

## Pengaruh peningkatan flow gas metan terhadap sifat optis lapisan tipis amorf silikon karbon (a-SiC:H) hasil deposisi metode DC sputtering

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### Abstrak

Indeks bias ( $n$ ) dan koefisien absorpsi optis ( $\alpha$ ) lapisan tipis amorf silikon karbon terhidrogenasi (a-SiC:H) telah diteliti dari hasil pengukuran refleksi dan transmisi. Lapisan tipis a-SiC:H dihasilkan dengan metode deposisi dc sputtering menggunakan target silikon dalam campuran gas argon dan metan. Indeks bias ( $n$ ) berkurang dengan peningkatan flow rate gas metan. Koefisien absorpsi optis ( $\alpha$ ) bergeser ke energi yang lebih tinggi dengan bertambahnya flow rate gas metan. Lapisan tipis cenderung makin tidak teratur dan memiliki gap optis yang lebih lebar pada flow rate gas metan tinggi. Relasi komposisi terhadap sifat-sifat optik lapisan tipis akan didiskusikan demikianpula terhadap ketidakteraturan jaringan amorf.

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Methane Flow Rate Effects On The Optical Properties of Amorphous Silicon Carbon (a-SiC:H) Films Deposited By DC Sputtering Methods. We have investigated the refractive index ( $n$ ) and the optical absorption coefficient ( $\alpha$ ) from reflection and transmission measurements on hydrogenated amorphous silicon carbon (a-SiC:H) films. The a-SiC:H films were prepared by dc sputtering method using silicon target in argon and methane gas mixtures. The refractive index ( $n$ ) decreases as the methane flow rate increase. The optical absorption coefficient ( $\alpha$ ) shifts to higher energy with increasing methane flow rate. At higher methane flow rate, the films tend to be more disorder and have wider optical gap. The relation of the optical properties and the disorder amorphous network with the compositional properties will be discussed.