

선택적 레이저 공정을 이용한 구리 나노 입자의 소결 특징 분석 및  
플렉서블 전자 소자 제작 기술 개발에 관한 연구  
Study of Thermal Behaviors on sub-50 nm Copper Nanoparticles  
by Selective Laser Sintering Process for Flexible Applications

권진형<sup>a,\*</sup>, 조현민<sup>a</sup>, 이하범<sup>a</sup>, 엄현진<sup>b</sup>, 고승환<sup>a</sup>

<sup>a</sup>서울대학교 기계공학과(E-mail: jhs0909k@snu.ac.kr), <sup>b</sup>한국생산기술연구원

**초 록 :** The effect of different thermal treatments on the sub-50 nm copper nanoparticles is examined in the aspects of chemical, electrical and surface morphology. The copper nanoparticles are chemically synthesized and fabricated for paste-type solution. Simple bar coating method is practiced as a deposition process to form copper thin film on a typical slide glass. Deposited copper thin films are annealed by two different routes: general tube furnace with 99.99 % Ar atmosphere and selective laser sintering process. The thermal behavior of the different thermal-treated copper thin films is compared by SEM, XRD, FT-IR and XPS analysis. In this study, the laser sintering process ensures low annealing temperature, fast working speed and ambient-accessible route. Moreover, the laser-sintered copper thin film shows good electrical property and enhanced chemical stability than conventional thermal annealing process. Consequently, the proposed laser sintering process can be compatible with plastic substrate for flexible applications.