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Deposition and structural properties of Silicon Carbide thin films for solar cells applications

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Amorphous and nanocrystalline silicon carbide thin films were deposited on corning glass 7059 and c-Si (100) substrates using the Hot Wire Chemical Vapor Deposition (HWCVD) and Magnetron Sputtering (MS) techniques. Samples were prepared at low substrate temperatures below 300 degrees celsius and a gas mixture of SiH₄/CH₄/H₂ was used in case of HWCVD. For MS, the temperature of the substrate was varied between 300-600 degrees celsius and Ar plasma was used to sputter a SiC target in a H₂ plume environment. X-ray diffraction (XRD) and transmission electron microscopy (TEM) were used to investigate the phase changes and crystallinity in the films. Plan view and cross section specimen were prepared by the TRIPOD polishing technique for the TEM structural investigation. Fourier Transform Infrared Spectroscopy (FTIR) was used to investigate the hydrogen content and the SiC vibrational bonds in the samples.

Level (Hons, MSc, PhD, other)?

MSc

Consider for a student award (Yes / No)?

No

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

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