AGING OF FEMTOSECOND LASER ABLATION COPPER NANOPARTICLE

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Novel nanoparticles with significant antimicrobial properties is extensively studied in the last two decades due to their different properties from the bulk material in size reduction and high surface area This is a superscript[1,2], Copper (Cu) nanoparticle was found to have antiviral properties against a range of viruses This is a superscript[3], the nanoparticle can increase the drug solubility in water and the drug uptake by the infected cell which can increase the biomedical application in drug delivery system This is a superscript[4].

In this work, femtosecond laser ablation of Cu target in water was utilized to generate colloidal Cu NPs, which were applied as an active material for the antiviral coatings. The coatings on glass substrates were applied by spraying polyvinyl butyral (PVB) and Cu NPs. Coatings appeared effective against model Coronavirus and Herpesvirus. The presence of the Cu2O phase in the synthesized NPs was confirmed by various tests. SAED studies indicated that the laser-ablated Cu colloids tend to oxidize, still they do not change their characteristic green color. The presence of surfactant in water helped prevent the rapid ageing of the observed Cu colloid.

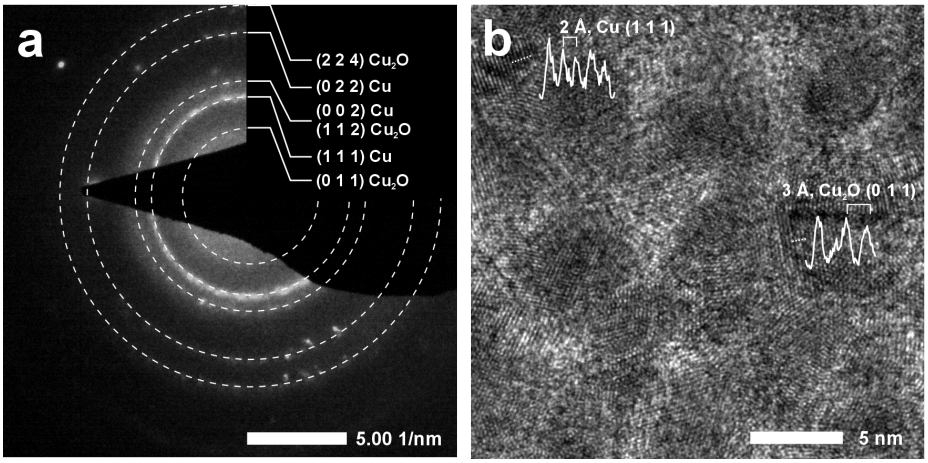

Fig. 1. structural analysis of DLC:Cu film. (a) SAED of the film lamella with identified hkl indexes and phases. (b) TEM lamella of the films with facets addressed to Cu and Cu2O

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