

**Investigation of Some Hard Coatings
Synthesized by Ion Beam Assisted Deposition**

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ABSTRACT

Ion beam assisted deposition (IBAD) technique has been used to synthesize hard coatings including diamond-like carbon (DLC), carbon nitride (CN) and metal-ceramic multilayered films. It is found that DLC films formed at low energy ion bombardment possess more SP^3 bondings and much higher hardness. The films exhibit an excellent wear resistance. The CN films synthesized by IBAD method consist of tiny crystallites dispersed in amorphous matrix, which are identified by electron diffraction pattern to be β - C_3N_4 . Nanometer multilayered Fe/TiC films have been deposited by ion beam sputtering. The structure and properties are strongly dependent on the thickness of the individual layers and modulation wave length. It is disclosed that both hardness and toughness of the films could be enhanced by adjusting the deposition parameters.