Supplementary Material (ESI) for New Journal of Chemistry

Lanthanide Macrocyclic Quinolyl Conjugates as Luminescent Molecular Switches and Logic Gate Functions using HO^- and O_2 as Inputs

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Electronic Supplementary Information

Figure 1 : UV spectra of Tb1

[**Tb1**] = 0.27 mM in TEAP 0.1 M. Initial pH = 11.04; titration with $HClO_4$.
Spectra were recorded using the parameters described in the experimental section.

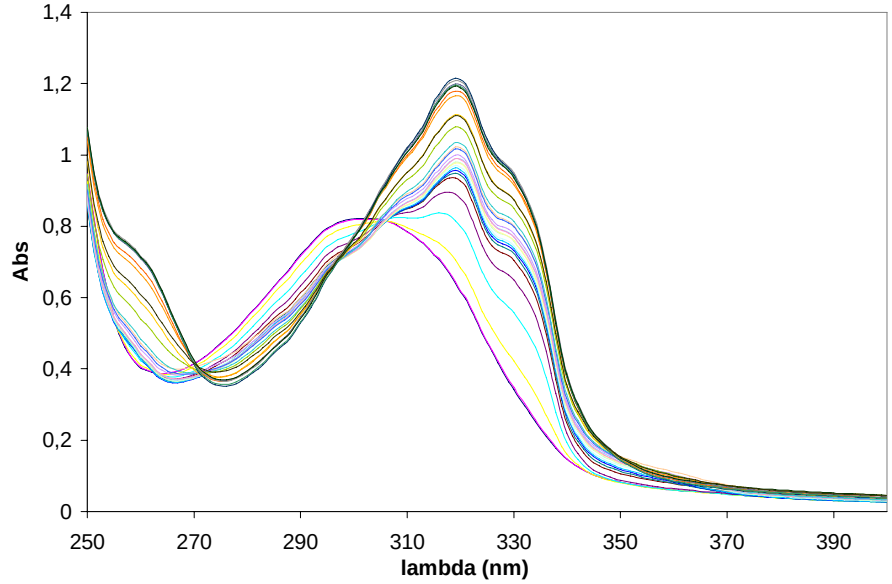


Figure 2 : Fluorescence spectra of Tb1

[**Tb1**] = 50 µM in TEAP 0.1 M. Initial pH = 3.13; titration with Et_4NOH.
Spectra were recorded using the parameters described in the experimental section.

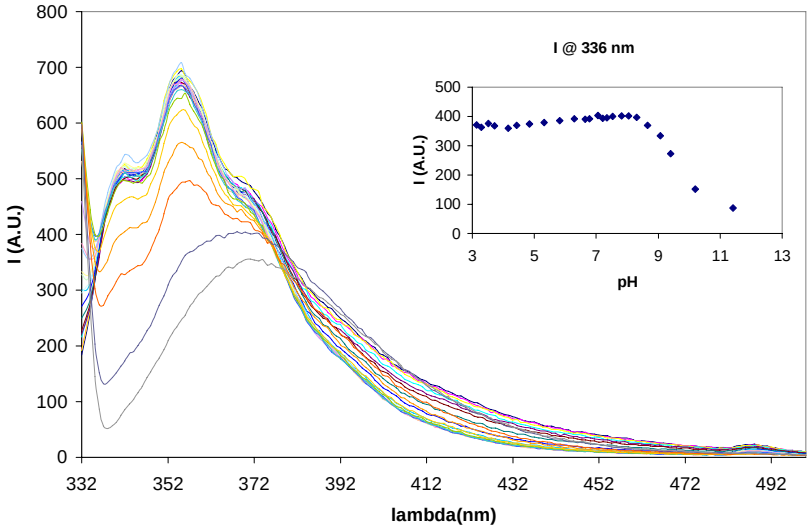
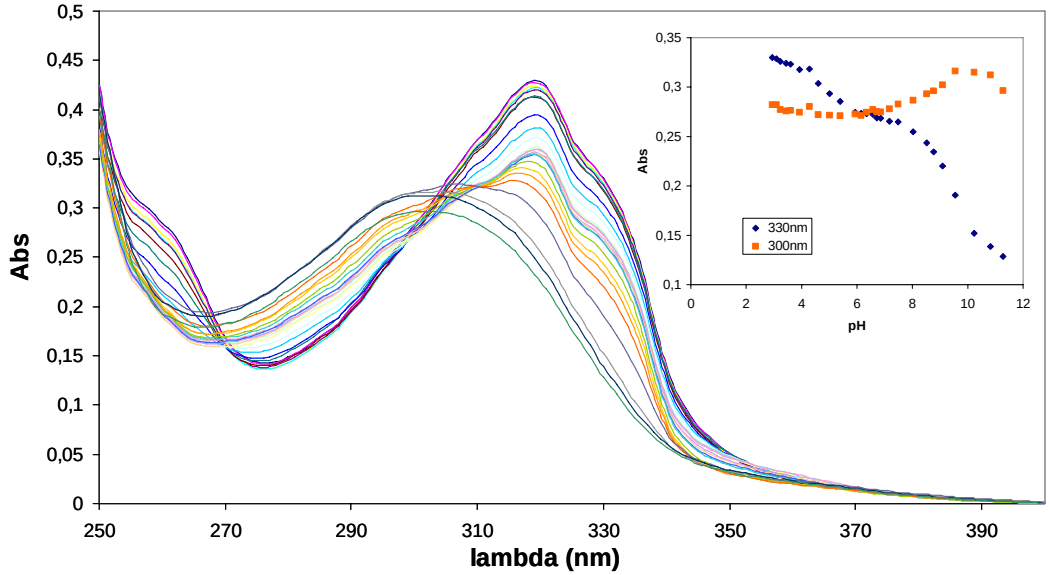


Figure 3 : UV and Phosphorescence spectra of Tb1/Eu1

[**Tb1**] = 29.9 µM, [**Eu1**] = 29.8 µM in TEAP 0.1 M. Initial pH = 2.94; titration with Et_4NOH. Spectra were recorded using the parameters described in the experimental section except for the excitation wavelength of phosphorescence : λ_{exc} = 300 nm.



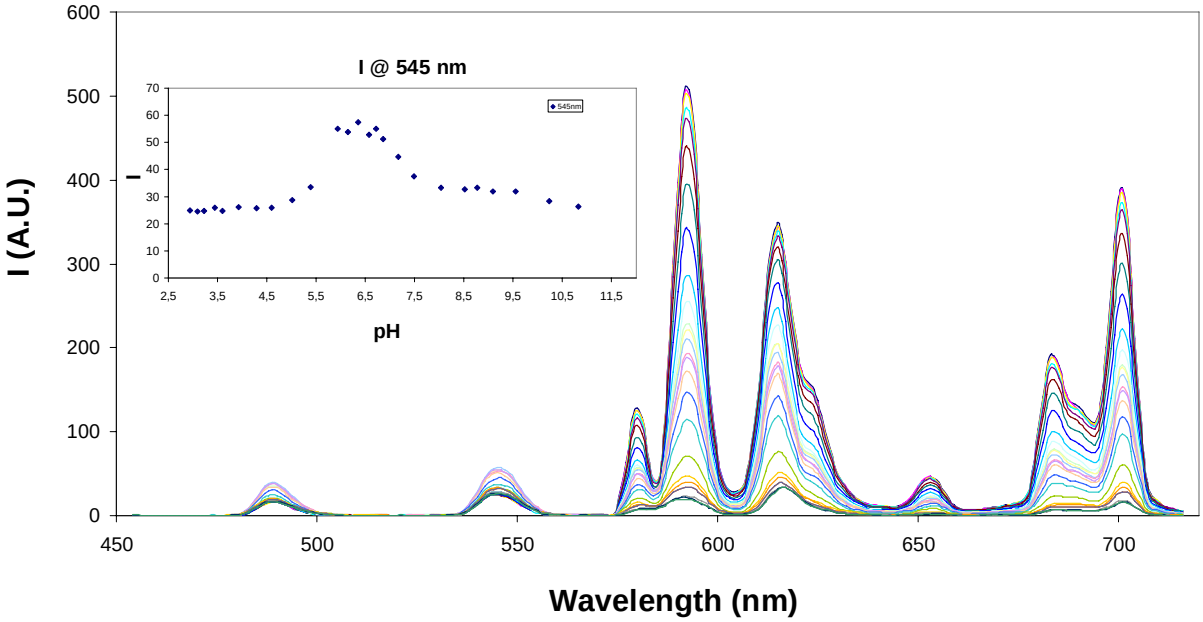


Figure 4 : Phosphorescence spectra of Tb1 in the presence of Argon
[**Tb1**] = 47.0 µM, in TEAP 0.1 M. Initial pH = 3.13; titration with Et_4NOH.
Spectra were recorded using the parameters described in the experimental section

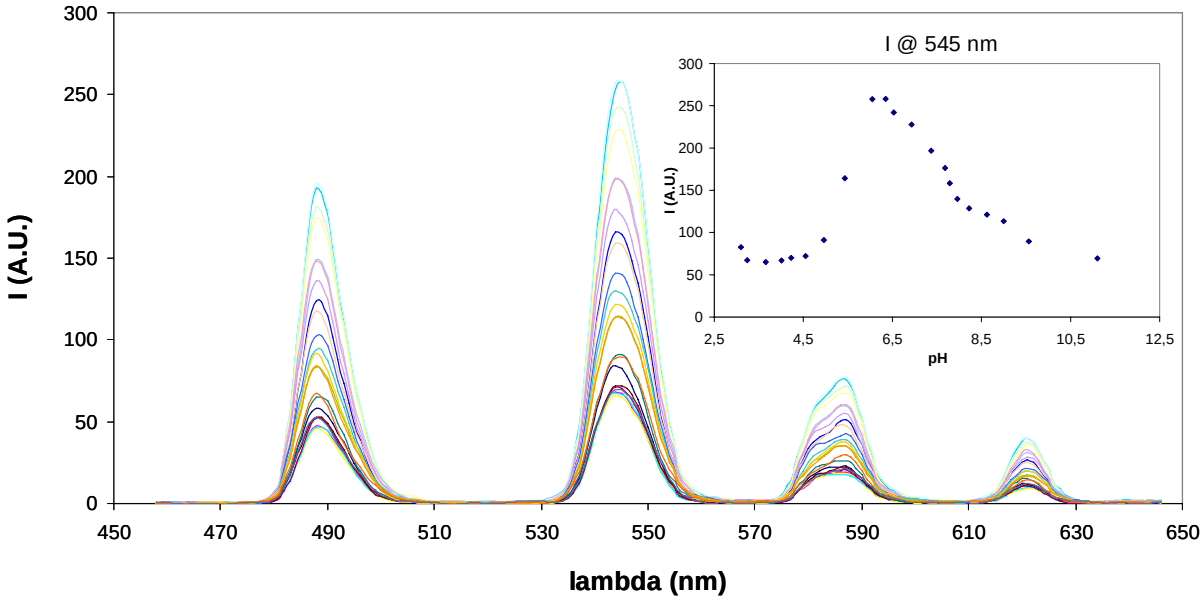


Figure 5 : Phosphorescence spectra of Eu1 in the presence of Argon
[**Eu1**] = 50 µM, in TEAP 0.1 M. Initial pH = 3.38; titration with Et_4NOH.
Spectra were recorded using the parameters described in the experimental section

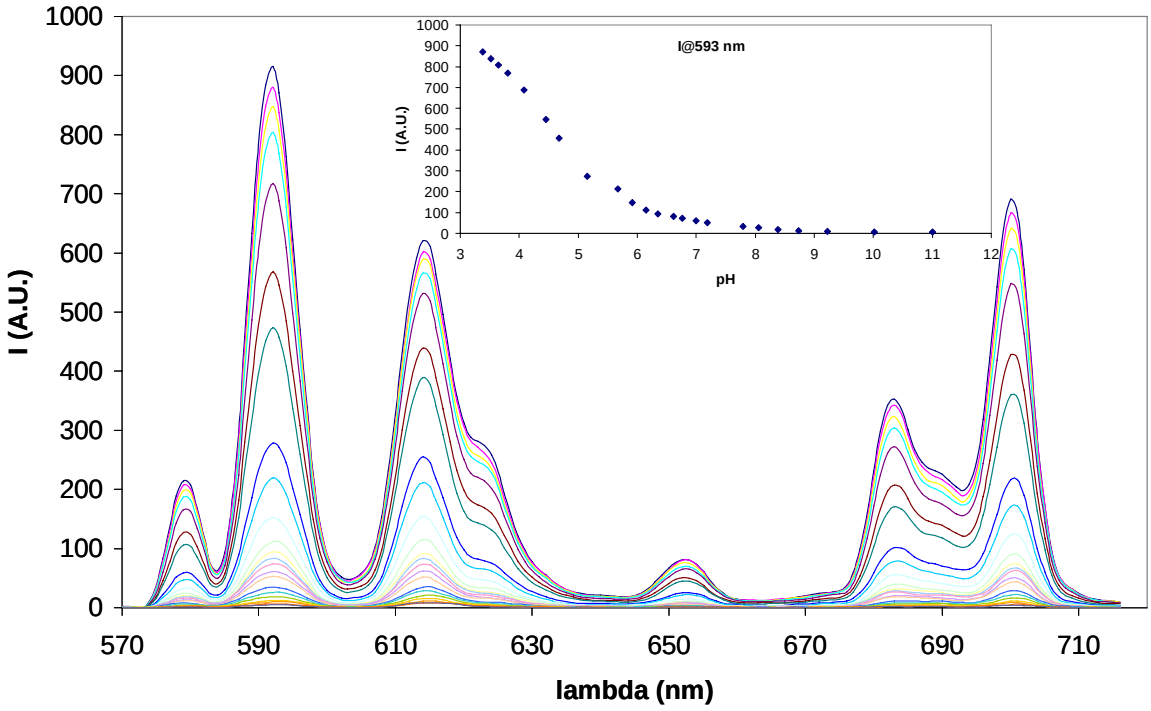


Figure 6 : Fluorescence spectra of a mixture Tb1/Eu1

[**Tb1**] = 29.9 µM, [**Eu1**] = 29.8 µM in TEAP 0.1 M. Initial pH = 2.94; titration with Et_4NOH. Spectra were recorded using the parameters described in the experimental section.

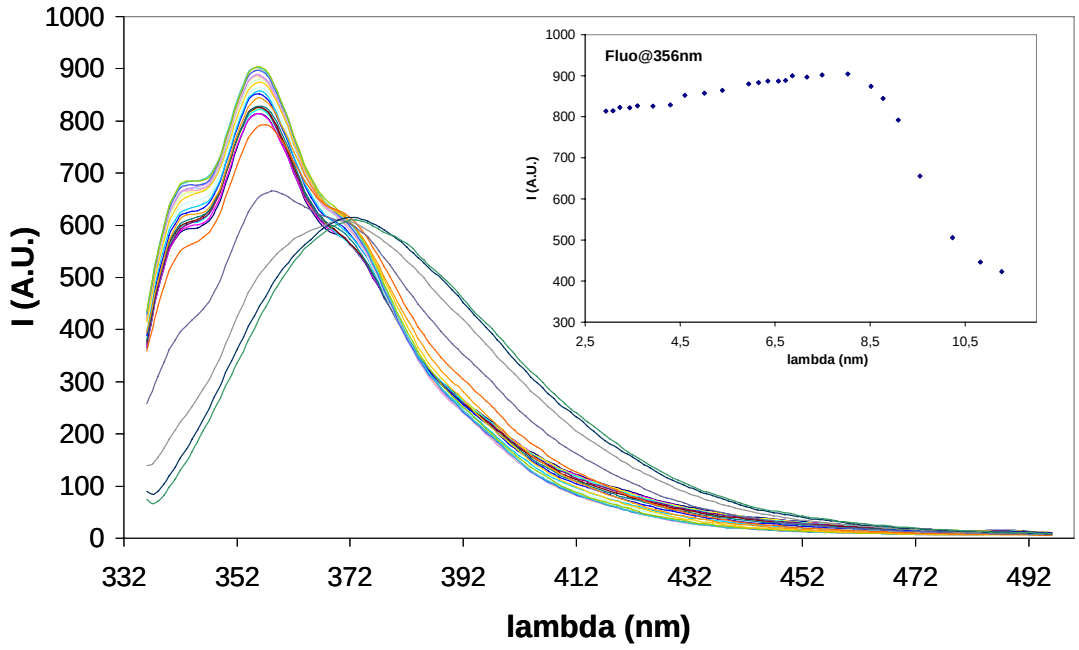


Figure 7 : Phosphorescence spectra of a mixture Tb1/Eu1

[**Tb1**] = 29.9 µM, [**Eu1**] = 29.8 µM in TEAP 0.1 M. Initial pH = 2.94; titration with Et_4NOH. Spectra were recorded using the parameters described in the experimental section.

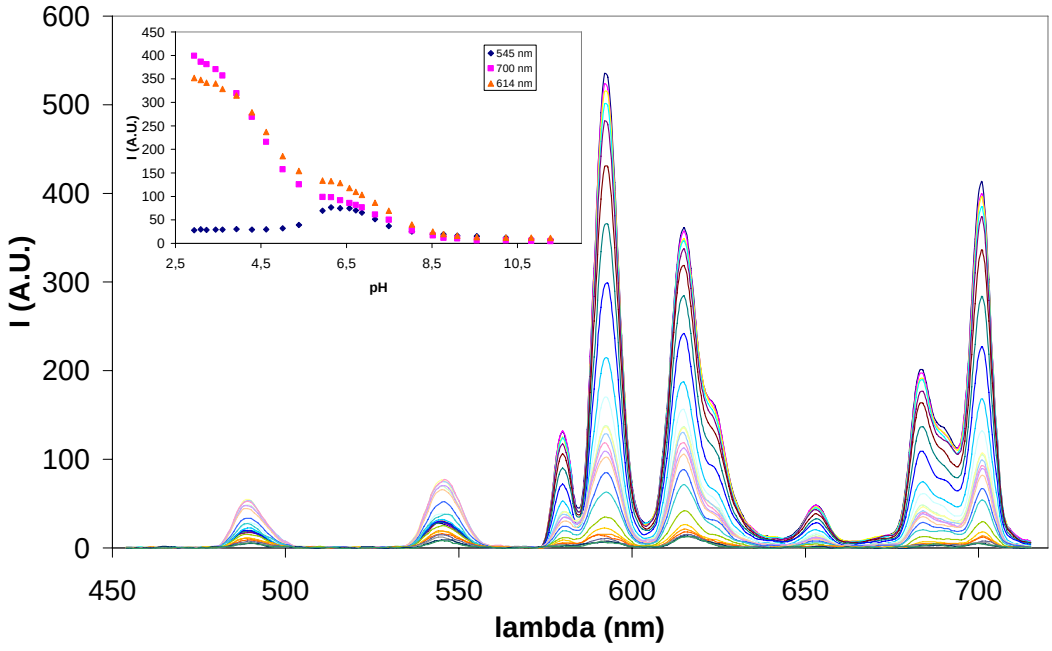


Figure 8: Parallel operation of NAND, NOR and NOT OH^- gates. a) A truth table expressing HO^- and O_2 as *inputs* and the emission at three different wavelengths as *outputs*, b) Conventional gate notation.

a)

Inputs		Outputs		
OH^-	O_2	545 nm	622 nm	700 nm
0	0	1	1	1
0	1	1	0	1
1	0	1	0	0
1	1	0	0	0

b)