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Seunghyun Lee, Dongchul Choi, Hushan Piao, Yongkeun Son

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*Seunghyun Lee[a], Dongchul Choi, Hushan Piao, Yongkeun Son**

Department of Chemistry and BK21 plus HRD Center for Creative Convergence Chemical Sciences, Sungkyunkwan University, Suwon 440-746, Korea

**Corresponding Author:*

E-mail address: ykson@skku.edu / Tel.: +82-31-290-7068 / Fax : +82-31-290-7075

Abstract

To form a conducting network at a low temperature in printed electronic circuits, conductive metal fillers for e-inks have to be small in size because the melting point of a nanoparticle (NP) is inversely correlated with its radius. We prepared NP using a one-step synthesis process with direct ligand exchange and the nano-materials showed metallization at low temperatures. TEM images showed that the final spherical particles have diameters of 5.4±0.7nm. The metallization of the silver NP was confirmed with SEM images and the metallization mechanism is discussed in detail. The results indicated that sinterization necks appeared with heat-treatment below 200°C.

Keywords

silver nanoparticle, conductive ink, e-ink, printed electronics, ink-jet printing, sintering, low temperature metallization