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Synthesis and characterization of highly conductive nanoparticle copper ink for inkjet printing**Eon Ju Lee, Ho Young Jun and Si Ok Ryu**
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Many industries are focused on the nanoparticle metallic inks for the fabrication of electronic devices. Silver ink is a typical metallic ink having high conductivity and thermal stability. However, there is a limitation to use it in the fabrication due to its high material cost. Copper is considered as a substitute material for silver, but copper ink has an oxidation issue under atmospheric conditions. Cost effective, highly conductive and oxidation-free copper nanoparticle ink was synthesized in this study. Copper complexes and copper nanoparticles were used in the synthesis to prevent its oxidation. Expanding its application to various substrates, the synthesized nanoparticles were thermally treated at relatively low temperatures in the range of 50~400 °C. The prepared copper ink was printed on the silicon substrates and the printed films were then characterized. Each particle of copper complexes and copper nanoparticles was analyzed by Thermogravimetric Analyzer (TGA). Sheet-resistance was measured by four point probe. Surface morphology of the prepared electrode was also analyzed using Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM). From our results, the synthesized copper ink showed the suitable properties to apply to inkjet printing process for the fabrication of various electronic devices.

Biography

Eon Ju Lee has completed her Bachelor's degree in Chemical Engineering from Yeungnam University and currently pursuing her Master's degree at Yeungnam University. Her main research topic is the synthesis and application of highly conductive nanoparticle copper ink.

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