

# SYNTHESIS AND CHARACTERIZATION OF SnO<sub>2</sub> THIN FILMS DEPOSITED ON STAINLESS STEEL AISI 304 SUBSTRATE

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## ABSTRACT

The tin dioxide has been used in a great number of technological applications, especially in sensor, catalysts, optical equipments, photovoltaic cells and others. The application of ceramic films as resistant materials to the corrosion has been focus of interest in several industrial sections. With the purpose of minimizing the corrosive processes that attack metallic structures, this work aimed at the synthesis of ceramic thin films SnO<sub>2</sub> based deposited in stainless steel AISI 304. The method of the polymeric precursors was used in this research for obtaining of precursors resins of the SnO<sub>2</sub> films pure and lanthanum-doped in different concentrations (1, 3 and 5% in mol). The films were deposited by the dip-coating and spin-coating techniques for a better packing, and thermally treated in mufla in the temperatures of 673, 723 and 773K for two hours. The samples of SnO<sub>2</sub> were characterized morphologic and structurally by X Ray Diffraction, TG-DTA, Raman Spectroscopy, Atomic Force Microscope and Scanning Electron Microscope. Besides, regarding the electrochemical characteristics the films were analyzed through the Electrochemical Impedance Spectroscopy technique. The results of those characterizations indicate the obtaining of fine films free from trines, monophasic, dense, with good adherence to the metallic substrate in the whole range of studied temperature. The impedance electrochemistry demonstrates the high resistance of the ceramic SnO<sub>2</sub> films pure and doped front to the corrosive attack in saline electrolyte (Na<sub>2</sub>SO<sub>4</sub>) in comparison with the stainless steel AISI 304.