

Effect of Hacac/Ti⁴⁺ and H⁺/Ti⁴⁺ molar ratio at morphology, structural, optical properties and photonic efficiency of sol-gel TiO₂ thin film

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The global concern about environment and problems of disposal of pollutants has induced various academics groups to develop new methods of treatments or to improve well-known processes. Nowadays Advanced Oxidation Processes is one of many processes widely studied and improved because it's your principal characteristic are the total mineralization of organic compounds. In this work, TiO₂ was obtained by sol-gel method using titanium(IV) isopropoxide as precursor and acetylacetone at the presence of acetic acid or hydrochloric acid. In general, the TiO₂ thin films prepared with acetic acid showed higher photonic efficiency than the films prepared with hydrochloric acid. This improvement can be due to better distribution of spherical particles and the presence of only one crystalline phase (anatase). However, the type of acid was essential to define these characteristics and, moreover, the strength of acid influenced the rate of hydrolysis and condensation resulting in lower roughness of thin film surface.