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## **Microstructural and photo-induced properties of undoped and silver-doped in situ crystallized titanium dioxide coatings prepared by magnetron sputtering**

Imane SAYAH<sup>1</sup>, Mohammad Arab Pour Yazdi<sup>1</sup>, Abdessamad Aouni<sup>2</sup>, Alain Billard<sup>1</sup>

<sup>1</sup>LERMPS-UTBM, Belfort Cedex, France <sup>2</sup>ERMMM- FSTT, Tangier, Morocco

ima.sayah@gmail.com

Nowadays, photocatalysis has been applied as a promising technique for alternative clean energies and purification technologies such as self-cleaning surfaces and water treatment. Anatase structure titania (TiO<sub>2</sub>) has been considered to be the most suitable catalyst for these environmental applications owing to its chemical and photochemical stability, non-toxicity, low-cost and high photocatalytic activity under UV irradiation [1].

The aim of this study is to investigate the influence of in-situ crystallization on the microstructural and the photocatalytic properties of undoped and silver doped TiO<sub>2</sub> coatings deposited on glass slides at different temperatures. Then, a first step of this study consisted in depositing a SiN<sub>x</sub> barrier layer on the glass slide to prohibit further diffusion of alkali elements during the deposition stage which otherwise should poison the active coating [2-3].

The second step was to synthesize pure TiO<sub>2</sub> and silver-doped TiO<sub>2</sub> films at high pressure by magnetron sputtering at temperatures between 250 and 550°C. Silver was introduced in the coatings at different contents by co sputtering simultaneously to titanium a silver target.

The samples were characterized by X-ray diffraction, scanning electron microscopy and by measurement of water angle contact variations. The photocatalytic activity was finally assessed by using the Orange G decomposition upon UV or visible illumination.

References:

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### **Keywords**

Photocatalysis

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