm{O}$ ) calculated values of trimeric models of polymers PVDM-1 and PVDMS.

| Polymer | $\left[\lambda_{\text {obs }}\left(\lambda_{\text {calc }}\right)\right] \mathrm{nm}$ | absorbance | Oscillator <br> strength (f) <br> (calc) | Transition |
| :---: | :---: | :---: | :---: | :---: |
| PVDM-1 | 276(291) | 0.583 | 0.0208 | $\begin{gathered} \mathrm{HOMO} \rightarrow \mathrm{LUMO}+2 \\ (92 \%) \end{gathered}$ |
|  | 430 (354) | 0.744 | 0.043 | $\begin{gathered} \text { HOMO } \rightarrow \text { LUMO+1 } \\ (99 \%) \end{gathered}$ |
|  | 457 (468) | 0.829 | 0.0034 | $\text { HOMO-2 } \rightarrow \text { LUMO }$ <br> (100\%) |
| PVDMS | 297 (214) | 0.617 | 0.008 | HOMO-8 $\rightarrow$ <br> LUMO+1 (56\%) |

