Supplementary Materials

Eu-Doped Citrate-Coated Carbonated Apatite Luminescent Nanoprobes for Drug Delivery

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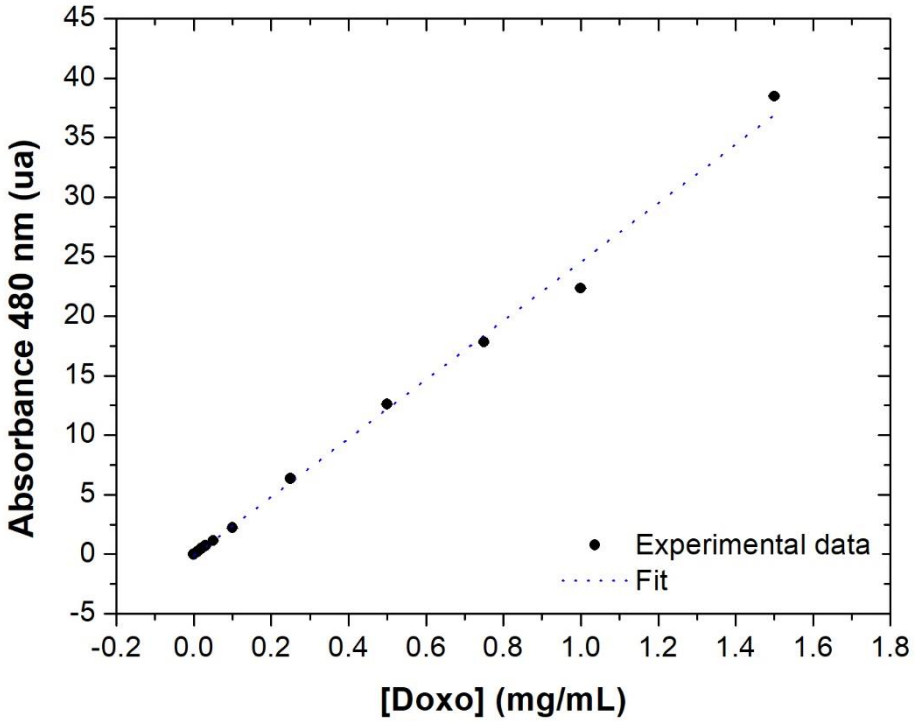

Figure S1. Standard calibration straight line Doxo on Eu:cit-cAp nanocrystals. Dotted blue line represents the lineal fitting of the experimental data.

Table S1. Kinetics parameters obtained from the lineal fitting of the experimental data.

Parameter		R^2
Intercept [ua]	-0.1 ± 0.3	0.99424
Slope [mL mg^{-1}]	24.7 ± 0.6	

Equation S1:

$$Q(t) = Q_{max}\,(1\text{-}e^{(-t/\tau)}) \qquad \text{(Lagergren's equation)}$$

Q is the amount of drug adsorbed on the nanoparticle surface and τ the time needed to reach approximately a 63% of Q_{max}

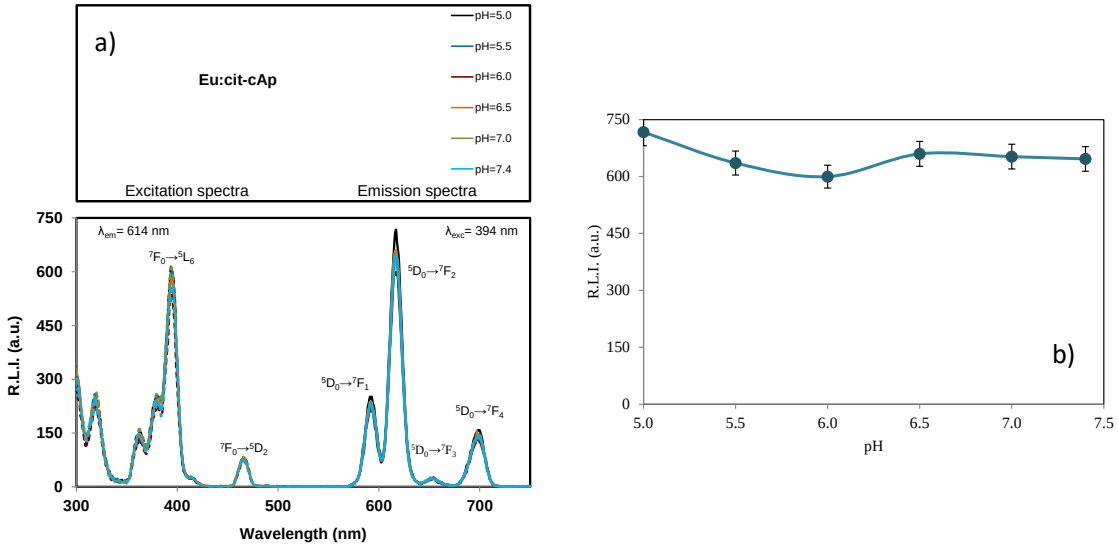

Figure S2. (**a**) excitation (dashed line) and emission (solid line) spectra of Eu:cit-cAp nanoparticles suspended in water at 25 °C at several pHs and (**b**) the effect of the pH on the luminescence emission of these particles; slit-widths$_{exc/em}$ = 10/10 nm, t_d = 120 μs, t_g = 5 ms, detector voltage 800v.

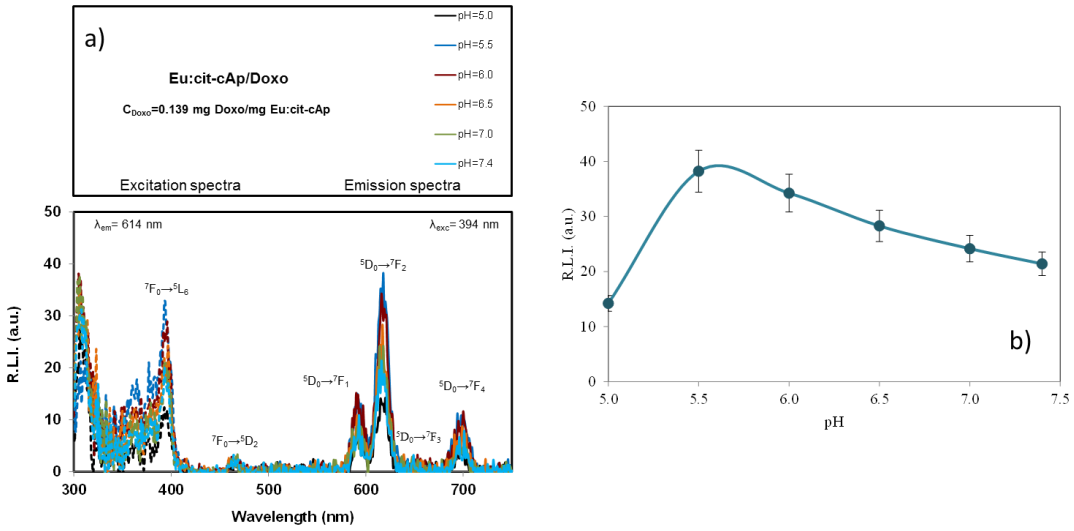

Figure S3. (**a**) excitation (dashed line) and emission (solid line) spectra of Eu:cit-cAp nanoparticles loaded with 0.139 mg Doxo/mg Eu:cit-cAp suspended in water at 25 °C at several pHs, and (**b**) the effect of the pH on the luminescence emission of these particles; slit-widths$_{exc/em}$ = 10/10 nm, t_d = 120 μs, t_g = 5 ms, detector voltage 800v.

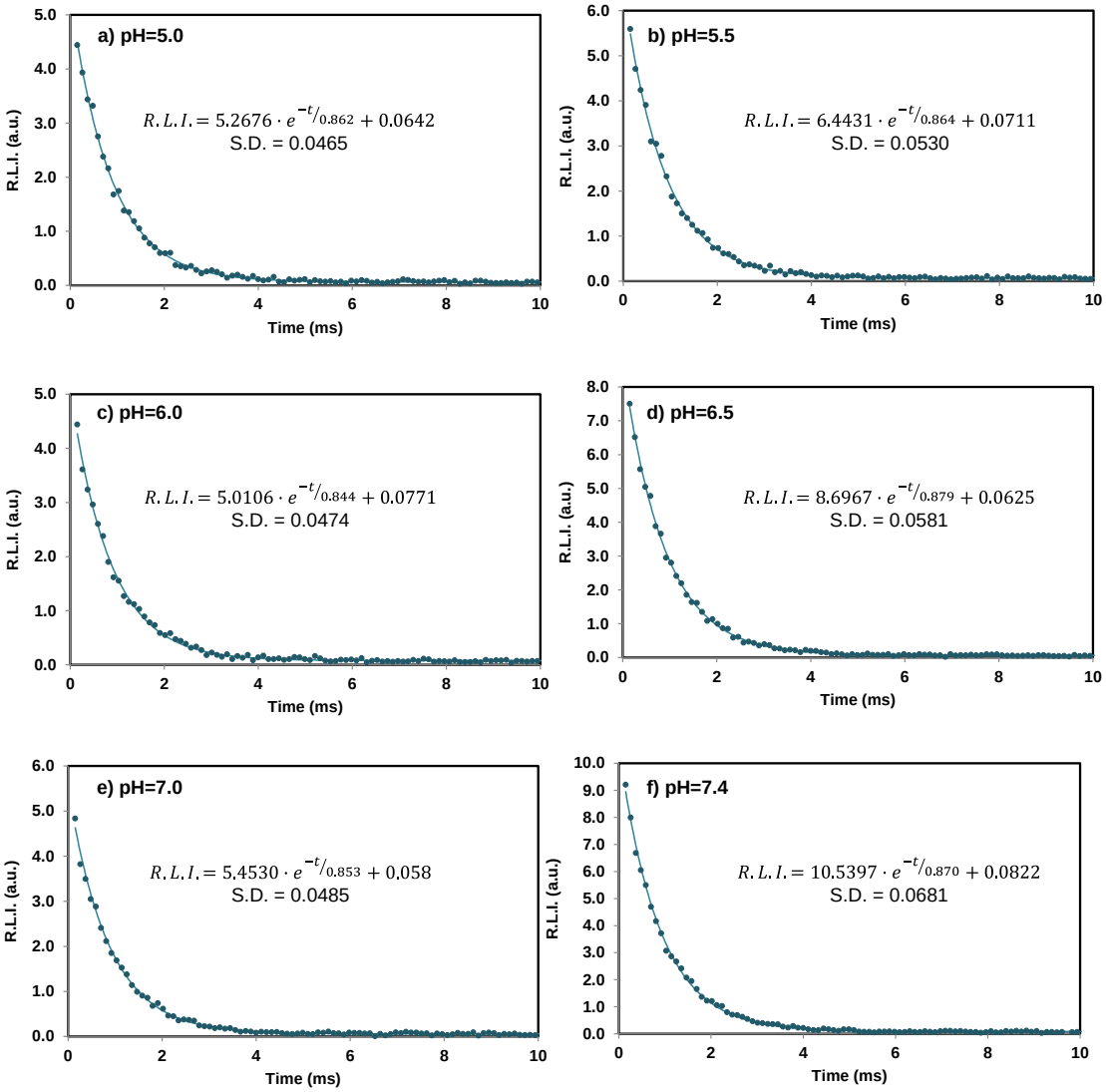

Figure S4. luminescence decay curve of Eu:cit-cAp nanoparticles suspended in water at 25 °C at several pHs, $\lambda_{exc/em}$=394/618 nm, slit-widths$_{exc/em}$ = 10/10 nm, and detector voltage = 780 V. Circles correspond to experimental data and lines to the fitting equation.

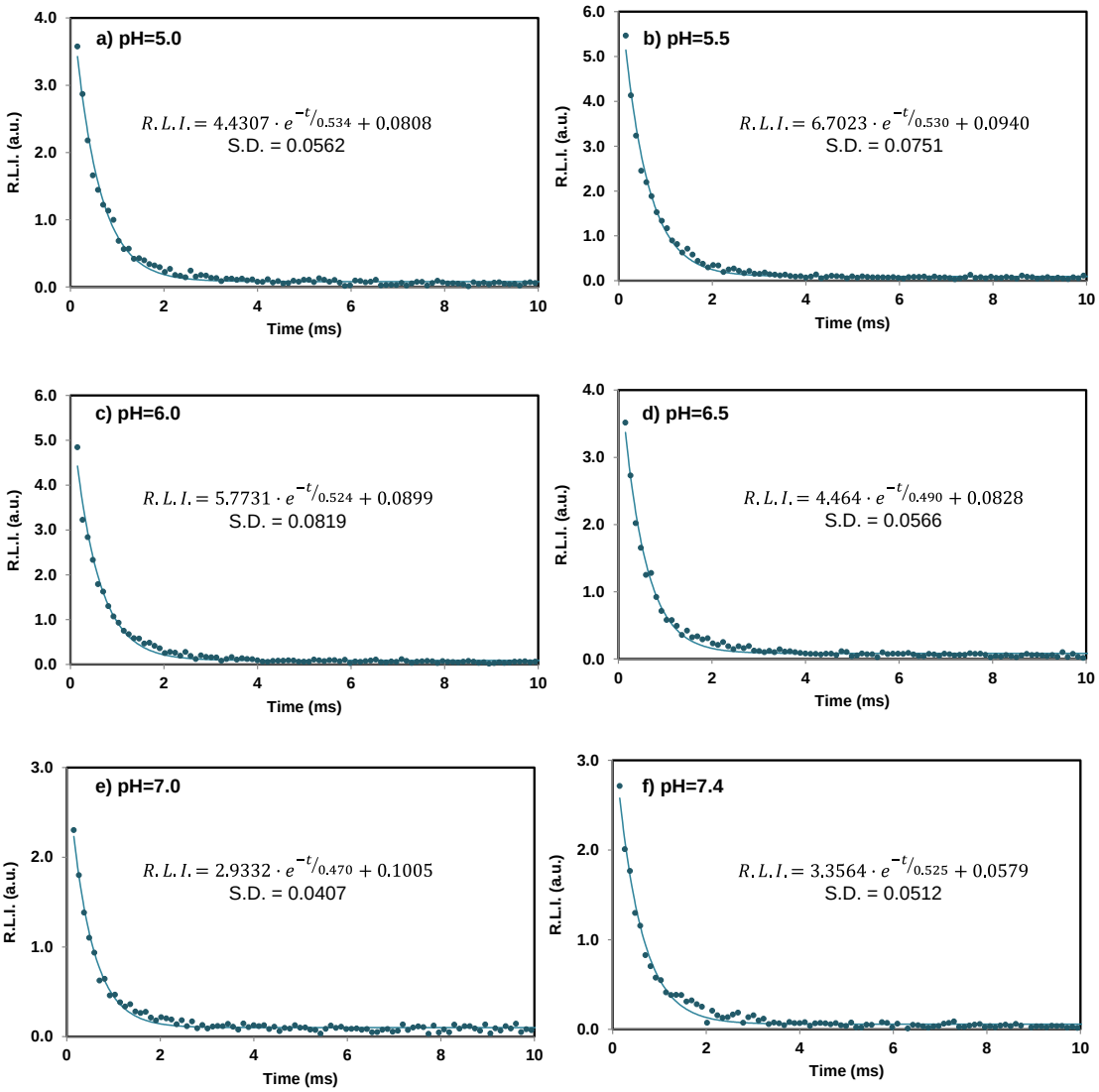

Figure S5. luminescence decay curve of Eu:cit-cAp nanoparticles loaded with 0.139 mg Doxo/mg Eu:cit-cAp suspended in water at 25 °C at several pHs. $\lambda_{exc/em}$ = 394/614 nm, slit-widths$_{exc/em}$ = 10/10 nm, and detector voltage = 780 V; circles correspond to experimental data and lines to the fitting equation.

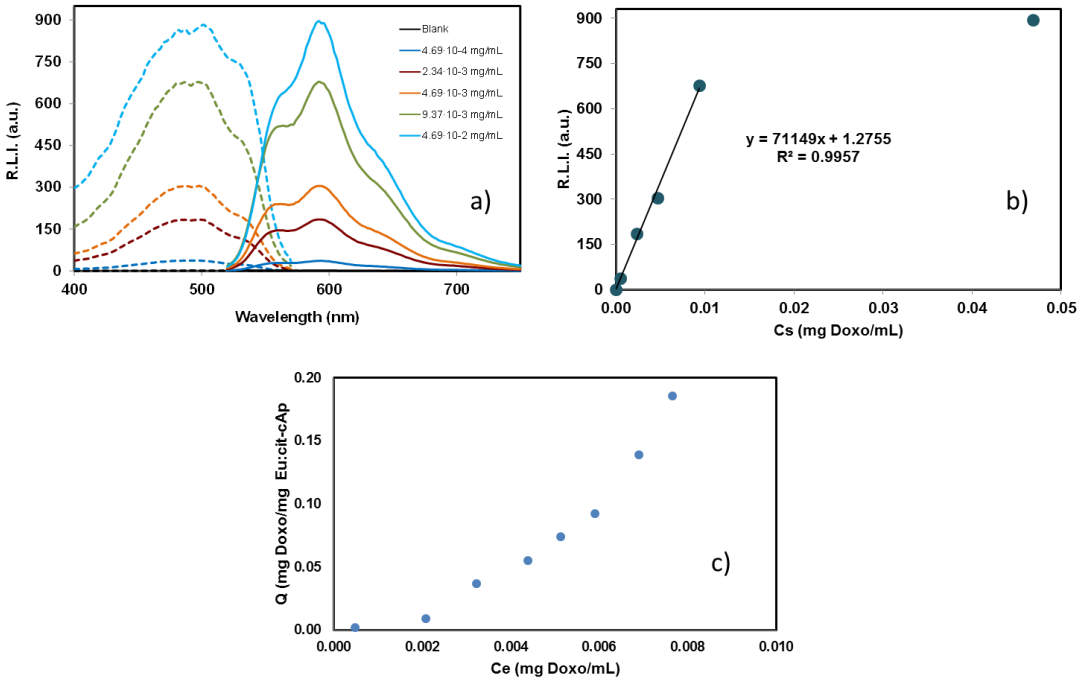

Figure S6. (**a**, **b**) calibration curve of Doxo in water, and (**c**) determination of the absorbed Doxo on the Eu:cit-cAp nanoparticles versus the equilibrium Doxo concentration.

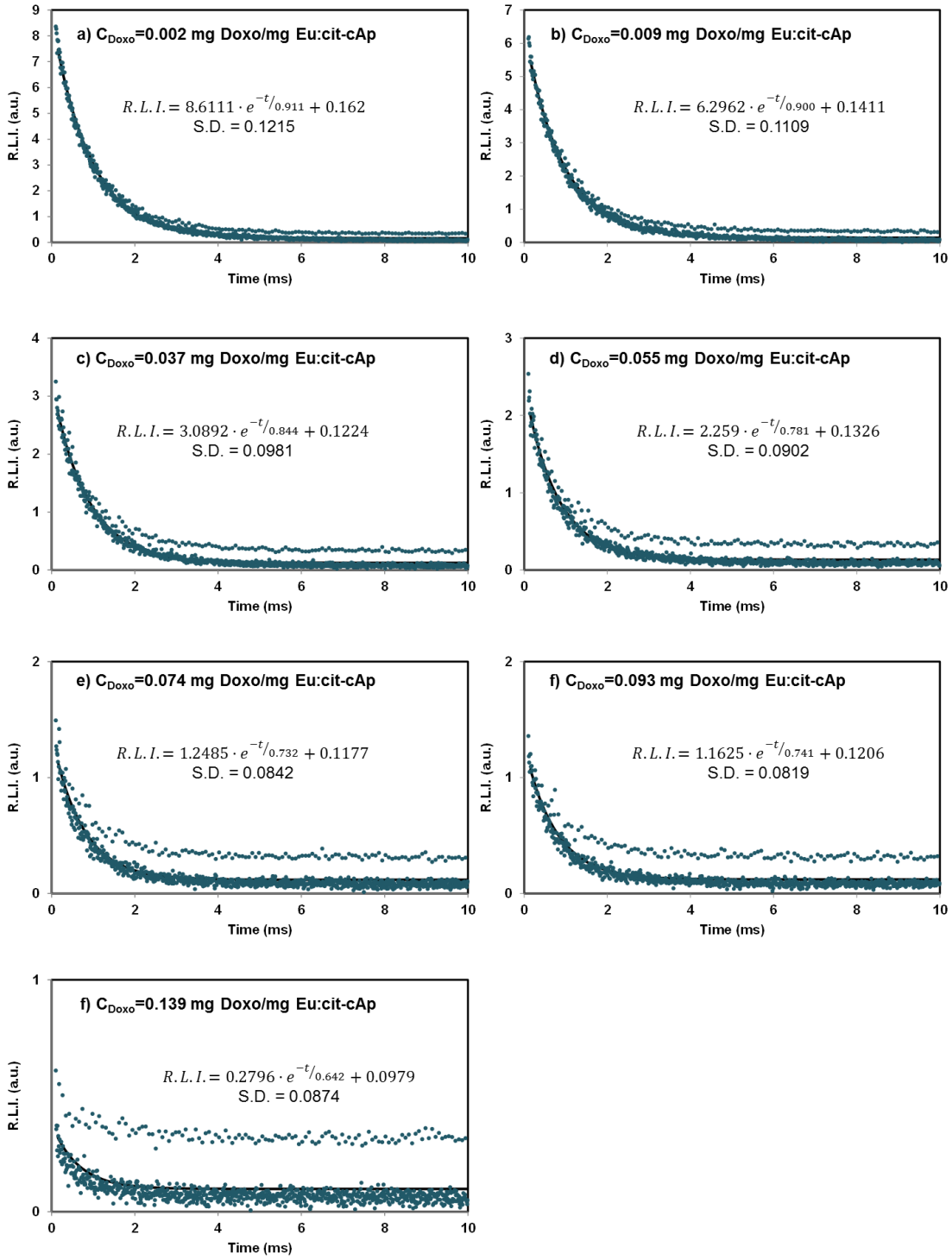

Figure S7. luminescence decay curve of Eu:cit-cAp/Doxo nanoparticles with varying concentration of Doxo suspended in HEPES buffer at pH=7.4 and 25ºC; $\lambda_{exc/em}$ = 394/614 nm, slit-widths$_{exc/em}$ = 10/10 nm, and detector voltage = 780 V; circles correspond to experimental data and lines to the fitting equation.

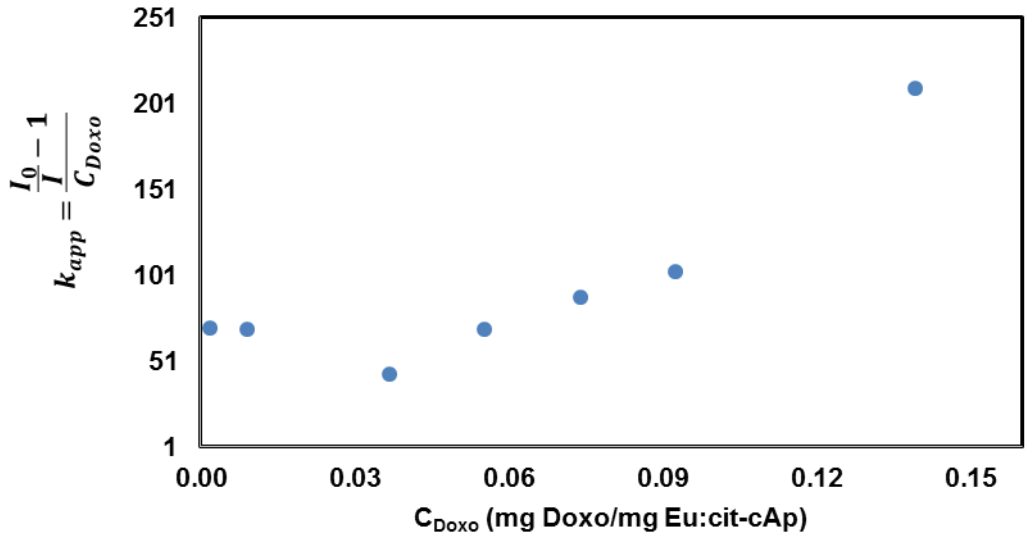

Figure S8. Variation of the apparent quenching constant with the concentration of the quencher.