

Lemon Peel Extract as a Green Reducing Agent for Copper-Doped Titanium Nanotubes Synthesis

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Abstract – In this study, we report the green synthesis of copper-doped titanium nanotubes using a biogenic approach. Lemon peel extract was used as the reducing and capping agent for the synthesis of copper-doped titanium nanotubes. The formation of the nanotubes was confirmed by various characterization techniques such as X-ray diffraction, transmission electron microscopy, scanning electron microscopy, and energy-dispersive X-ray spectroscopy. The results showed that the copper-doped titanium nanotubes had a high degree of crystallinity and a well-defined tubular structure. The photodegradation of methylparaben was used to evaluate the photocatalytic activity of the nanotubes, and it was found that the copper-doped titanium nanotubes exhibited excellent photocatalytic activity under UV light. This study presents a simple, cost-effective, and environmentally friendly method for the synthesis of copper-doped titanium nanotubes, which can be used as an effective photocatalyst for the degradation of organic pollutants.

Keywords – Green Synthesis; Environment; Photocatalytic Activity; Titanium Nanotube; Copper Oxide