

Effects of preparation conditions on the optical properties of thin films of tellurium oxide

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Abstract

Thin films of tellurium oxide were prepared by thermal evaporation. The effects of preparation conditions and post-deposition vacuum annealing on the optical constants of the thin films were studied. Substantial changes in the optical constants, density, structure and stoichiometry were observed following changes in the preparation conditions and annealing. The majority of the films were found to be deficient in oxygen. The presence of metallic Te was detected in films deposited on heated substrates and in all the films that were annealed. All the samples showed some degree of absorption at photon energies below the band gap. One explanation for this absorption could be oxygen deficiency and the presence of metallic Te.
