## Physicochemical and Optical Characterization of Rutile TiO2 Thin Films Grown by APCVD Technique

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**Abstract :** In this study, pure rutile TiO2 thin films were directly synthesized on silicon substrates by Atmospheric Pressure Chemical Vapor Deposition technique (APCVD) using TiCl4 as precursor. We studied the physicochemical properties and the optical properties of the produced coatings by means of standard characterization techniques of Fourier Transform Infrared Spectroscopy (FTIR) combined with UV-Vis Reflectance Spectrophotometry. The absorption peaks at 423 cm-1 and 610 cm-1 were observed for the rutile TiO2 thin films, by FTIR measurements. The absorption peak at 739 cm-1 due to the vibration of the Ti-O bonds, was also detected. UV-Vis Reflectance Spectrophotometry is employed for measuring the optical band gap from the measurements of the TiO2 films reflectance. The optical band gap was then extracted from the reflectance data for the TiO2 sample. It was estimated to be 3.05 eV which agrees with the band gap of commercial rutile TiO2 sample.

Keywords : titanium dioxide, physicochemical properties, APCVD, FTIR, band gap

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