Degradation of Rhodamine by Fenton process using Magnetic ferrites Nanoparticles

C. C. Arruda, T. R. Giraldi, C. Ribeiro

Embrapa – Instrumentação Agropecuária, São Carlos-SP, Brazil

This work consists in the study of Rhodamine B (RB) degradation by the Fenton process [1], using magnetic ferrites nanoparticles. The main objective is to verify the effectiveness of the Fe_3O_4 nanoparticles in degradation of pollutant in water. The Fe_3O_4 nanoparticles were obtained by the Polymeric Precursor's Method [2]. The syntheses was done from $FeSO_4$ and $Fe_2(SO_4)_3$, using citric acid ($C_6H_8O_7$) as a complexant agent, and ethylene-glycol (C_2H_4 $(OH)_2$) as a polymerizing agent. The solutions were submitted to a thermal treatment at 450°C. The performance of these nanoparticles was evaluated as heterogeneous catalyst through measures of the kinetics of degradation of RB in the reaction Fenton (with addition of H_2O_2). Finally, in order to study the different compositions, $CoFe_2O_4$ and $Fe^{II}CoFe^{III}{}_4O_8$ ferrite was synthesized by the same method. The results show that the Fe_3O_4 and $Fe^{II}CoFe^{III}{}_4O_8$ ferrites present significant efficiency in the degradation of RB. On the other hand, practically it doesn't there be degradation in presence of $CoFe_2O_4$ nanoparticles.

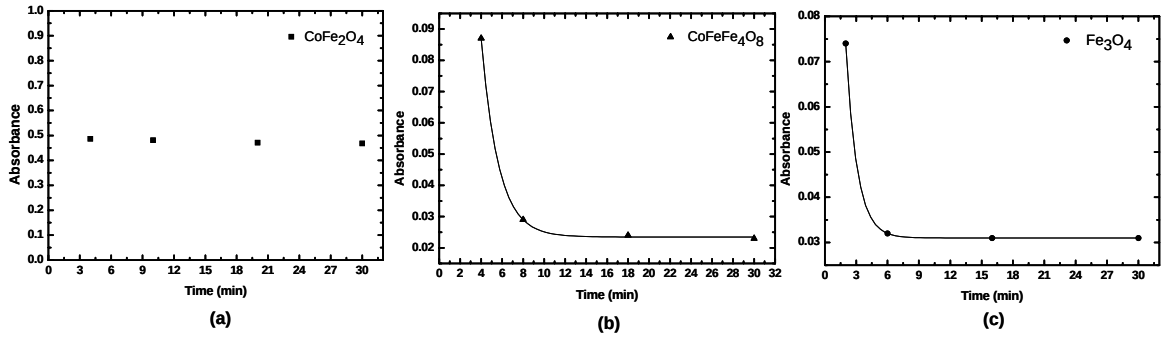

Figure 1: Degradation of Rhodamine B / H_2O_2 with different ferrites compositions.

References:

[1] Nogueira, R.; Silva, M. & Trovo, A., *Solar Energy* **79**(4), (2005), 384.

[2] Arima, M. et al,*J. Am. Ceram. Soc.* **79**(11), (1996), 2847.

Keywords: Magnetic ferrites, Fenton process, Rhodamine B.

cezararruda@yahoo.com.br

Rua XV de Novembro, 1452 – Centro – São Carlos-SP – Brazil - CEP: 13560-970