

# HIGH TEMPERATURE MATERIALS AND PROCESSES

**EDITOR-IN-CHIEF**

*Hiroyuki Fukuyama, Sendai*

**EDITORIAL ADVISOR**

*Yoshio Waseda, Sendai*

**ASSOCIATE EDITOR FOR EUROPE**

*Hans-J. Fecht, Ulm*

**ASSOCIATE EDITOR FOR AMERICA**

*Ramana Reddy, Alabama*

**EDITORIAL BOARD**

*Michel Baron, Carmaux*

*Michal Besterci, Kosice*

*Alexandra V. Byakova, Kiev*

*Wei Gao, Auckland*

*Andreas Glaeser, Berkeley*

*Zbigniew Grzesik, Krakow*

*Jeff De Hosson, Groningen*

*Kallarackel T. Jacob, Bangalore*

*Georges Kipouros, Nova Scotia*

*Fedor A. Kuznezov, Novosibirsk*

*Indranil Manna, Kharagpur*

*Hideo Nakajima, Osaka*

*Takashi Nakamura, Sendai*

*Toru Okabe, Tokyo*

*Oleg Ostrovski, Sydney*

*Koulis Pericleous, Greenwich*

*Seshadri Seetharaman, Stockholm*

*Boris Straumal, Moscow*

*Shigeru Suzuki, Sendai*

*Toshihiro Tanaka, Osaka*

*Peter Terzieff, Vienna*

*Satoshi Uda, Sendai*

*Knut Urban, Juelich*

**DE GRUYTER**

**ABSTRACTED/INDEXED IN** Chemical Abstracts, Index Copernicus, current Contents (diverse) / Current Contents Connect, Journal Citation Reports / Science Edition, SciSearch (Science Citation Index Expanded)

The publisher, together with the authors and editors, has taken great pains to ensure that all information presented in this work (programs, applications, amounts, dosages, etc.) reflects the standard of knowledge at the time of publication. Despite careful manuscript preparation and proof correction, errors can nevertheless occur. Authors, editors and publisher disclaim all responsibility for any errors or omissions or liability for the results obtained from use of the information, or parts thereof, contained in this work.

The citation of registered names, trade names, trademarks, etc. in this work does not imply, even in the absence of a specific statement, that such names are exempt from laws and regulations protecting trademarks etc. and therefore free for general use.

ISSN 0334-6455 · e-ISSN 2191-0324

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at [www.degruyter.com/htmlp](http://www.degruyter.com/htmlp)

**RESPONSIBLE EDITOR(S)**

Prof. H. Fukuyama, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; Email: [fukuyama@tagen.tohoku.ac.jp](mailto:fukuyama@tagen.tohoku.ac.jp), Prof. Y. Waseda, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan, Email: [waseda@tagen.tohoku.ac.jp](mailto:waseda@tagen.tohoku.ac.jp)

**JOURNAL MANAGER** Claudia Hill, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany. Tel.: +49 (0)30 260 05-172, Fax: +49 (0)30 260 05-250, Email: [claudia.hill@degruyter.com](mailto:claudia.hill@degruyter.com)

**RESPONSIBLE FOR ADVERTISEMENTS** Panagiota Herbrand, De Gruyter, Rosenheimer Straße 143, 81671 München, Germany, Tel.: +49 (0)89 769 02 – 394, Fax: +49 (0)89 769 02 – 350, Email: [panagiota.herbrand@degruyter.com](mailto:panagiota.herbrand@degruyter.com)

© 2014 Walter de Gruyter, Berlin/Boston

**TYPESETTING** Asco Typesetters, Hong Kong

**PRINTING** Franz X. Stückle Druck und Verlag e.K., Ettenheim  
Printed in Germany

Cover Illustration: [AbleStock.com/Thinkstock](http://AbleStock.com/Thinkstock)



## Contents

Atanu Saha, H. Roy and A.K. Shukla

**Failure of a Pendent Reheater Tube in a 110 MW Thermal Power Plant — 299**

Jie Dang, Guo-Hua Zhang and Kuo-Chih Chou

**Phase Transitions and Morphology Evolutions during Hydrogen Reduction of  $\text{MoO}_3$  to  $\text{MoO}_2$  — 305**

G. Wei, M. Hasegawa, M. Ichinose, S. Miyata, N. Yokozeki, M. Myouchin and M. Iwase

**Iso-thermal Section of the Phase Diagram of the System  $\text{Na}_2\text{MoO}_4$ - $\text{MoO}_3$ - $\text{La}_2\text{O}_3$  at 1073 K — 313**

Jun-Hao Liu, Guo-Hua Zhang and Kuo-Chih Chou

**Reaction Kinetics of  $\text{Fe}_2\text{O}_3$  and  $\text{BaCO}_3$  to Prepare  $\text{Ba}_2\text{Fe}_2\text{O}_5$  — 319**

Zaoyuan Li, Yan Wang, Xiaowei Cheng and Xiaoyang Guo

**The Slag Influence on High Temperature Resistance of Aluminophosphate Cement for Heavy Oil Thermal Recovery — 325**

Juraj Blach and Ladislav Falat

**The Influence of Thermal Exposure and Hydrogen Charging on the Notch Tensile Properties and Fracture Behaviour of Dissimilar T91/TP316H Weldments — 329**

Yuhui Wang, Jun Zhao, Jianhua Liu and Ruijun Zhang  
**Effect of High Pressure Heat Treatment on Microstructures and Micro-mechanical Properties of CuZn Alloy — 339**

J.R. Dankwah and P. Koshy

**Effect of HDPE Addition on the Pre-reduction of  $\text{Mn}_3\text{O}_4$  to MnO by Metallurgical Coke — 345**

Yun Yao, Gang Xie, Ning Song, Yanqing Hou, Xiaohua Yu and Rongxing Li

**Thermodynamics of  $\text{CuInO}_2$  Preparation by Cation Exchange Reaction — 355**

Halvor Dalaker and Merete Tangstad

**The Interactions of Carbon and Nitrogen in Liquid Silicon — 363**

Mingliang Wang, Peipeng Jin and Jinhui Wang  
**Hot Deformation and Processing Maps of 7005 Aluminum Alloy — 369**

Xuyang Liu, Meilong Hu, Chenguang Bai and Xuewei Lv  
**Direct Electro-deoxidation of Ilmenite Concentrate to Prepare FeTi Alloy in  $\text{CaCl}_2$  Molten Salt — 377**