Hydrogen Induced Voids in Hydrogenated Amorphous Silicon Carbon (a-SiC:H): Results of Effusion and Diffusion Studies

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The void formation in Si-rich a-SiC:H films deposited with dc magnetron sputtering is studied by effusion measurements of hydrogen and of implanted rare gases and secondary ion mass spectrometry (SIMS). Rare gas atoms were incorporated into the material by ion implantation. The results suggest a widening of the network openings with increasing alloy concentration. However, the void formation is mainly attributed not to an increase in carbon concentration but to an increase in hydrogen incorporation.

Keywords: Amorphous alloys; SIMS; Implantation