

Growth of Low Voltage Phosphors Prepared by R.F. Magnetron Sputter  
Deposition

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Abstract

Field Emission Display (FED) is a new kind of Vacuum Flat Cathode Ray Tube (VFCRT) display. Due to the attractive advantages of FED, it is a good candidate for replacing the conventional Cathode Ray Tube (CRT) in flat panel displays. In FED, light is based on low-voltage cathodoluminescence (about 80-100 Volt). It is a low voltage, low power consumption and full-color display. Then, it is necessary to develop the low voltage phosphors for future FED applications.

The low voltage thin film phosphor ( ) has been successfully developed in this paper. Magnesium tungstate ( ) thin film phosphors prepared by the R. F. magnetron sputter deposition were characterized. Processing parameters such as operation power, working pressure, and oxygen/argon ratio were found to play the important roles in affecting the phases present in the as-deposited films. The - and - were determined as the major phases and the as a minor phase in the films studied. The - phase was stable for the films grown at higher powers or working pressures, whereas the - phase appeared to be a dominant phase for the films grown at higher oxygen concentration. The scanning electron microscope (SEM) characterization indicated that the films were rather dense and grown in a columnar array. The effect of processing parameters on the film morphology was not noticeable. The results of fluorescence spectrum measurement showed that the emission of low voltage thin film ( ) was 3950 .

Keyword : field emission display, flat cathode ray tube display, thin film phosphors and fluorescence spectrum