Seminar

Institute for Plasma Research

Title : Copper Oxide coating on Fabric and Yarn using Magnetron Sputtering for Antibacterial Applications

Speaker: Dr. Infant Solomon Vinoth
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Date : 3rd September 2021 (Friday)

Time : 10.30 AM

Venue : Online - Join the talk:
https://meet.ipr.res.in/Dr.Infantsolomon_PDFextension

Abstract :

Copper is well recognized for its antimicrobial activity and the cost effective application comparing to other antibacterial materials. On the other hand, copper oxide show similar properties in its surface level. The copper oxide coatings have extensive applications in wearable electronics, gas sensors, heat proof and anti-odor dressing etc. In this work two different experimentations have been performed to study the antibacterial activities of copper oxide coatings. The main focus of this work lies on wound dressing fabrics.

The copper oxide coating has been deposited on polypropylene fabric by using planar magnetron reactive sputtering with partial oxygen atmosphere. The developed coating shows the formation of cupric oxide predominantly and the samples have been subjected to structural and antibacterial studies like XRD, Raman spectroscopy and zone of inhibition test.

Similarly, the polyester yarn has been coated with copper oxide by using cylindrical magnetron sputtering. Around fifty meters of polyester yarn has been coated by passing the yarn through the sputtering region with the speed of 50 cm/min approximately. After deposition, typical fabric similar to the wound dressing material has been made, and the abovementioned characterizations have been performed for both yarn and fabric samples. The copper oxide formation is confirmed by structural studies and zone of inhibition test has been performed as preliminary study. Detailed antimicrobial analysis is under process.

References:
1. Michael Hans et al, Langmuir 29, 16160 (2013).
2. N.M. Denisov et al, Inorganic Materials 52 (5), 523 (2016).
3. Salima Mathews et al, Applied and Environmental Microbiology 81 (18) (2015).