Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Supporting Information

A nanochannels array based device for the determination of isoelectric point of proteins confined in nanochannel

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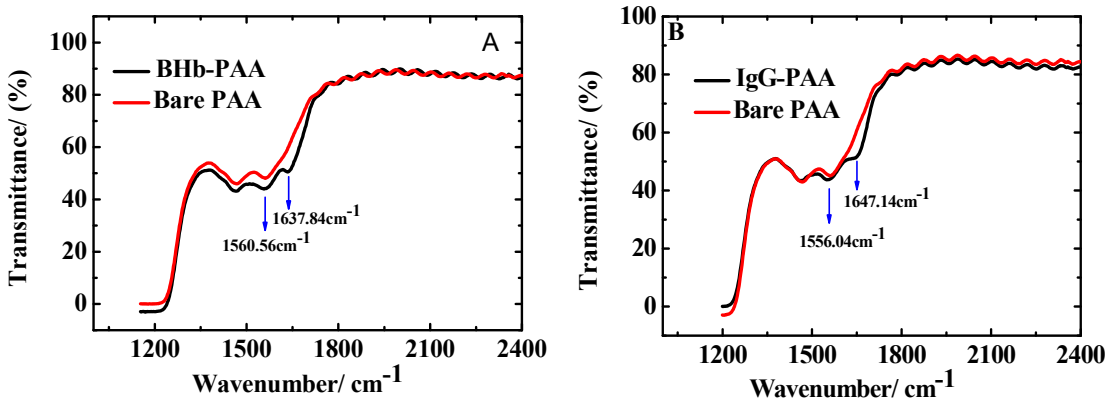

Figure S1. FTIR spectra of BHb (A) and IgG (B) of PAA membranes without (Bare PAA) and with modification by silane, glutaraldehyde and protein (BHb-PAA and IgG-PAA).

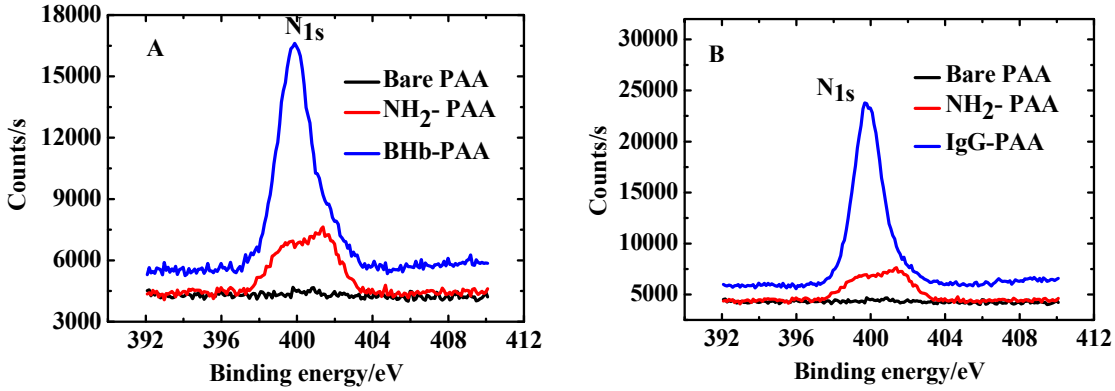

Figure S2. XPS spectra of BHb (A) and IgG (B) of PAA membranes without (Bare PAA) and with modification by silane (NH_2-PAA), glutaraldehyde and protein (BHb-PAA and IgG-PAA).

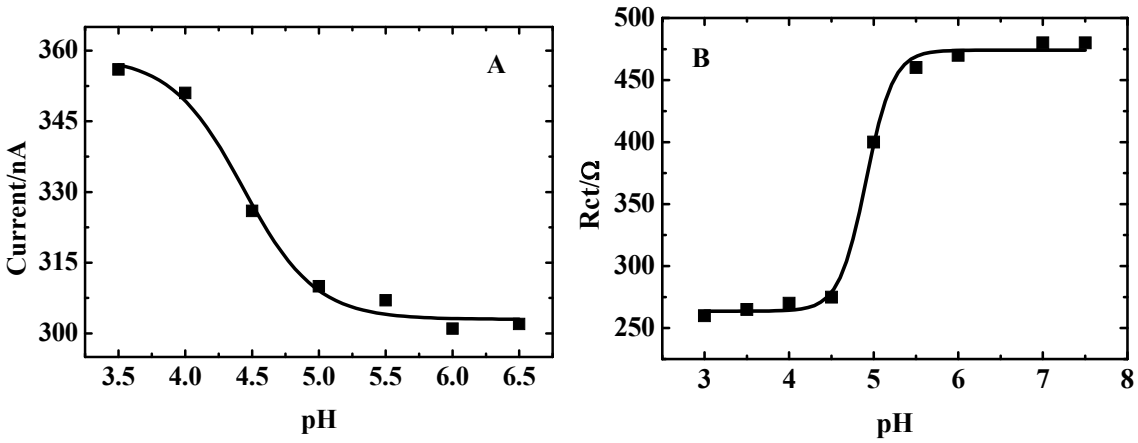

Figure S3. A: Plot of the maximal steady-state current of diffused ferricyanide through the Bovine Serum Albumin modified nanochannels array as a function of solution pH. The detection potential of ferricyanide was 0.0 V. The electrolyte is 100 mM PBS. B: Plot of interfacial electron transfer resistance (R_{ct}) of ferricyanide/ferrocyanide at a BSA covalently modified on a 3-mercaptopropionic acid self-assembled monolayer/gold electrode as a function of solution pH (electrolyte: 100 mM PBS + 100 mM KCl + 1 mM $Fe(CN)_6^{3-/4-}$).

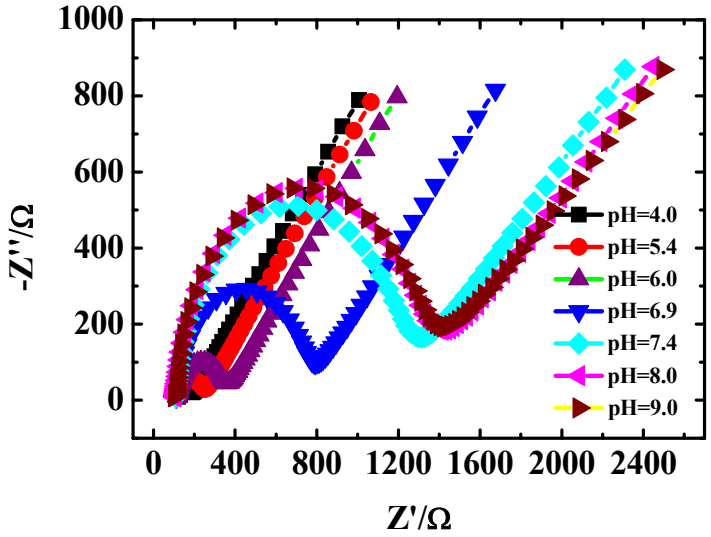

Figure S4. Nyquist plots of impedance corresponding to hemoglobin-modified Au disk electrode in a solution of 100 mM PBS + 100 mM KCl + 1 mM $Fe(CN)_6^{3-/4-}$ with different solution pH.

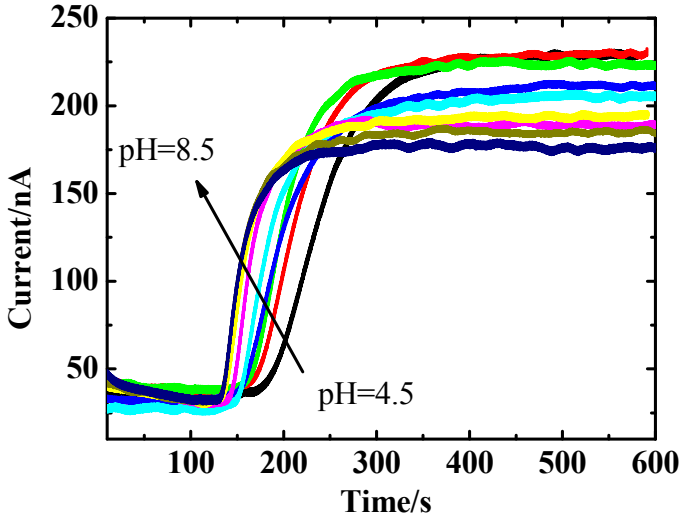

Figure S5. Electrochemical reduction current of ferricyanide ion diffused through PAA nanochannels (20 nm in diameter) modified with the goat anti-rabbit IgG secondary antibody as a function of time in 100 mM PBS with different solution pH. The detection potential of ferricyanide was 0.0 V. The initial concentration of ferricyanide was 0.3 mM and added at 100 s.

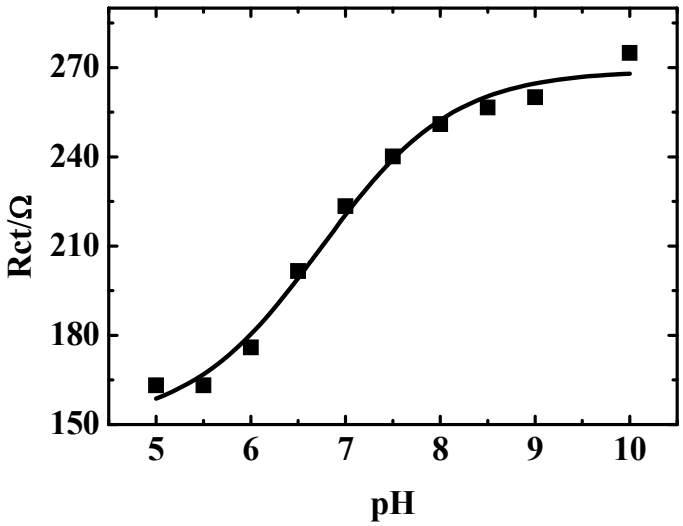

Figure S6. Plot of interfacial electron transfer resistance (R_{ct}) of ferricyanide/ferrocyanide at a goat anti-rabbit IgG secondary antibody covalently modified on a 3-mercaptopropionic acid self-assembled monolayer/gold electrode as a function of solution pH (electrolyte: 100 mM PBS + 100 mM KCl + 1 mM $Fe(CN)_6^{3-/4-}$).