

Metal Grid Embedded Transparent Electrode with graphene for Flexible Organic Light-Emitting Diodes (OLEDs)

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Graphene electrodes have received much attention as a replacement for contemporary ITO in optoelectronic devices as it has high flexibility, high transmittance and low cost of its raw materials. Still high sheet resistance of graphene makes it unsuitable for OLED application. With low resistance metal, auxiliary grids can prevent non-uniform luminance from current drop when combined with graphene electrode. In this study, we introduced a simple method for fabrication of micro-patterned metal grid embedded graphene electrode. The metal grid pattern was imprinted on the UV cured resin using reusable PDMS mold thereafter filled with the silver paste ink. After that, CVD-grown graphene was dry transferred onto the metal grid to make full area coverage as a main electrode. Our graphene electrodes combined with metal grid have reasonable properties to replace ITO that they have transmittance~90% and also resistance<10Ω/□. We also demonstrated the characteristics and chemical sintering of silver inks, various methods to improve the grid properties, and electrical stability issue compared to silver nanowires.