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"Gheorghe Asachi" Technical University of Iasi, Romania

FENTON AND PHOTO-FENTON OXIDATION OF SULFIDIC SPENT CAUSTIC: A COMPARATIVE STUDY BASED ON STATISTICAL ANALYSIS

Sharifah Hanis Yasmin Sayid Abdullah[1], Mohd Ariffin Abu Hassan[1*], Zainura Zainon Noor[1], Siti Fadilah Md Noor[1], Azmi Aris[2]

[1]Department of Chemical Engineering, Faculty of Chemical Engineering, Universiti Teknologi Malaysia, 81310, Skudai, Johor, Malaysia
[2]Department of Environmental Engineering, Faculty of Civil Engineering, Universiti Teknologi Malaysia, 81310, Skudai, Johor, Malaysia

Abstract

This investigation compared the performance of Fenton and photo-Fenton oxidation processes in the treatment of sulfidic spent caustic wastewater. Response surface methodology, particularly central composite design was used to investigate the effect of Fe/H_2O_2 and H_2O_2/COD in assessing treatment process efficiency. Empirical models were developed to describe the relationship between the factors and responses. The models were validated through analysis of variance and were further used in process optimization. The best solution for Fenton process was found to be at Fe/H_2O_2 and H_2O_2/COD ratio of 0.07 and 2.52 correspondingly. On the other hand, lower H_2O_2/COD ratio of 1.84 was achieved in photo-Fenton process. Removal of COD and sulfide up to 97% and 100% was observed with photo-Fenton process.

Key words: Fenton oxidation, photo-Fenton oxidation, response surface methodology, sulfide oxidation, sulfidic spent caustic

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∗ Author to whom all correspondence should be addressed: e-mail: mariffin@utm.my