Adsorption of dioxide titanium from aqueous solution using different types of adsorbents
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Dioxide titanium (TiO$_2$) is a white powder used to improve color, providing opacity and provide backlight to other dyes, being considered the only really white colorant. It is used in many different products as paints and lacquers, plastics, paper, rubber, cosmetics and as food additives. Because of its great importance in the scope on the industries, the effluent generated by its production should have special attention, once when suspended in rivers TiO$_2$ is retained on aquatic plants what prevents them from making photosynthesis. The adsorption process has been widely used in the treatment of industrial waste. Therefore, the purpose of this work was to evaluate between several types of adsorbents which provide the largest percentage of removal and the equilibrium time of the process. For the choice of adsorbent 30 ml of a solution of 0.25 g L$^{-1}$ was placed into 125 mL conical flasks with 0.3000 g of adsorbent which was shaken at 150 rpm for 48 hours at a temperature of 30 °C. The equilibrium time of adsorption were determined at 30 °C by monitoring the concentration of TiO$_2$ in an aqueous solution with an initial concentration of 0.1 g L$^{-1}$ over time. All the experiments were made in triplicate. The results obtained indicated that between 21 types of adsorbents studied, the one who had the best results was the Watercel ZF 0410® zeolite. The equilibrium time obtained with the zeolite was 9 hours, with 99.78% of retention and adsorption capacity of 50 (g of TiO$_2$/g of zeolite).