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A study of optical properties of hydrogenated microcrystalline silicon films prepared by plasma enhanced chemical vapor deposition technique at different conditions of excited power and pressure
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^a Physics Department, King Abdulaziz University, P.O. Box, 80203 Jeddah, Saudi Arabia

^b Institute of Optoelectronics, Nankai University, Tianjin, 300071, China

Abstract

Two sets of hydrogenated microcrystalline silicon thin-film samples were prepared by Plasma Enhanced Chemical Vapor Deposition (PECVD) technique at different deposition conditions of excited power and pressure. The correlation between the crystalline volume fraction for the samples determined from Raman spectra and the excited power, pressure, absorption coefficient, refractive index and optical energy gap was discussed. The values of optical parameters (refractive index and absorption coefficient), were calculated from the transmission spectra in the range 400-2500 nm. The optical band energy gap and Urbach energy were obtained using the calculated values of absorption coefficients. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

a-Si:H; Electrical conductivity; Infrared and Raman spectra; Optical properties; Plasma enhanced chemical vapor deposition

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