



Photocatalysis with titanium dioxide to remove colour of exhausted reactive dyebaths without pH modification

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ABSTRACT

This work is focused on photocatalytic decolourisation of residual textile dyebaths with ultra-fine titanium dioxide (TiO₂) without pH modification. Synthetic solutions were prepared with tertiary mixtures of three hydrolysed reactive dyes to simulate the industrial conditions. Two photocatalysts (referred as K1 and K2, respectively) were tested to remove colour of the synthetic dyebaths under UV light and solar light irradiation. The decolourisation treatment was also applied to residual cotton dyeing liquors containing the same trichromie of dyes. In all cases, K2 provided better results than K1. For synthetic and industrial effluents, the almost full decolourisation was reached with K2 both with UV and solar light irradiation. In all the experiments, decolourisation was achieved without any pH adjustment, which is an important advantage in order to simplify the process, to avoid chemicals consumption and to reduce the conductivity of the treated effluent. The use of solar light is also an additional advantage from an environmental point of view although it increases the treatment time.

Keywords: Photocatalysis; TiO₂; Decolourisation; Reactive dyebaths; pH adjustment; Solar light

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