

Nanocomposites and nanomaterials

EMR study of ROS generated by irradiation of TiO₂:S,C/ hydroxyapatite/fluorapatite

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Titanium dioxides has long been recognized as dental and orthopedic implant materials. To improve the implant-tissue osseointegration, considerable effort has been exerted to modify the TiO₂ surface structure both physically and chemically [1,2]

In this work the electron magnetic resonance (EMR) study of reactive oxygen species (ROS) generated by irradiation of TiO₂:S,C/hydroxyapatite/fluorapatite is presented. All samples were researched in the dark and under blue light irradiation (460 nm) and green light irradiation (525 nm). EMR spectroscopy and spin trapping has shown that HO generation through excitation of FAp-TiO₂ is greater than of Hap-TiO₂. The antifungal effects resulting from the ability of acrylic resin containing FAp-TiO₂ to generate ROS via photocatalysis may be hardness to develop a wide range of acrylic resins to facilitate denture cleaning. Furthermore, Hap irradiation with green light is greater than Hap irradiation with blue light and FAp irradiation with blue light is greater than FAp irradiation with green light.

1. G. Yuwei, *et al.* Detection of reactive oxygen species (ROS) generated by TiO₂ (R), TiO₂ (R/A) and TiO₂ (A) under ultrasonic and solar light irradiation and application in degradation of organic dyes// *Journal of hazardous materials.*- 2011.- 192.2.- P. 786-793.

2. S. Tomofumi, *et al.* ESR detection of ROS generated by TiO₂ coated with fluoridated apatite. // *Journal of dental research.* – 2010. - 89.8. –P. 848-853.