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Inkjet printing of silver conductive ink on textiles for wearable electronic applications

In this study, silver nanoparticles were synthesized with a starch-based reduction biosystem at room temperature. With this approach, high concentration silver nanoparticles were produced on a large scale with a low starch/AgNO3 mass ratio, which was very advantageous for the low cost and high conductivity. Conductive inks were prepared from the synthesized silver nanoparticles by dispersion of the nanoparticles in a non-conductive commercial ink. Various patterns have been developed by printing silver nanoparticles with different percentages from 5% to 25% on a cotton substrate using a syringe. The printed patterns show a resistivity drop depending on the sintering temperature and nanoparticle concentration in the range of 8M and 8× 10-5 MΩ by heat treatment varying between 60°C and 320°C for 10min. In addition, a LED test was successfully performed on the fabrics. These flexible patterns produced by inkjet printing would present a considerable success for textile-based electronic devices at a low cost.

Recent Publications

1. Mohamed TAHIRI (2020): Sulfate removal from aqueous solutions using esterified wool fibers: isotherms, kinetic and thermodynamic studies In Evertz, Janus, Linder (Hrsg.) 2020): Handbook of Pränatal and Perinatal Psychology. Basel: Springer International Publishing. S. 619-626
2. Fettouche, S.(2019), Boukhriss, A., Tahiri, M. et al. Naked Eye and Selective Detection of Copper(II) in Mixed Aqueous Media Using a Cellulose-based Support. Chem. Res. Chin. Univ. 35, 598–603 .
3. M. Tahiri, M. Laaouan, et al.(2017), Impact of stabilized leachate residues from the uncontrolled landfill of Mohammedia city on the ''Oued El Maleh'' river and on the soil. J. Mater. Environ. Sci., Volume 9, Issue 12, Page 4487-4495

Biography

Mohamed Tahiri is a Chairholder of UNCHAIN-UH2C (University Chair on Innovation) Since January 2010. As part of his TEMPUS-supported role, Mohamed TAHIRI has received extensive training in Europe in Innovation, Technology Transfer, Intellectual Property Rights, and innovation Management. He holds in his faculty a Bachelor's in sanitation management in urban areas. He's conducting R&D in partnerships with various industries. Professor Mohamed TAHIRI is awarded Hassan II Prize for Environment in 2009 for his contribution to disseminating citizen eco-initiatives at Moroccan university. He published over 40 general and research articles and organized international meetings and conferences in Morocco (FIERTE Maroc 2007: International Conference on Renewable Energies and Water Technologies in partnership with commerce and navigation chamber of Almeria Spain; MENA Symposium on ''Environment analysis and economical evaluation, Marrakech 2009).

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