

Web of Science

[Full Text from Publisher](#) |
 [Look Up Full Text](#) |
 |
 Save to EndNote online |
 [Add to Marked List](#)

359 of 499

Optical and electrical performance of Yb/InSe interface

By: Alharbi, SR (Alharbi, S. R.)^[1]; Qasrawi, AF (Qasrawi, A. F.)^[2,3]

[View ResearcherID and ORCID](#)

MATERIALS SCIENCE IN SEMICONDUCTOR PROCESSING

Volume: 43 Pages: 60-64
 DOI: 10.1016/j.mssp.2015.11.022
 Published: MAR 1 2016
[View Journal Impact](#)

Abstract

In this study a 300 nm ytterbium transparent thin film is used as substrate to a 300 nm thick InSe thin film. The optical transmittance, reflectance and absorbance of the glass/InSe and Yb/InSe films are measured and analyzed. The optical data allowed determining the effects of the Yb layer on the energy band gap, on the dielectric and on optical conductivity spectra. The band gap of the InSe films shrunk from 2.38/139 to 1.90/1.12 eV upon Yb layer interfacing leading to a band offset of 0.48/0.27 eV. On the other hand, the modeling of the optical conductivity in accordance with the Lorentz theory revealed a free carrier scattering time, carrier density and mobility of 0.225 (fs), $3.0 \times 10^{19}(\text{cm}^{-3})$ and $2.53 \text{ cm}^2/\text{Vs}$ for the Yb/InSe interface, respectively. As these values seem to be promising for employing the Yb/InSe interface in thin film transistor technology, the current voltage characteristics of Yb/InSe/C Schottky diode were recorded and analyzed. The electrical analysis revealed the removal of the tunneling channels by using Yb in place of Al. In addition, the "on/off" current ratios, the Schottky barrier height and the switching voltage of the Yb/InSe/C device are found to be 18.8, 0.76/0.60 eV and 0.53 V, respectively. (C) 2015 Elsevier Ltd. All rights reserved.

Keywords

Author Keywords: [Optical materials](#); [Coating](#); [Optical desorption spectroscopy](#); [Dielectric properties](#)

Author Information

Reprint Address: Qasrawi, AF (reprint author)
 + Atilim Univ, Grp Phys, AAUJ, TR-06836 Ankara, Turkey.

Reprint Address: Qasrawi, AF (reprint author)
 + Atilim Univ, Fac Engn, TR-06836 Ankara, Turkey.

Addresses:

- + [1] King Abdulaziz Univ, Fac Sci, Dept Phys, Al Faisaliah Campus, Jeddah, Saudi Arabia
- + [2] Atilim Univ, Grp Phys, AAUJ, TR-06836 Ankara, Turkey
- + [3] Atilim Univ, Fac Engn, TR-06836 Ankara, Turkey

E-mail Addresses: atef.qasrawi@atilim.edu.tr

Funding

Funding Agency	Grant Number
Deanship of Scientific Research (DSR), King Abdulaziz University, Jeddah	127-363-1436-G
DSR	

[View funding text](#)

Publisher

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

Citation Network

4 Times Cited
 16 Cited References
[View Related Records](#)
[Create Citation Alert](#)
(data from Web of Science Core Collection)

All Times Cited Counts
 4 in All Databases
 4 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: 4
 Since 2013: 23
[Learn more](#)

Most Recent Citation
 Al Garni, S. E. [Plasmon Interactions at the \(Ag, Al\)/InSe Thin-Film Interfaces Designed for Dual Terahertz/Gigahertz Applications](#). PLASMONICS, APR 2017.
[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](#).

Categories / Classification**Research Areas:** Engineering; Materials Science; Physics**Web of Science Categories:** Engineering, Electrical & Electronic; Materials Science, Multidisciplinary; Physics, Applied; Physics, Condensed Matter**Document Information****Document Type:** Article**Language:** English**Accession Number:** WOS:000370093200009**ISSN:** 1369-8001**eISSN:** 1873-4081**Journal Information****Table of Contents:** [Current Contents Connect](#)**Impact Factor:** [Journal Citation Reports](#)**Other Information****IDS Number:** DD7HB**Cited References in Web of Science Core Collection:** **16****Times Cited in Web of Science Core Collection:** **4**