Supporting information for

On-off QD switch that memorizes past recovery from quenchings by diazonium salts

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Pictures of QD solutions after addition of compound 1

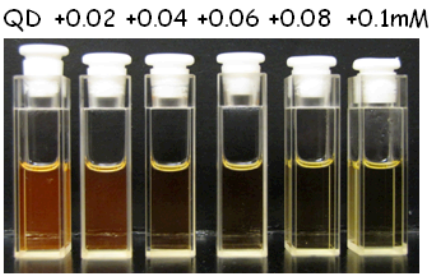

Fig. S1. Pictures of QD_{610} solutions (0.5μM) in toluene with different amounts of **1**.

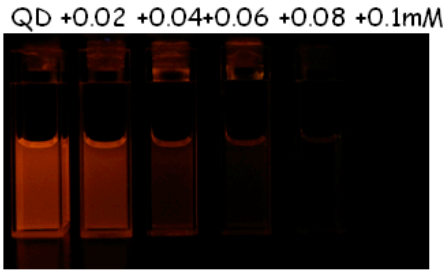

Fig. S2 Pictures QD_{610} solutions (0.5μM) in toluene with different amounts of **1** under UV irradiation.

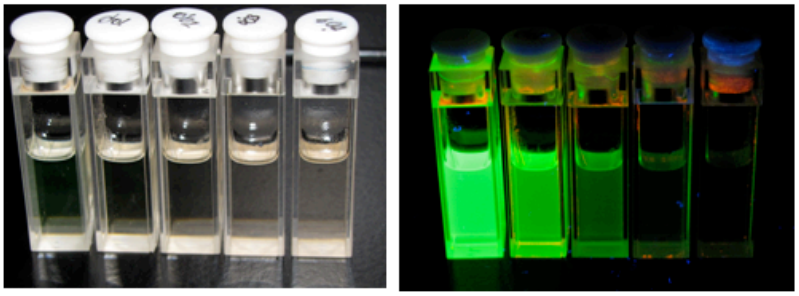

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Fig. S3. Left: picture QD_{546} solutions (0.5μM) in toluene with different amounts of **1**. Right: the same under UV irradiation.

Lifetime distribution for QD_{610}

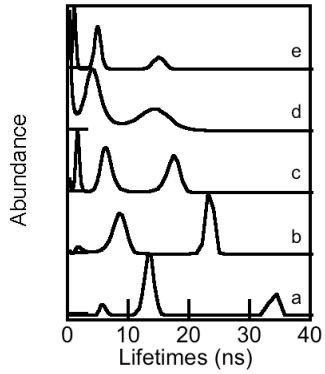

Fig. S4. Lifetime distribution for each decay trace for QD_{610} in absence (a) or in presence 0.02 mM (b), 0.06 mM (c), 0.08 mM (d) and 0.1 mM (e) of **1.**

Note: IRF has been taken into account for our fittings and the decays have been zeroed. The experimental error in the lifetime measurements increases at higher concentrations of 1 (reaching a value of ca. 20%). The fluorescence decay profiles were fitted by three exponential functions: $a_1\exp(-t/\tau_1) + a_2\exp(-t/\tau_2) + a_3\exp(-t/\tau_3)$ [S.-C. Cui, T. Tachikawa, M. Fujitsuka and T. Majima, *J. Phys. Chem. C.* **2008**, 112 (49) 19625-19634]

Table 1. Emission lifetimes of QD_{610} with different amounts of **1**.

[1] (mM)	a_1 (%)	τ_1 (ns)	a_2 (%)	τ_2 (ns)	a_3(%)	τ_3 (ns)	$<\tau>$ (ns)
QD_{610}	24	2.12	68.5	12.4	7.6	39.35	11.9
0.02	39.6	2.93	54	11.35	6.6	36	9.6
0.04	65	2.7	28	5.8	7	21.45	4.9
0.08	73	0.8	24	5.34	3	22.8	2.5
0.1	80	1.035	19	5.889	1.18	26.35	2.25

The average lifetime has been obtained using the following equation: $<\tau>= \dfrac{\sum a_i\tau_i}{100}$;

where $<\tau>$ is the average lifetime, a_1 is the preexponential factor and τ_i is the lifetime.

M. Jones, J. Nedeljkovic, R. J. Ellingson, A. J. Nozik, and G. Rumbles. J. Phys. Chem. B, 2003, 107(41), 11346-11352; S.-C. Cui, T. Tachikawa, M. Fujitsuka and T. Majima, J. Phys. Chem. C. 2008, 112 (49) 19625-19634.

Fluorescence recovery comparison for QD_{610} under UVB and UVA illumination

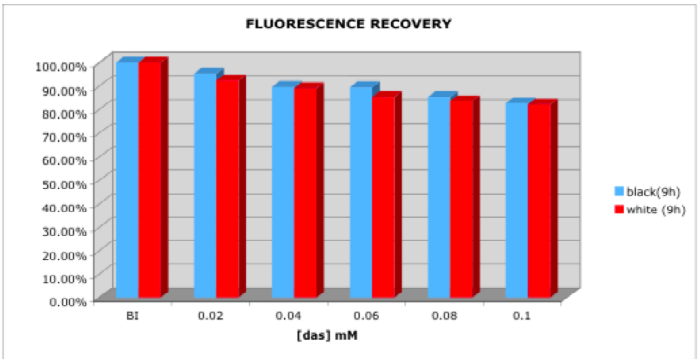

Fig. S5. Comparative fluorescence recovery using UVA (blue) and visible (red) lamps for QD_{610} after a single cycle of addition and recovery.

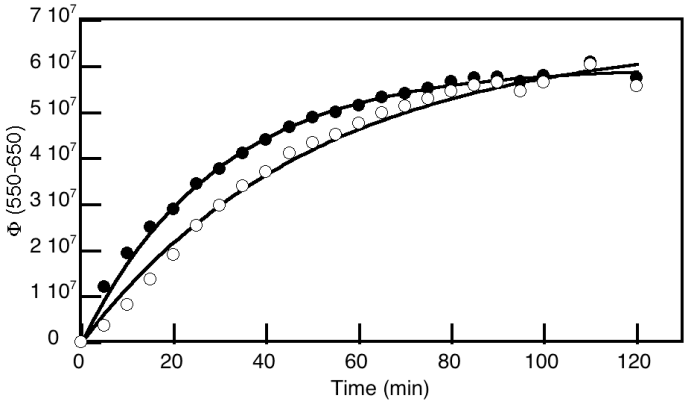

Fig. S6. Kinetics of the fluorescence recovery during the first irradiation with UVA light of QD_{610} under nitrogen (filled circles) and under air (open circles).

Evolution of QD_{546} fluorescence

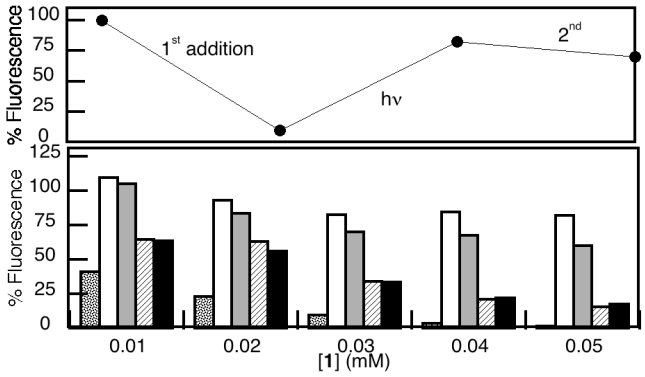

Fig. S7. Bottom: Evolution of QD_{546} (0.5 μM) in toluene fluorescence with different concentrations of **1** after the first addition ⊡, first irradiation □, second addition ▩, second irradiation ◪ and third addition ■. Top: detail for QD_{546} with 0.03 mM of **1**. Irradiated with UVA light.

Magnetic field effect

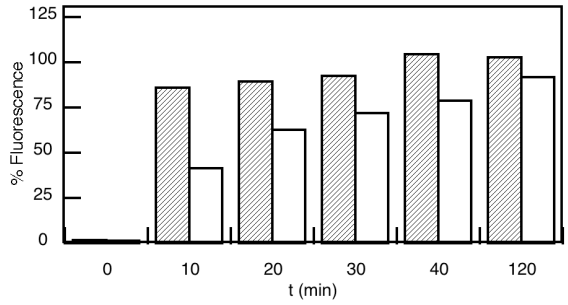

Fig. S8. Kinetics of fluorescence recovery using a xenon lamp as irradiation source □ and the same in presence of a magnetic field ◪.

Study for core-only QD_{558}

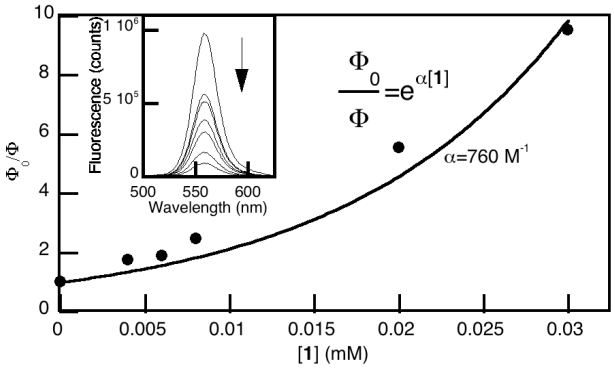

Fig. S9. Stern–Volmer plot of a QD_{558} solution (0.5 μM) in toluene. Inset: QD_{558} emission spectra (λ_{ex} = 450 nm) upon incremental additions of **1**: 0.004 mM, 0.006 mM, 0.008 mM, 0.02 mM and 0.03 mM.

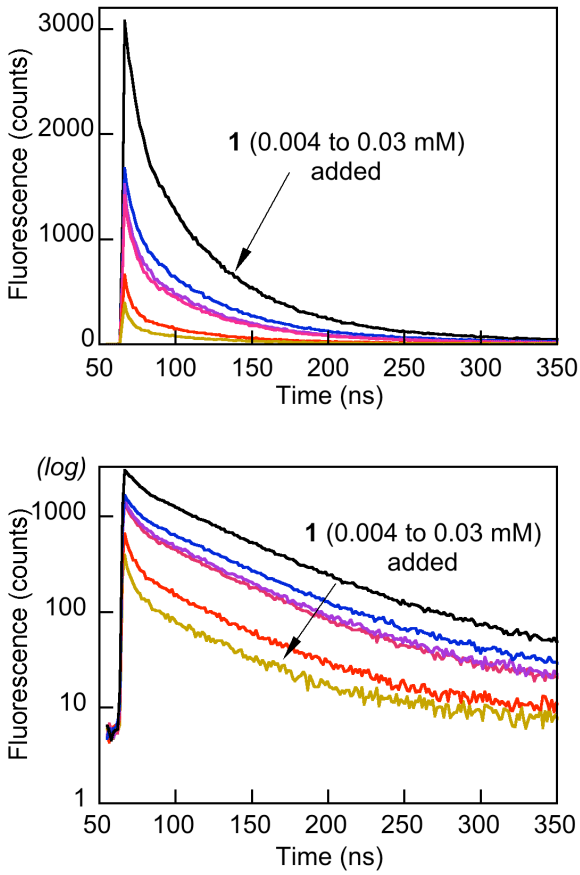

Fig. S10. Kinetic time profiles of QD_{558} (0.5 μM) in toluene with different amounts of **1**. Shown in a linear scale at the top and a log scale at the bottom.