

Synthesis and Characterization of Silver Nanoparticles and Their Ink-jet Printing Applications

Mohammad Vaseem, 이길목¹, 최한석¹, 한윤봉^{1,*}
전북대학교 공과대학; ¹전북대학교
(ybhahn@jbnu.ac.kr*)

Inkjet printing is an efficient alternative to conventional photolithography for producing various electronic devices and has advantages such as low cost, high-speed patterning, and applicability to various substrates. However, most inkjet-printing application require sophisticated synthetic procedures for preparing mono-disperse nanoparticles without particle-particle aggregation in the dispersion medium. Therefore, the development of a simple and reliable method for nanoparticles based ink in an aqueous solution is still a challenge for its inkjet printing application. In this report, Ag nanoparticles in presence of poly-vinyl pyrrolidone (PVP) as a dispersant suited for inkjet printing have been investigated. As-synthesized pure Ag nanoparticles were well dispersed in water-ethylene glycol solvent mixture which was directly used as an ink. Further, using as-formulated Ag ink we have successfully demonstrated jetting and writing of various over-printed Ag pattern line on Si/SiO₂ substrate. As-printed Ag lines were further analyzed in terms of its resistivity with varying sintering temperature from room-temperature to 300°C.