Synthesize of Zinc Ion Solution by Zinc Thin Films Ionizing Radiation Method and its Application on Antibacterial

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Abstract

Zinc oxide thin films have been widely investigated due to their catalytic, semiconducting, and optical properties. However, the presence of zinc thin films also has often limited the resulting material properties. Spray application from thin-film nanotechnology is a new idea to collaborate between material science and biotechnology to maintain the quality of agricultural products. In this study, zinc thin films were deposited on glass substrates using DC magnetron sputtering, investigating the method to prepare zinc ion solution from zinc thin films treated with DI water under Ionizing radiation by UV-C, and application on antibacterial activity. The texture and thickness of sputtered zinc films, the zinc ion solution concentration and its application on *Eschericia coli* were measured by X-ray diffraction spectroscopy, alpha step, Electrical conductivity, Inductively coupled plasma mass spectrometry, and disk diffusion test. Zinc-ion release has been examined from the zinc films in water by UV-C radiation. Additionally, the antibacterial effect has been studied on several concentration of zinc ion solution 0,10,15, and 30 ppm. The antibacterial ability was affected by high concentration of zinc ions. The high antibacterial activity against *Eschericia coli* reflected its potential in food preservation used as a food preservative on agricultural products.

Keywords : Thin Film, UV-C radiation, Zinc Ion, Antibacterial activity, food preservative

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