## **Electronic Supplementary Information (ESI)**

## Tuning of Polyarylene Ether Nitrile Emission Profile by using Red-emitting Gold Nanoclusters via Fluorescence Resonance Energy Transfer

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Figure S1.The UV-Vis spectra of Au NCs/PEN polymer mixture solution (1:1 volume ratio) for 5 days.



Figure S2. The fluorescent emission spectra of PEN polymer solution (1.5 mg/mL), PEN polymer diluted with 5%  $H_2O$  and 5% BSA aqueous solution (50 mg/mL).



Figure S3. The fluorescence emission spectra of BSA solution (50 mg/mL) and PEN solution (1.5 mg/mL) in the presence of different relative concentrations of BSA aqueous solution.



Figure S4. The fluorescence spectra of Au NCs/PEN complex with Au NCs relative concentration lower than 50%.



Figure S5. The photos (a) of vials containing Au NCs (left), 70% Au NCs mixed with 30% PEN (middle), 70% Au NCs/30% PEN mixture in the presence of HCl (right) under white light (top), UV light (bottom) irradiation and their corresponding fluorescent emission spectra when excited at 365 nm (b).