Sub 20nm Nano Patterning on the Flexible Substrates by Secondary Sputtering Lithography and its Application to Flexible Transparent Conducting Film

장성우, 전환진, Cheng Jin Ahn, Min Liang Jin, 정희태*
KAIST
(heetae@kaist.ac.kr*)

Flexible transparent electrodes with the combination of high transmittance, electrical conductivity and flexibility are essential for the flexible organic solar cell, light-emitting diodes. Currently, indium tin oxide (ITO) coated film is most often used because ITO has high transparency to visible light and low sheet resistance for electrical current conduction. However, ITO is costly due to limited resources and it is easily brittle. So it is difficult to apply to the flexible electronics. Recently, advances in nano materials research have opened the door for other transparent conductive materials like CNT, graphene, and nanowire. Here we report alternative metallic line pattern for flexible transparent electrodes. This sub 20nm metallic nano pattern on the PDMS is fabricated by secondary sputtering phenomenon with low angle ion milling step and it almost corresponds to transmittance and conductivity compared to the ITO. And metal nanowire has higher flexibility than ITO.