Supporting Information

Reducing Polyazomethine to Poly(N-phenylbenzylamine) with Near Infrared Electrochromic, Fluorescence and Photovoltaic Properties

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\textbf{Fig. S1} IR spectra of RPAM-a-RPAM-e
Fig. S2 $^1$H NMR spectra of RPAM-a – RPAM-e

Fig. S3 TG diagrams of RPAM-a to RPAM-e
Fig. S4 Changes of PL intensity of RPAM-a - RPAM-d in THF before and after addition of TFA in THF. (The inset describes the PL dependence of the concentration of TFA)

Fig. S5 PL spectra of RPAM-b (concentration: $1.0 \times 10^{-5}$ mol L$^{-1}$ C-N bonds) on addition of various concentrations of proton in the mixed solvent (THF/H$_2$O 1:1 v/v).
Fig. S6 Repetitive CV scanning of the RPAM-a, RPAM-b, RPAM-c, RPAM-e film on the ITO/glass electrode in 0.1 M LiClO₄/MeCN solution over the potential range from 0 to 1.6 V at a scan rate of 50 mV/s.
Fig. S7 Electrochromic behavior of RPAM-a, RPAM-b, RPAM-c, RPAM-e thin film (in CH₃CN with 0.1 M LiClO₄ as the supporting Electrolyte) 0.0-1.6(V vs. Ag/AgCl)

Fig. S8 Dynamic changes of the transmittance and current upon switching the potential between -0.2 and 1.0 V (vs. Ag/AgCl) with a pulse width of 8 s applied to the cast film of polymer RPAM-d on the ITO-coated glass slide in MeCN containing 0.1 mol L⁻¹ LiClO₄. The absorption was recorded at 551 nm.
Fig. S9 Current consumption between -0.2 and 1.0 V (vs. Ag/AgCl) of polymer RPAM-b, RPAM-c, RPAM-d, RPAM-e thin film on the ITO-coated glass substrate in a 0.1 mol\textsuperscript{-1} LiClO\textsubscript{4}/CH\textsubscript{3}CN solution with a cycle time of 8 s.
Fig. S10 A typical photocurrent and photovoltaic response for an RPAM-b, RPAM-c, RPAM-e immobilized ITO glass upon exposure to on/off light at room temperature.