The role of TiO_2 nanoparticles and photocatalytic processes in the treatment of industrial effluents.

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In recent years, new textile materials have been developed using nanotechnology-based tools. These have been extensively investigated for use in various scientific and technological fields. This multidisciplinary methods of changing surface has become thus an essential step in order to combine different physical and chemical properties for obtaining a multifunctional material. The development of self-cleaning textile surfaces with combined properties has a great potential for reducing environmental impact related pollution caused by effluents and its versatility in application to any geometry.[1] [2]

The release of untreated wastewater, primarily from textile industries as well as sewage in rivers and lakes stimulate serious ecosystem imbalances that, if not addressed can escalate to create conditions that threaten human health. The need for versatile materials, which reduce or minimize the effect of hazardous compounds is growing rapidly. . In this context, the photocatalytic activity of nanomaterials based on titanium dioxide (TiO_2) in textile applications has been identified as a strategic vector with a considerable industrial impact. [3]

The heterogeneous photocatalysis is potentially a powerful technological tool for various applications Titanium dioxide is by far the most applied material,in photocatalitic processas due to its availability in the crust, high chemical stability, high oxidation power, low toxicity and low cost [4]. The techniques of deposition of TiO_2 particles in a liquid phase have attracted considerable interest, as such matrials and technques are with low production cost and relative ease of industrial implementation. [5]

The implementation and use of photocatalityc textiles in environmental remediation has a high relevance directly related with their contact area. Titanium dioxide was applied by a mechanical process called padding in this work. The textiles werefully characterized in order to investigate whether they retainthe initial properties while the surface maintaining self-cleaning abilities. The samples of textiles were subjected to hot wash tests to assessthe adhesion of nanoparticles.

References

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