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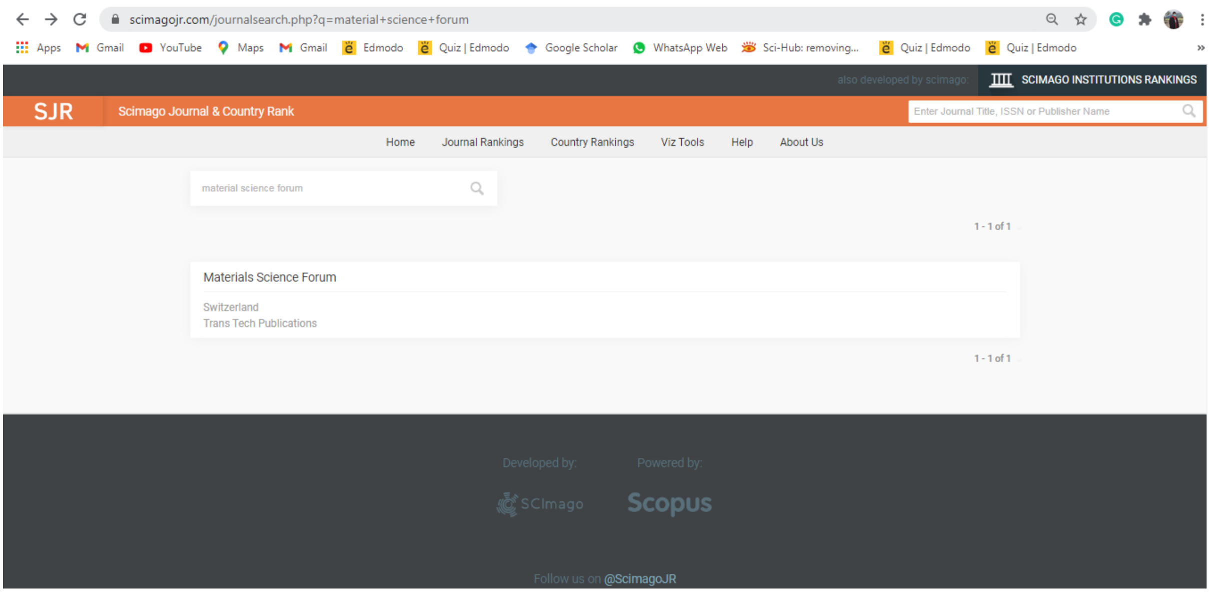

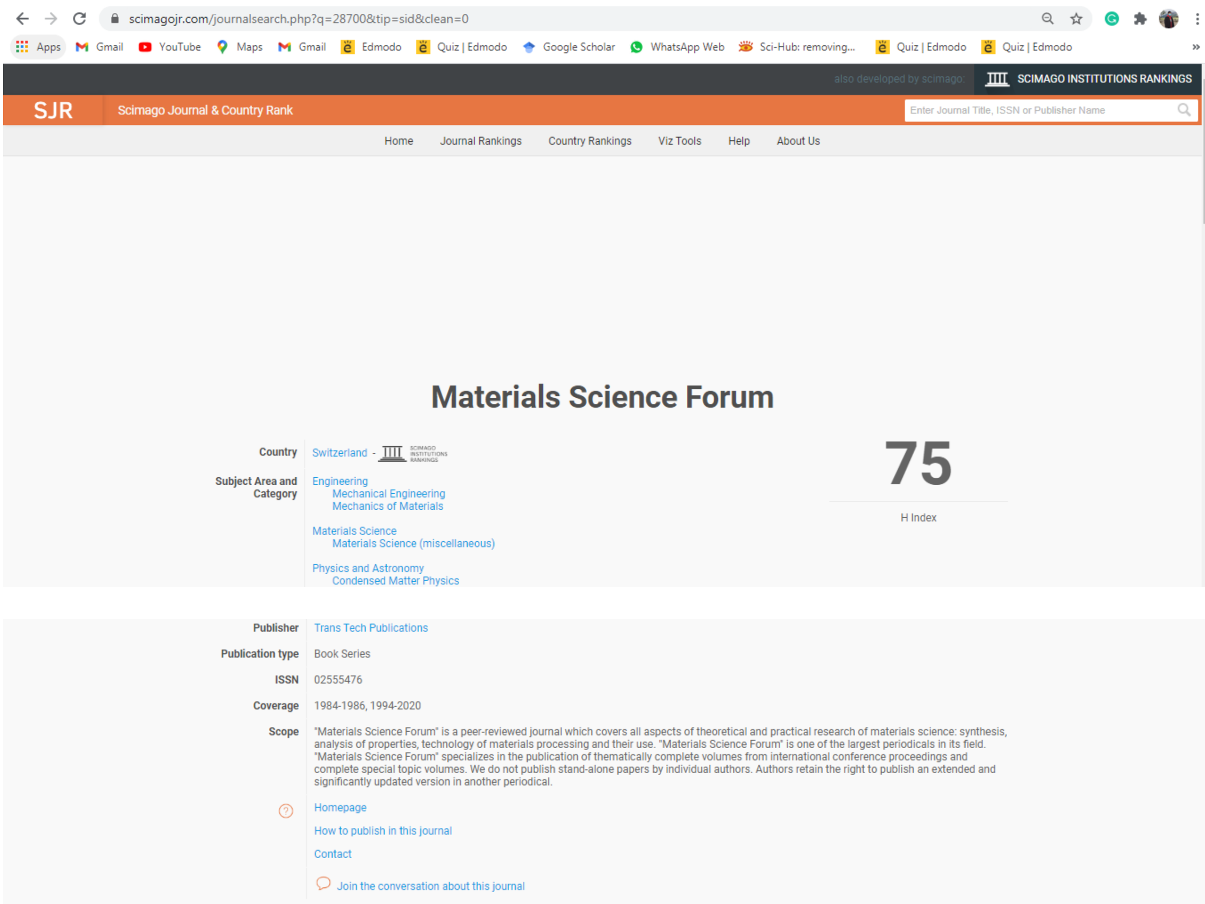

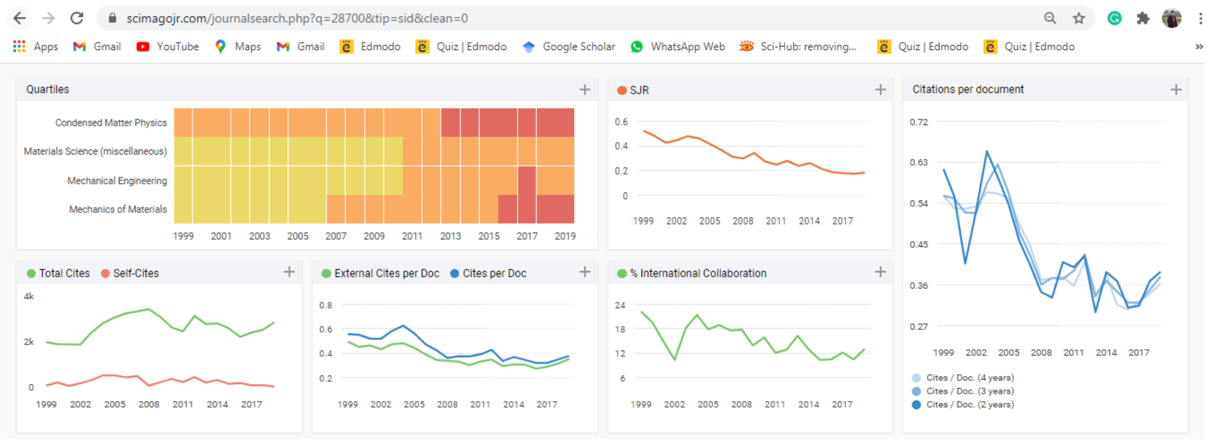
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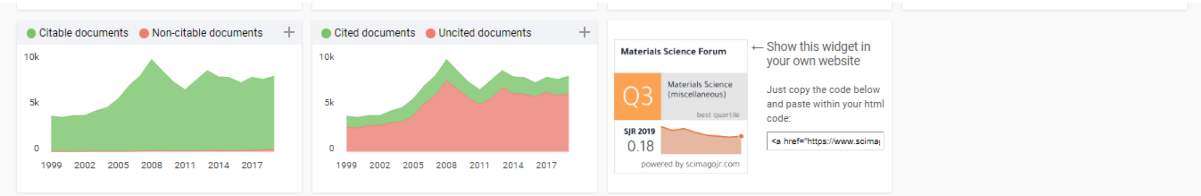
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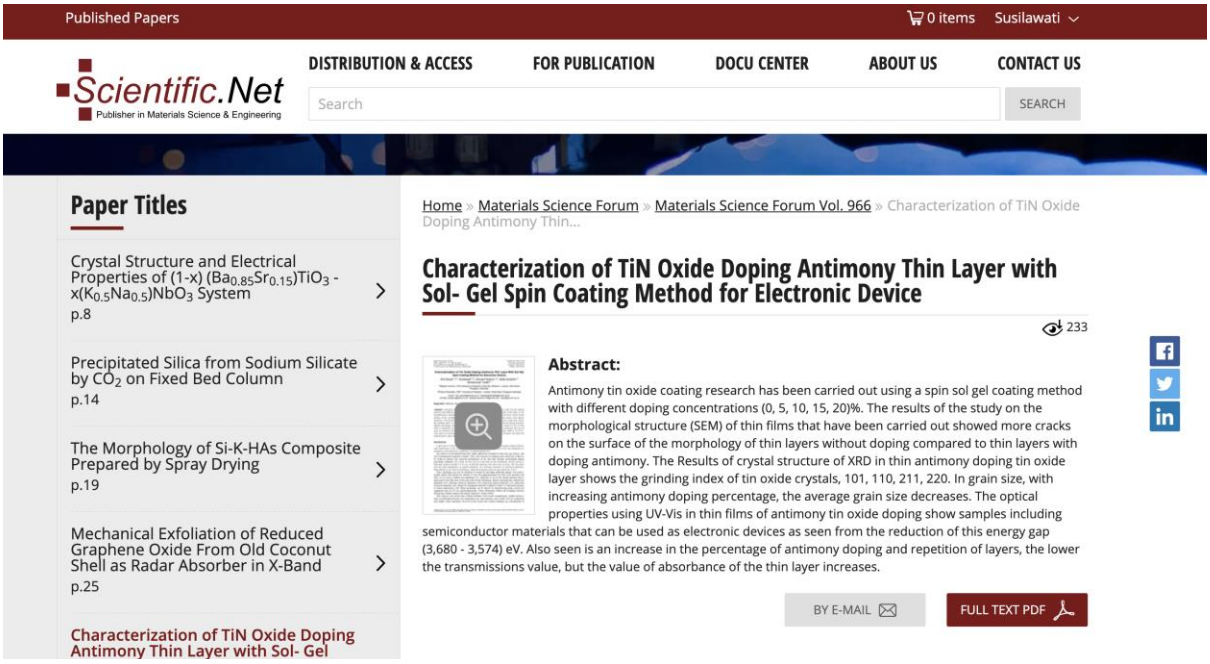

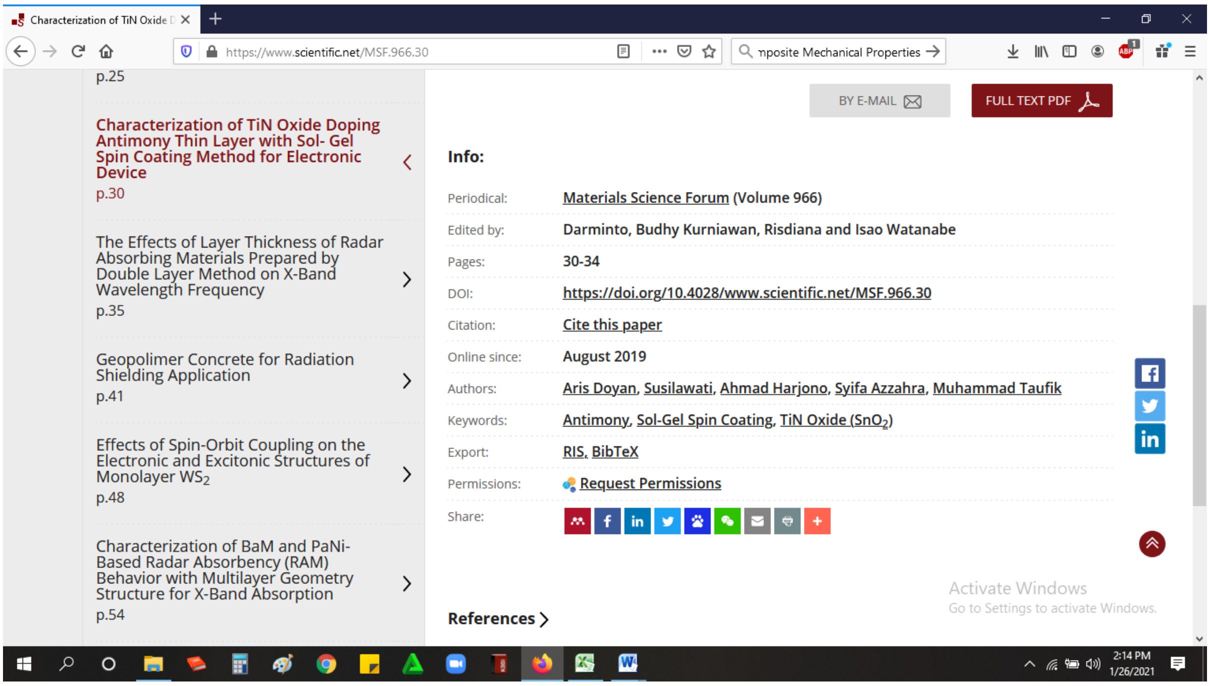

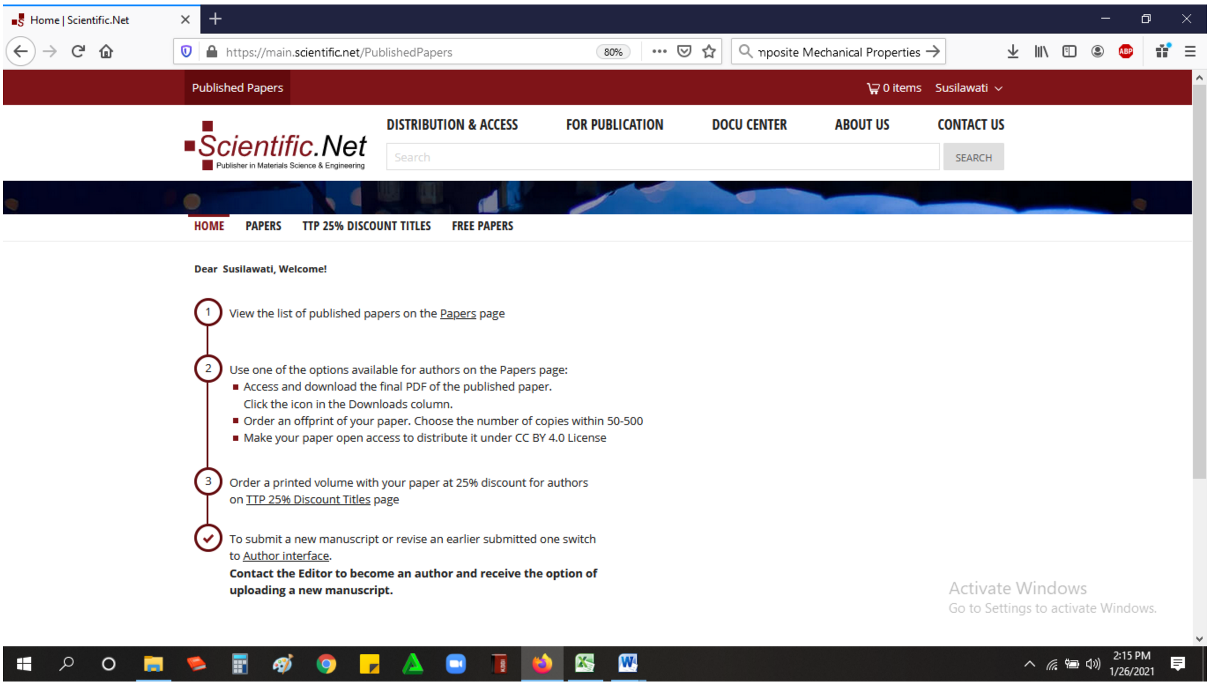
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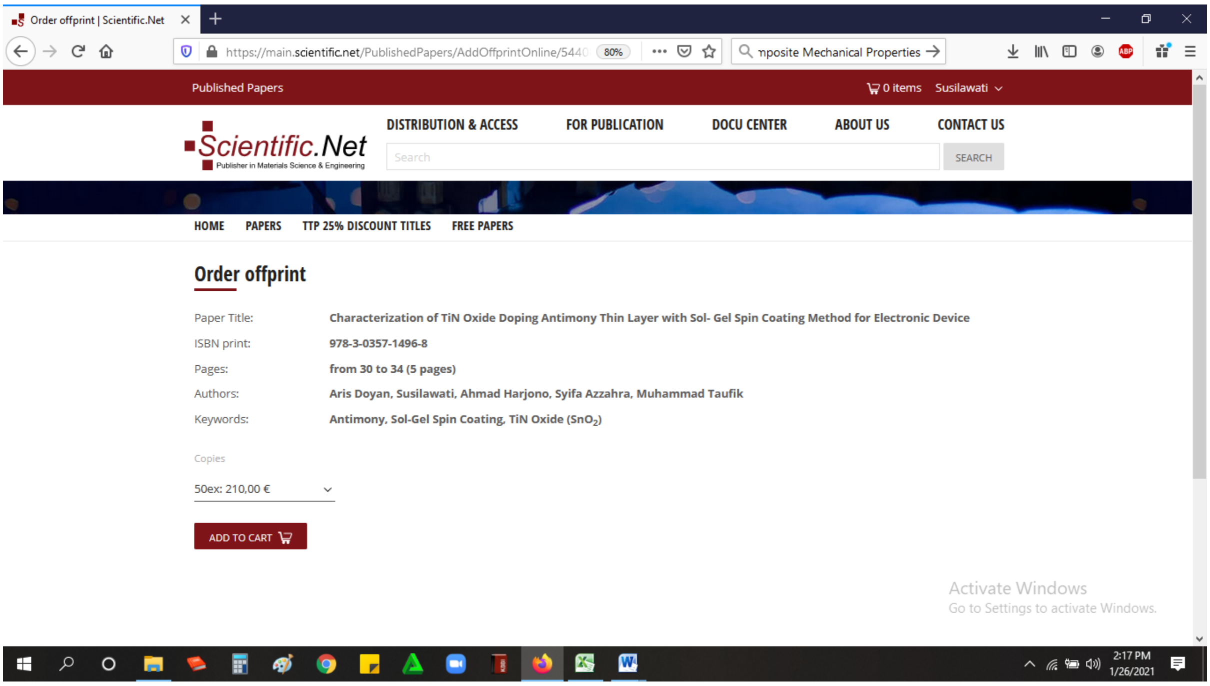
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Characterization of Tin Oxide Doping Antimony Thin Layer With Sol-Gel Spin Coating Method for Electronic Device

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Keywords: Antimony, Sol-gel Spin Coating, Tin Oxide (SnO_2).

Abstract. Antimony tin oxide coating research has been carried out using a spin sol gel coating method with different doping concentrations of 0, 5, 10, 15, 20 %. The results of the study on the morphological structure (SEM) of thin films that have been carried out showed more cracks on the surface of the morphology of thin layers without doping compared to thin layers with doping antimony. The Results of crystal structure of XRD in thin antimony doping tin oxide layer shows the grinding index of tin oxide crystals, 101, 110, 211, 220. In grain size, with increasing antimony doping percentage, the average grain size decreases. The optical properties using UV-Vis in thin films of antimony tin oxide doping show samples including semiconductor materials that can be used as electronic devices as seen from the reduction of this energy gap from 3.680 to 3.574 eV. Also seen is an increase in the percentage of antimony doping and repetition of layers, the lower the transmissions value, but the value of absorbance of the thin layer increases.

Introduction

A thin layer is a layer consisting of material inorganic, organic, metal and organic metal mixtures with thicknesses in the order of micrometers to nanometer orders which have the properties of insulators, semiconductors, conductors, or superconductor [1].

Tin oxide in its development has been widely applied for example in solar cells, gas sensors and TCO (Transparent Conductive Oxides). This is the concern of scientists in the world, one of them is by trying to improve the electrical performance of the thin film through experimental doping percentage variations The results showed that tin oxide had several advantages, namely having a band gap width of around 3.5 eV [2], so that the electrons were quite easy to move. The thin layer also has high transparency in optical properties, low electrical resistance in electrical properties, high stability in the fields of mechanics, chemical resistance and toxic gas sensitivity [3,4,5].

These advantages can also be modified as needed by providing additional doping. Tin oxide is usually doped with indium [6], lithium [7] zinc [8],copperaluminum [9], flour [10], antimony and flour [11] as well as indium and palladium [12]. Antimony is one of the dopant elements that is quite good in the thin layer of tin oxide with several advantages, namely increasing the conductivity properties [13], reducing resistivity properties [14], improving optical properties [15], improving electrical properties [16], dopant for transparent material Conductor Oxide [17] and good response to sensor applications [18]. These advantages can be known by characterizing using several test equipment such as UV-Vis spectrophotometer, X-Ray Diffraction (XRD) and Scanning Electron Microscope (SEM) coupled with Energy Dispersive X-Ray (EDX).

This research uses sol-gel spin coating technique with several considerations, namely having a short crystallization process, low temperature use, nano particles, pure results [19] are economical and simple. Some parameters involved in the sol-gel spin coating technique are concentration of

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