Oxygen plasma treatments of ITO surface to improve the performance of OLEDs

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Indium tin oxide (ITO)-coated glass substrates are commonly used as the anode due to their high transmittance in visible region, relatively high work function, and high conductivity. ITO properties, such as work function and surface morphology, are very important for the OLED device performance. So we performed oxygen plasma treatments that have been known the most commonly used in ITO treatments in order to improve efficiency, turn on voltage and brightness, quantum efficiency of OLEDs. ITO surface was treated by oxygen plasma with different RF power, chamber pressure and exposure time. The relationship between the properties of ITO was modified by oxygen plasma treatments. These treatments can increase ITO work function, which may be due to surface carbon removal, change in ratio of surface constituents (Sn, In, O), and Fermi level shift. As a result, the ITO work function was progressed in the hole-injection efficiency form ITO to hole-transporting layer and OLED performance was improved by oxygen plasma treatments.