

Judul Artikel : Characterization of SnO₂ Film with Al-Zn Doping Using Sol-Gel Dip Coating Techniques

Penulis : Aris Doyan, Susilawati, Norma Ikraman and Muhammad Taufik

Nama Seminar/Konferensi/Simposium : Journal of Physics: Conference Series

Penyelenggara/Penerbit : IOP Publishing Ltd

Waktu/Tempat Pelaksanaan : 6-7 September 2017/Yogyakarta, Indonesia

Halaman : 012015-1 -012015-6

ISBN/ISSN : *ISSN: 1742-6596*

Web Prosiding : <https://iopscience.iop.org/issue/1742-6596/1011/1>

URL Dokumen : <https://iopscience.iop.org/article/10.1088/1742-6596/1011/1/012015/pdf>

DOI : <http://doi.org/10.1088/1742-6596/1011/1/012015>

URL Peer Review : <http://eprints.unram.ac.id/17383/>

URL Dokumen Cek Similarity atau Originality : <http://eprints.unram.ac.id/17448/>

LINK INDEX : <https://www.scopus.com/authid/detail.uri?authorId=57205535848>

Tanggal/Waktu : Semester Gasal 2017/2018

Satuan : 1 Makalah/tahun

Volume Kegiatan : 1

Profil Prosiding dan Publisher


scimagojr.com/journalsearch.php?q=130053&tip=sid&clean=0

also developed by scimago: SCIMAGO INSTITUTIONS RANKINGS

SJR Scimago Journal & Country Rank

Home Journal Rankings Country Rankings Viz Tools Help About Us

Journal of Physics: Conference Series

Country	United Kingdom -  SCIMAGO INSTITUTIONS RANKINGS	<h1>70</h1> <p>H Index</p>
Subject Area and Category	Physics and Astronomy Physics and Astronomy (miscellaneous)	
Publisher	IOP Publishing Ltd.	
Publication type	Conferences and Proceedings	
ISSN	17426588, 17426596	
Coverage	2005-2020	
Scope	The open access Journal of Physics: Conference Series (JPCS) provides a fast, versatile and cost-effective proceedings publication service.	

scimagojr.com/journalsearch.php?q=130053&tip=sid&clean=0

Scope The open access Journal of Physics: Conference Series (JPCS) provides a fast, versatile and cost-effective proceedings publication service.

- [Homepage](#)
- [How to publish in this journal](#)
- [Contact](#)
- [Join the conversation about this journal](#)

SJR

Year	SJR
2006	0.26
2007	0.25
2008	0.25
2009	0.25
2010	0.27
2011	0.28
2012	0.28
2013	0.25
2014	0.26
2015	0.25
2016	0.24
2017	0.23
2018	0.23

Citations per document

Year	Cites / Doc. (4 years)	Cites / Doc. (3 years)	Cites / Doc. (2 years)
2005	0.2	0.2	0.2
2006	0.48	0.48	0.48
2007	0.45	0.45	0.45
2008	0.48	0.48	0.48
2009	0.50	0.50	0.50
2010	0.50	0.50	0.50
2011	0.52	0.52	0.52
2012	0.52	0.52	0.52
2013	0.45	0.45	0.45
2014	0.52	0.52	0.52
2015	0.52	0.52	0.52
2016	0.52	0.52	0.52
2017	0.52	0.52	0.52
2018	0.58	0.58	0.58
2019	0.60	0.60	0.60

Year	Total Cites	Self-Cites
2005	0	0
2006	1000	1000
2007	2000	1000
2008	3000	1000
2009	4000	1000
2010	5000	1000
2011	6000	1000
2012	7000	1000
2013	7000	1000
2014	8000	1000
2015	9000	1000
2016	10000	1000
2017	12000	1000
2018	15000	1000
2019	20000	5000

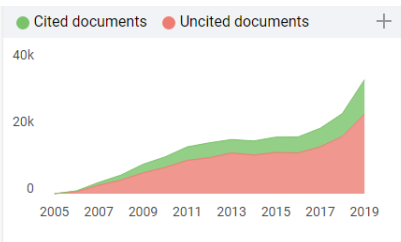
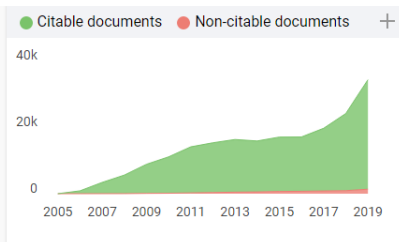
Year	Cites / Doc. (4 years)	Cites / Doc. (3 years)	Cites / Doc. (2 years)
2005	0.2	0.2	0.2
2006	0.48	0.48	0.48
2007	0.45	0.45	0.45
2008	0.48	0.48	0.48
2009	0.50	0.50	0.50
2010	0.50	0.50	0.50
2011	0.52	0.52	0.52
2012	0.52	0.52	0.52
2013	0.45	0.45	0.45
2014	0.52	0.52	0.52
2015	0.52	0.52	0.52
2016	0.52	0.52	0.52
2017	0.52	0.52	0.52
2018	0.58	0.58	0.58
2019	0.60	0.60	0.60

External Cites per Doc **Cites per Doc**

Year	External Cites per Doc	Cites per Doc
2005	0.0	0.2
2006	0.45	0.48
2007	0.45	0.45
2008	0.45	0.48
2009	0.45	0.50
2010	0.45	0.50
2011	0.45	0.52
2012	0.45	0.52
2013	0.45	0.45
2014	0.45	0.52
2015	0.45	0.52
2016	0.45	0.52
2017	0.45	0.52
2018	0.45	0.58
2019	0.45	0.60

% International Collaboration

Year	% International Collaboration
2005	20
2006	25
2007	25
2008	28
2009	28
2010	28
2011	28
2012	28
2013	25
2014	28
2015	28
2016	25
2017	20
2018	15
2019	10



Journal of Physics: Conference Series

Not yet assigned quartile

SJR 2019
0.23

powered by scimagojr.com

← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimagojr.com" style="border: 1px solid #ccc; padding: 2px 5px; display: inline-block;">https://www.scimagojr.com
```

Artikel tulisan author yang terbit di Journal of Physics: Conference Series

← → ↻ iopscience.iop.org/issue/1742-6596/1011/1

Apps Gmail YouTube Maps Gmail Edmodo Quiz | Edmodo Google Scholar WhatsApp Web Sci-Hub: removing... Quiz | Edmodo Quiz | Edmodo

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our [Privacy and Cookies policy](#).

IOPSCIENCE Journals Books Publishing Support Login

Journal of Physics: Conference Series

Table of contents

Volume 1011
2018
◀ Previous issue Next issue ▶

The International Conference on Theoretical and Applied Physics 6–8 September 2017, Yogyakarta, Indonesia
Accepted papers received: 16 April 2018
Published online: 09 May 2018

Open all abstracts



Preface

OPEN ACCESS 011001
The International Conference on Theoretical and Applied Physics
+ Open abstract View article PDF

OPEN ACCESS 011002

JOURNAL LINKS

- Journal home
- Information for organizers
- Information for authors
- Search for published proceedings
- Contact us
- Reprint services from Curran Associates



← → ↻ iopscience.iop.org/issue/1742-6596/1011/1

Apps Gmail YouTube Maps Gmail Edmodo Quiz | Edmodo Google Scholar WhatsApp Web Sci-Hub: removing... Quiz | Edmodo Quiz | Edmodo

OPEN ACCESS 012015
Characterization of SnO₂ Film with Al-Zn Doping Using Sol-Gel Dip Coating Techniques
A Doyan, Susilawati, N Ikraman and M Taufik
+ Open abstract View article PDF

OPEN ACCESS 012016
Effect of annealing temperature on optical properties of TiO₂ 18 NR-T type thin film
Nandani, A Supriyanto, A H Ramelan and F Nurosyid
+ Open abstract View article PDF

OPEN ACCESS 012017
The Effect of Pluronic 123 Surfactant concentration on The N₂ Adsorption Capacity of Mesoporous Silica SBA-15: Dubinin-Astakhov Adsorption Isotherm Analysis
Donanta Dhaneswara, A. A. A. Siti Agustina, P. Dewantoro Adny, Farhan Delayori and Jaka Fajar Friansyah
+ Open abstract View article PDF

Biophysics and Medical Physics

OPEN ACCESS 012018
The Effect of UVC Irradiation on the Mechanical Properties of Chitosan Membrane in Sterilization Process
N N Rupiasih, M Sumadiyasa and I K Putra
+ Open abstract View article PDF

Energy and Environmental Physics

OPEN ACCESS 012019
Study and Fabrication of Super Low-Cost Solar Cell (SLC-SC) Based on Counter Electrode from Animal's Bone
D R Fadillah, M N Fajar, A N Ain, R I Haqqiqel, P R Wirawan and Endarko
+ Open abstract View article PDF

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our [Privacy and Cookies](#) policy. 🗕

Journal of Physics: Conference Series

PAPER • OPEN ACCESS


Characterization of SnO₂ Film with Al-Zn Doping Using Sol-Gel Dip Coating Techniques

A Doyan¹, Susilawati², N Ikraman³ and M Taufik²

Published under licence by IOP Publishing Ltd

[Journal of Physics: Conference Series, Volume 1011, The International Conference on Theoretical and Applied Physics 6-8 September 2017, Yogyakarta, Indonesia](#)

Citation A Doyan et al 2018 *J. Phys.: Conf. Ser.* 1011 012015

 [Article PDF](#)

References ▾

+ [Article information](#)

Abstract

Sn_{1-2x}Al_xZn_xO₂ film has been developed using sol-gel dip coating technique. The materials SnCl₂·2H₂O, AlCl₃ and ZnCl₂ dissolved in water and ethanol with 5:95 volume ratio. Variations dopant concentration x = 0.000, 0.005, 0.0025, and 0.050. The film was grown with sol concentration 0.4 M, the withdrawal speed of 12 cm/min and sintering at 600 °C for 30 minutes. The characteristics Sn_{1-2x}Al_xZn_xO₂ films

359 Total downloads



Turn on MathJax

Share this article



Abstract

References

Related content

JOURNAL ARTICLES

[Sputter Etching of the SnO₂ Film](#)

[Preparation and Characterization of Nanostructured CuO Thin Films using Sol-gel Dip Coating](#)

[Preparation and characterization of SnO₂ films for sensing applications](#)

[Crack-Free TiO₂ Thin Film via Sol-Gel Dip Coating Method: Investigation on Molarity Effect](#)

[Sol-gel synthesis of Sr-doped SnO₂ thin films and their photocatalytic properties](#)

[Structural and optical characterisation of tin dioxide thin films by sol-gel dip coating technique](#)

PDF

Help

Journal of Physics: Conference Series

PAPER • OPEN ACCESS

Characterization of SnO₂ Film with Al-Zn Doping Using Sol-Gel Dip Coating Techniques

To cite this article: A Doyan et al 2018 *J. Phys.: Conf. Ser.* 1011 012015

View the [article online](#) for updates and enhancements.

Related content

[Sputter Etching of the SnO₂ Film](#)
Takeshi Hayashi and Hirokazu Tsukamoto

[Preparation and Characterization of Nanostructured CuO Thin Films using Sol-gel Dip Coating](#)
S S Shariffudin, S S Khalid, N M Sahat et al.

[Preparation and characterization of SnO₂ films for sensing applications](#)
P Stefanov, G Atanasova, E Manolov et al.

Recent citations

[The effect of annealing temperature thin films indium doped SnO₂ to optical properties and material composition](#)
A Doyan et al

Characterization of SnO₂ Film with Al-Zn Doping Using Sol-Gel Dip Coating Techniques

A Doyan¹, Susilawati¹, N Ikraman¹, M Taufik²

¹Magister Science, Post Graduate of Mataram University, Mataram, Indonesia

²Physics Education Mataram University, Indonesia

Email: arisdoyan@yahoo.co.id

Abstract. Sn_{1-2x}Al_xZn_xO₂ film has been developed using sol-gel dip coating technique. The materials SnCl₂·2H₂O, AlCl₃ and ZnCl₂ dissolved in water and ethanol with 5:95 volume ratio. Variations dopant concentration $x = 0.000, 0.005, 0.0025, \text{ and } 0.050$. The film was grown with sol concentration 0.4 M, the withdrawal speed of 12 cm/min and sintering at 600 °C for 30 minutes. The characteristics Sn_{1-2x}Al_xZn_xO₂ films with various doping concentration phase were characterized by XRD. The morphological characteristics and the composition of the constituent elements of the film were characterized by SEM-EDX. The characteristics of the shape, structure, and size of the particles were characterized by TEM. The XRD results show that all films have a tetragonal SnO₂ rutile phase without any secondary phase with an average particle size in the range 5.14 – 2.09 nm. The SEM results show that the film grown has a smooth morphology with a striped texture ($x = 0.00$), and there is a crack ($x = 0.050$). The EDX results show that the composition and distribution of the constituent elements of the film are uniformly distributed. TEM results show that the particle films has tetragonal rutile structure, orthorhombic and amorphous with a spherical shape.

Keywords: Tin oxide, Zinc doping, Al doping, Sol-Gel, Dip Coating

1. Introduction

The tin oxide (SnO₂) is one n-type transparent semiconductor material with a wide energy band gap (~ 3.6 eV), combines high optical transparency and low resistivity that makes this material applied to solar cells, Liquid Crystal Display and other optoelectronic devices. In addition, SnO₂ is very sensitive to the presence of surrounding gas which makes it is applied as gas sensors [1]. Due to its nature and application, the study of SnO₂ engineering is very intensive. The preparation and growth of SnO₂ film can be done with various techniques such as Chemical Vapor Deposition (CVD) [2], DC and RF Sputtering [3], Pulsed Laser Deposition [4], Chemical Bath Deposition [5], and Sol-Gel Spray Pyrolysis [6], Sol-Gel Spin Coating [7], and Sol-Gel Dip Coating [8]. Of all these methods, Sol-Gel Dip Coating is a very good technique, because it is the simplest one that can grow the film on various forms of the substrate, ease in controlling particle growth and doping, and economical addition.

The characteristics of SnO₂ films are known to be enhanced by the addition of doping. Dopants generally have larger or smaller valence electrons with Sn⁺, and have a similar ionic radius. Dopants may be of a single element such as Sb, F, Zn, Al, Mn or double-shaped elements such as Sb-F, Zn-Co, and others that depend on the application of SnO₂ itself. The SnO₂ films doped with Zn²⁺ and Al³⁺ ions are known to affect SnO₂ properties themselves, including stabilizing SnO₂ particles and changing energy band gaps, increasing optical transmittance and electrical conductivity, altering structural, increasing responsiveness, selectivity and stability in sensor gas. However, it is not yet known how the effect of these two dopants



E-mail dengan ICTAP 2017

[ICTAP]Your paper has been uploaded

Dari: ICTAP (ictap@fisika.or.id)

Kepada: arisdoyan@yahoo.co.id; susilawatihambali@yahoo.co.id; ikraman@yahoo.com

Tanggal: Selasa, 1 Agustus 2017 14.02 WITA

dear Dr. Aris Doyan,

Thank you for uploading paper entitled CHARACTERIZATION OF SNO₂ FILMS WITH Al-Zn DOPING USING SOL-GEL DIP COATING TECHNIQUE to The International Conference on Theoretical and Applied Physics (ICTAP) .

Your submission will undergo the NORMAL REVIEW PROCESS of the ICTAP

You can see all your submissions and modify your paper by login to our system at <https://conference.fisika.or.id/>.

Once again, thank you very much for your submission to the ICTAP

For more information please contact us at email:ictap@fisika.or.id

.

Regards,

The conference chairs

[ICTAP]Your Paper has been ACCEPTED WITH MINOR REVISIONS

Dari: ICTAP (no-reply@fisika.or.id)

Kepada: arisdoyan@yahoo.co.id; susilawatihambali@yahoo.co.id; ikraman@yahoo.com; ictap@fisika.or.id

Tanggal: Selasa, 31 Oktober 2017 14.11 WITA

Dear Dr. Aris Doyan,

Your paper #7-181 entitled "CHARACTERIZATION OF SNO₂ FILMS WITH Al-Zn DOPING USING SOL-GEL DIP COATING TECHNIQUE " has been subjected to a review process by our reviewers who are experts in the related fields. Based on the reviewers recommendations, I am delighted to inform you that your manuscript has been ACCEPTED WITH MINOR REVISIONS for our conference.

The Editors Comment is inserted below, and you have to login to <https://conference.fisika.or.id/> for detailed information such as reviewers comment/recomendation.

Thank you very much for submitting your article to the ICTAP. I look forward to receiving the revised version of your manuscript. **Authors must resubmit the revised full paper by November 7, 2017.** For more information please contact us at email:ictap@fisika.or.id.

--

Kind regards,

The Conference Chairs