

THE PHOTOCATALYTIC POTENTIAL OF $\text{SiO}_2/\text{TiO}_2\text{:Ce(IV)-Eu(III)}$ MATRICES

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Titanium dioxide (titania) is a highly efficient photocatalyst used extensively for the degradation of organic pollutants, air purification, water splitting, and reduction of nitrogen to ammonia [1–2]. However, only a small UV fraction of solar light (<5%) can be utilized because of large band gap (~ 3 eV) of titanium dioxide semiconductor structure, and due to this, another materials have been used as absorbent. It is the aim of this work to present the synthesis of the silica/titania systems (30:70) and $\text{SiO}_2/\text{TiO}_2\text{:Ce(IV)-Eu(III)}$, their catalytic properties in the photodegradation of methylene blue, in both UV and visible light region. In the Figure 1 are presented the UV-VIS spectra of the solution resultant of the reaction between silica/titania matrices and $\text{SiO}_2/\text{TiO}_2\text{:Ce(IV)-Eu(III)}$, with methylene blue.

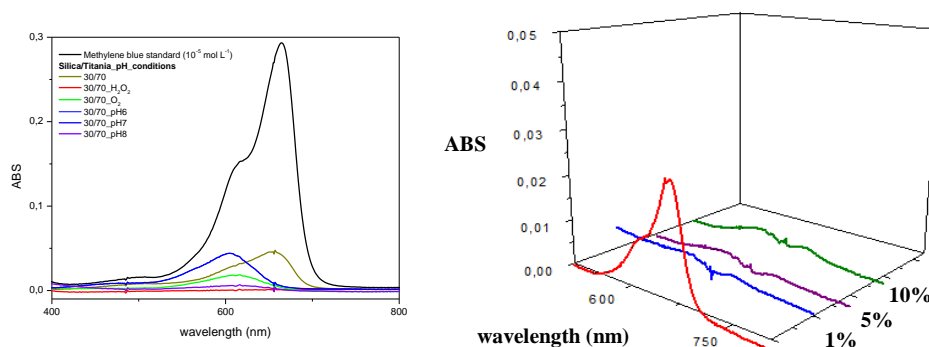


Figure 1. UV-VIS spectra of supernatant resulting of the reaction between silica/titania matrices (a) and $\text{SiO}_2/\text{TiO}_2\text{:Ce(IV)-Eu(III)}$ (b), with methylene blue solution.

Through of the spectra can be observed that the best conditions for degradation complete of the methylene blue was pH 7, presence of hydrogen peroxide, aeration, 30:70 ratio between SiO_2 and TiO_2 ; and 5% of Ce(IV) and Eu(III).

[1] L.X. Cao, Z. Cao, S.L. Suib, T.N. Obee, S.O. Hay, J.D. Freihauty, J. Catal. 196 (2000) 253.

[2] E. Piera, J.A. Aylo'n, X. Domenech, J. Peral, Catal. Today 76 (2002) 259.

CNPq, FACEPE, CAPES and CENAPESQ/UFRPE.