

Large Scale Organic Light Emitting Layer with PVK and Ir(ppy)₃ and Buffer layers

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Organic light emitting layer in OLED device was formed by gravure printing process in this work. Thickness and roughness control was characterized by applying various mixed solvents and various annealing in this work.

The device layer structure of the OLED device is as follow: Glass/ITO/PEDOT: PSS/PVK +Ir(ppy)₃-active layer/LiF/Al. PVK(Poly(N-vinylcarbazole))was used as a host and Ir(ppy)₃ as green-emitting dopant. PVK (Poly (N-vinyl carbazole)) and Ir(ppy)₃ was used as the active light emitting material. The thickness of the active layer was controlled by the multiple-printing technique and annealing method. Also we used mixed solvent with three different solvents. To make the surface smooth, the concentration of inks needed to be diluted. Different annealing temperature are required for the different areas of devices. Annealing treatment process helps in improving the surface uniformity by redistributing the molecules. PVK, Ir(ppy)₃, TPD, PBD among others TPD has most low glass transition temperature at 69°C. As scale up the OLED area the annealing treatment temperature needs optimized.

Also we PEDOT buffer layer was gravure printed in this work.