

Optical Reactivity Modification of Titanium Oxide coatings on Ceramic filters by Nitrogen ion Implantation

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We investigated the modification of optical response properties of titanium dioxide (TiO₂) coatings on the ceramic water-purification filters by using ultraviolet-visible absorption spectroscopy and X-ray diffraction. The TiO₂ coatings were prepared on ceramic substrate by e-beam evaporation method. These amorphous TiO₂ were turned into anatase phase by heat treatment at 700°C for 2 hours. The doping of N atoms into the TiO₂ coatings was done by using 70KeV of N⁺ ion implantation with the dose of 1.0×10^{17} ions/cm², followed by post-irradiation heat treatment at 550°C for 2 hours. Methylene blue test of TiO₂ coatings to solar irradiation showed that the post-evaporation heated TiO₂ was photocatalytic and N-doped TiO₂ reacted to the visible part of solar irradiation.