

Assessment of SiO₂ nanotubes activity to modify DL- α -Tocopherol via ¹O₂ generation under visible light irradiation

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I.

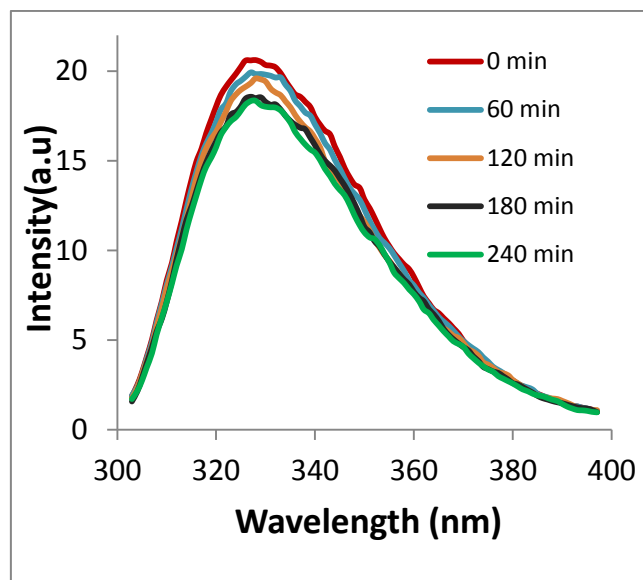


Figure S1 Decrease in tocopherol photoluminescence signal under visible exposure ($\lambda > 420$ nm) for 240 minutes.

A slight decay of tocopherol can be perceived in the first 60 minutes of light exposure, which continues up to 180 minutes, when it stops.

II.

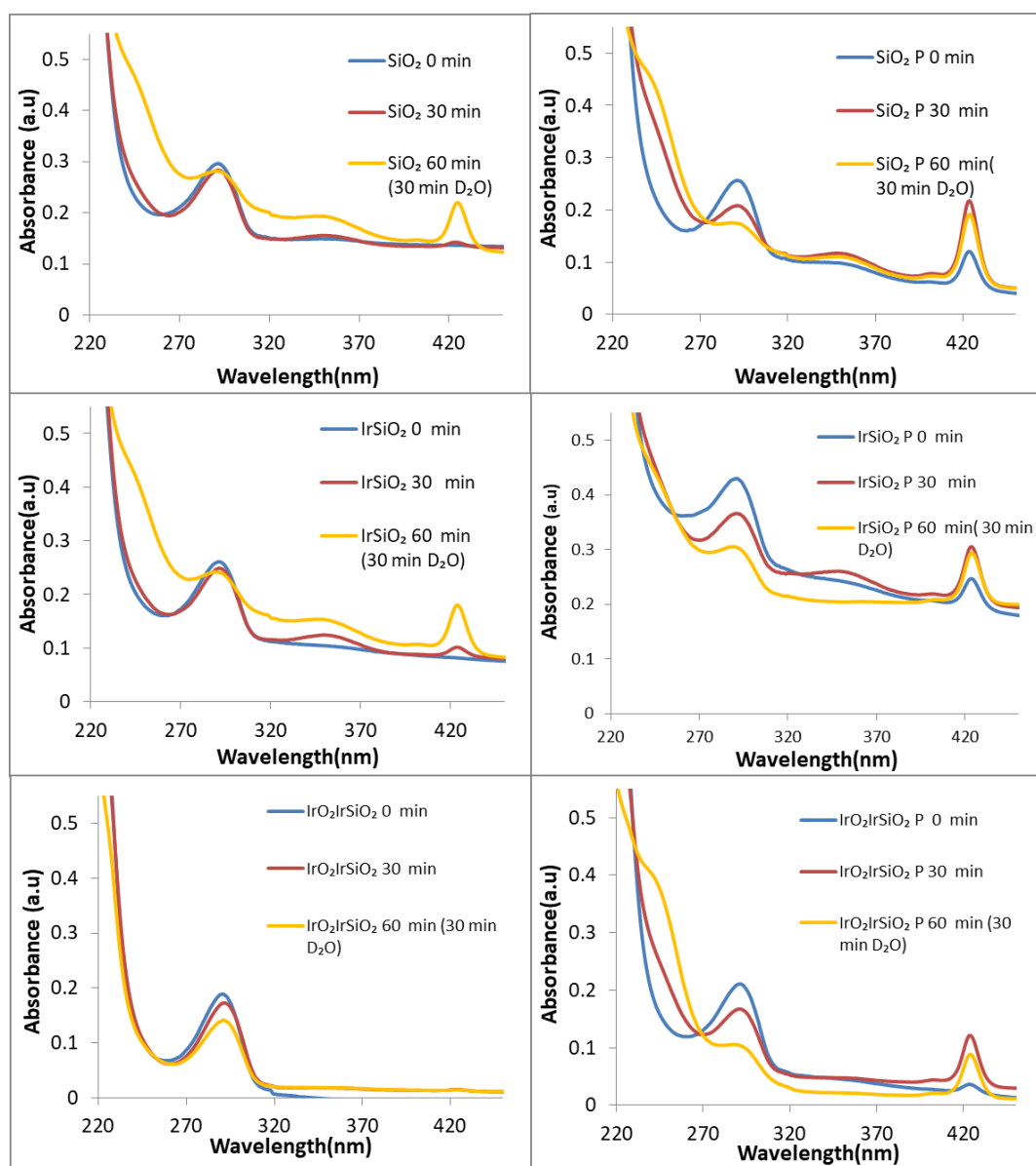


Figure S2 Decrease in tocopherol absorbance in the presence of SiO_2 - based materials under visible irradiation.

The DL α tocopherol absorbance is peaked at 290 nm, after 30 minutes of irradiation a small decrease is perceivable for all inorganic samples, the decay being strongly illustrated for the systems containing hybrid derivatives with porphyrin. Apart from the previously-mentioned peak, UV Vis spectra present a quite large absorption band around 340 nm and a well-defined peak centered at 417 nm. D_2O adding and supplementary exposure for 30 minutes to visible irradiation brings for all the systems excepting that containing $\text{IrO}_2\text{IrSiO}_2$, a sharp decrease of the main peak from 290 nm and the appearance of a shoulder around 240 nm. The clearer decay of DL α -tocopherol absorbance and the best-represented reaction product distribution are registered for the system containing the SiO_2P sample.

III.

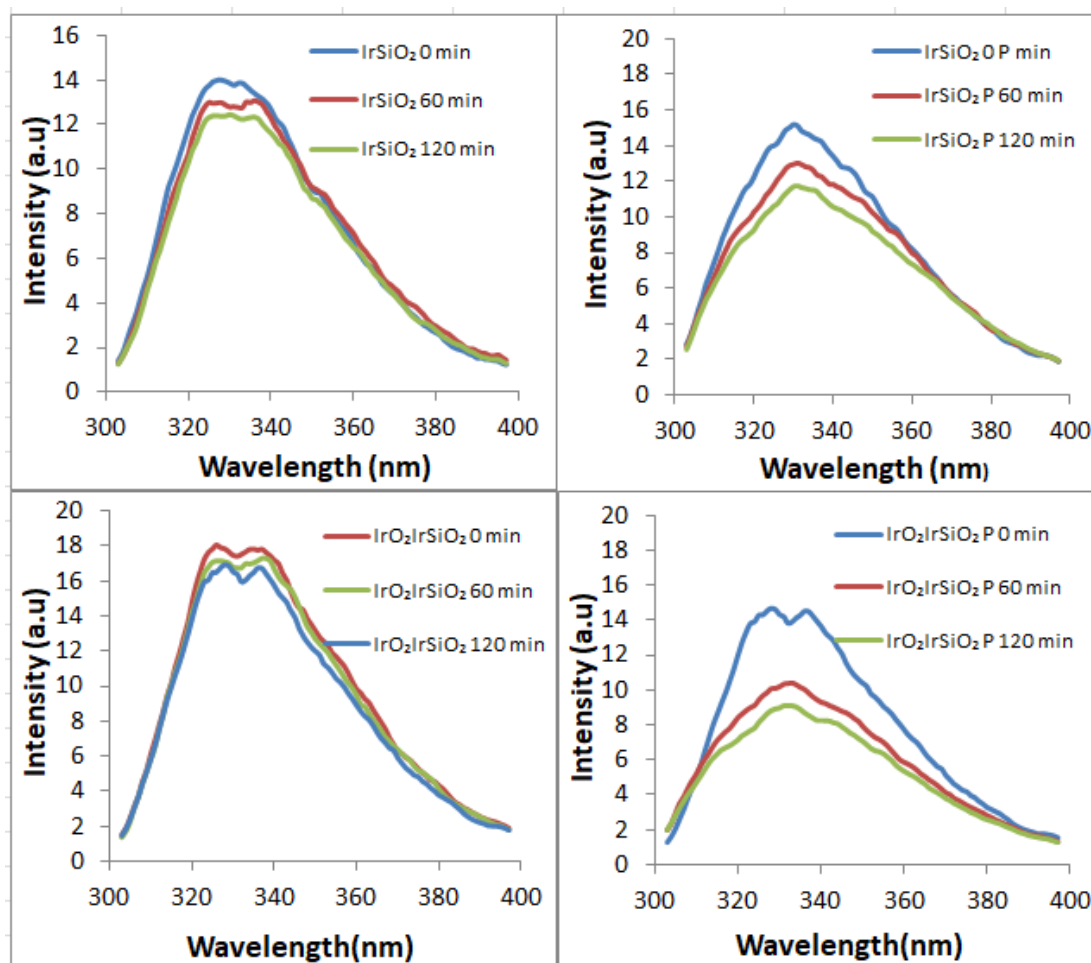


Figure S3. Decrease in DL α tocopherol PL signal under visible light exposure for 120 minutes in the presence of IrSiO₂ and IrO₂IrSiO₂ samples

The decrease in PL signal of DL Tocopherol for the iridium-modified samples (IrSiO₂ and IrO₂IrSiO₂) after 120-minute reaction time is slight but in line with the results presented in Figure 9 from the manuscript during the first 30 minutes of reaction time. Their derivatives with porphyrin (IrSiO₂P and IrO₂IrSiO₂P) emphasize a better photoactivity, most probably dependent on the loaded porphyrin onto the inorganic matrices. It can be assumed that, for longer irradiation time, the rate of the tocopherol decay is slower than in the first 30 minutes (Figure 9). One explanation could be the higher temperature of the reaction medium induced by the prolonged light exposure triggering the decrease in singlet oxygen photogeneration (favored by the low temperature).