The diffusion of hydrogen and inert gas in sputtered a-SiC:H alloys: Microstructure study

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Abstract

The microstructure of DC sputtered amorphous silicon carbon (a-SiC:H) is studied by effusion measurements of hydrogen and of implanted inert gases helium, neon, argon and secondary ion mass spectrometry. The results suggest that the motion of inert gas atoms is controlled by the diffusion, greatly depending on a broadening of network openings. Already at carbon concentrations of 25 at\%, isolated voids disappeared presumably because interconnected voids are formed. A void formation is mainly attributed to an increase in hydrogen incorporation in the samples.

Keywords: Amorphous films; Sputtering; Hydrogen effusion; SIMS

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