Preparation of Boron Carbide Thin Films by Reactive sputtering of Boron

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This experiment was carried out to apply to the surface of computer hard-disk. Boron carbide thin films were prepared by RF magnetron sputtering. The films were deposited onto CoCr/Cr/SiO_2/Si (100) substrates with an RF power of 25, 50 and 75 W at room temperature, 100°C, and 200°C. The reactive gas was introduced up to 1.5 vol%(CH_4/(Ar+CH_4)) during deposition, and the resulting composition of the films matched these ratios, as observed by Auger electron spectroscopy. In X-ray photoelectron spectroscopy, two well-resolved peaks in C(1s) spectra were observed around 284 eV, indicating C-C bond at 284.5 eV and B-C bond at 283.5 eV. The X-ray diffraction results of these films revealed the amorphous or nanocrystalline characteristics. The surface hardness test be using the nanoindenter. The scratched films endured load of 45 N.

References

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