

「校際傑出學術論文授權暨發表會」

論文摘要表

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論文名稱	具有色彩純度穩定性之藍光有機發光二極體研製
英文論文名稱	The fabrication of blue organic light-emitting diodes with the stabilities of colorimetric purity.
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系所名稱	電子工程系所
學年度	99 學度
語文別	英文
中文關鍵詞：有機發光二極體、色彩純度	
外文關鍵詞：organic light-emitting diodes、colorimetric purity	
中文摘要：研究中設計元件能階結構，使激子在主體上產生，有效的改善載子侷限，因此本論文中，我們利用高遷移率的有機材料摻雜於發光層，達到載子平衡機制之效果，提高電子與電洞發光層復合之機率，來提升元件之發光效率。並針對此有機發光元件進行光電特性量測與探討。	

本論文中藍光有機元件結構： $(\text{ITO}/\text{NBP}/\text{MADN}/\text{Alq}_3/\text{LiF}/\text{Al})$ 為此研究的基礎，為了改善載子平衡的注入，實驗中我們採用一個電洞注入層(m-MTDATA)材料，將 $(\text{ITO}/\text{m-MTDATA}/\text{NBP}/\text{MADN}/\text{Alq}_3/\text{LiF}/\text{Al})$ 之元件結構，藉此結構改善傳統有機發光二極體中電洞傳輸速度遠大於電子的缺點，增加電洞注入材料而改善電洞傳輸速度，因此增加發光層中電子與電洞復合機率，藉此改善元件亮度、效率與電壓驅動之有機發光二極體。次要部分實驗中利用(Dpvbi)螢光材料摻雜於發光層之中，材料需具備一個良好的發光材料及高發光效率，將(Dpvbi)摻雜於發光層(MADN)，結構為： $(\text{ITO}/\text{m-MTDATA}/\text{NBP}/\text{MADN}(\text{X}) : \text{Dpvbi} (1-\text{X})/\text{Alq}_3/\text{LiF}/\text{Al})$ ，將具有優越色彩純度穩定性之有機發光體元件。藉由電激發產生的激子(exciton)可將能量轉移到高螢光效率及穩定的摻雜物中發光，以改善元件驅動電壓及色彩純度的穩定度。

英文摘要： The fabrication design elements of the energy level structure, the excitons generated in the main body, effectively improve the carrier confinement in this thesis, we use the high mobility of the organic material doped light-emitting layer, to the effect of carrier balancing mechanism, improve the electron and hole emitting layer composite probability, to improve the efficiency of light-emitting components. And organic light-emitting components for this measurement and optical properties of.

This paper the blue structure of : $(\text{ITO} / \text{NBP}/\text{MADN}/\text{Alq}_3/\text{LiF}/\text{Al})$ the basis for this study, in order to improve the balance of carrier injection, the experiment we used a hole injection layer (m-MTDATA) materials, the $(\text{ITO}/\text{m-MTDATA}/\text{NBP}/\text{MADN}/\text{Alq}_3/\text{LiF}/\text{Al})$ of the device structures, structural improvements to the traditional organic light-emitting diode in the electronic hole is much larger than the shortcomings of transmission speed, increasing the hole injection material to improve the hole transport speed, thus increasing the light-emitting layer composite probability of electrons and holes, thereby improving the device brightness, efficiency and driving voltage of organic light-emitting diodes. Minor part of this thesis, the experiment using (Dpvbi) fluorescent light-emitting layer being doped material, materials need to have a good light-emitting materials and high luminous efficiency, the (Dpvbi) doped light-emitting layer (MADN),the structure of : $(\text{ITO} / \text{m-MTDATA} / \text{NBP} / \text{MADN} (\text{X}) : \text{Dpvbi} (1-\text{X}) / \text{Alq}_3/\text{LiF}/\text{Al})$, will have excellent stability of the color purity of organic light-emitting body components. Produced by electrical excitation of excitons energy can be transferred to the high fluorescence efficiency and stability of light-emitting dopant in order to improve the electrical drive voltage and the stability of colorimetric purity.