Pixelated graphene array on flexible substrate for OLED panels

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Abstract

In this work, we proposed an integration scheme for fabricating flexible OLED display panels which have pixelated graphene array as their transparent electrode layout. With the aim of utilizing graphene films as transparent electrodes for OLED display applications, we developed a patterning process which yields dimensional accuracy and absence of surface contamination. Using a display compatible process graphene film was directly patterned into a pixel array on a polyimide (PI) film. On the pixelated graphene array, two-color OLED and a thin-film encapsulation layer were formed to realize a fully operational OLED under bending condition. We believe that our pixelated graphene array and integration scheme on flexible substrates have a wide range of applications in OLED display where light weight, mechanical compliance and form factor matters. Our result strongly matters in the realm of flexible devices, in which the uniqueness of graphene bears an indispensable role

References

[1] Jin-Wook Shin et al 2D Mat. **5** (2017) 014003.
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[3] Jaehyun Moon et al Diamond Relat. Mater. **57** (2015) 68

Figures

Figure 1: 370 mm×470 mm sized Graphene anode OLED panel with driving capacity.

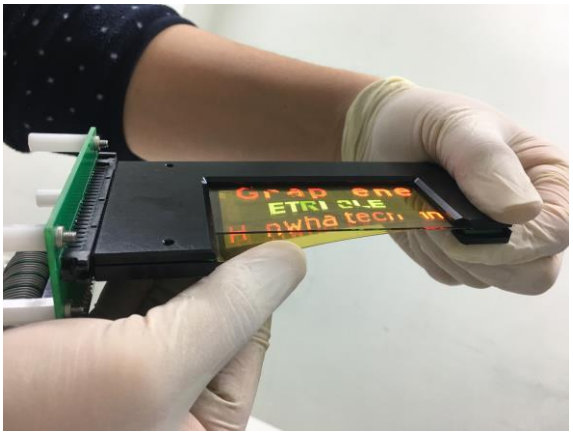

Figure 2: Flexible OLED with pixelated Graphene electrode array.

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