

Article title: In situ photoexcitation of silver doped titania nanopowders for activity against bacteria and yeasts

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Abstract Photocatalytic and in situ microbial activity of the amorphous and annealed states of Ag-doped and un-doped titania, were examined. Studies on their structure, morphology, composition and the photo-absorption characteristics of these materials, were performed.

These results were correlated with the photocatalytic and microbial activity against methicillin resistant *Staphylococcus aureus* K324 (MRSA), methicillin susceptible *Staphylococcus aureus* ATCC 25923 (MSSA), *Escherichia coli* PA 170, and yeasts *Candida albicans* ATCC 90028. The annealed powders containing anatase form of titania exhibited relatively higher photocatalytic activity, corresponding to activity against MRSA, when exposed to UV-A radiation. In comparison, amorphous powders, exhibited low photoactivity and showed poor antibacterial performance against MRSA under UV-A exposure. Doping of amorphous titania with Ag resulted in an anti-MRSA effect without exposure to UV radiation. In the Ag-doped crystalline anatase samples the size of Ag primary nanocrystallites increased, which led to the decrease of the surface concentration of Ag and detriment anti-MRSA activity.

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