

## Superhydrophobic Behavior of SnO<sub>2</sub>-TiO<sub>2</sub> Composite Thin Films

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**Abstract :** SnO<sub>2</sub>-TiO<sub>2</sub> nanocomposite thin films were prepared by the sol-gel method on borosilicate glass substrate. The films were annealed at a temperature of 300°C, 400°C, and 500°C respectively for 2h in the air. The films obtained were further modified with stearic acid in order to decrease the surface energy. The X-ray diffraction patterns for the SnO<sub>2</sub>-TiO<sub>2</sub> thin films after annealing at different temperatures can be indexed to the mixture of TiO<sub>2</sub> (rutile and anatase) and SnO<sub>2</sub> (tetragonal) phases. The average crystallite size calculated from Scherrer's formula is found to be 6 nm. The SnO<sub>2</sub>-TiO<sub>2</sub> thin films were hydrophilic which on modification with stearic acid exhibit superhydrophobic behavior. The increase in hydrophobicity of SnO<sub>2</sub> film with stearic acid modification is attributed to the change in surface energy of the film. The films exhibit superhydrophilic behavior under UV irradiation for 1h. Thus, it is observed that stearic acid modified surfaces are superhydrophobic but convert into superhydrophilic on being subjected to UV irradiation. SnO<sub>2</sub>-TiO<sub>2</sub> thin films have potential for self-cleaning applications because of photoinduced hydrophilicity under UV irradiation.

**Keywords :** nanocomposite, self-cleaning, superhydrophobic, surface energy

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