

Web of Science

A review of recent advances in transparent p-type Cu2O-based thin film transistors

By: Al-Jawhari, HA (Al-Jawhari, H. A.)

MATERIALS SCIENCE IN SEMICONDUCTOR PROCESSING

Volume: 40 Pages: 241-252
 DOI: 10.1016/j.mssp.2015.06.063
 Published: DEC 2015
[View Journal Impact](#)

Abstract

One of the crucial challenges that face the wide-spread implementation of flexible and transparent electronics is the lack of high performance p-type semiconductor material. Cu2O in thin-film form is a potentially attractive material for such applications because of its native p-type semi-conductivity, transparency, abundant availability, non-toxic nature, and low production cost. This review summarizes recent research on using copper oxide Cu2O thin films to produce p-type transparent thin-film transistors (TFTs) and complementary metal-oxide-semiconductor (CMOS) devices. After a short introduction about the main advantages of Cu2O semiconductor material, different methods for depositing and growing Cu2O thin films are discussed. The hi-tech development, along with the associated obstacles, of the Cu2O-based thin-film transistors is reviewed, with special emphasis on those made of sputtered Cu2O films. Finally, the bilayer scheme as one of the most exciting and promising technique for both TFTs and CMOS devices will be considered. (C) 2015 Elsevier Ltd. All rights reserved.

Keywords

Author Keywords: p-Type TFTs; Transparent oxides; Cu2O thin films
KeyWords Plus: OXYGEN PARTIAL PRESSURES; COPPER-OXIDE; OPTICAL-PROPERTIES; ROOM-TEMPERATURE; CU2O; MOBILITY; FABRICATION; DEPOSITION; OXIDATION

Author Information

Reprint Address: Al-Jawhari, HA (reprint author)
 King Abdulaziz Univ, Dept Phys, Jeddah 21551, Saudi Arabia.
Addresses: [1] King Abdulaziz Univ, Dept Phys, Jeddah 21551, Saudi Arabia

E-mail Addresses: hajjawhari@kau.edu.sa

Publisher

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

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: Review
Language: English
Accession Number: WOS:000363344600033
ISSN: 1369-8001
eISSN: 1873-4081

Citation Network

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

All Times Cited Counts
 15 in All Databases
 15 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: 14
 Since 2013: 137
[Learn more](#)

Most Recent Citation
 Sun, Hui. Ag composition gradient CuCr0.93Mg0.07O2/Ag/CuCr0.93Mg0.07O2 coatings with improved p-type optoelectronic performances . JOURNAL OF MATERIALS SCIENCE, OCT 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](#).

Journal Information

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

Impact Factor: [Journal Citation Reports](#)

Other Information

IDS Number: CU2HM

Cited References in Web of Science Core Collection: **63**

Times Cited in Web of Science Core Collection: **15**

