

Field emission of nitrogen-doped diamond-like-carbon (DLC) thin film

ABSTRACT

An experimental study of the field emission from nitrogen doped Diamond-Like-Carbon (DLC) thin films prepared by plasma Chemical Vapor Deposition (CVD) was carried out for the purpose of investigating the characteristic of field electron emission from the surface of nitrogen doped DLC thin film. Thin DLC film was deposited on silicon using the plasma CVD method, from a mixture of Methane (CH₄), Helium (He) and Nitrogen (N₂) at room temperature. Emission current was measured while high voltage was applied between the cathode-anode diode structures. Barrier height was obtained by current density-electric field (J-E) characteristic in the relation of Fowler-Nordheim equation. The value of barrier height in range of 0.03eV to 0.06eV was obtained and considered as low barrier.