Pengaruh anil termal terhadap besarn optis lapisan tipis a-SiC:H hasil metode DC sputtering II. target grafiti

Rosari Saleh, author

Abstrak

Studi tentang pengaruh anil termal terhadap besaran optis dan disorder lapisan tipis amorf silikon karbon terhidrogenasi (a-SiC:H) telah dilakukan. Lapisan tipis dihasilkan dengan teknik deposisi sputtering menggunakan target grafit dan wafer silikon yang dilakukan dalam campuran gas argon dan hidrogen, kemudian dikarakterisasi dengan spektroskopi uv-vis (ultra violet-visible) sebelum dan setelah diberikan perlakuan anil termal. Indeks bias n dan koefisien absorpsi α diperoleh dari hasil pengukuran transmitansi. Gap optis memperlihatkan sedikit variasi terhadap temperatur anil, yakni meningkat dengan bertambahnya temperatur anil sampai 500 °C. Kenaikan temperatur anil menyebabkan densitas lapisan tipis berkurang dan demikianpula disorder jaringan amorfnya. Hasil eksperimen akan didiskusikan dalam hubungannya dengan kondisi deposisi dan hasil eksperimen lain.

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The Effect of Thermal Annealing on the Optical Properties of a-SiC:H Films Produced by DC Sputtering Methods: I. Graphite Target Case. A study of the annealing effect on optical properties and disorder of hydrogenated amorphous silicon carbon (a-SiC:H) films was undertaken. The films were prepared by sputtering technique using graphite target and silicon wafer in argon and hydrogen gas mixture, and then characterized by uv-vis (ultra violet-visible) spectroscopy before and after annealing. Index of refraction n and absorption coefficient α of films have been determined from measurements of transmittance. The optical gap show small variation with annealing temperature, increasing with increasing annealing temperature up to 500 °C. An increase of annealing temperature leads to reduced film density and the amorphous network disorder. The experimental results are discussed in terms of deposition condition and compared to other experimental results.