Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Preparation of silver-carbon nanotubes composites with plasma electrochemistry OLIVER HOEFFT, LARA LOHMANN, MARK OLSCHEWSKI, FRANK ENDRES, Institute of Electrochemistry, Clausthal University of Technology — Plasma electrochemistry is a powerful tool to generate free nanoparticles in aqueous solutions and especially in ionic liquids (ILs) [1,2]. Due to their very low vapour pressure, ionic liquids can be employed under vacuum conditions as fluid substrates or solvents. Thus, ionic liquids are well suitable electrolytes for plasma electrochemical processes delivering stable and homogeneous plasmas. We have shown that free copper and germanium nanoparticles can be obtained in ILs by applying a plasma as a mechanically contact-free electrode [2]. Here we present our results using an argon plasma for the electrochemical synthesis of silver on pure and pre-treated multiwall carbon nanotubes (MWCNTs) in 1-ethyl-3-methylimidazolium dicyanamide. For the pre-treatment of the MWCNTS we have used a dielectric barrier discharge plasma (DBD) at atmospheric pressure. For the untreated MWCNTs we have found a formation of free silver nanoparticles between, on and in the vicinity of the carbon nanotubes. In case of the plasma treated MWCNTs a silver-carbon nanotubes composite is formed. Thus, the treatment of the MWCNTs obviously has a great influence on the deposit. Therefore we additionally have investigated the influence of the DBD on the chemical composition of the MWCNTs surface with X-Ray Photoelectron Spectroscopy. [1] R. Akolkar and R. M. Sankaran, J. Vac. Sci. Technol. A 2013, 31, 050811 [2] N. Spitczok v. Brisinski, O. Höfft and Frank Endres, J. Mol. Liquids 2014, 192, 59

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Date submitted: 08 Jun 2016 Electronic form version 1.4