STUDY OF FILMS PRODUCED BY PIIID OF HEXAMETHYLDISILAZANE-ARGON MIXTURE.

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Abstract

Plasma polymer thin films are pinhole free and have also high crosslinking structure. This kind of films are insoluble in mild acids and bases and present good adhesion on different materials. These features make them very attractive for industrial applications and they are used in various sectors such as electronics, mechanical, biomedical, electrical, protective coatings and others. In this work we report the physical, structural and mechanical properties of plasma polymer obtained from hexamethyldisilazane mixed with argon using plasma immersion ion implantation and deposition technique, The (pp- HMDSN-ar) films were deposited in a stainless steel plane parallel plates electrodes excited by radio-frequency power source operating at 13,56 MHz, 50W at a total pressure (HMDSN and argon) of 10Pa. The negative bias of 10kV and 100Hz pulse was used as the implantation ion source. The structural characterization of the films was done by FTIR spectroscopy. Absorptions were observed, between, 3500 cm- to 3200 cm-, 3000 cm - to 2900 cm-, 2500 cm- to 2000 cm-, 1500 cm- to 700 cm-, corresponding bonds in CH2 and CH3 molecules , C-N bonds, and strain C-H bonds, Si-CH3 and Si-N groups. The contact angle for water was approximately 98º and the surface energy is near 30 mJ/m^2 which represents a hydrophobic surface, measured by goniometric method. The refractive index of these materials present values from 1,70 to 1,65 measured by ultraviolet-visible technique. The thickness of the samples was measured by profilometry and showed values from 200 nm to 90 mm for different deposition times. Hardness value near 3GPa was found for the films measured by manoindentation technique. .

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