

The characteristics of the Direct Negative Metal Ion Beam Source and its Applications

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In this paper a newly developed direct negative metal ion beam deposition (DMIBD) source has been introduced and the effect secondary direct negative metal ion beam energy on the property of diamond like carbon (DLC) and transparent conducting ITO thin films has been reported.

By DMIBD, DLC films with a significant sp^3 component can be formed and ITO films with a resistivity of 4.6×10^{-4} cm and an optical transmittance of 90% at 550 nm were prepared at an optimized ion beam energy condition. Especially in case of ITO deposition, polycrystalline ITO films were prepared on the glass substrate without intentional substrate heating process with effective kinetic energy transfer by incident secondary negative metal ions during ITO deposition.

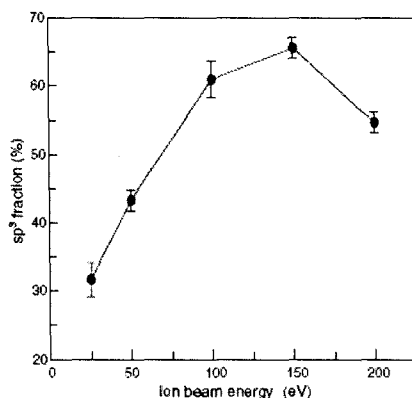


Fig. 1. The effect of ion beam energy on the sp^3 component in DLC films.

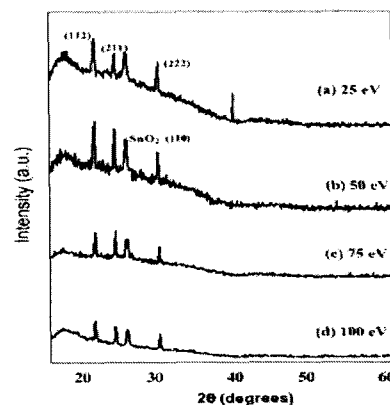


Fig. 2. XRD spectra of ITO thin films deposited under different ion beam energy.