

Web of Science

Electrical and optical properties of a- SexTe_{100-x} thin films

By: Khan, ZH (Khan, Zishan H.)^[2,4]; Salah, N (Salah, Numan)^[2]; Habib, S (Habib, Sami)^[2]; Al-Ghamdi, AA (Al-Ghamdi, A. A.)^[1]; Khan, SA (Khan, Shamshad A.)^[1,3]

[View ResearcherID and ORCID](#)

OPTICS AND LASER TECHNOLOGY

Volume: 44 Issue: 1 Pages: 6-11

DOI: 10.1016/j.optlastec.2011.05.001

Published: FEB 2012

[View Journal Impact](#)

Abstract

The dc electrical conductivity of as deposited thin films of a- SexTe_{100-x} ($x = 3, 6, 9$ and 12) is measured as a function of temperature range from 298 to 383 K. It is observed that the dc conductivity increases exponentially with the increase in temperature in this glassy system. The value of activation energy calculated from the slope of $\ln \sigma(\text{dc})$ vs. $1000/T$ plot, is found to decrease on incorporation of dopant (Se) content in the Te system. On the basis of pre-exponential factor (σ_0), it is suggested that the conduction is due to thermally assisted tunneling of the carriers in the localized states near the band edges. The optical absorption measurements show an indirect optical band gap in this system and it decreases on increasing Se concentration. The optical constants (extinction coefficient (k) and refractive index (n)) do change significantly with the photon energy and also with the dopant Se concentration. The decrease in optical band gap may be due to the decrease in activation energy in the present system. It is also found that the real and imaginary parts of dielectric constants show a significant change with the photon energy as well as with the dopant concentration. With large absorption coefficients and compositional dependence of optical band gap and optical constants (n and k), these materials may be suitable for optical disk applications. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords

Author Keywords: Activation energy; Absorption coefficient; Optical constants

KeyWords Plus: BAND-GAP; CHALCOGENIDE; CONDUCTIVITY; ALLOYS; PHOTOCONDUCTIVITY; CRYSTALLIZATION; SEMICONDUCTORS; AFFINITIES; ABSORPTION; CONSTANTS

Author Information

Reprint Address: Khan, SA (reprint author)

+ King Abdulaziz Univ, Dept Phys, POB 80203, Jeddah 21589, Makkah, Saudi Arabia.

Addresses:

+ [1] King Abdulaziz Univ, Dept Phys, Jeddah 21589, Makkah, Saudi Arabia

+ [2] King Abdulaziz Univ, Ctr Nanotechnol, Jeddah 21589, Makkah, Saudi Arabia

[3] St Andrews Coll, Dept Phys, Gorakhpur 273001, UP, India

+ [4] Jamia Millia Islamia, Dept Appl Sci & Humanities, Fac Engr & Technol, New Delhi, India

E-mail Addresses: shamshad_phys@yahoo.com

Funding

Funding Agency	Grant Number
King Abdul Aziz City for Science and Technology, (KAACST), Riyadh, Saudi Arabia	ARP-3-17

[View funding text](#)

Citation Network

17 Times Cited

43 Cited References

[View Related Records](#)

[Create Citation Alert](#)

(data from Web of Science Core Collection)

All Times Cited Counts

17 in All Databases

17 in Web of Science Core Collection

0 in BIOSIS Citation Index

0 in Chinese Science Citation Database

0 in Data Citation Index

0 in Russian Science Citation Index

0 in SciELO Citation Index

Usage Count

Last 180 Days: 1

Since 2013: 2

[Learn more](#)

Most Recent Citation

Martinkova, Simona. [Crystal growth in \$\text{Se}_{70}\text{Te}_{30}\$ thin films followed by SEM and in situ XRD](#). JOURNAL OF APPLIED PHYSICS, OCT 14 2016.

[View All](#)

This record is from:

Web of Science Core Collection
- Science Citation Index Expanded

Suggest a correction

If you would like to improve the quality of the data in this record, please [suggest a correction](#).

Publisher

ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB,
OXON, ENGLAND

Categories / Classification

Research Areas: Optics; Physics

Web of Science Categories: Optics; Physics, Applied

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000295311500002

ISSN: 0030-3992

Journal Information

Table of Contents: [Current Contents Connect](#)

Impact Factor: [Journal Citation Reports](#)

Other Information

IDS Number: 825VZ

Cited References in Web of Science Core Collection: **43**

Times Cited in Web of Science Core Collection: **17**