



## **Cr<sup>+6</sup> and Zn<sup>+2</sup> Removal for Heterogeneous Photocatalysis with TiO<sub>2</sub> in Synthetic Wastewater**

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**Abstract :** Water sources pollution caused by the presence of metals, it's actually one of the environmental major concerns. In the present study, the hexavalent Chromium (Cr<sup>+6</sup>) and divalent Zinc (Zn<sup>+2</sup>) removal efficiency was evaluated using heterogeneous photocatalysis with titanium dioxide (Degussa P25) in a batch reactor. Both metal presents have harmful effects on public health and environment. The photocatalytic reduction process from Cr<sup>+6</sup> to Cr<sup>+3</sup> and Zn<sup>+2</sup> to Zn<sup>0</sup> in aqueous solutions with hexavalent Chromium or divalent Zinc initial concentrations of 5, 15 and 25 mg/L. It was performed in a batch reactor with a stipulated reaction volume of 250 mL, for the purpose it was provided a wooden box, which have a 20 W ultraviolet light lamp, installed in the chamber superior part. The tests were performed with pH initial conditions (2, 6 and 10 pH units) and photocatalyst doses (2.0, 2.5 y 3.0 g/L de TiO<sub>2</sub>), from a multifactorial experimental design of three factor and three levels. From the obtained results it is noticed that the heterogeneous photocatalysis is an excellent instrument for the removal Cr<sup>+6</sup> in aqueous solutions, when their concentrations are relatively low, because for the initial concentration of 5 mg/L from Cr<sup>+6</sup> is possible its total removal. Furthermore, it was found that this technology is less effective for Cr<sup>+6</sup> removal in high concentrations (15, 25 ppm), because this one presents slow reaction kinetics, which were studied in this investigation. For other hand, it was found that this technology is not effective for Zn<sup>+2</sup>, because only 3% of removal was achieved.

**Keywords :** hexavalent Chromium, divalent Zinc, titanium dioxide, photocatalysis.

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