



BIOMEDICINE 2021: Making the hospital a safer place by the sonochemical coating of all its textiles with antibacterial nanoparticles

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Introduction

A sonochemical method was developed for coating surfaces. It was applied to coat metals, ceramics, polymers. Glasses, textiles and even paper. It demonstrated that a large variety of properties can be imparted to the substrate. It can make the surface magnetic, conductive, fluorescent, antibacterial, and antiviral.

As far as coating textiles it is considered the best coating technique since cotton coated with CuO nanoparticles that was washed 65 cycles in Hospital washing machines (75 or 92 °C) revealed 83 % of the particles on the cotton at the end of this long process¹. For making textiles antibacterial we employed ZnO, CuO, and

Zn_{0.11}Cu_{0.89}O as the coated layer on the textiles (cotton, Polyester, Nylon and their mixtures). The killing mechanism of the bacteria was due to the creation of ROSs. Hydroxyl radicals, superoxide anions, and singlet oxygen were detected as a result of the reaction of the metal oxide with water.

This coating technique was applied to medical devices as well. Contact lenses, Urinal Catheters and Cochlear electrodes were all coated with metal oxide nanoparticles and exhibited excellent antibacterial properties.

It is worth mentioning that we own two sonochemical roll to roll coating machines and are attempting to introduce in the market new face masks. Finally, the SONO MASK that is currently being sold all over the market is a demonstration of a technique that has gone all the way from the laboratory to the market.



This work is partly presented at 3rd International Conference on Biomedicine & Pharmacotherapy -Webinar- July 26-July 27, 2021.