

**BCREC**

ISSN 1978-2993

# Bulletin of Chemical Reaction Engineering & Catalysis

Volume 5, Number 2, Year 2010, 27 December 2010

An Electronic Journal. Available online at: <http://brec.undip.ac.id/>

Department of Chemical Engineering,  
DIPONEGORO UNIVERSITY

Masyarakat Katalisis Indonesia –  
Indonesian Catalyst Society (MKICS)



Bull. Chem. React. Eng. Catal.	Vol. 5	No. 2	63– 126	Semarang December 2010	ISSN 1978 -2993
-----------------------------------	--------	-------	---------	---------------------------	--------------------



## AIMS AND SCOPE

**BULLETIN OF CHEMICAL REACTION ENGINEERING and CATALYSIS (ISSN 1978-2993)**, an electronic journal, provides a forum for publishing the novel technology related to chemical reaction engineering and catalysis engineering.

Scientific articles dealing with chemical reaction engineering, catalysis engineering, catalyst characterization, novel innovation of chemical reactor, etc. are particularly welcome. The journal encompasses research articles, original research report, review articles, short communications, and scientific commentaries in chemical reaction engineering and catalysis, including: fundamental of catalysis, fundamental of chemical reaction engineering, chemistry of catalyst, applied chemical reaction engineering, applied catalysis, applied bio-catalysis, applied bio-reactor, chemical reactor design, catalyst regeneration, and industrial practice of catalysis and chemical reactor engineering.

The articles should be submitted electronically in MS Word / OpenOffice file to Editorial Office email ( [bcrec@undip.ac.id](mailto:bcrec@undip.ac.id) ) or through **Online Submission at <http://ejournal.undip.ac.id/index.php/bcrec>**. Please read the author guidelines before manuscript submission.

## ABSTRACTING & INDEXING

Bulletin of Chemical Reaction Engineering and Catalysis (BCREC) covered by following services:

- SCIRUS - for scientific information (<http://www.scirus.com/>)
- EBSCOHOST Academic Search Complete (<http://search.ebscohost.com>)
- CHEMICAL ABSTRACT SERVICES (CAS), (<http://www.cas.org>)
- GOOGLE SCHOLAR (<http://scholar.google.com>)
- EPRINTS UNDIP (<http://eprints.undip.ac.id>)
- DIRECTORY OF OPEN ACCESS JOURNAL (DOAJ) (<http://www.doaj.org>)
- GENEVA FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH ([http://www.gfmer.ch/Medical\\_journals/Biochemistry\\_chemistry\\_physics.htm](http://www.gfmer.ch/Medical_journals/Biochemistry_chemistry_physics.htm))
- DMOZ OPEN DIRECTORY PROJECT (<http://www.dmoz.org/Science/Chemistry/Publications/Journals/>)
- RESEARCHGATE - SCIENTIFIC NETWORK (<https://www.researchgate.net/application/Index.html>)
- SOCOLAR, PR China (<http://www.socolar.com>)
- NCSU LIBRARIES, (<http://www.lib.ncsu.edu/journals/browse.php?search=b&page=116>)
- ALUMNI E-LIBRARY (<http://sunzi1.lib.hku.hk/ER/detail/cof/4196022>)
- HINDU WEBSITE SEARCH - SCIENCE CHEMISTRY PUBLICATIONS JOURNALS (<http://>)

## PUBLICATION INFORMATION

### **Bulletin of Chemical Reaction Engineering and Catalysis (ISSN 1978-2993)**

Short journal title: **Bull. Chem. React. Eng. Catal.** For year 2011, Volume 6, Number 1 — 2 are scheduled for publication.

Bulletin of Chemical Reaction Engineering and Catalysis is electronically published via journal website (<http://bcrec.undip.ac.id>). The BCREC journal has been distributed by **EBSCO PUBLISHING**

(**ACADEMIC SEARCH COMPLETE—<http://search.ebscohost.com>**) started from Volume 4 Number 1 Year 2009 to present.

The BCREC journal is published by Department of Chemical Engineering, Diponegoro University, and Masyarakat Katalis Indonesia—Indonesian Catalyst Society (MKICS)

Commencement of publication: January 2006



## EDITORIAL BOARD

### Editor in Chief:

**Dr. Istadi**

Department of Chemical Engineering, Diponegoro University, Jln. Prof. Sudharto, Kampus UNDIP Tembalang, Semarang, Central Java, INDONESIA 50239; E-mail: bcrec@undip.ac.id

### Editorial Member:

**Prof. Dr. Purwanto**, Department of Chemical Engineering, Diponegoro University, Jln. Prof. Sudharto, Kampus UNDIP Tembalang, Semarang, INDONESIA 50239, E-mail: purwanto@undip.ac.id

**Dr. Didi Dwi Anggoro**, Department of Chemical Engineering, Diponegoro University, Jln. Prof. Sudharto, Kampus UNDIP Tembalang, Semarang, INDONESIA 50239, E-mail: anggoro\_phd@yahoo.com

**Dr. Mohammad Djaeni**, Department of Chemical Engineering, Diponegoro University, Jln. Prof. Sudharto, Kampus UNDIP Tembalang, Semarang, Central Java, INDONESIA 50239, E-mail: mzaini98@yahoo.com

## ADVISORY INTERNATIONAL EDITORIAL BOARDS

### **Prof. Dr. Mostafa Barigou**

School of Chemical Engineering, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom, Tel: +44 (0) 121 414 5277, Fax: +44 (0) 121 414 5324, Email: m.barigou@bham.ac.uk

### **Prof. Dr. Raghunath V. Chaudhari**

Center for Environmental Beneficial Catalysis, Department of Chemical and Petroleum Engineering, The University of Kansas, 1501 Wakarusa Dr., Building B-Room 112B, Lawrence, KS 66047 -1803, USA, Phone: 785 864 1634; Fax: 785 864 6051

### **Prof. Dr. Dmitry Yu. Murzin**

Laboratory of Industrial Chemistry and Reaction Engineering, Abo Akademi University, Biskopsgatan 8, 20500, Turku/Åbo, Finland, ph: + 358 2 215 4985 fax:+ 358 2 215 4479, e-mail: dmurzin[at]abo.fi

### **Dr. Yibo Zhou**

2351 Gilman Hall, Department of Chemistry, Iowa State University, USA, Phone: 1-515-294-6986, Email: yibozhou[at]iastate.edu

### **Assoc. Prof. Dr. Sibudjing Kawi**

Department of Chemical and Biochemical Engineering, National University of Singapore, Singapore, E-mail: chekawis@nus.edu.sg

### **Prof. Dr. Ram Prasad**

Department of Chemical Engineering and Technology, Institute of Technology, Banaras Hindu University, India, E-mail: rprasad.che[at]itbhu.ac.in

### **Assoc. Prof. Dr. Subagio**

Department of Chemical Engineering, Institut Teknologi Bandung, Jl. Ganesha 10, Bandung, Indonesia, E-mail: subagio@che.itb.ac.id

### **Assoc. Prof. Dr. Abdullah**

Department of Chemical Engineering, Diponegoro University, Semarang, Indonesia, E-mail: abd\_busairi@yahoo.com

### **Prof. Dr. Nor Aishah Saidina Amin**

Chemical Reaction Engineering Group (CREG), Faculty of Chemical and Natural Resources Engineering, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia, E-mail: profnoraishah@yahoo.com

### **Assoc. Prof. Dr. Y. H. Taufiq-Yap**

Putra Centre for Catalysis Science and Technology, Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia, E-mail: yap@fsas.upm.edu.my

### **Prof. Dr. Hadi Nur**

Ibnu Sina Institute for Fundamental Science Studies, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia, E-mail: hadi@kimia.fs.utm.my

### **Prof. Dr. Abdul Rahman Mohamed**

School of Chemical Engineering, Universiti Sains, Malaysia, 14300 Nibong Tebal, Pulau Penang, Malaysia, E-mail: chrahman@eng.usm.my

### **Dr. Hery Haerudin**

Research Center for Chemistry, Indonesian Institute Of Sciences (PP Kimia – LIPI), Kawasan PUSPIPTEK, Tangerang, Banten, Indonesia; E-mail: h.haerudin@katalisis.org ; h\_haerudin@yahoo.com

### **Dr. Yang Hong**

Dalian Institute of Chemical Physics, Chinese Academy of Sciences, 457 Zhongshan Road, Dalian 116023, China E-mail: yanghong@dicp.ac.cn

### **Dr. Oki Muraza**

CENT & Department of Chemical Engineering, King Fahd University of Petroleum and Minerals (KFUPM), PO Box 5040 Dhahran 31261 KSA, Saudi Arabia E-mail: omuraza@kfupm.edu.sa



## PREFACE

**BULLETIN OF CHEMICAL REACTION ENGINEERING & CATALYSIS (BCREC)**, Volume 5, Number 2, Year 2010 is an electronic journal as a media for communicating all research activities in Chemical Reaction Engineering and Catalysis fields, and disseminating the novel technology and news related to chemical reaction engineering, catalyst engineering and science, and catalytic reactor engineering.

In this issue, articles related to: Mesoporous Silica from Rice Husk ; A Review on Diesel Soot Emission, its Effect and Control; Optimal Geometric Configuration for Power Consumption in Baffled Surface Aeration Tanks; Isothermal Kinetics of Catalyzed Air Oxidation of Diesel Soot; Optimization of Reactor Temperature and Catalyst Weight for Plastic Cracking to Fuels Using Response Surface; Catalytic Hydrogenation of Acetone to Isopropanol: An Environmentally Benign Approach are highlighted.

The BCREC journal is an online electronic journal. Visitors can read and download any full-text articles for free of charge. The research articles submitted to the BCREC journal will be peer-reviewed by at least two reviewers. Accepted research articles will be available online (free download) following the journal peer-reviewing process. Language used in this bulletin is English or Indonesian, but English is preferable. Website address of BCREC journal is: <http://bcrec.undip.ac.id>, while website address for Online Submission is: <http://ejournal.undip.ac.id/index.php/bcrec>.

Editor would like to appreciate all researchers, academicians, industrial practitioners focused on chemical reaction engineering and catalysis to contribute to this online journal. This journal is also expected to be a reputable international journal.

The BCREC journal has been distributed by **EBSCO PUBLISHING (ACADEMIC SEARCH COMPLETE—<http://search.ebscohost.com>)** started from Volume 4 Number 1 Year 2009 to present.

**Dr. Istadi (Editor-in-Chief)**

Chemical Reaction Engineering & Catalysis, Department of Chemical Engineering, Diponegoro University  
E-mail: [bcrec@undip.ac.id](mailto:bcrec@undip.ac.id)



## TABLE OF CONTENTS

1. Aims and Scope .....	(i)
2. Indexing and Abstracting .....	(i)
3. Editorial Board .....	(ii)
4. Preface .....	(iii)
5. Table of Content .....	(iv)
6. Mesoporous Silica from Rice Husk Ash ( <i>V.R. Shelke, S.S. Bhagade, and S.A. Mandavgane</i> ) ...	(63 - 67)
7. A Review on Diesel Soot Emission, its Effect and Control ( <i>R. Prasad, Venkateswara Rao Bella</i> )	(69 - 86)
8. Optimal Geometric Configuration for Power Consumption in Baffled Surface Aeration Tanks ( <i>Bimlesh Kumar, Thiyam Tamphasana Devi, Ajey Kumar Patel, Ankit Bhatla</i> ) .....	(87 - 93)
9. Isothermal Kinetics of Catalyzed Air Oxidation of Diesel Soot ( <i>R. Prasad, and Venkateswara Rao Bella</i> ) .....	(95 - 101)
10. Optimization of Reactor Temperature and Catalyst Weight for Plastic Cracking to Fuels Using Response Surface Methodology ( <i>I. Istadi, S. Suherman, and Luqman Buchori</i> ) .....	(103 - 111)
11. Catalytic Hydrogenation of Acetone to Isopropanol: An Environmentally Benign Approach ( <i>Ateeq Rahman</i> ) .....	(113 - 126)
12. Author Guidelines .....	(127 - 129)
13. Copyright Transfer Agreement .....	(130 - 131)
14. Submission Information	