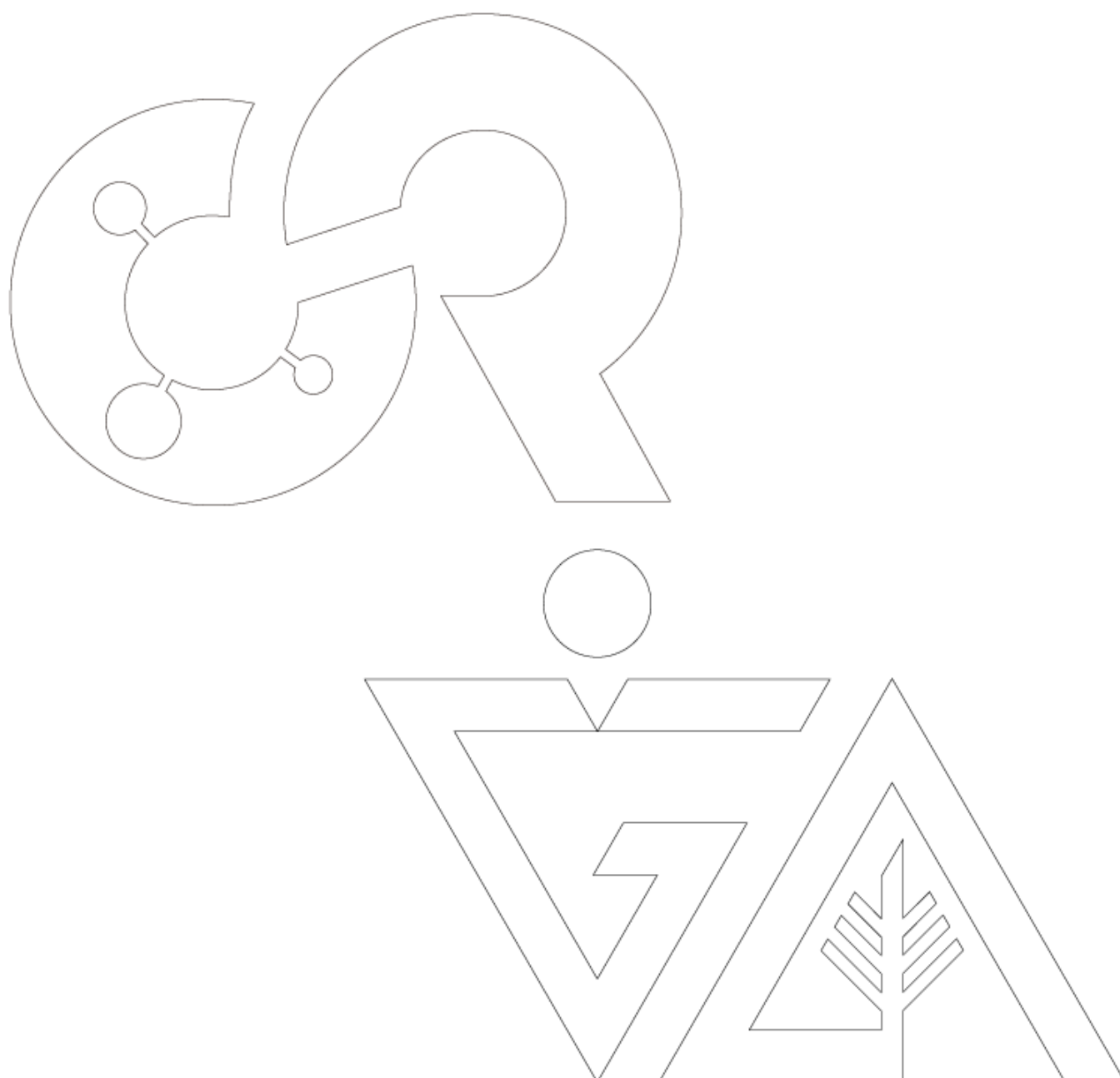

EVERGREEN

Volume.04

Issue. 01 March 2017

Joint Journal of
Novel Carbon Resource Sciences & Green Asia Strategy



Editorial Board for
Evergreen – Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy

Editor-in-Chiefs

Bidyut Baran Saha and Kyaw Thu

Editors

Hideo Nagashima, Seigi Mizuno, Kazuhide Ito and Naoko Okibe

Evergreen – Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy
Volume 4 Issue 1 (March 2017)

Published by
Green Asia Education Center, Kyushu University,
Research and Education Center of Carbon Resources, Kyushu University, and
Research and Education Center for Advanced Energy Materials, Devices, and Systems, Kyushu University
6-1 Kasuga-koen, Kasuga, Fukuoka 816-8580 Japan
Tel: +81-92-583-7934
Fax: +81-92-583-8909
Journal Website: http://www.tj.kyushu-u.ac.jp/leading/en/c_publication/evergreen.php
E-mail: evergreen@ga.kyushu-u.ac.jp

Copyright: 2017 by
Green Asia Education Center, Kyushu University,
Research and Education Center of Carbon Resources, Kyushu University, and
Research and Education Center for Advanced Energy Materials, Devices, and Systems, Kyushu University
All rights reserved.
ISSN: 2189-0420 (Print)
ISSN: 2432-5953 (Online)

Printed by
Midori Printing Co., Ltd.
6-17-12 Hakataeki-Minami, Hakata-ku, Fukuoka 812-0016 Japan
<http://www.midori-p.com/>

Evergreen

Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy

Volume 04, Issue 01, March 2017

CONTENTS

Kuniko Chihara, Masato Ito, Ayuko Kitajou, Shigeto Okada Cathode Property of $\text{Na}_2\text{C}_x\text{O}_x$ [$x = 4, 5, \text{ and } 6$] and $\text{K}_2\text{C}_6\text{O}_6$ for Sodium-ion Batteries	1
Kosuke Nakamoto, Ryo Sakamoto, Ayuko Kitajou, Masato Ito, Shigeto Okada Cathode Properties of Sodium Manganese Hexacyanoferrate in Aqueous Electrolyte	6
Md Kabiruzzaman, Rezwan Ahmed, Takeshi Nakagawa, Seigi Mizuno Investigation of $c(2 \times 2)$ Phase of Pb and Bi Coadsorption on Cu(001) by Low Energy Electron Diffraction	10
Doo-Won Kim, Hyun-Sig Kil, Koji Nakabayashi, Seong-Ho Yoon, Jin Miyawaki Improvement of Electric Conductivity of Non-graphitizable Carbon Material <i>via</i> Breaking-down and Merging of the Microdomains	16
Ahmed M.E. Khalil, Osama Eljamal, Ramadan Eljamal, Yuji Sugihara, Nobuhiro Matsunaga Treatment and Regeneration of Nano-scale Zero-valent Iron Spent in Water Remediation	21
Nik Mohd, Mohamed M. Kamra, Makoto Sueyoshi, Changhong Hu Three-dimensional Free Surface Flows Modeled by Lattice Boltzmann Method: A Comparison with Experimental Data	29
Amr M. Halawa, Basman Elhadidi, Shigeo Yoshida POD & MLSM Application on DU96-W180 Wind Turbine Airfoil	36
Takayuki Oka, Taro Handa, Fujio Akagi, Sumio Yamaguchi, Toshiyuki Aoki, Koichiro Yamabe, Yusuke Kihara Steady-state Analysis of Supersonic Mixing Enhanced by a Three-dimensional Cavity Flow	44
Mohamed M. Kamra, Changhong Hu Implementation of Unstructured Multi-dimensional THINC for Practical Multi-Phase Flow Simulations	52
Tarek N. Dief, Shigeo Yoshida System Identification and Adaptive Control of Mass-Varying Quad-Rotor	58



Editorial

Evergreen - Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy is continuing with the publication of quality-papers as a full-fledged Scientific Journal. This is the Volume 4, Issue 1 edition. As a Journal included in the SCOPUS Citation and Google Scholar Citation Indexes, Evergreen has been thriving as an excellent publication to wider scientific communities with higher impact.

Being a strong advocate for the Carbon Neutral Society, Evergreen emerged as an excellent publication for Novel Carbon Resource Sciences & Green Asia Strategy. As stated in the Asia Development Outlook 2016, Asia contributes almost two-third of the World GDB growth. However, economic growth often outpaced infrastructure and regulation development, thus creating undesirable outcomes such as pollution (air, water and soil), excessive urbanization and severe traffic congestion. It has never been the best time in realizing the economic growth and green environment in synergetic harmony. Together, we, Asian, can make it and Evergreen is part and parcel of this journey.

Ten articles from several submitted manuscripts are published in the current edition. These papers are judiciously screened through by renown international experts in the respective research fields. The articles are diverse in research area yet unified in contributing to achieving Green environment and society. This issue is excellently balanced with the articles on the latest developments in both science and engineering fields. Some highlights on the interesting papers are an investigation of the various cathode properties for Sodium-ion batteries, investigation on $c(2 \times 2)$ phase of Pb and Bi coadsorption on Cu(001) by low energy electron diffraction, and improvement of Electric Conductivity of Non-graphitizable Carbon Material via Breaking-down and Merging of the Microdomains. We also have articles on steady-state analysis of supersonic mixing enhanced by a three-dimensional cavity flow and lattice Boltzmann Method for three-dimensional free surface flows verified with experimental data. We believe these articles offer scientific insights, enjoyable reading and contribute in marching towards the Green society.

The present issue won't be realized without the contributions by the authors and our expert reviewers from all over the world who spent their precious time and most importantly their unrivalled knowledge in evaluating the manuscripts. We gratefully acknowledge the strong support and contribution by the Editorial Board members and the Editorial Office Staffs, Mr. Masayoshi Makino and Ms. Mieko Inoue, who directed a great effort from the beginning till the publication.

Bidyut Baran Saha & Kyaw Thu

Editor-in-Chiefs

Evergreen - Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy

Bidyut Baran Saha, Ph.D.

Professor and Principal Investigator

Thermal Science and Engineering Division

International Institute for Carbon-Neutral Energy Research (WPI-I²CNER)

Kyushu University

744 Motoooka, Nishi-ku, Fukuoka-shi, Fukuoka 819-0395, Japan

Tel and Fax: +81-92-802-6722

E-mail: saha.baran.bidyut.213@m.kyushu-u.ac.jp

Adjunct Professor

Kyushu University Program for Leading Graduate School, Green Asia Education Center

Kasuga-koen 6-1, Kasuga-shi, Fukuoka 816-8580, Japan

Tel: +81-92-583-7903, Fax: +81-92-583-8909

E-mail: sahabb@gmail.com

URL: http://www.cm.kyushu-u.ac.jp/dv10/Koyama_lab/pdf/Prof.Saha.pdf

http://www.cm.kyushu-u.ac.jp/dv10/Koyama_lab/pdf/Research_Interest_Prof.Saha.pdf

Kyaw Thu, Ph.D.

Associate Professor

Kyushu University Program for Leading Graduate School, Green Asia Education Center

Kasuga-koen 6-1, Kasuga-shi, Fukuoka 816-8580, Japan

Tel: +81-92-583-7903, Fax: +81-92-583-8909

E-mail: kyaw.thu.813@m.kyushu-u.ac.jp