

A Simple Light-Outcoupling Enhancement Method for Organic Light-Emitting Diodes

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Abstract : We propose to use a gradual-refractive-index dielectric (GRID) as a simple and efficient light-outcoupling method for organic light-emitting diodes (OLEDs). Using the simple GRIDs, we could improve the light outcoupling efficiency of OLEDs rather than relying on difficult nano-patterning processes. Through numerical simulations using a finite-difference time-domain (FDTD) method, the feasibility of the GRID structure was examined and the design parameters were extracted. The outcoupling enhancement effects due to the GRIDs were proved through severe experimental works. The GRIDs were adapted to bottom-emission OLEDs and top-emission OLEDs. For bottom-emission OLEDs, the efficiency was improved more than 20%, and for top-emission OLEDs, more than 40%. The detailed numerical and experimental results will be presented at the conference site.

Keywords : efficiency, GRID, light outcoupling, OLED

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