

Preparation of tin oxide (SnO₂) thin films using thermal oxidation

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ABSTRACT

The present research study deals with the preparation of tin oxide (SnO₂) nanostructures using thermal oxidation method. At first, Sn thin film was deposited on silicon (Si) substrate by thermal evaporation and then, thermal oxidation of the deposited Sn thin film was carried out at the growth temperature of 100°C with growth time of 1 hour in tube furnace. The structural property of SnO₂ nanostructures was investigated by using FESEM and EDX. The FESEM results showed that Sn was successfully grown on Si substrate and the SnO₂ nanoparticles with diameters of 97.5nm to 142nm were recorded. It was observed that the particles were agglomerated to form the SnO₂ particles. The radiation of sunlight illumination was conducted for four consecutive sunny days and the results showed that the highest reading 189.9 W/m² was recorded at day two for the daytime temperature 38°C. It was also noticed that the highest solar radiation percentage at day two was measured 18.9%.

KEYWORDS:

Film growth; Nanostructures; Oxide films; Substrates; Thermal evaporation