Treatment of industrial effluent through heterogeneous photocatalysis of TiO_2 during synthesis in advanced oxidative process

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Abstract

The objective of this research was to characterize the effluent to be treated, as well as the efficacy and behavior of titanium dioxide when applied together in presence of sunlight to perform a photocatalytic process. Several important points were considered for a better degradation of components present in the effluent, as well as the angle of inclination of the galvanized plate used in the photocatalytic experiment, concentration of the catalyst used and maximum sample distribution in the form of a water slide under the plate for greater contact with the solar spectrum. To perform the tests, the titanium dioxide catalyst of the Degussa® brand was used as suspension to provide a better interaction between sample and semiconductor and this was done in a reactor produced by the author himself who used solar radiation as a calorimetric source and radioactive. The pH, turbidity, total solids, conductivity, true color and plating parameters were evaluated in the raw effluent for characterization purposes and in the effluent after the treatment. The results indicated that the heterogeneous photocatalysis met the objectives proposed for the conclusion of this research, because it was efficient to degrade matter present in the medium which was inserted in association with the selected catalyst. The physico-chemical characterization of the effluent had an important role in the final result of the heterogeneous photocatalysis. It was efficient both to oxidize organic matter present in the effluent and also oxidized biological material as indicated in the results obtained in the plating analysis.

Biography

Douglas Braga Santos graduated in Chemical Technician course in 2013 and began his Undergraduate studies in 2014 in the Bachelor of Chemistry course, finishing in July 2018. He applied for Master applications for the second semester of the same year with the intention of giving segment the study line addressed in the Undergraduate work. He has experiences on chemical, working in quality control and as a Technical Responsible in a food company.

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