The Fabrication of Flexible Transparent Electrode Based on Silver Nanowires

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With the rapid development of touch devices such as display screens, photovoltaic cells and organic light-emitting diodes (OLEDs), there is a growing demand for transparent conductive electrodes.Currently, the indium tin oxide (ITO) occupies the vast majority market of transparent electrodes. However, the rare element In greatly restricts the supply of ITO. Further, the ceramic brittle ITO does not have good mechanical bending properties. Therefore, people are committed to finding the alternatives. In recent years, nanowires, carbon nanotubes, graphene and other nanomaterials have played important roles in the preparation of flexible conductive films. Among them, silver nanowires are considered to be the most potential transparent electrode material, since the low square resistance at the same transmittance compared with other nanomaterials. In this project, a detailed experimental study on the growth and synthesis of silver nanowires has been carried out. The ultra-long silver nanowires with diameter of 80 nm and length of 40 μm were successfully synthesized. Combined with micro-nano processing technologies such as UV lithography, flexible transparent electrodes with both great conductivity and transmittance were successfully prepared on the surface of PDMS substrate.

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