



## Chief Editor

Muhammad Rifai, Dr.

## Editors

Kasumi Yoshida, Prof.,	Tokyo Institute of Technology, Japan
Masaki Kato, Prof.,	Doshisha University, Japan
Sabu Thomas, Prof.,	Mahatma Gandhi University, India
Hiroyuki Miyamoto, Prof.,	Doshisha University, Japan
Yose Fahmi Buys, Dr.,	University of Malaya, Malaysia
Sharul Ismail, Dr.,	Universiti Malaya Terengganu, Malaysia
Darminto, Prof.,	Institut Teknologi Sepuluh Nopember, ITS, Indonesia
Myrtha Karina Sancoyorini, Dr.,	Indonesian Institute of Sciences, Indonesia
Budhi Kurniawan, Dr.,	Universitas Indonesia, Indonesia
Sudaryanto, Dr.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Andon Insani, M.Eng., Dr.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Mujamilah, M.Sc.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Abu Khalid Rivai, M.Eng., Dr.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Adel Fisli, Dr.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Iwan Sumirat, Dr. Eng.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Wisnu Ari Adi, Dr.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Sudirman, Drs., M.Si.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia

## Assistant to Editor

Rina Rahmayanti, Dra.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Nanda Shabrina, S.Si.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Evangelin Hutamaningtyas, S.Si.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia
Ahmad Hasan Asari, S.Si.,	Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia

## Information Technology Support

Yatno, Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia

---

Publisher : Center for Science & Technology of Advanced Materials - National Nuclear Energy Agency  
Mailing Address : National Nuclear Energy Agency  
Puspiptek Serpong, Tangerang 15314, Indonesia  
Phone: +62 21-758 74261, +62 21-756 2860 ext. 4009-4010, Fax.: +62 21-756 0926, e-mail: [jusami@batan.go.id](mailto:jusami@batan.go.id)



---

INDONESIAN JOURNAL OF MATERIALS SCIENCE

Vol. 21 No. 1, October 2019

PREFACE

The development of materials science and technology plays an active role in the development of several fields of life including industry, medical, infrastructure, energy and the others. Researchers and academics are the forefront of this development and Indonesia Journal of Materials Science – JUSAMI – was founded to represent their needs, which are now widely recognized as an integral part of scientific and characterization investigations. JUSAMI Vol. 21 No. 1, October 2019 is proudly published several paper entitled: Study of Microstructural and Corrosion Properties of Aluminium Alloy 7075 after Plasma Nitriding; Growth of ZnS:Ag:Cu Thin Film Deposited on Glass Substrates using Thermal Evaporation Technique for Alpha-photovoltaic; The Effect of Ratio of Gas Mixture for Mechanical Properties and Crystal Structures on 316L Stainless Steel Biomaterial Using Dc Sputtering Technique; Calculated Radioactivity Yields of Gallium-67 using Matlab Codes; Isotherm, Thermodynamic, and Kinetics Studies of Iodide Adsorption on The Al<sub>2</sub>SBA-16 Mesoporous Nanomaterial as Radiopharmaceutical Vehicle Candidate; Microstructure of Oxide Dispersion Strengthened Steel With Cr Content Variation; and Electrochemistry Study on The Relationship Between Grain Boundary State and Corrosion Behavior of Ultrafine Grained Iron Chromium Alloy.

All papers published in this volume of JUSAMI have been peer reviewed through processes administered by the journals Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a JUSAMI.

Finally, this issue would not have been possible without the greatest support of the Editorial Board and secretariat members, and we would like to express our sincere thanks to all of them. And all the Editorial Boards conveyed the support of the writers and reviewers, so that the Indonesia Journal of Material Science could display articles on quality research and development materials that are expected to contribute to the development of materials science.

Editor in Chief

## Author Guidelines

### General Information about Indonesian Journal of Materials Science (Jusami)

#### 1. Journal scope

The topics discussed in Indonesian Journal of Materials Science are research & development results in: Material science and engineering; and Technological innovations and applications in industry based on materials such as polymers, ceramics, composites, metals or metal alloys, which are related to mechanical, magnetic, physical, dielectric or electronic properties with discussion includes: synthesis and modification and development of methods; testing and characterization; simulation and modeling; and nuclear engineering and its application in material science, etc.

#### 2. Originality and novelty

The submitted text must be: own work/not the result of plagiarism; not rewriting without updates and novelty; and shows the current status supported by an adequate library

#### 3. Systematic articles

Manuscripts must include the following parts (in order):

- **Article Title**  
Paper's title in capital letters and not more than 14 words
- **Abstract**  
ARTICLE TITLE IS REWRITTEN IN UPPERCASE. Abstract is written in English include background, methodology, the results and conclusions. The abstract should be brief and clear, not exceeding than 200 words. Do not include art work, tables, elaborate equations or references.
- **Keywords**  
maximum 5 words with the first word is the most important word.
- **Introduction**  
Manuscripts written in Indonesian or English are typed with Microsoft Word for Windows on A4 size paper with right, left, top and bottom margins 30, 20, 30 and 25 mm respectively. The text is typed with the new romance font time, the distance between lines is 1 space, consisting of 2 columns, with a maximum of 8 spaces including images, tables and attachments. The introductory section contains a brief ex-planation of the background and importance of the research problem, the current scientific status which is accompanied by a review of the latest references (literature of the last 5 years), hypothesis and research objectives accompanied by a novelty statement from this study. The reference numbers are written in sequence in square brackets, for example [1], or [2-5], or [1, 3].
- **Experimental Method**
- **Materials and Instruments**  
Includes an explanation of the material used in the study by stating the brand or origin of the material obtained, written in sentence form. For example, sodium chloride, pro analyst (Sigma-Aldrich), battery waste obtained from the Z plant. The equipment used in this paper mentioned the brand and type and its function in this experiment. For example Differential Scanning Calorimeter (DSC) Perkin Elmer Jade for thermal analysis, JEOL JEM 1400 Transmission Electron Microscope (TEM) for microstructure analysis.
- **Method and Procedure**  
Method and Procedure is in the form of sentences that describe the steps of the research conducted.
- **Results and Discussion**  
Discussion is carried out by referring to the objectives/hypotheses presented in INTRODUCTION and comparing with the results that already exist in the reference. At the end of the discussion, further research can be submitted. Tables are numbered and must be referred sequentially according to the contents of the article. Each table must be accompanied by a title and if there is a measurement result, the unit must also be written in the title section. Tables are made without vertical dividing lines. All images given numbers must be referenced in articles in sequence. Images are sent in the form of Excel files that can still be edited for graphics and in the form of bitmaps (BMP, JPEG, TIFF, GIF) for photos/images. Images in the form of bitmaps must have a resolution of more than 300 dpi, unless there is a resolution limit for scientific reasons. Labels/captions are given in separate parts of the image. Graphs are given names and units on the axis. The writing of chemical equations and or mathematical agreements is carried out by the Microsoft Equation program and is numbered with Arabic numbers according to the discussion flow. Abbreviations must be completed at the beginning of loading in the article.
- **Conclusion**  
Conclusions are written in paragraph forms without numbering or indenting.
- **Acknowledgment**  
Acknowledgments are conveyed to funders and individuals who support the implementation of research and writing.
- **References (in IEEE citation style)**  
Use Mendeley for creating list of references.

#### 4. Adequacy of data and discussion

Manuscripts must include data with provisions including:

- The amount of data presented can be considered sufficient.
- Data is presented in graph/table form and has been given sufficient information
- Data presented has been accompanied by discussion.

# JURNAL SAINS MATERI INDONESIA

## *Indonesian Journal of Materials Science*

Vol. 21, No. 1, October 2019

### Table of Contents

Preface .....	i
Abstract .....	ii
1. Haerul Ahmadi, Rizky Abdul Aziz, Suprpto Suprpto, Tjipto Sujitno, Sophie Hapsari, <i>Study of Microstructural and Corrosion Properties of Aluminium Alloy 7075 after Plasma Nitriding</i> .....	1-7
2. Emy Mulyani, Tjipto Sujitno, Dessy Purbandari, Ferdiansjah Ferdiansjah, Sayono Sayono, <i>Growth of ZnS:Ag:Cu Thin Film Deposited on Glass Substrates using Thermal Evaporation Technique for Alpha-photovoltaic</i> .....	8-12
3. Wiwien Andriyanti, Bunyamin Arsyad, Ravendianto Ravendianto, Tjipto Sujitno, Suprpto Suprpto, Dwi Priantoro, <i>The Effect of Ratio of Gas Mixture for Mechanical Properties and Crystal Structures on 316L Stainless Steel Biomaterial Using Dc Sputtering Technique</i> .....	13-20
4. Imam Kambali, <i>Calculated Radioactivity Yields of Gallium-67 using Matlab Codes</i> .....	21-26
5. Maria Christina Prihatiningsih, Sri Sundari Retnoasih, Athanasia Elra Andjioe, Noor Anis Kundari, Edy Giri Rachman Putra, <i>Isotherm, Thermodynamic, and Kinetics Studies of Iodide Adsorption on The Al_SBA-16 Mesoporous Nanomaterial as Radiopharmaceutical Vehicle Candidate</i> .....	27-34
6. Marzuki Silalahi, Bernadus Bandriyana, Arbi Dimiyati, Bambang Sugeng, Syahfandi Ahda, Fitria N, <i>Microstructure of Oxide Dispersion Strengthened Steel With Cr Content Variation</i> .....	35-39
7. Ahadi Damar Prasetya, Muhammad Rifai, Ahmad Hasan As'ari, Mujamilah Mujamilah, Hiroyuki Miyamoto, <i>Electrochemistry Study on The Relationship Between Grain Boundary State and Corrosion Behavior of Ultrafine Grained Iron Chromium Alloy</i> .....	40-46
Keyword Index .....	47
Author Index .....	48