

Deposition and physical properties of thin TiO₂ and N-doped TiO₂ films prepared by High Power Impulse Magnetron Sputtering

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The chemical composition, optical, photo-catalytic, and crystallographic properties of TiO₂ and N-doped TiO₂ thin films prepared by High Power Impulse Magnetron Sputtering are studied. The phase formation on the TiO₂ films (anatase, rutile or amorphous) is adjusted via the pressure ($p=0.75-15$ Pa) in the deposition chamber. The different crystallographic phases were determined by grazing incidence X-ray diffractometry (GIXD). XPS measurements revealed nearly stoichiometric TiO₂ composition with a small amount of incorporated N in the films. The photo-catalytic activity was determined from decomposition of methylene blue. Optical parameters ($n+ik$, transmittance T , reflectance R and absorbance A) are measured as function of the photon energy in the UV-Vis range with spectroscopic ellipsometry (SE).

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