

Yong Hee Kim ¹, Eun Kwang Lee ¹, and Joon Hak Oh ¹

¹POSTECH, Korea, Republic of

The development of a highly mechanically stable metal electrodes on deformed substrates is of great importance for realizing future electronic devices. Interfacial adhesive bonding between metals and stretchable substrates has been the key concern due to delamination problem of metal electrodes. Typically, the adhesion force between metal electrodes and stretchable substrate is weak because of the large difference in hydrophilicity. To address this problem, metal adhesion layer such as Cr or Ti is used between metal electrodes and substrates. However, these metals are harmful to the human body. In this study, we have developed a simple and effective method to improve adhesive bonding between electrodes on stretchable substrates using organic primer. After coating the primer solution on targeted substrates, metal electrodes showed stronger adhesive bonding with substrates compared with pristine substrates. The metal electrodes do not get damaged after 20 % stretching state of stretchable substrates. Furthermore, the metal electrodes are successfully patterned using photolithography without residue. Our findings demonstrate an important methodology for the biocompatible and cost-effective adhesive layer and their versatile use for the modulation of surface characteristics in stretchable electronics.