

Hybrid Silver Nanowire Electrode Containing Embedded Metal Grid for Optoelectronic Devices

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The flexibility is one of the hot issues on next generation electronics. Many researchers have been studying about developments of flexible electrodes, devices, encapsulation, substrate and so on for achieving commercially available flexible electronic devices. Among the flexible electronics, flexible transparent electrode is the key element for flexible opto-electronics such as lightings, photovoltaics and touch screen panel. There are so many kinds of flexible transparent electrode, graphene, carbon nanotube, metal nanowire, etc. They show great potentials due to theoretical electrical characteristics, their practical conductivities, however, have been still insufficient.

In this study, we proposed a novel concept of transparent electrode which is composed of metal microwires (MWs) and nanowires (NWs). Sparse microwires which have low resistance act as minimizing the loss of electrical power at large area devices and nanowires spread charges uniformly to whole device area. The electrode has less than $1 \Omega/\square$ of resistance with 85% of transmittance and doesn't break when it is bended at a 1 mm of bending radius. We also show a flexible lighting device based on this micro/nanowire electrode.

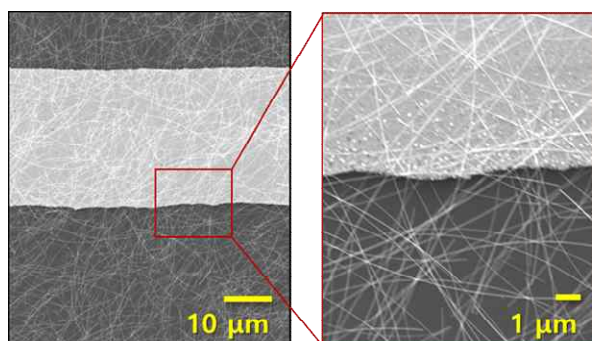


Fig. 1. Scanning electron microscope images of micro/nano wires.

References

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