

6th Annual International Conference on Material Engineering and Application (ICMEA 2019)

IOP Conference Series: Materials Science and Engineering
Volume 730

Guangzhou, China
20 - 21 December 2019

ISBN: 978-1-7138-2589-0
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/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2021)

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

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
Web: www.proceedings.com

TABLE OF CONTENTS

MATERIAL ENGINEERING

A STUDY ON PHYSICAL AND CHEMICAL PROPERTIES OF DETONATION NANODIAMOND	1
<i>Shengzhong Xie, Lingzhi Ma, Weiping Zeng, Peng Gao, Xuezhong Liu</i>	
PREPARATION OF TIC BASED CERMET WITH DIFFERENT RATIO OF CU AND AL.....	7
<i>Nengwei Wang, Shuquan Wan</i>	
EFFECT OF HEAT INPUT PARAMETERS ON MOLTEN POOL SIZE DURING SELECTIVE LASER MELTING OF TI-6AL-4V POWDER THROUGH NUMERICAL SIMULATION	14
<i>Liang Zhang, Kaiqi Wu, Qiyun Yang, Xiaoqing Ni, Tao Wang, Wenheng Wu, Lin Lu</i>	
MECHANISM OF LOW CYCLE FATIGUE DAMAGE FOR NICKEL-BASED POWDER SUPERALLOY	20
<i>Zhe Liu, Gaofeng Tian, Hao Fu, Zhen Ji, Shanwu Yang, Chengchang Jia</i>	
DEVELOPMENT OF A STABLE CARBON ISOTOPES ANALYSIS INSTRUMENT BASED ON TUNABLE DIODE LASER ABSORPTION SPECTROSCOPY.....	27
<i>Xiaojuan Cui, Zhirong Zhang, Tao Pang, Hua Xia, Pengshuai Sun, Bian Wu, Runqing Yu</i>	
THE HOT DEFORMATION BEHAVIOUR OF ANTIBACTERIAL TI-10WT.%CUSINTERED ALLOY	33
<i>Liqiu Shi, Chun Xiang, Feng Yu, Zhihong Li</i>	
THERMAL CONDUCTIVITY AND SOUND ABSORPTION PROPERTIES OF CARBON NANOTUBE / FOAM ALUMINUM COMPOSITES	38
<i>Zhe Liu, Mingying Chen, Junjiao Han, Zhaoyang Lang, Xiaoqin Yan, Yousong Gu, Zhe Ji, Chengchang Jia</i>	

MATERIAL ENGINEERING AND APPLICATION

ANALYSIS OF THE APPLICATION OF LASER WELDING TECHNOLOGY ON MAINTENANCE OF THE UNDERWATER COMPONENTS OF NUCLEAR POWER STATION.....	45
<i>Zhiqiang Sun, Shaohua Yin, Zhongbing Chen, Jianlin Zhang, Jianlu Shang, Yishi Lv</i>	
STUDY ON ELECTRICAL CHARACTERISTICS OF TITANIUM DIBORIDE POWDER APPLIED IN POWER FIELD	54
<i>Yu Zhu, Yongxing Wang, Enyuan Dong, Mingjie Li, Chao Sun, Hongchuan Chu</i>	
SYNTHESIS AND CHARACTERIZATION OF BIOBR MICROSTRUCTURES VIA FREE SURFACTANT SOLVOTHERMAL ROUTE	60
<i>Yuqin Mao, Luping Zhu, Kaixiang Liu, Qiang Chen, Yongjin Zou, Xinying Shen, Guihong Liao</i>	
STUDY ON THE EFFECT OF GALACTO-OLIGOSACCHARIDE (GOS) IN RELIEVING CONSTIPATION AND DEFECATING FECES EXCRETION	65
<i>Jin Wang, Ping-Ju Tsai, Pei-Hsuan Chen, Manxiang Ye, Hua Cao, Jiao Guo, Zhengquan Su</i>	

PREPARATION OF PBS AND CaCO ₃ COMPOSITE DEGRADABLE MATERIALS BASED ON MELT BLENDING	70
<i>Ligui Xiong, Zhigang Tu, Shangxian Zhang, Xiaoyuan Liu, Xingni Peng</i>	
ANALYSIS OF T23 STEEL WELD-JOINT ON THE STRESS RELAXATION CRACK AT MEDIUM TEMPERATURE	75
<i>Zhiqiang Sun, Yuwei Wang, Zhongbing Chen, Yu Zhang, Yongsan Ding, Hongbin Zhu, Shaohua Yin</i>	
CAUSE ANALYSIS OF TYPE IV CRACKING OF MAIN STEAM PIPE OF ULTRA SUPERCRITICAL UNIT	86
<i>Yao Xu, Shaohua Yin, Chunpo Tang, Long Zhou</i>	
CURRENT STATUS AND PROSPECTS OF UNDERWATER WELDING TECHNOLOGY FOR KEY SENSITIVE EQUIPMENT IN NUCLEAR POWER PLANTS	94
<i>Shaohua Yin, Zhiqiang Sun, Zhongbing Chen, Jianlin Zhang, Jianlu Shang, Yishi Lv, Maotao Huang</i>	
FIRST-PRINCIPLES INVESTIGATION OF β -TITANIUM DOPING WITH TRACE TRANSITION METAL ELEMENTS.....	101
<i>Jia Song, Luyu Wang, Kaiqi Wu, Wenheng Wu, Liang Zhang</i>	
A GENETIC ALGORITHM FOR ECONOMIC ORDER QUANTITY WITH A SHORT PRODUCT LIFE CYCLE.....	107
<i>Bing Chang Ouyang</i>	
STRUCTURAL RESPONSE ANALYSIS OF NONLINEAR PAVEMENT BASED ON GRANULAR MATERIAL	113
<i>Longwei Zhang, Chunlei Wang, Xupeng Dong, Xiaochun Zhang</i>	
RESEARCH ON DAMPING CHARACTERISTICS OF PHOTO-CONTROLLED ELECTORRHEOLOGICAL DAMPER	123
<i>Xiang Liu, Yusong Chen, Xinjie Wang</i>	
FRACTURE ANALYSIS OF THE CHAIN PIN SHAFT OF AN ESCALATOR LADDER.....	131
<i>Chenghong Peng, Weiheng Zhu, Ling Chen, Xiaoke Zhu, Zhiling Chen</i>	
CONSTRUCTION AND APPLICATION OF HEIGHT CONTROL MODEL OF URBAN BUILDING BASED ON GIS: TAKING GUANYUN COUNTY AS AN EXAMPLE	138
<i>Lei Zhang, Lin Yao, Xiaohua Chen</i>	
STUDY ON TEMPERATURE RECOGNITION OF THERMAL PAINT BASED ON COLOR CAMERA.....	148
<i>Ziqiang Hu, Ningfang Liao</i>	
A PRELIMINARY STUDY ON HAKKA CHARACTERISTIC SOUP PLANT RESOURCES IN EASTERN GUANGDONG	154
<i>Qihe Yang, Lubing Li, Hesheng Yang, Lihui Mou, Wei Kuang</i>	
PREPARATION OF MnO ₂ /ATTAPULGITE COMPOSITES FOR ADSORPTION OF Ni(II).....	169
<i>Jianli Zhang, Yuan Yu, Weidong Liang</i>	
PREPARATION OF CNTS / ALUMINUM FOAM COMPOSITES.....	175
<i>Zhaoyang Lang, Mingying Chen, Junjiao Han, Zhe Liu, Xiaoqin Yan, Yousong Gu, Zhen Ji, Chengchang Jia</i>	

THE STUDY OF MICROSTRUCTURE AND MECHANICAL PROPERTIES OF TWO HIGH STRENGTH STEELS.....	181
<i>Shihan Li, Xiaolin Wang, Wei Zhao, Zunzhao Li</i>	
ANALYSIS OF CHEMICAL CONSTITUENTS IN FICUS HIRTA VAHL. BY LCMS-IT-TOF AND GC-MS.....	187
<i>Wenjing Tang, Jianping Chen, Mengjiao Du, Lishi Chen, Yi Yang, Shufen Wu, Biting Zhang, Chuqin Yu</i>	
FRICITION AND WEAR MECHANISM OF HIGH TEMPERATURE BRAKE FRICTION MATERIALS.....	193
<i>Junjiao Han, Qian Qiu, Keyan Ning, Ming Han, Nan Zhang, Chaoyang Lang, Zhe Liu, Zhen Ji, Chengchang Jia</i>	
STUDY ON PREPARATION, MICROSTRUCTURE AND PROPERTIES OF MICRO-ARC OXIDATION CERAMIC COATING ON AZ91 MAGNESIUM ALLOY IN PHOSPHATE ELECTROLYTE.....	199
<i>Xianming Chen, Yingying Fan</i>	
RESEARCH ON CUMULATIVE DAMAGE EVALUATION METHOD FOR STRUCTURAL IMPACT ON AIRBORNE ARMORED VEHICLE IN LANDING PROCESS.....	206
<i>Xinhua Fu, Yong Lu, Jun Wang, Xueyang Chen</i>	
NUMERICAL SIMULATION OF A BIONIC BLADE ON SMALL-SCALE WIND TURBINE.....	214
<i>Kuang-Yuan Kung, Jun-Liang Chen, Cheng-Hsing Hsu, Wei-Feng Tsai</i>	
<u>ENERGY SCIENCE AND ENVIRONMENTAL ENGINEERING</u>	
RESEARCH ON STATIC CHARACTERISTICS OF STEEL-CONCRETE COMPOSITE BEAM CABLE-STAYED BRIDGE DURING CONSTRUCTION.....	219
<i>Zeying Yang, Yongye Qu, Jianbo Qu, Yalei Zhang, Wenchao Qi, Xinnan Xie</i>	
LANDSCAPE ECOLOGICAL RISK ASSESSMENT OF DIANCHI LAKE BASIN BASED ON LAND USE CHANGE.....	226
<i>Zhiqiang Lin, Shuangyun Peng, Shaojian Pu, Xiaoliang Ma, Yanlian Zhou</i>	
A COMPARATIVE STUDY OF TOLL COLLECTION SYSTEMS BETWEEN PHILIPPINES AND TAIWAN.....	233
<i>Chiao Ven Huang, Mary Chanille Teaño, Hui Ming Wee</i>	
TWO-ROTATION ORTHOGONAL COMBINATION DESIGN OPTIMIZES THE PROCESS PARAMETERS OF FRESH-CUT ROSA GREEN.....	239
<i>Peixin Han, Xiaoguang Feng, Xin Zhao, Huijun Liu, Xiangning Chen</i>	
POSITIVE EFFECT OF CHAIQIN WENDAN DECOCTION ON ANXIETY AND DEPRESSION MODEL RATS.....	245
<i>Xiaobing Li, Xinmin Li, Ruijuan Cai, Binbin Qi, Yuzhu Li, Tian Wang, Wen Liu, Wenyu Chen, Yan Chen, Mengge Ma, Shicheng Ren, Xiaomei Liu, Xuejiao Liang, Dexing Wang, Guangbin Shen, Huxiao Zhang, Bing Zhang</i>	
CONVENTIONAL BRIDGE DAMAGE IDENTIFICATION BASED ON BP NEURAL NETWORK.....	251
<i>Zeying Yang, Yalei Zhang, Yaping Wang, Ning Wang, Haina Cui, Yongye Qu</i>	
NUMERICAL MODEL PROGRESS OF LIQUID FUEL MICRO-DROPLETS EVAPORATION.....	257
<i>Yang Yu, Xiao Zhang</i>	

ON BROADBAND NONLINEAR PIEZOELECTRIC ENERGY HARVESTING TECHNIQUES	262
<i>Chuahua Sun, Guangqing Shang</i>	
PHOTOCHEMICAL PREPARATION OF SELENIUM-RGO COMPOSITE FOR APPLICATION IN PHOTOCATALYTIC DEGRADATION	268
<i>Wenyu Zhong, Fengqiang Sun, Guping He</i>	
OXIDATIVE LEACHING OF VANADIUM FROM VANADIUM-CHROMIUM REDUCING RESIDUE WITH MNO ₂	275
<i>Hao Peng, Liu Yang, Ya Chen, Jing Guo</i>	
CRITICAL TECHNOLOGIES FOR DEVELOPMENT OF TURBINE BLADE DESIGN INSPECTION & INTEGRATION SOFTWARE	281
<i>Wei Wang, Xiaolong Xiao</i>	
BIOMASS DERIVED FUELS FOR GAS TURBINE APPLICATION.....	288
<i>Taiyan Zhang, Yongling Yao, Chengbin Lu, Bin Xu, Dongyang He</i>	
EFFECT OF NOZZLE STRUCTURE PARAMETERS ON STEADY EMISSION CHARACTERISTICS IN AN OPPOSED-PISTON TWO-STROKE DIESEL ENGINE.....	295
<i>Shangxue Wang, Zhijun Zhang, Jiangfeng Dong, Wenyuan Xu</i>	
ANALYSIS OF THE INFLUENCE OF COAGULANT ON PHOSPHORUS IN LANDSCAPE WATER ENVIRONMENT.....	302
<i>Chunhong Su</i>	
PROGRESS OF AIRBORNE LIDAR OF OCEAN CHLOROPHYLL OBSERVATIONS INCLUDING ALGORITHM AND INSTRUMENTS.....	307
<i>Yongzhi Li, Kun Yu, Wenkai Zhang, Dan Li, Zheng Zhao, Xiao Jiang, Dingjian Jin, Boxuan Shang, Houmao Wang</i>	
ANALYSIS OF CLIMATE AND WATER RESOURCES CHARACTERISTICS IN CHONGQING.....	313
<i>Rong Chen, Jinglan Wang, Weihua Zhang</i>	
HYDROCHEMICAL TYPES OF KARST GROUNDWATER IN TAILAI BASIN	319
<i>Jianguo Feng, Deshuai Ji, Zongjun Gao, Tongmin Lu, Minghao He</i>	
CONSTRUCTION OF AIR POLLUTION MONITORING AND PRE-WARNING PLATFORM—TAKING DAMING COUNTY, HANDAN CITY, HEBEI PROVINCE AS AN EXAMPLE	325
<i>Huan Qian, Jianwei Yue, Jingze Li, Kesong Ding</i>	
ANALYSIS OF METEOROLOGICAL ELEMENTS AND CLIMATE CHANGE IN POYANG LAKE BASIN	330
<i>Jie Wen, Yilin Wang, Guangru Sun, Shujing Liu, Weihua Zhang</i>	
THE NUMERICAL SIMULATION OF GAS-LIQUID TWO PHASE FLOW IN ANNULAR GAP VENTURI OF CONVERTER WET DUST REMOVAL	337
<i>Mengmeng Ye, Mei Liang, Fuping Qian, Jinli Lu</i>	
DISTANCE PREDICTION OF SLOPE-FOOT LANDSLIDE IN SOUTHWEST OF CHINA BASED ON GA-BP NEURAL NETWORK	344
<i>Hao Zhou, Yong Chen, Ruoying Tian</i>	

COMPLEX ENVIRONMENTAL CHARACTERISTICS OF COASTAL SALT SPRAY AREA AND EFFECT OF CARBON DIOXIDE CONTENT ON CORROSION OF STEEL BARS	352
<i>Jun Liu, Lu Hu, Yingqiu Song</i>	
EFFECTS OF ATRAZINE ON THE GROWTH OF SUAEDA HETEROPTERA	358
<i>Yujie Huo, Haifeng Wei, Yumeng Zhao, Jie He, Mingliang Zhang</i>	
DISTRIBUTION FEATURES OF PHYTOPLANKTON AND ITS CORRELATION WITH ENVIRONMENTAL FACTORS OF BAIMA LAKE.....	364
<i>Jun Wang, Sushu Wu, Bowen Fan, Wenmeng Chen</i>	
STUDY ON ECOLOGICAL VULNERABILITY OF DIANCHI LAKE BASIN BASED ON GIS-BASED PRINCIPAL COMPONENT ANALYSIS	372
<i>Xiaoliang Ma, Shuangyun Peng, Cong Lin, Zhiqiang Lin, Yanlian Zhou</i>	
A STUDY ON ENVIRONMENTAL COST OF CHINA'S OIL PRODUCTION AND UTILIZATION.....	379
<i>Lijuan Wang, Xiaojun Chen, Qian Tang, Qiang Sun, Huili Wang, Ling Jin</i>	
ENHANCED ECOSYSTEM SERVICES BY LAND USE COMPOSITION ADJUSTMENT CAN REDUCE WEATHER DISASTERS LOSS UNDER CLIMATIC CHANGE	383
<i>Yixiao Kuang, Yu Peng, Bing Sun, Chunqian Jiang, Weiguo Sang</i>	
WHICH PROVINCES SHOULD PAY MORE ATTENTION TO CO ₂ EMISSIONS IN CHINA'S CONSTRUCTION INDUSTRY?	390
<i>Fen Li, Jianbao Chen</i>	
WASTEWATER EMISSION REDUCTION BY CHINA'S INDUSTRIAL IMPORTS OF AND ITS INFLUENCING FACTORS	400
<i>Wangsong Xie, Qirong Zhu</i>	
ANALYSIS OF CHANGES IN ECOLOGICAL PATTERNS IN THE UPPER REACHES OF THE MINJIANG RIVER ONE OF TYPICAL DISASTER PRONE AREA OF CHINA.....	409
<i>Guangwen Ma, Yang Yu, Guang Wang, Fenyong Zhang, Haijiang Liu, Lihuan He, Yeyao Wang</i>	
INHERENT ANALYSIS ON FEATURE AND MECHANISM OF RENEWABLE ENERGY SYSTEM IN ST-3E SYSTEM.....	415
<i>Chunyan Diao, Bojun Cui, Yunjie Wu, Jianfeng Li</i>	
STUDY ON WATER QUALITY CHARACTERISTICS AND PRODUCTION COEFFICIENTS OF URBAN DOMESTIC SEWAGE IN SHANGHAI.....	421
<i>Mina Song, Chunyan Diao, Lei Jia, Lei Yang, Bojun Cui</i>	
DRAINAGE AND TOTAL NITROGEN LOSS OF CROPLAND UNDER DRIP IRRIGATION AND SUBSURFACE PIPE DRAINAGE.....	427
<i>Shan Zhang, Qian Tan, Hang Zhao, Tong Zhang</i>	
ANALYSIS OF DISTURBANCE FACTORS IN ZHALONG WETLAND LANDSCAPE DYNAMICS.....	432
<i>Yuqing Yang, Adu Gong, Yuhong Zhang, Yanling Chen, Tingting Zeng</i>	
COMPARATIVE STUDY ON SEVERAL DETERMINATION METHODS OF CHLOROPHYLL CONTENT IN PLANTS	438
<i>Jing Li, Xiaoyan Zhou, Jiaping Zhou, Ran Shang, Yu Wang, Pei Jing</i>	

THREE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY INTEGRATIVE SIMULATION SYSTEM BASED ON GIS OF DONGHU IN WUHAN	444
<i>Xiaojuan Li, Mutao Huang, Ronghui Wang</i>	
A SURVEY ON MULTI-PRODUCT SUSTAINABLE ECONOMIC PRODUCTION QUANTITY MODEL CONSIDERING WASTEWATER EMISSION COSTS	450
<i>Yu-Hua Chiang Li, L L Sy, K C Lomibao, J D German, H M Wee</i>	
JASON-1 OBSERVATION OF TYPHOON STORM SURGE AND ANALYSIS BASED ON NUMERICAL SIMULATION.....	455
<i>Zhou Qiu, Gang Zheng, Jingsong Yang, Guoqi Han, Xiaohui Li, Chuanzheng Zhang, Lizhang Zhou, Yan Wang</i>	
DROUGHT CRISIS: A PATH-ANALYSIS IN BEIJING-TIANJIN-HEBEI REGION	460
<i>Wenhui Qiao, Yanru Pu, Zhuo Wei, Peng Wang</i>	
OVERVIEW OF DEEP CONVOLUTIONAL NEURAL NETWORK APPROACHES FOR SATELLITE REMOTE SENSING SHIP MONITORING TECHNOLOGY	467
<i>Xiunan Li, Peng Chen, Kaiguo Fan</i>	

Author Index