

Flexible quantum dot color conversion layer with high stability using polyimide

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Quantum dot (QD) is attracting attention as a display material such as a color conversion layer (CCL) due to its wide absorption and narrow emission band. When using QD as a display material by incorporating into polymer nanocomposites, QD is susceptible to external conditions such as oxygen, water, heat, and UV. The polymer nanocomposite must be manufactured to ensure stability of QDs. However, conventional polymers such as polymethyl methacrylate and photoresist have been utilized in a narrow range of applications in that the polymers cannot effectively protect QDs due to high oxygen and moisture infiltration as well as low heat resistance and flexibility. We fabricated QD-polymer nanocomposite using polyimide (PI) which have high heat resistance, low oxygen and moisture penetration with outstanding flexibility. Previous studies did not use PI as a display material since PI absorbs UV wavelength range. Recently however, it has been reported to be used as a material for a QD CCL while using blue wavelength as a backlight. We expect that this QD-PI nanocomposite will secure high stability of QD and will be used in various applications such as flexible displays and CCL.