

Visible-light activating of TiO_2 by dye-sensitization for degradation of pharmaceutical compounds.

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S.1. Spectrum of the Repti Glo 5.0 lamps; S.2 Reactive system; S.3. Molecular structure of the dyes and areas of predominance according to pH; S.4. Raman Spectroscopy; S.5. FT-IR spectra; S.6. UV-Vis spectra.

S.1. Spectrum of the Repti Glo 5.0 lamps

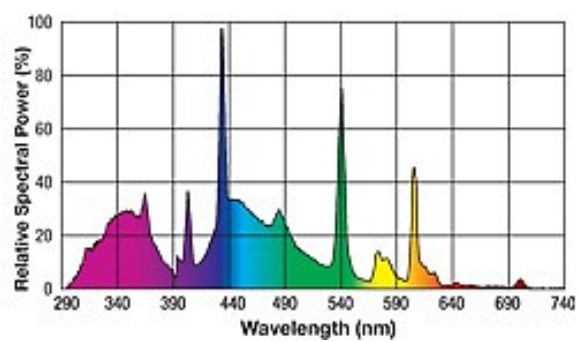


Fig. S. 1. Spectrum of the Repti Glo 5.0 lamp.

S.2. Reactive system

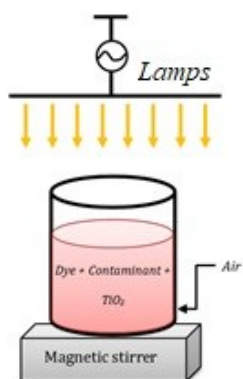


Fig. S. 2. Reactive system, photoreactor for dye sensitized process.

S.3. Molecular structure of the dyes and areas of predominance according to pH

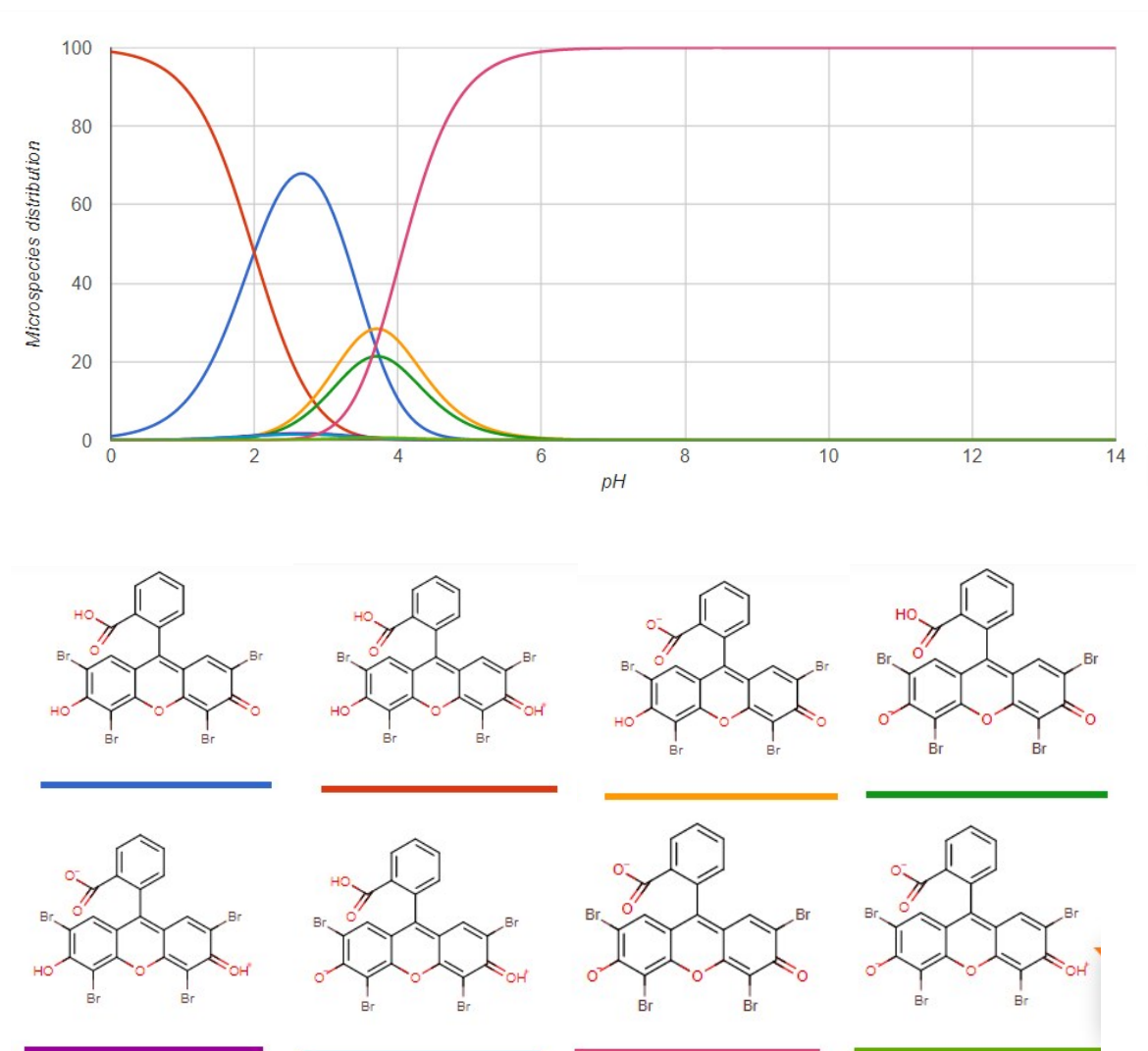


Fig. S. 3 Predominance zones of Eosin y according to pH taken from Chemicalize.com.

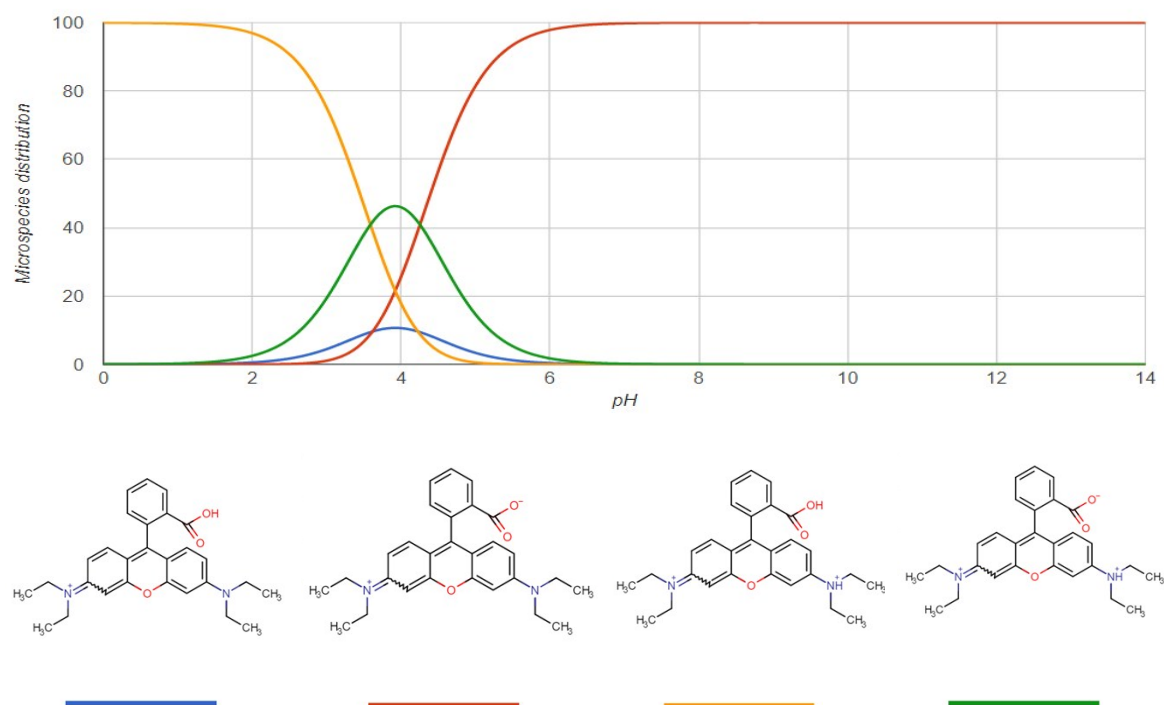


Fig. S. 4. Predominance zones of Rhodamine B according to pH taken from Chemicalize.com.

S.4. Raman Spectroscopy

Raman spectroscopy was used for elucidating the vibration band of sensitized catalysts. Figure S.3 shows the Raman scattering spectra of the TiO_2 , TiO_2 -Ey and TiO_2 -RhB. Based on these results the intensities of TiO_2 -dye composites lie in the order TiO_2 -RhB < TiO_2 -Ey < TiO_2 . The peaks 198, 398, 515 and 640 cm^{-1} corresponding to anatase phase are almost invisible for sensitized catalysts. There is no displacement of the bands with respect to the titanium dioxide Degussa P-25, which would indicate that there are no changes in the crystalline structure of the catalyst, as expected (Low, Lai, & Abd Hamid, 2017; Toumazatou et al., 2017).

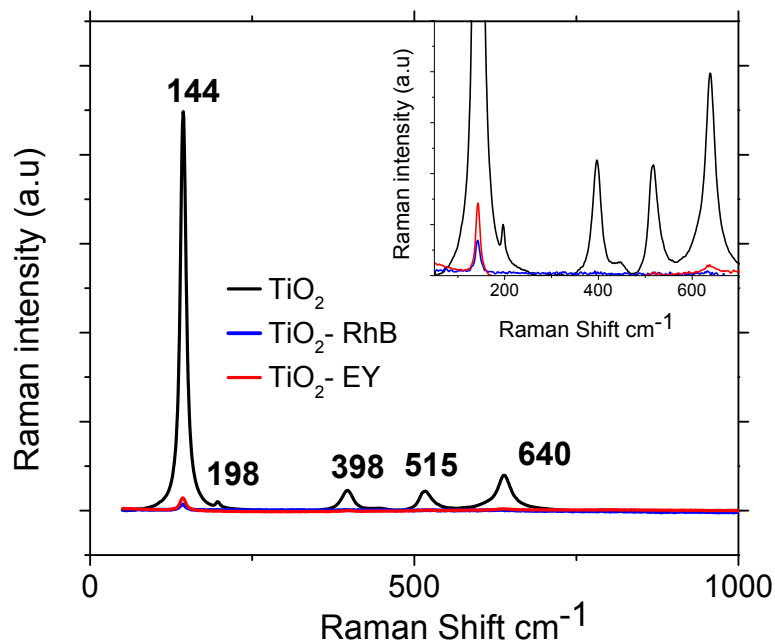


Fig. S.5. Raman scattering spectra of the TiO_2 , TiO_2 -Ey and TiO_2 -RhB.

S.5. FT-IR spectra

In Figure S.4. The FT-IR spectra of TiO_2 and $\text{TiO}_2\text{-Ey}$ are show, it can see that peaks corresponding to the colorant are not identified. However, there is a growth in the band from 3600 to 3000 cm^{-1} and in the band at 1500 cm^{-1} , which is associated with an increase in the OH groups.

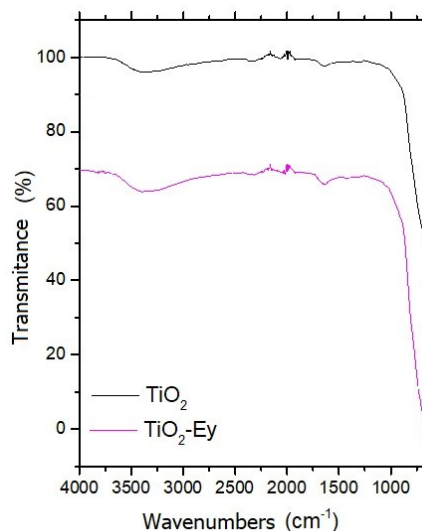


Fig. S.6. FT-IR spectra of TiO_2 and $\text{TiO}_2\text{-ey}$.

S.6. UV-Vis spectra

Figure S.5 shows the UV-Vis absorption spectra for TiO_2 , $\text{TiO}_2\text{-Ey}$ and $\text{TiO}_2\text{-RhB}$ suspensions at catalyst and dye concentrations of 200 mgL^{-1} and 16 mgL^{-1} , respectively. It can see that the absorption of the suspensions with dyes is much higher and the peaks corresponding to the dyes are evident. It is notorious the displacement of the absorption towards the region of visible light.

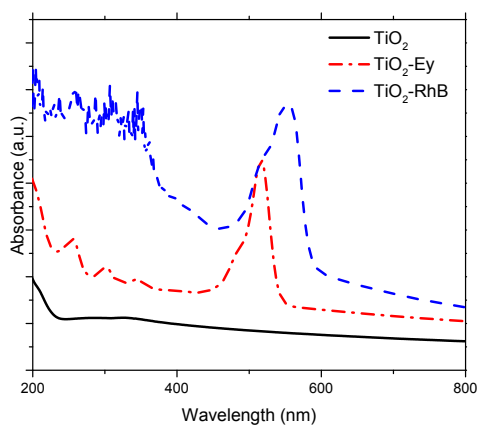


Fig. S.7. UV-Vis spectra of TiO_2 , $\text{TiO}_2\text{-Ey}$ and $\text{TiO}_2\text{-RhB}$ suspensions.