

Morphology and temperature treatment control on photocatalytic and photoluminescence properties of SrWO₄ crystal

Nadine DIRANY^{1,2}, Abdelali HALLAOUI¹, Jean Christophe VALMALETTE¹ and Madjid ARAB^{1,*}

¹ Université de Toulon, Aix Marseille Univ, CNRS, IM2NP, CS 60584, Toulon Cedex 9, F-83041, France

² Université Libanaise – Laboratoire MCEMA, Beyrouth - Liban

* Corresponding Author's: madjid.arab@univ-tln.fr

Supporting information

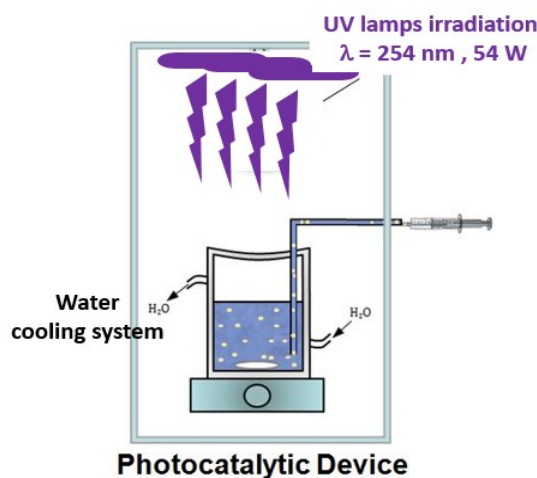


Figure S1: Photocatalyst device under UV irradiation at 254 nm and 54 W

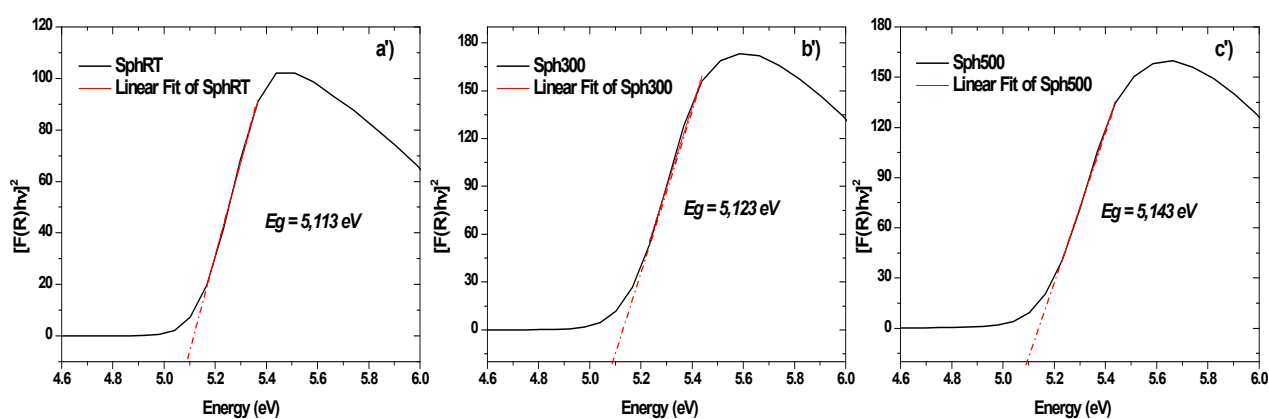


Figure S2: Kubelka – Munk functions derived from the UV-Vis reflectance spectra of the SrWO₄ sphere structures: a') SphRT, b') Sph300°C and c') Spi500°C.

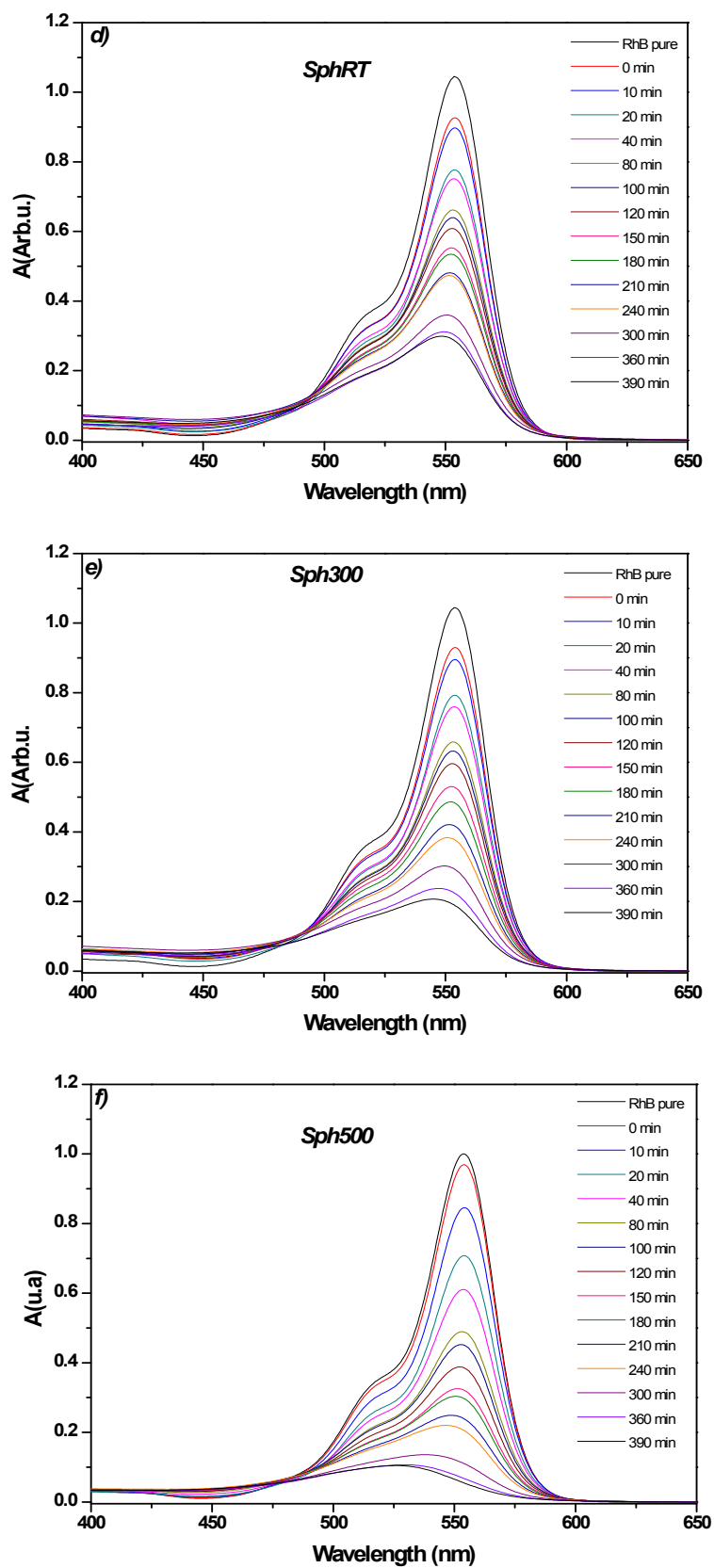


Figure S3: UV-Vis spectrum of the RhB solution decomposed under UV irradiation in the presence of SrWO₄ spheres: a') SphRT; b') Sph300 °C and c') Sph500 °C.

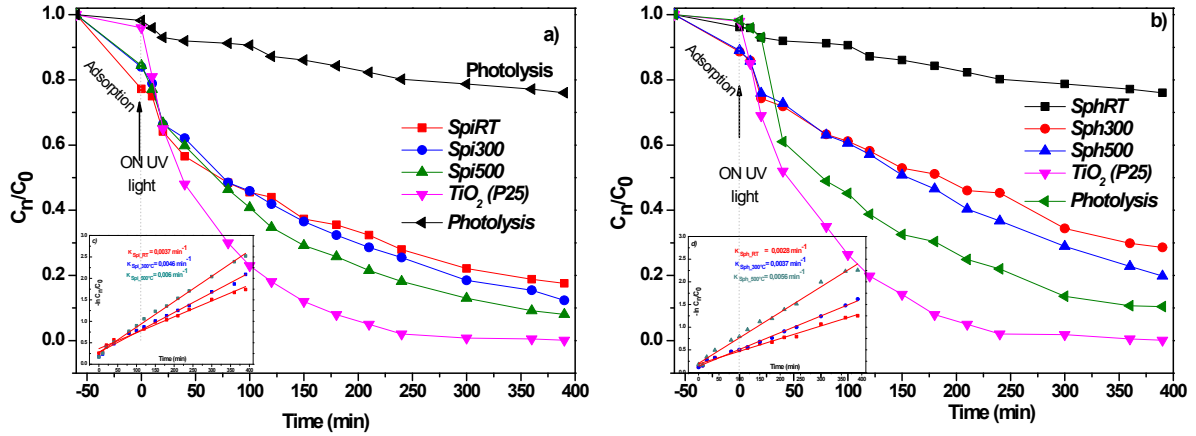
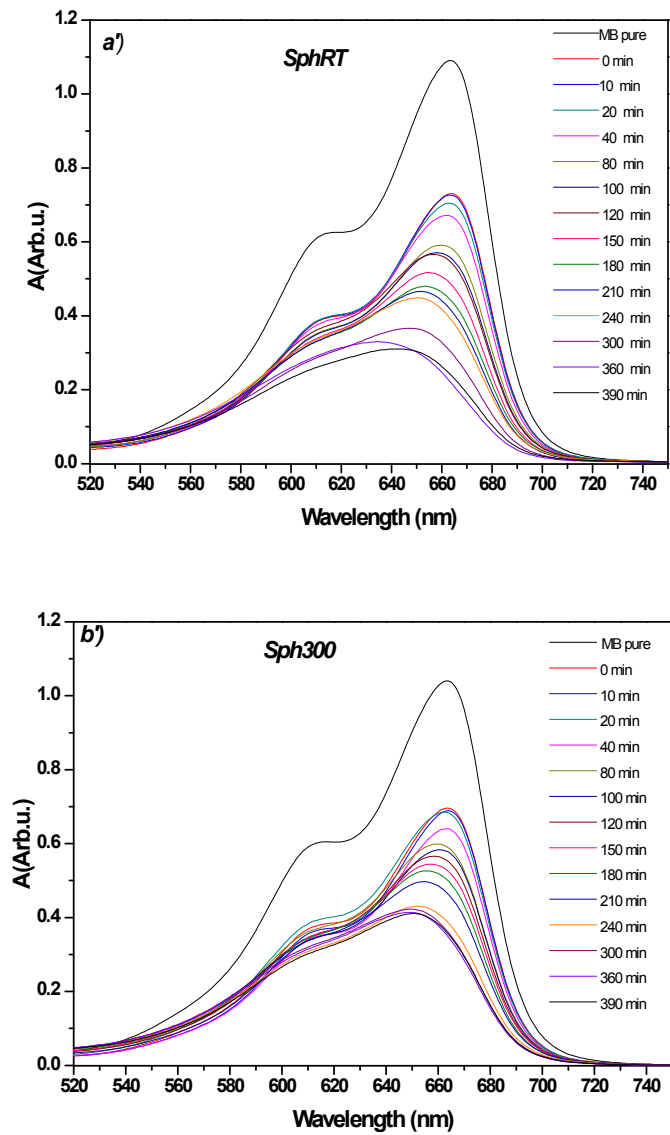


Figure S4: Photodegradation rate of SrWO₄ (a) spindles and (b) spheres treated at different temperatures. Inset figures c, d) correspond to the rate constants of the photocatalytic reaction.



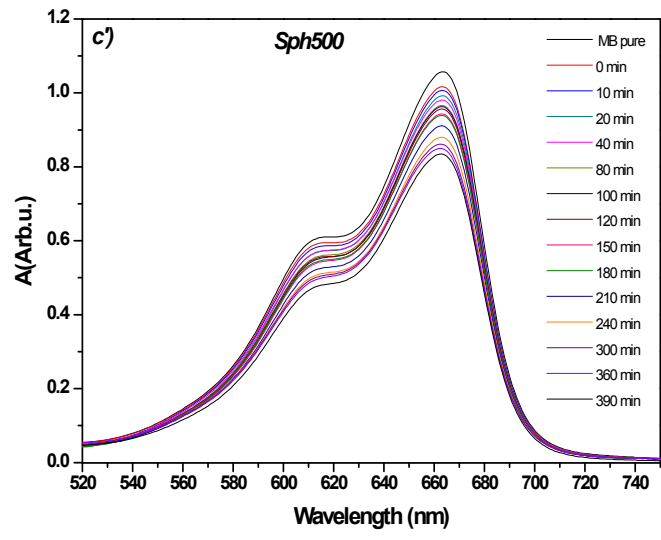


Figure S5: Absorption spectrum of photodegraded MB in the presence of SrWO₄ spheres: a') Sph_RT; b') Sph_300°C and c') Sph_500 °C.

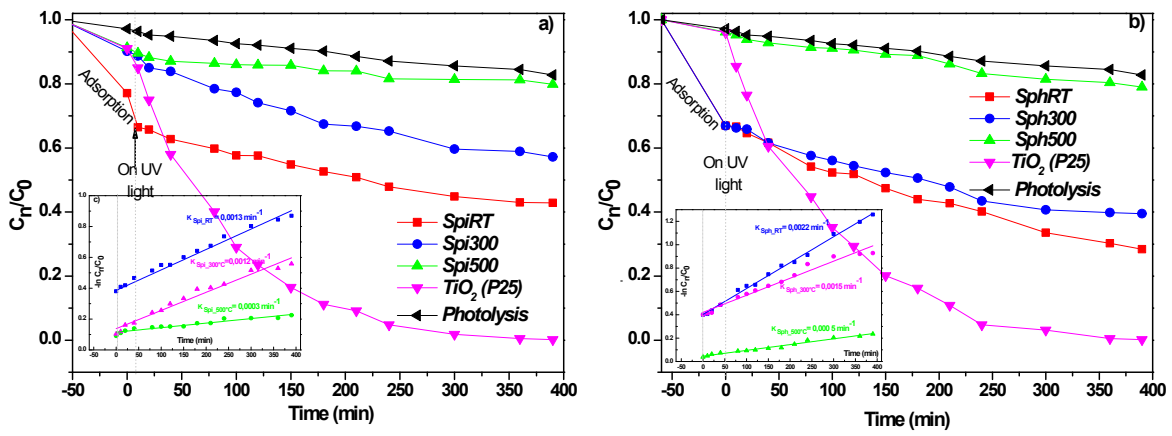


Figure S6: Photocatalytic efficiency of the various SrWO₄ samples of a) spindles and b) spheres co-precipitated at ambient temperature and calcined at 300°C and 500°C.

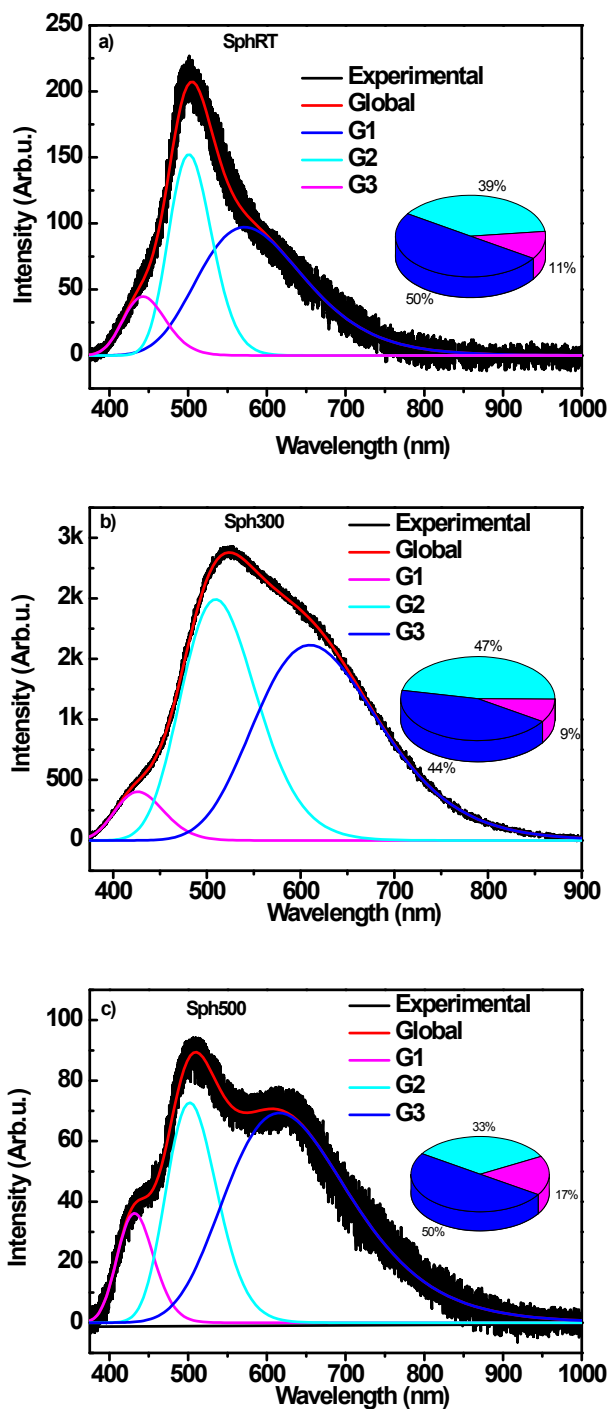


Figure S7: Luminescence analyses under UV light irradiation. Experimental emission bands of the SWO spheres: a') SphRT; b') Sph300°C and c') Sph500°C. The inset pie chart corresponds to the integrated intensity of each Gaussian component.

Table S1. The calculated CIE colour coordinates for both samples

Morphology	Temperature	X	Y
Spindles	RT	0.296	0.415
	300°C	0.350	0.425
	500°C	0.357	0.253
Spheres	RT	0.337	0.386
	300°C	0.445	0.432
	500°C	0.348	0.421

Table S2. The integrated intensities and centroid energies of G1, G2, G3 components and global spectra as a function of composition x.

SrWO ₄		Global Spectra		Bands					
form	Temperature	G		G1		G2		G3	
		Intensity	Wavelength	Intensity	Wavelength	Intensity	Energy	Intensity	Wavelength
		y	th	y	th	y	y	y	th
Spheres	RT	131	502	61,6	443	51	502	19	570
	300°C	2020	523	885,9	402	951	510	177	608
	500°C	87	510	44,4	431	28,7	502	14	614
Spindles	RT	141	506	46	428	74	500	23	602
	300°C	17122	632	5458	419	10982	555	635	672
	500°C	2080	516	1020	437	717	506	342	596