Supplementary Materials

No.	Reactions	Rate Constants (at 45 °C)
R1.	$SO_3^{2-} + H^+ \leftrightarrow HSO_3^-$	$k_1=2.0\times10^{10}$ M^{-1} s^{-1} $k_{-1}=2.0\times10^{3}$ M^{-1} s^{-1}
R2.	$HSO_3^- + H^+ \leftrightarrow H_2SO_3$	$k_2=12.0\times10^{9}$ M^{-1} s^{-1} $k_{-2}=2.0\times10^{8}$ M^{-1} s^{-1}
R3.	$3\ HSO_3^- + BrO_3^- \rightarrow 3\ SO_4^{2-} + Br^- + 3\ H^+$	$k_3=0.13$ M^{-1} s^{-1}
R4.	$3\ H_2SO_3 + BrO_3^- \rightarrow 3\ SO_4^{2-} + Br^- + 6\ H^+$	$k_4=30$ M^{-1} s^{-1}
R5.	$6\ H_2SO_3 + BrO_3^- \rightarrow 3\ S_2O_6^{2-} + Br^- + 3\ H_2O + 6\ H^+$	$k_5=2$ M^{-1} s^{-1}

Table S1. The most important composite reactions of the BrO_3^- – SO_3^{2-} pH oscillator and the rate constants at 45 °C (41,42).

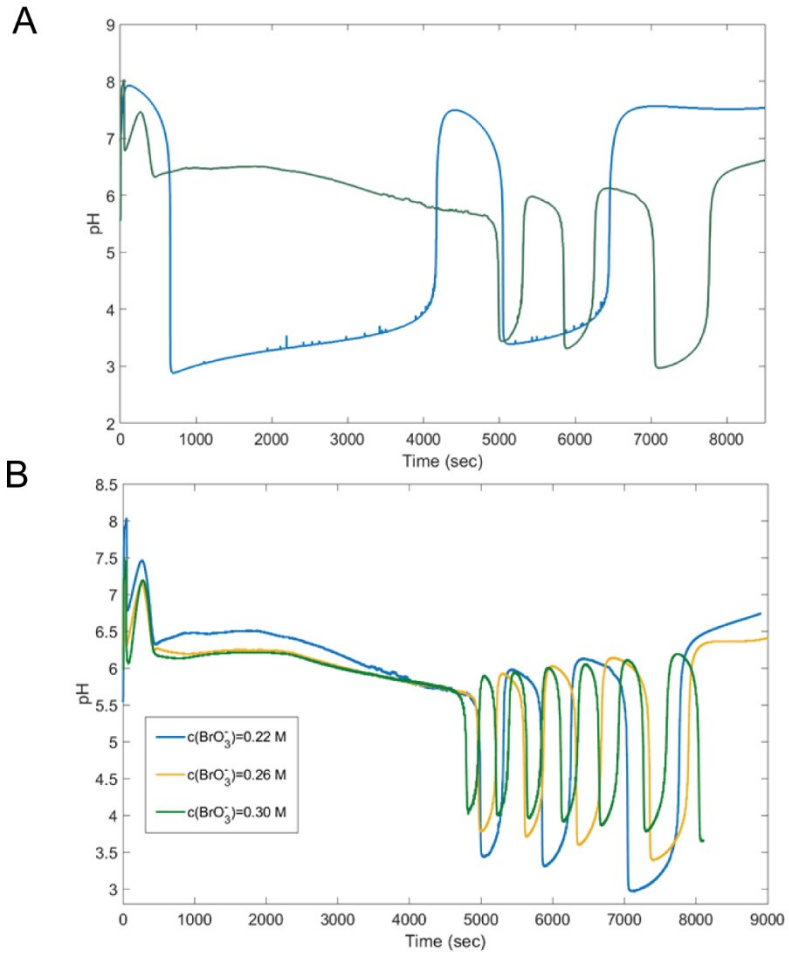

Figure S1. pH oscillation at different reaction conditions. (A) in the pure system when Na_2SO_3 (c=2.0 M) and H_2SO_4 (c=0.0675 M) was inflowed at a rate of 0.08 ml/min to 15.0 cm^3 solution of 0.22 M $NaBrO_3$ at T = 40 °C (blue line) and in the coupled system containing 6 µmol PEG_{45}-CTA and 360 µmol DPA (other experimental conditions are the same) (green line). (B) pH oscillations when the solution of Na_2SO_3 (c=2.0 M) and H_2SO_4 (c=0.0675 M) was inflowed at a rate of 0.08 ml/min to 15.0 cm^3 solution of 0.22 M (blue), 0.26 M (yellow) or 0.3 M (green) $NaBrO_3$ containing 6 µmol PEG_{45}-CTA and 360 µmol DPA at T = 40 °C.

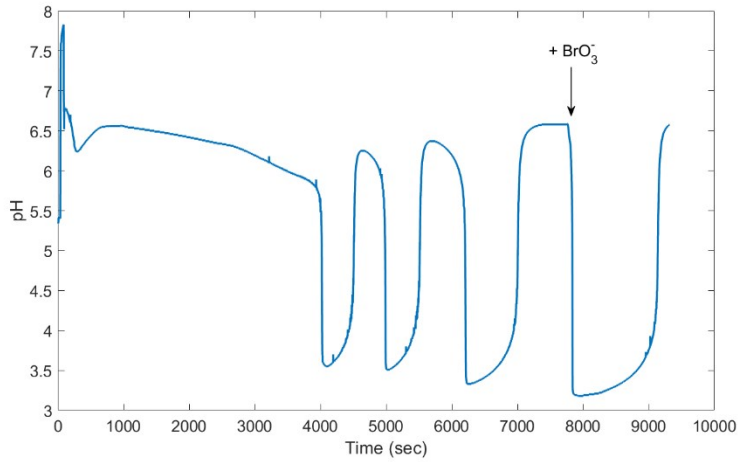

Figure S2. The revival of the pH oscillation after the addition of extra BrO_3^- (1 ml of 0.6 M Na BrO_3). Original conditions: 15.0 cm^3 solution of 0.22 M $NaBrO_3$ containing 6 µmol PEG_{45}-CTA and 360 µmol DPA to which Na_2SO_3 (c=2.0 M) and H_2SO_4 (c=0.0675 M) was inflowed at a rate of 0.08 ml/min at at T = 40 °C.

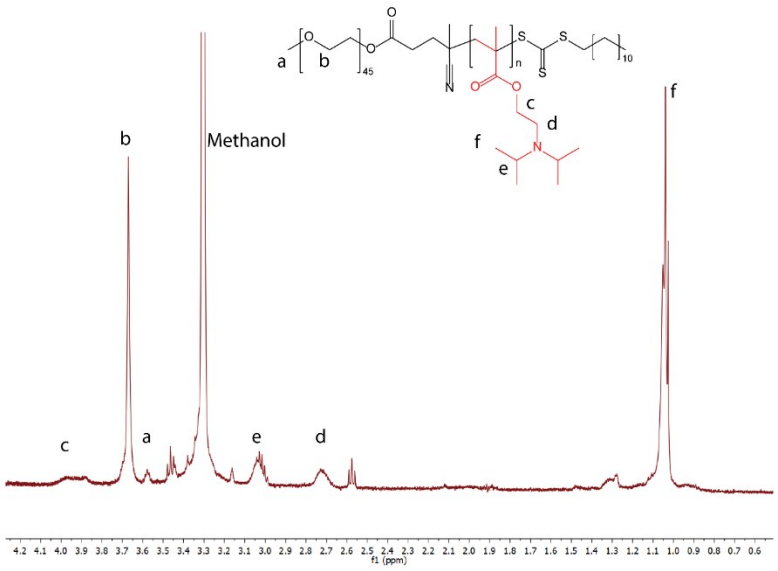

Figure S3. ^{1}H-NMR spectrum of PEG-b-PDPA

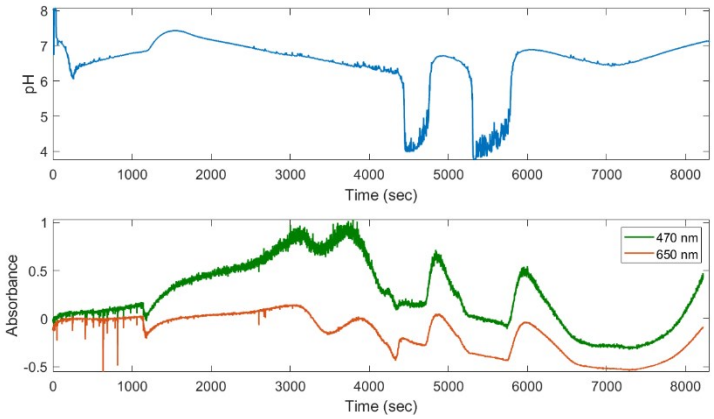

Figure S4. Measured pH oscillations and the absorbance in time at two wavelengths. The solution of Na_2SO_3 (c=2.0 M) and H_2SO_4 (c=0.06 M) was inflowed at a rate of 0.08ml/min to 15.0 cm^3 solution of 0.22 M $NaBrO_3$ containing 6 µmol PEG_{45}-CTA and 360 µmol DPA at T = 40 °C.

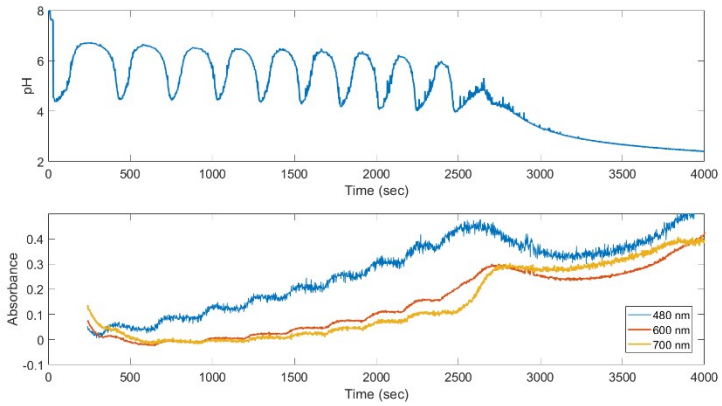

Figure S5. Measured pH oscillations and the absorbance in time at 3 wavelengths. The solution of Na_2SO_3 (c=2.0 M) and H_2SO_4 (c=0.125 M) was inflowed at a rate of 0.08ml/min to 15.0 cm^3 solution of 0.20 M $NaBrO_3$ and 0.04 m $K_4Fe(CN)_6$ containing 6 µmol PEG_{45}-CTA(2S), 390 µmol BA and 60 µmol AA at T = 20 °C.