



Black Nickel Solar Absorber: Preparation and characterization of black nickel films

Abdullah Moukhtar Nosseir

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This book focus on preparation and characterization of black nickel films. Thin films of black nickel on copper substrate for solar collector applications are prepared using electrochemical deposition technique. The electrodeposition parameters such as current density, temperature, concentration, additives and duration are optimized in order to improve the properties of the prepared films. Due to the amorphous structure of black nickel film, the oxygen and sulphur ligands have different interactions with the 3d energy levels of nickel and zinc cations. In this case, the prepared black nickel film can absorb almost all the wavelengths in solar range. The oxygen as additive is used to improve the optical properties of the back nickel. The oxygen is added through the addition of hydrogen peroxide. The electrodeposited films have been physically characterized by using X-ray diffraction, energy dispersive X-ray, scanning electron microscope. Also these films have been optically characterized by using color analysis tool and emissivity, absorptivity and reflectivity spectroscopic measurements.

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