Hybrid Transparent Electrodes for Flexible Devices

In this talk, I'll firstly introduce my research institute (KIMS) and Plasma Processing Department and my research areas containing the development of various plasma sources and its applications. And I'll move on the main issues about hybrid transparent electrodes for flexible devices. Indium-tin-oxide (ITO) is widely used as a transparent conductive electrode in opto-electronic devices due to its electrical and optical properties. However ITO films are made by vacuum process such as sputter, furthermore the brittleness of ITO films is a bottleneck for flexible electronics. Many researchers have been developed the other kinds of TCEs such as conducting polymer, Graphene, AgNWs, and so on. I'll introduce metal mesh and highly stable AgNWs using plasma technology. For more advanced transparent electrode, we have developed a hybrid structure which consists of very narrow printed Ag grids for assisted electrodes embedded in flexible substrate. And OLEDs and OSCs showed very higher flexibility which could withstand after almost folding, 1 mm of bending radius and show similar efficiencies compared with that of ITO.