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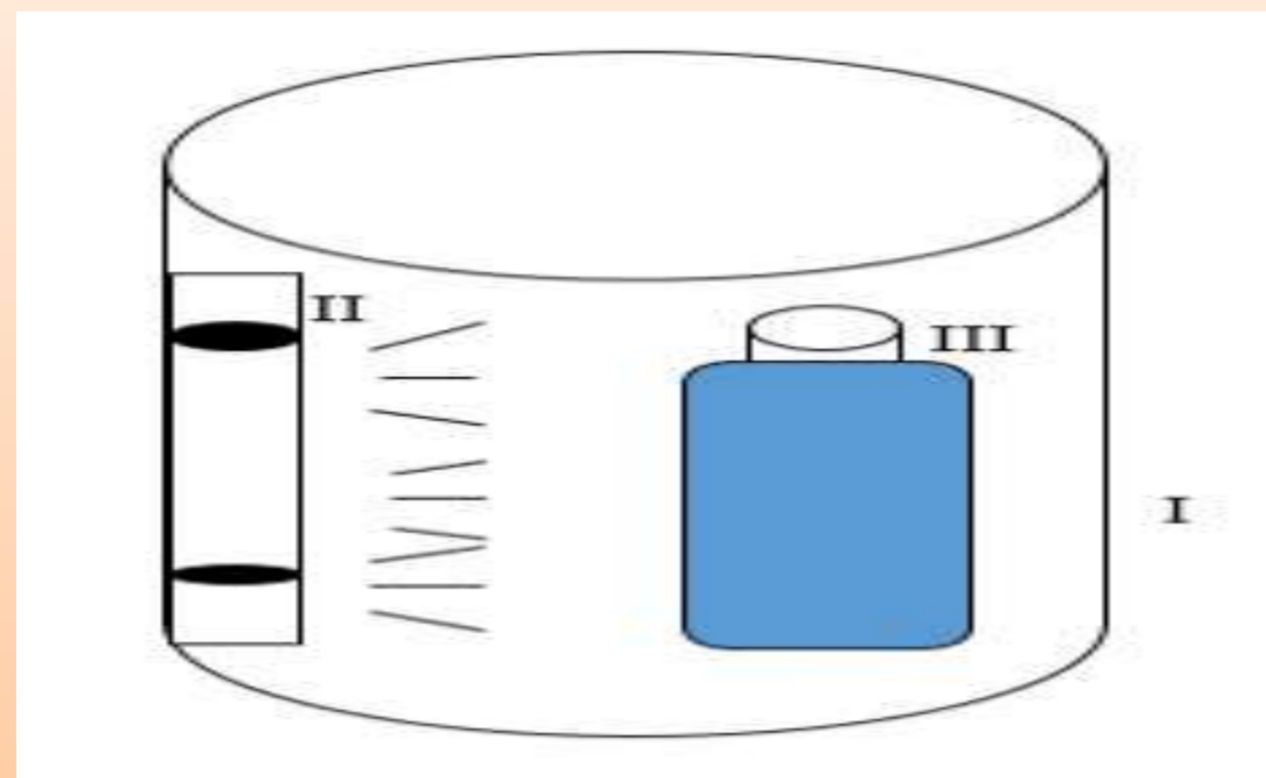
Objectif

The work performed during this study aimed to study and compare the performance of the plant extract synthesized nanomaterial and the commercial one (TiO_2) on the photocatalysis process of an organic textile dye (ORANGE G).

Our objectives were the comparison between the performance of each semi-conductor also to know the efficiency of the photocatalysis process to remove the organic dye.

Experimental part

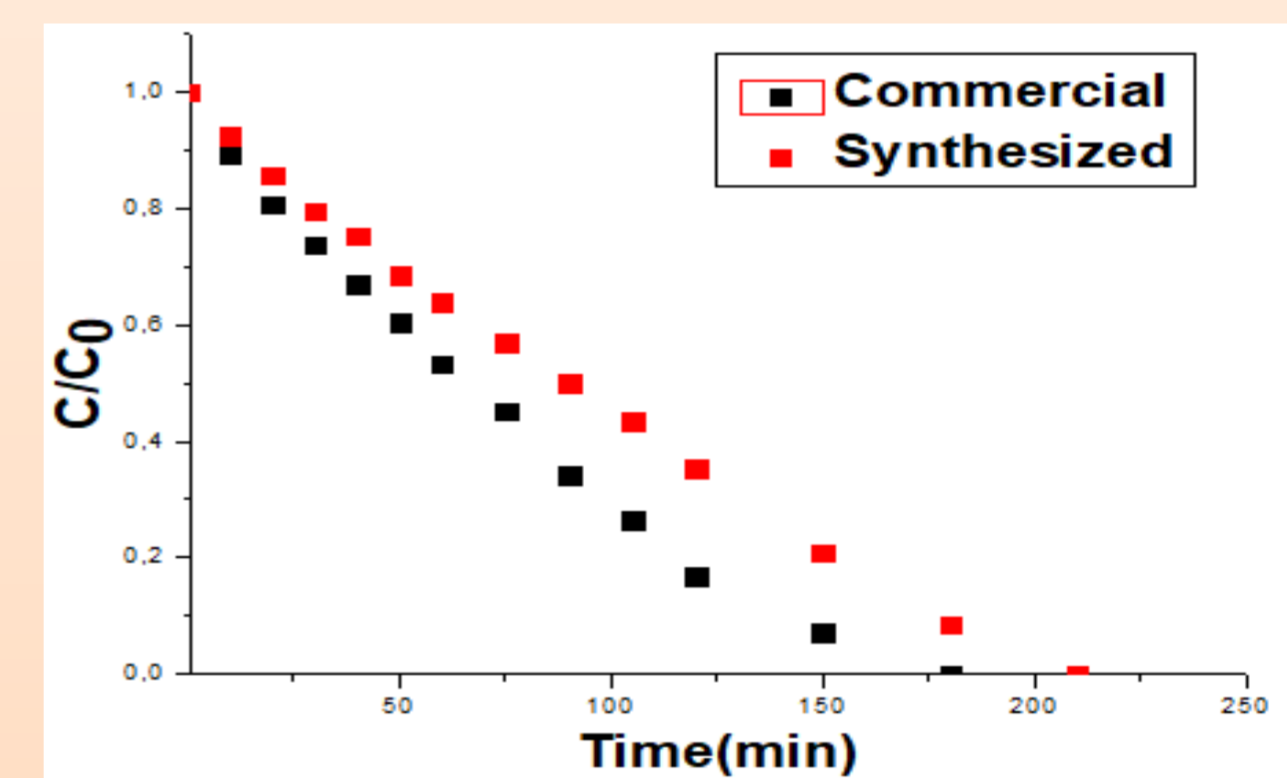
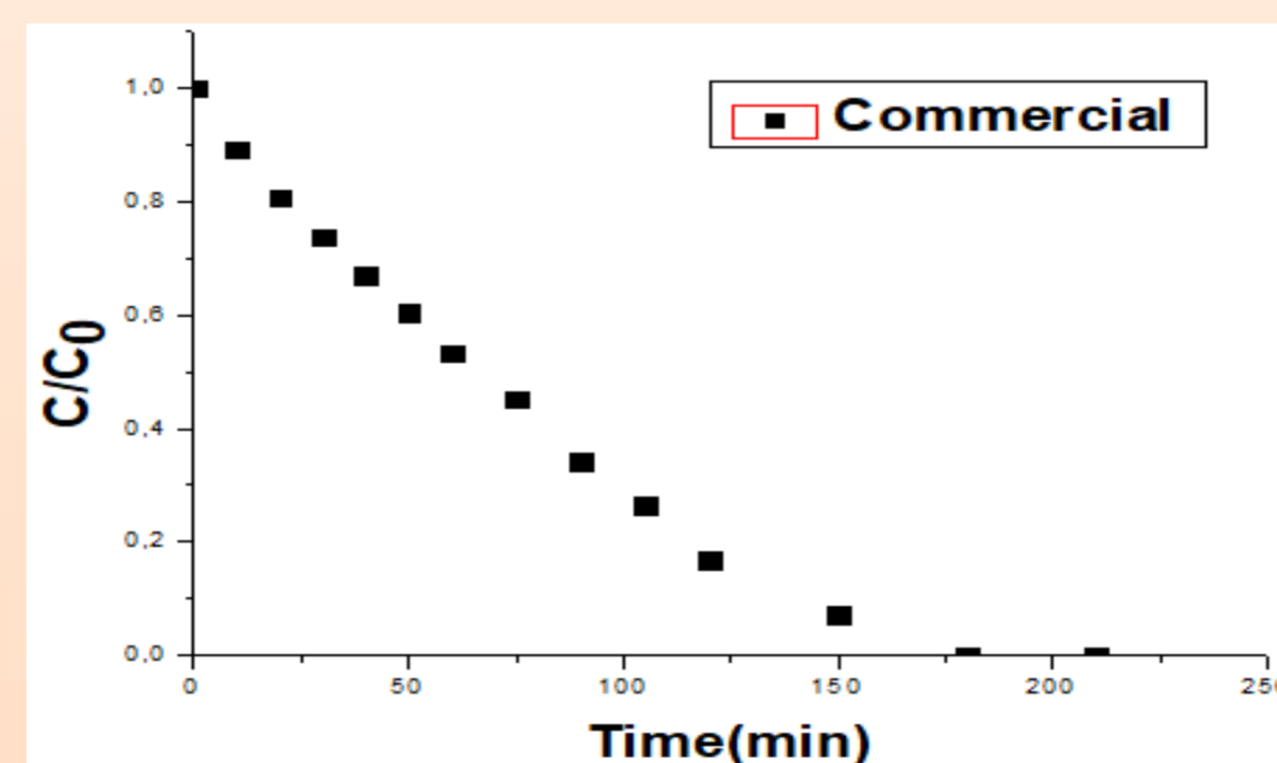
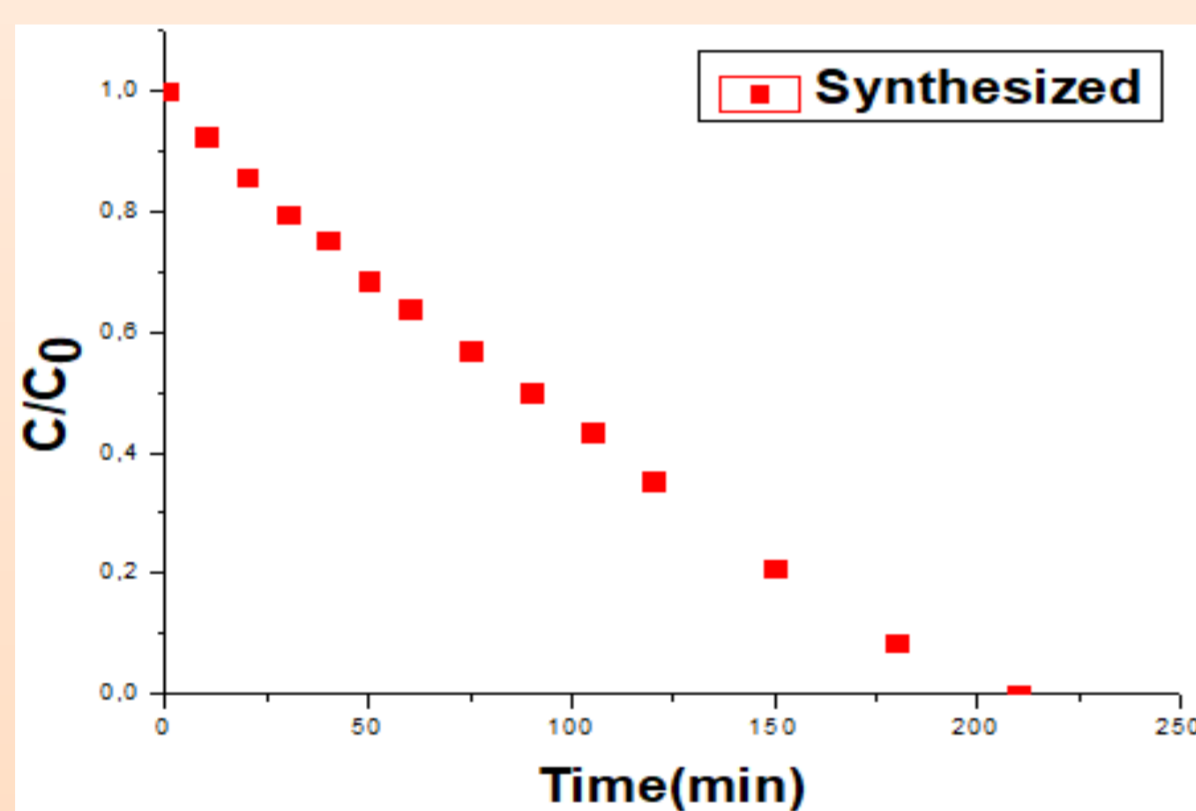
Monochromatic irradiation 365 nm was performed in a device consisting of a cylindrical chamber equipped with UV lamp and magnetic stirrer at base.



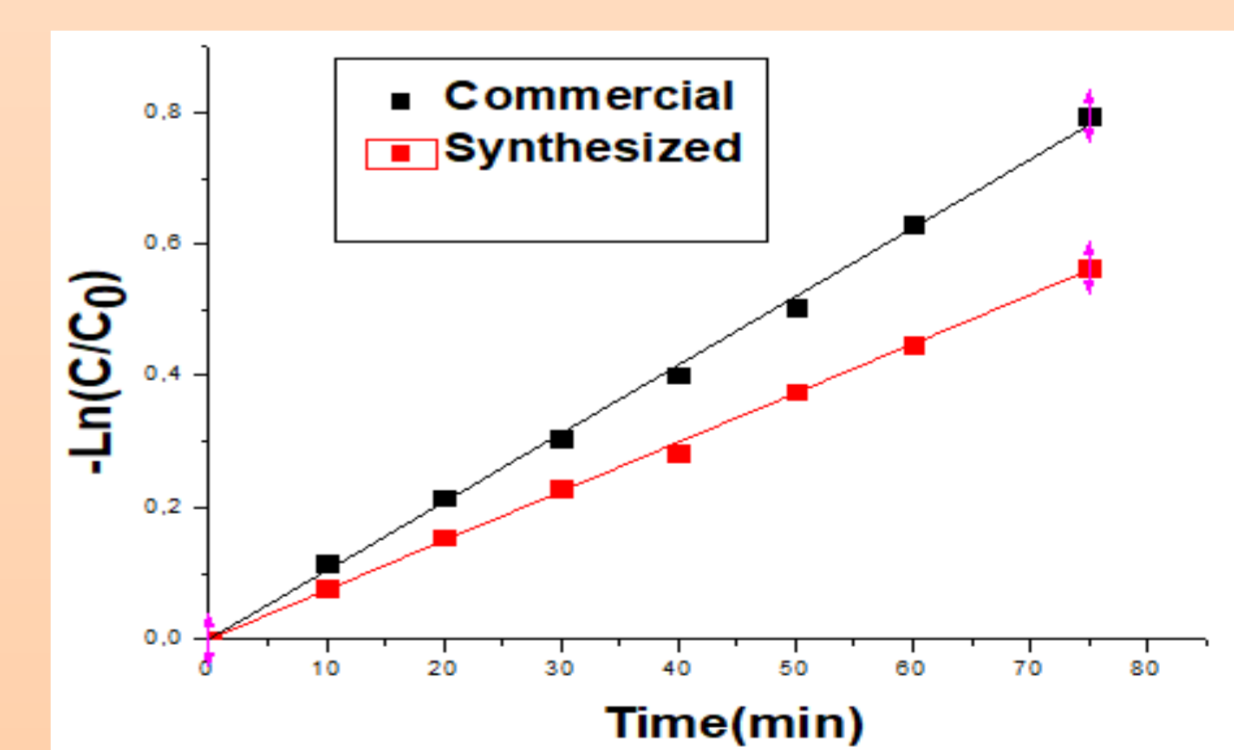
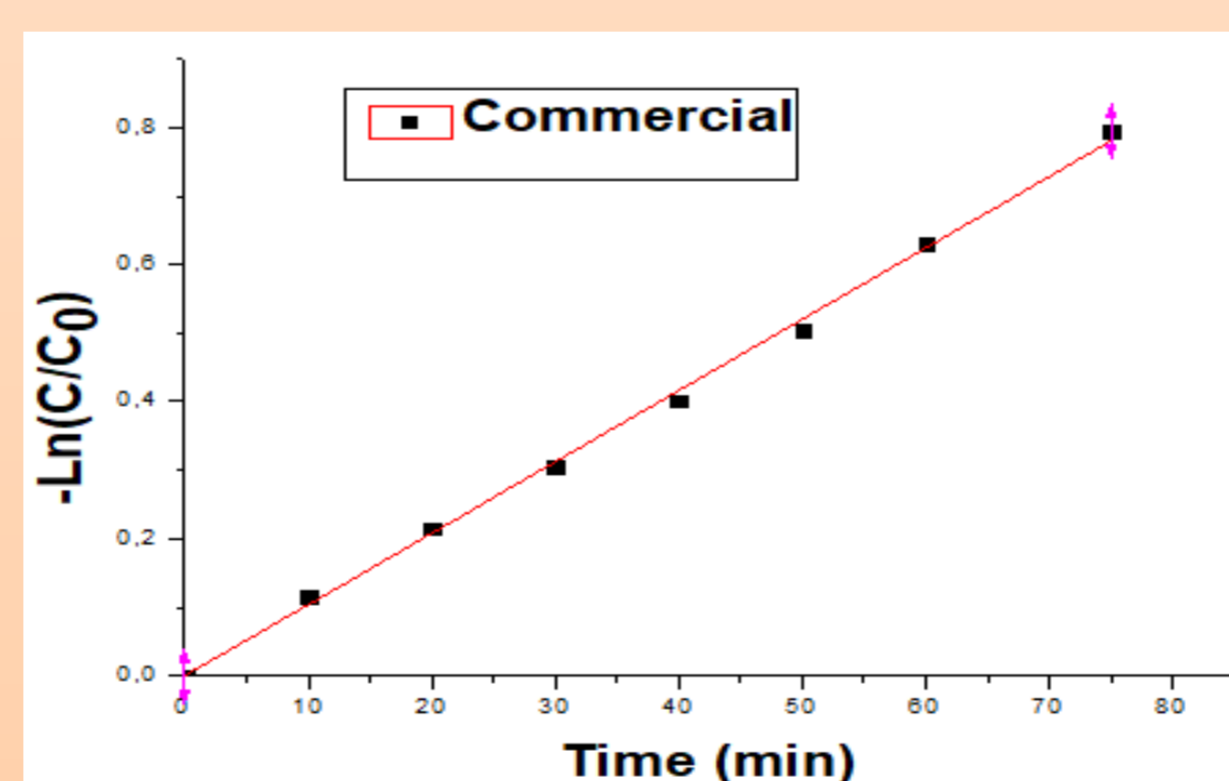
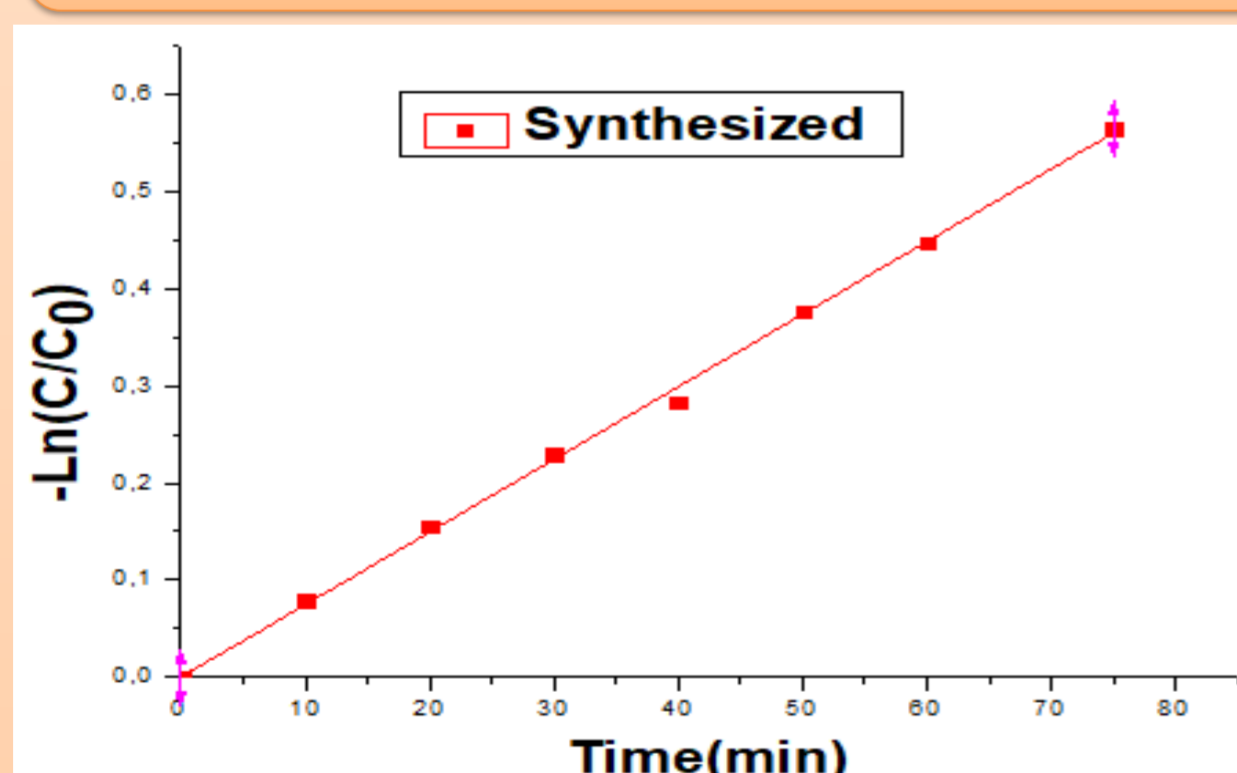
- I. Cylindrical aluminium chamber
- II. UV lamp (15W/365 nm)
- III. Pyrex reactor.

The different samples of the ORANGE G were analyzed by spectrophotometer "SHIMADZU UV-1800" controlled by the software UV PROBE at wave length of 478 nm corresponding to the maximum absorbance of the dye.

Results



Efficiency of the photocatalytic degradation of ORANGE G as the variation of C/C_0 with irradiation time .



Linear plots of $-\ln(C/C_0)$

The kinetics of ORANGE G degradation have been also investigated by plotting $-\ln(C/C_0)$ with time. Linear correlation for OG degradation was obtained for all samples which fit well the first order model and the apparent rate constant k' has been estimated.

We can see clearly that the performance of the synthesized semiconductor is very close to the commercial one

Conclusion

TiO_2 Nanomaterials has been synthesized using a plant extract and the results showed a good degradation of the organic dye (ORANGE G) under the UV irradiation and it was closer to the commercial one , ecofriendly and cost low.