

Preparation of Highly Conductive Al Thin Film via an Solution-Stamping Process

이혜문*, 윤중열
한국기계연구원 부설 재료연구소
(hyelee@kims.re.kr*)

Aluminum(Al) is considered to be highly applicable not only to electrical conductive features, such as lines and films, but also to electrodes for ohmic contact, such as cathodes of solar cells and OLED, due to its low electrical resistivity and work function. However, colloidal solutions consisting of sound Al nanoparticles have not been successfully prepared yet because of the high oxidative behavior of Al. The high reactivity of Al to oxygen results in oxide layers on the surface of Al particles during the preparation of nanoparticles or ink; these oxide layers hamper the application of Al nanoparticles to electronic devices as they decrease electrical conductivity. Thus, the conventional colloidal solution containing Al nanoparticles is not proper to directly prepare Al films for electronic devices which must be fabricated at temperature lower than 150°C. In this study, we propose a solution-stamping process to prepare a highly conductive Al thin film using an ink solution with an Al precursor. Using the developed solution-stamping process, we successfully fabricated a conductive Al thin film with excellent electrical properties on rigid and flexible substrates.