

# **5th Annual International Conference on Material Engineering and Application (ICMEA 2018)**

IOP Conference Series: Materials Science and Engineering  
Volume 484

Wuhan, China  
14 - 16 December 2018

## **Editors:**

**Tarek Aly Elsayed  
Arnulfo Luevanos Rojas  
Ke Wang**

ISBN: 978-1-5108-8481-6  
ISSN: 1757-8981

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

This work is licensed under a Creative Commons Attribution 3.0 International Licence. Licence details:  
<http://creativecommons.org/licenses/by/3.0/>.

Printed by Curran Associates, Inc. (2019)

For permission requests, please contact the Institute of Physics  
at the address below.

Institute of Physics  
Dirac House, Temple Back  
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481  
Fax: 44 1 17 920 0979

[techtracking@iop.org](mailto:techtracking@iop.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# Table of contents

## Volume 484

**The 5th Annual International Conference on Material Engineering and Application (ICMEA 2018)**

**14–16 December 2018, Wuhan, China**

**Accepted papers received: 7 January 2019 Published online: 19 March 2019**

### **Preface**

[The 5<sup>th</sup> Annual International Conference on Material Engineering and Application](#)

[Committees of ICMEA 2018](#)

[Peer review statement](#)

### **Papers**

[Effects of Electrochemical Etching Conditions on the Formation and Photoluminescence Properties of P-Type Porous Silicon](#)

Le Lu, Wenbing Li, Liqiang Zhang and Daohan Ge.....1

[Effect of Yogurt on Gastrointestinal Motility of Dyspepsia Mice](#)

Xiaobing Li, Fajun Li, Weiwen Zhang, Shiping Shen, Lining Wang, Huan Zhang, Mengyuan Ding, Huanhuan Chen and Mingming Huang.....6

[Viscosity and Free Surface Energy as Parameters Describing the Adhesion of the Epoxy Resin to the Substrate](#)

AS Zewczak and MS Zelag.....12

[Influence of Neutralization on Hydration of Hemihydrate Phosphogypsum Plaster](#)

Xuemei Chen and Jianming Gao.....18

[Carbon Nano-Onions Embedded CuO Nanosheets: An Excellent Stable Anode Material for Lithium Ion Battery](#)

Zhongjing Hao, Meng Qin, Yueming Li, Xiaoju Lv, Dafeng Zhang and Qiushi Wang.....23

[Size-Tunable Mesoporous Silica for Macromolecular Drug Delivery](#)

Yiyu Wang, Chunqing Niu, Jiamin Gu, Chao Hu, Youning Wang and Junhua Zhang.....29

[The Effect of Cone Additional Permanent Magnet Thickness on Magnetic Field Distribution and the Levitation Force of Single Domain GdBCO Bulk Superconductor](#)

Jun Ma, Yongjie Zhou, Jinglin Li, Bohang Chen and Weiqiang Fang.....36

[Rice Straw/Sewage Sludge-Based Composite Activated Carbon: Its Some Basic Properties and Adsorption Effect for Cr \(VI\)](#)

Liangqian Fan, Xianda Wang, Wenxin Wan, Qin Liu, Jie Cai and Yan Wan.....42

[The Low Molecular Weight Organic Acids in Root Exudates of \*Leersia hexandra\* Swartz and Its Role in Mobilization of Insoluble Chromium](#)

Chancui Wu, Jie Liu, Ying Liang, Yongrong Jiang and Xuehong Zhang.....47

[Preparation of Catalyst by Phosphating Slag and Its Photocatalytic Performance on Rhodamine B and Methyl Orange](#)

Weilin Guo, Lijun Wang, Lingxue Kong, Yongmin Qiao and Suna Zhang.....55

[Effect of Dietary Carbohydrate/Protein Ratios and Feeding Frequency on Carbohydrate Metabolism of Common Carp](#)

Zhenyan Cheng, Anqi Wang, Ze Fan, Jinhui Sun, Pei Cui and Xiuting Qiao.....62

[Experiment and Mechanism Analysis of Selective Non-Catalytic Reduction with the Compound Reducing Agents in a Lab-scale CFB Reactor](#)

Jiancong Dong, Degui Bi, Tuo Zhou, Juan Yu, Xiaojiang Wu and Zhongxiao Zhang.....72

[Study on Preparation of Activated Carbon from Sludge](#)

Mingming Du, Tao Yu, Feifei Wang and Chengtun Qu.....78

[Investigation of Hybrid Natural Fibre Reinforced Composite for Impact Energy Absorption](#)

Yiou Shen, Yichun Guo and Yan Li.....83

[Dependencies between Cracking Patterns and the Physico-Mechanical Properties of Microsilica Modified Cement Matrix](#)

M Szeląg and A Szewczak.....90

[Research on New Materials in Civil and Construction Engineering](#)

Peng Jiang and Junhai Hu.....96

[Chip Deformation Mechanism during Drilling of Nickel-based Superalloy FGH97](#)

Yang Qiao, Peiquan Guo, Hongtang Chen, Shouren Wang and Hui Wang.....99

[Temperature Effect on Dislocation Slip Mechanism of Nanotwinned Mg with Void Defect at the Twin Boundary](#)

Kaixin Huang, Junping Yao, Qiyao Hu, Letian Shao and Zhong Sun.....103

[Experimental Study on Preparation and Mechanical Properties of CF Knitted Fabric Composites for Nut Lining](#)

Bin Zhao, Zhipei Tong, Qiang Zhang, Peng Zhang, Yongqi Cheng and Yousong Sun.....107

[Mode I Elastic Solution of Cracked Composite Plate](#)

Yongyong Suo, Purong Jia, Qiang Wang and Leilei Zeng.....113

[The Price Linkage between Oil, Gold, Stock and Exchange Rate Based on Vine Copula](#)

Huan Sun.....119

[Experimental Investigation of NO<sub>x</sub> Reduction by Urea Solution Injection in Fuel-rich Zone of Coal Combustion](#)

Degui Bi, Zhongxiao Zhang, Zhixiang Zhu, Jiancong Dong and Tuo Zhou.....126

[Experimental Research on NO<sub>x</sub> Emission Characteristics During Coal Combustion in the Stoker-fired Boiler](#)

Xinwei Guo, Zhongxiao Zhang, Juan Yu, Jian Zhang, Degui Bi, Jiancong Dong, Hao Bai and Junjie Fan.....132

[Analysis on Characteristics of Structural Impact Response of Airborne Armored Vehicle in Landing Process](#)

Xinhua Fu.....140

[Investigation on Fusion Bridge of Au Electrical Contacts Material under Different Voltage](#)

Jiheng Fang, Di Wu, Jinghong Chen, Xi Liu, Ming Xie, Song Chen, Jieqiong Hu, Yongtai Chen, Youcai Yang, Hongwei Ma, Jiming Zhang and Manmen Liu.....147

[Numerical Analysis of Influencing Factors and Capability for Line Laser Scanning Thermography Nondestructive Testing Technology in Chemicals Corrosion Defect Detection](#)

Zhengwei Yang, Xingyu Xie, Yin Li and Gan Tian.....155

[The Research and Application of Industrial Robot in Steel Deep Processing Field](#)

Xiaodong Hao, Yan Bian, Lu Bai, Lihua Li and Changjie Sun.....160

[The Relationship between Morphology of Milling Surface and Its Corrosion Resistance for Nickel base Superalloy FGH97](#)

Jinping Shi, Peiquan Guo, Yang Qiao, Shouren Wang and Tonghui Liu.....164

[Stress and Strain of Cracked Orthotropic Sheet](#)

Purong Jia, Gang Wang, Long Zhang and Yongyong Suo.....170

[A Simple and High-performance Platform for Refractive Index Sensing based on Plasmonic Metal Disks on a Metal Mirror](#)

Xianchao Liu, Rui Ma, Duncan Sutherland and Jun Wang.....176

[Application of Lanthanum Oxide and Cerium Oxide in E4303 Electrode](#)

Enhui Li, Nengwei Wang and Shuquan Wan.....181

[Delaunay-Based Aircraft Engine Casing Strain Reconstruction and Data Processing](#)

Kun Wang and Kejia Liu.....188

[Mechanical Property of Roof Plate Based on Engineered Cementitious Composites](#)

Yuxin Gao, Rui Shen, Shuo Wang, Xinyi Yan, Baojun Cheng, Yanning Kong, Yao Bi and Jun Wang.....193

[Effect of Pinellia Ageratum Decoction on Cisplatin-induced Vomiting and Its Mechanism](#)

Xiaobing Li, Shu Wang, Wenjing Chen, Mengting Zhao, Xueqing Kong, Xiaoyu He, Yan Chen, Wenyu Chen, Tong Wu, Chunlei Xu, Jun Huang and Shuanzhu Song.....199

[Distributed Optical Fiber Micro-vibration Sensing for Broken Fabric Bag Inspection in a Baghouse Filtration System](#)

Bo Shi, Jun Li, Xu'an Liu, Yuquan Tang, Tao Pang and Fengzhong Dong.....205

[The Development and Improvement of the Coal Chemical Circular Economy System in China: a Case Study](#)

Shuo Yang, Yun Fu, Wanying Zhao, Lili Wu and Jianfei Wang.....210

[Operation Performance Evaluation of Municipal Wastewater Treatment Plant by Analytic Hierarchy Process](#)

Xiaoxin Zhang, Jin Huang, Ling Lin, Yueping Wang and Xinheng Zhang.....220

[Technical Assessment of Industrial Solid Waste Recycling Process Based on the Willingness-to-Pay LCIA Model](#)

Huiting Guo, Shuo Yang, Xiuteng Wang and Jing Liu.....230

[Response of the Plant and Soil Features to Degradation Grades in Semi-arid Grassland of the Inner Mongolia, China](#)

Xia Xu, Honglei Jiang, Xiaoyu Tian, Mengxi Guan and Lingfei Wang.....244

[Study on Extreme Microbial Degradation of Petroleum Hydrocarbons](#)

Hong Li, Xiaokang Li, Tao Yu, Feifei Wang and Chengtun Qu.....251

[Synthesis and Degradation Properties of Heat-resistant Polymer based on Cyclotriphosphazene](#)

Yani Guo, Liyun Liang and Chengmei Liu.....256

[Development of Small Intestinal Submucosa as Biomaterial in Tissue Engineering](#)

Yu Wang, Peng Chen and Jianbo Qin.....261

[Polyurea Materials and Their Environmental Applications](#)

Xiaoqing Dong, Xubao Jiang, Shusheng Li and Xiang Zheng Kong.....266



[Co<sub>1-x</sub>Zn<sub>x</sub>In<sub>2</sub>S<sub>4</sub> Photocatalysts for Photocatalytic H<sub>2</sub> Production Activity](#)

Renzhang Wang, Zhiyun Liang, Fuying Li, Qiyou Wu, Peijing Xu and Yu Niu.....272

[Electrodeposition of PPy/HNO<sub>3</sub> Film and its Capacitive Behaviour](#)

Yong Chen, Xia Zhang, Juan Juan Li and Hui Xu.....276

[Market-Oriented Operation Pattern of Regional Power Network Integrated With High Penetration Level of Distributed Energy Resources](#)

Qing Duan, Jian Le, Xi Ye, Zhipeng Lv and Qian Zhou.....281

[Investigation Aging Behavior of High Energy Propellant Materials](#)

Gu Yan, Wenliang Liu, Qiong Wang, Jiaojiao Du, Fangfang Wang and Silong Yu.....292

[Development of Environment-Friendly Plastering Gypsum](#)

Xingyu Wang, Shuling Sun, Xiaohua Tian, Dongji Liu and Fengqing Zhao.....298

[Impact of Riverine Pollutants on the Water Quality of Lake Chaohu, China](#)

Wang Zhang, Kun Lei, Libiao Yang and Xubo Lv.....303

[Research Progress in Water Quality Improvement](#)

Changxin Cai, Canjun Liu and Baohui Men.....312

[A Study on the Application of Green Design Theory in Environmental Art Design](#)

Kun Bai.....317

[An AHP-Bayesian Model for Operational Risk Evaluation of Integrated Energy Systems](#)

Yongqi Yang, Wanlei Xue, Chaoyuan Li, Xin Zhao and Nan Xu.....322

[Short-time Transport Stress Affected Biochemical Parameters in \*Takifugu Rubripes\*](#)

Qingkui Wang, Lixiao Yang, Kezhi Xing, Xueliang Sun and Jinsheng Sun.....329

[Microbiostatic and Synergistic Actions of Extract of Green Walnut Peel](#)

Li Yang, Gu Yao, Rusi Wen and Lizhu Zhou.....338

[The Development and Application of the "DALY"-Based Environmental Risk Assessment Methods with a Case Study on the Impact of PM2.5 in Beijing](#)

Shuo Yang, Xiuteng Wang, Huiting Guo, Jing Liu and Jianfei Wang.....344

[Study on Environmental Risk Assessment and Management Methods for the Recycle of Industrial Solid Waste](#)

Shuo Yang, Huiting Guo and Xiuteng Wang.....353

[Antialgal Activity of Glycoglycerolipids Derived from a Green Macroalgae \*Ulva prolifera\* on Six Species of Red Tide Microalgae](#)

Yingying Sun, Shasha Dong, Ganlin Guo, Lei Guo and Yinfang Pu.....364

[Analysis of Iron and Manganese Release Effect in Drinking Water Systems from a New Perspective](#)

Huiyan Tong and Zhongyue Li.....371

[Study on the Existence Form and Removal of Boron Acid](#)

Rongrong He, Tao Yu, Jiajia Du and Chengtun Qu.....377

[A Review of the Mechanism of Microbial Degradation of Petroleum Pollution](#)

Xiaokang Li, Hong Li and Chengtun Qu.....382

Brief Analysis of Seasonal Correlations in the Power Generation Data of Photovoltaic Power Stations

Weihaoyu.....386