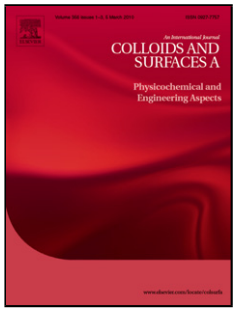

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Low-temperature synthesis of flower-like ZnO microstructures supported on TiO_2 thin films as efficient antifungal coatings for bamboo protection under dark conditions

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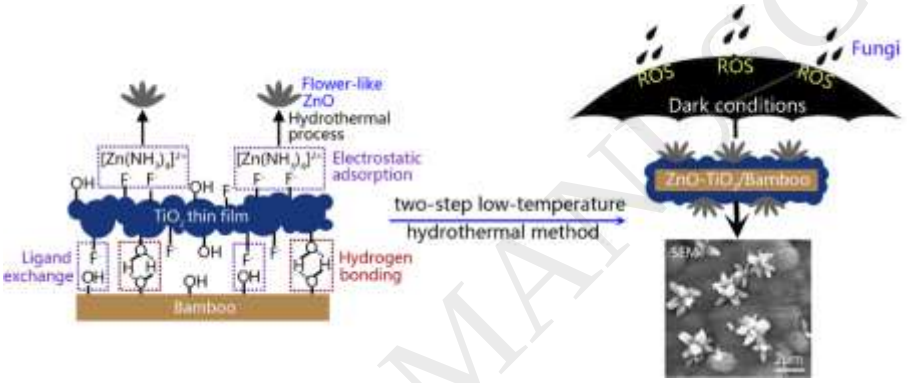

Abstract

Bamboo is readily infected with fungi because of its abundant sugar, starch and protein content, which greatly restricts its utilization. To develop a highly effective environmentally sound antifungal agent for bamboo, flower-like ZnO microstructures supported on TiO_2 thin films have been synthesized on bamboo surfaces by a facile two-step low-temperature hydrothermal method. According to the results of various analytical techniques, including X-ray diffraction, X-ray photoelectron spectroscopy, Fourier transform infrared–attenuated total reflectance spectroscopy, scanning electron microscopy, and energy-dispersive X-ray spectroscopy, the bamboo substrate combined with anatase TiO_2 by a hydrogen bonding or ligand exchange reaction between F^- and