Title: **Developing self-cleaning glasses**

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Titanium dioxide is a semiconductor material with a high oxidizing capacity capable of degrading organic and inorganic compounds. Its excellent self-cleaning capacity is attributed to the superhydrophilic property of the photocatalytic TiO_2 surfaces.

Titanium dioxide has been prepared by the sol-gel method. Thin films of TiO_2 have been deposited on the substrate using the immersion system layer by layer and have been annealed at different temperatures: 150, 300, 400 and 500°C. X-Ray Diffraction (XRD) results show that the crystal structure obtained is anatase. The optimum crystallization conditions have been found at a temperature of 500°C. The size of the nanoparticles of titanium dioxide has been characterized by Dynamic Light Scattering (DLS). The results have determined that the particle size is nanometric, around 10 nm. The influence of the number of layers deposited on the crystalline quality of the films has been investigated. The thickness of the layer deposited on the surface of the substrate has been characterized by Spectroscopic Ellipsometry. The results have shown a monolayer of TiO_2 nanoparticles adhered to the surface, around 10 nm. The wettability of thin films of TiO_2 has been determined by measuring the hydrophilicity, that is, the contact angle formed by the water droplet on the surface of the substrate, after UV irradiation. The results have shown that as the temperature increases the hydrophilicity increases, the surface of the thin films becomes superhydrophilic. Thin films have been photocatalytically activated with ultraviolet light. Several results confirm a slight photocatalytic performance of thin TiO_2 films in terms of methylene blue degradation.