

Accepted Manuscript

Conductive layers through electroless deposition of copper on woven cellulose lyocell fabrics

Waleri Root, Noemí Aguiló-Aguayo, Tung Pham, Thomas Bechtold



PII: S0257-8972(18)30508-5
DOI: doi:[10.1016/j.surfcoat.2018.05.033](https://doi.org/10.1016/j.surfcoat.2018.05.033)
Reference: SCT 23408
To appear in: *Surface & Coatings Technology*
Received date: 21 December 2017
Revised date: 4 April 2018
Accepted date: 15 May 2018

Please cite this article as: Waleri Root, Noemí Aguiló-Aguayo, Tung Pham, Thomas Bechtold, Conductive layers through electroless deposition of copper on woven cellulose lyocell fabrics. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Sct*(2017), doi:[10.1016/j.surfcoat.2018.05.033](https://doi.org/10.1016/j.surfcoat.2018.05.033)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Conductive layers through electroless deposition of copper on woven cellulose lyocell fabrics

Waleri Root*, Noemí Aguiló-Aguayo, Tung Pham, Thomas Bechtold

Research Institute for Textile Chemistry/Physics, University of Innsbruck, Hoehsterstrasse
73, 6850 Dornbirn, Austria.

*Corresponding author: waleri.root@uibk.ac.at

Abstract

The deposition of conductive metal layers on non-conductive material represents a key technology in the development of textile fiber based smart materials. We describe the results of a study on the electroless copper deposition on a woven cellulose fabric via surface activation through silver seeding. A bath composition containing HCHO and $C_4H_5KO_6$ in the molar ratio 1:0.08, a cellulose fabric and copper sulphate pentahydrate, at a pH of 12.5 was found to be optimum for reducing induction times of the deposition. Potentiometric measurements of the treatment solution during deposition allowed for an optimization of the bath compositions. The treated fabrics were analyzed with confocal laser scanning microscopy, photomicrograph scanning electron microscopy and energy dispersive X-ray to assess the topology, and with electrical measurements to determine the conductivity. The electrical sheet resistances ranged from 16.5 - 369.3 $\Omega \text{ sq}^{-1}$, which indicated that the deposition levels were not homogenous across the substrate. A continuous conductive copper layer was successfully deposited. As a test of the layer continuity, a Light emitting diode was successfully illuminated through the substrate.

Keywords:

Electrical Resistance; Redox potential; Tartrate ligand; Textile; Metallization

Download English Version:

<https://daneshyari.com/en/article/8023477>

Download Persian Version:

<https://daneshyari.com/article/8023477>

[Daneshyari.com](https://daneshyari.com)