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Characterisation of amorphous Se₉₇Te₃ nanoparticles prepared by ball milling
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Abstract

The authors' present research work is concentrated with structural and optical studies of amorphous Se₉₇Te₃ nanoparticles. The amorphous Se₉₇Te₃ material was used as a starting material. The ball milling was performed in a Laboratory 8000M-Mixer/Mill (SPEX) mill. The milled materials were characterised by XRD, transmission electron microscopy (TEM) and optical measurements within the wavelength region 300 nm-1000 nm. From XRD measurements, it is found that an amorphous stage is also achieved during the milling process. TEM measurements showed that after 30 hours, 40 hours and 70 hours of milling time, amorphous nanoparticles of different sizes were developed. The optical band gap and optical constants of the milled materials have been studied as a function of photon energy. Optical absorption measurements indicate that the absorption mechanism is due to indirect transition. It has been observed that the absorption coefficient increases lineally with the increase in photon energy and the optical band gap increases with the increase of milling time. Copyright © 2009, Inderscience Publishers.

Author Keywords

Ball milling; Nanoparticles; Optical constants

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