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## Antimicrobial activity of electrodeposited copper coating on double zincated aluminium plate

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The technique of electrodeposition can be used to deposit an adherent and strong copper film on aluminium products which bears the applications of touch surfaces like door knobs in the hospitals. Experiments were carried out to assess the antimicrobial properties of copper coatings deposited on a double zincated aluminium plate by electrochemical method and compare the same with that of a surface of the bulk copper. The electrodepositions was carried out in a non-cyanide alkaline bath which contains appropriate amount of copper nitrate, ammonium nitrate and tetra ethylene pent-amine. The scanning electron microscopic studies on the coating revealed that nodules of the deposited copper grow unevenly in the columnar form. The cross-sectioned view of the coating resembled that of seeds of promognate. Further, transmission electron microscopic studies on the coating found that individual nodules consist of nano sized crystallite with average size of 32nm. They include a large number of micro twins. The antimicrobial test against methicillin resistant staphylococcus aureus (MRSA) proved that within six hours of exposure 100% MRSA was killed by coated sample whereas that was only 88% by the surface of the bulk copper. The higher efficiency for antimicrobial activity exhibited by the coated film of copper compared to that of surface of the bulk of the copper is attributed to higher surface area possessed by former compared to latter one. In addition, because of the complex topographic formation of electrodeposited copper coating, the number of active contact points in touch with bacteria is quite high compared to those on the surface of the bulk copper. The mechanisms for the better anti-microbial activity compared to bulk copper are discussed in the paper.

### Biography

Prof. Rajendra Udupa has more than 30 years of teaching and research experience in National Institute of Technology Karnataka, India. Professor has obtained his under graduation, Post-graduation and Phd degree from Indian Institute of Science (IISc) Bangalore. The interested areas are extractive metallurgy, welding, casting, physical metallurgy and metal coating. Professor has guided five research scholars and number of UG and PG students. He has completed number of funded projects.

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