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Optical characterization of TiO2 thin films grown by sol-gel and r.f. sputtering methods for photocatalysis applications[1] J.G. MENDOZA-ALVAREZ, O. ZELAYA-ANGEL, Physics Dept. Cinvestav-IPN, G. TORRES-DELGADO, R. CASTANEDO-PEREZ, S.A. MAYEN-HERNANDEZ, J. MARQUEZ-MARIN, Unidad Queretaro. Cinvestav-IPN, A. FLORIDO-CUELLAR, CICATA-IPN. Unidad Legaria — Using the sol-gel method and the r.f. sputtering deposition technique we have grown titanium dioxide (TiO_2) thin films on Corning glass substrates for photocatalysis applications. For the sol-gel method we have tried different precursors such as acetylacetone, diethanolamine, HCl and HNO_3, in order to study the influence of the precursor on the structural and optical properties of the TiO_2 films. For the TiO_2 films grown by r.f. sputtering we changed the substrate temperature and the post-grown annealing conditions. Using X-ray diffractometry we have determined the presence of both, rutile and anatase crystalline phases in the films, and their correlation to the growth conditions. From the absorption spectra measured by spectrophotometry and photoacoustic spectroscopy we have been able to determine the bandgap energy and their dependence with the growth parameters. We present also results on the photoluminescence spectra for these sets of TiO_2 thin films and discuss the origin of the different radiative emission bands, and their possible correlation to the bleaching efficiency of these films for methylene blue.

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