



ISSN 1000-6931

CN 11-2044/TL

原子能科学技术

中国原子能科学研究院

2020 **5** (第54卷)

ATOMIC ENERGY SCIENCE
AND TECHNOLOGY

ATOMIC ENERGY SCIENCE
AND TECHNOLOGY

ISSN 1000-6931



万方数据

目 次

第十五届(2019 年)核技术应用学术交流会优秀论文选

自然循环反应堆 NHR-200 II 失水事故初步研究	王 岩,解 衡,谢 菲(769)
安全壳卸压排放过程模化分析	高志超,曹学武(776)
基于二十面体间断有限元离散求积组的 IRI-TUB 基准题验证	代 妮,张 斌,陈义学(782)
核电站中气溶胶再悬浮的 CFD 研究	江 斌,黄 挺,陈 炼,常华健(790)
ADS 熔盐散裂靶中子学性能研究	杨 璞,林作康,万唯实,严 睿,余笑寒,邹 杨(796)
AB-BNCT 中子靶物理设计分析	林作康,杨 璞,赵乾坤,申 森,何子锋(804)
基于多次碰撞源的屏蔽计算方法研究	王新宇,张 斌,陈义学(811)
火星表面环境对核反应堆屏蔽性能的影响分析	姚成志,赵守智,胡 古,解家春(820)
神经网络-遗传复合算法在压水堆堆芯换料设计中的应用	韦子豪,王 端,王东东,潘翠杰(825)
快堆燃料芯块压制成型技术研究	朱桐宇,张顺孝,吴金德,张彦龙(835)
压水堆二回路工况下碱化剂对结构材料腐蚀的影响	曹林园,王 辉,杨明馨,皮立新,张 鹏(842)
基于伴随粒子的快中子成像系统角分辨研究	孙世峰,欧阳晓平(850)
基于差频检测技术的高速 AD 单粒子翻转评估方法研究	彭惠薪,李 哲,郑宏超,于春青(857)
100 MeV 质子回旋加速器二期辐照效应管道设计	杨新宇,郭 刚,彭朝华,张艳文,覃英参,殷 倩,肖舒颜(863)
325 MHz 高功率波导窗设计研究	秦 成,朱志斌,杨 誉,吴青峰,窦玉玲,王修龙(870)
一种微束 X 射线衍射仪及其应用研究	姜其立,刘 俊,帅麒麟,李融武,程 琳(876)
BRISOL 钠同位素放射性核束的产生	唐 兵,崔保群,马 燮,马鹰俊,马瑞刚,陈立华,黄青华,王云峰(882)
乏燃料棒中关键核素径向分布特点及对废包壳测量准确度影响	柏 磊,王仲奇,刘晓琳,何丽霞,夏兆东,吕 牛(888)

化学

克量级铀中微量铈和铽的放化分离方法研究	王秀凤,丁有钱,毛国淑,马 鹏,杨 磊(895)
L 边密度计稳定性监控及 U、Pu 测量	康海英,罗中艳,郑维明,陶苗苗,朱海巧,张 彤,刘联伟,刘桂娇(903)

反应堆工程

堆芯燃料组件流阻特性模块式与整体式三维数值模拟方案比较	杨红义,周志伟,林 超,李 淞,王予焯(908)
失水事故后燃料厂房空气自然循环及氢气分布实验研究	陆雨洲,贡相羽,张会勇,张诗琪(916)

低流速排放下气溶胶水洗模型	周 彦,佟立丽,曹学武(923)
先进中子学栅格程序 KYLIN-II 输运模块并行优化开发	涂晓兰,柴晓明,刘 东,芦 韡,王 鑫,李勋昭,付元光,郭凤晨(930)
液态熔盐堆堆芯功率内模控制器设计与仿真	曾文杰,朱伟聪,谢金森,姜庆丰,于 涛(937)
长寿命小型自然循环铅基快堆燃料选型	刘紫静,赵鹏程,任广益,柯国土,于 涛,谢金森,陈珍平,何丽华,谢 芹,曾 浩(944)
钛合金 TA16 弹塑性修正因子数值分析方法研究	邵雪娇,杜 娟,杨 宇,傅孝龙,张 瀛,李 辉,郑连纲(954)
期刊基本参数: CN 11-2044/TL * 1959 * m * A4 * 192 * zh * P * ¥40.00 * 1200 * 27 * 2020-05	
本期责任编辑 王调霞 侯翠梅 汤晓浩 马英霞 王宝金 张秀平 韩翠娥	

CONTENTS

EXCELLENT ARTICLES SELECTED FROM THE FIFTEENTH ACADEMIC CONFERENCE (2019) ON NUCLEAR TECHNOLOGY APPLICATION

Preliminary Study on LOCA of Natural Circulation Reactor NHR-200 II	WANG Yan, XIE Heng, XIE Fei(769)
Scaling Analysis of Containment Depressurization Venting Process	GAO Zhichao, CAO Xuewu(776)
IRI-TUB Benchmark Verification Based on Discontinuous Finite Element Discrete Ordinates Quadrature Sets on Icosahedron	DAI Ni, ZHANG Bin, CHEN Yixue(782)
CFD Research on Aerosol Resuspension in Nuclear Power Plant	JIANG Bin, HUANG Ting, CHEN Lian, CHANG Huajian(790)
Neutronics Performance of Molten Salt Spallation Target in ADS	YANG Pu, LIN Zuokang, WAN Weishi, YAN Rui, YU Xiaohan, ZOU Yang(796)
Analysis of Physical Design for AB-BNCT Neutron Target	LIN Zuokang, YANG Pu, ZHAO Qiankun, SHEN Miao, HE Zifeng(804)
Shielding Calculation Method Based on n' th Collision Source	WANG Xinyu, ZHANG Bin, CHEN Yixue(811)
Effect of Martian Surface Environment on Nuclear Reactor Shielding Performance	YAO Chengzhi, ZHAO Shouzhi, HU Gu, XIE Jiachun(820)
Application of Neural Network-Genetic Composite Algorithm in Core Refueling Design for PWR	WEI Zihao, WANG Duan, WANG Dongdong, PAN Cuijie(825)
Study of Pressing Molding Technology for Fast Reactor Fuel Pellet	ZHU Tongyu, ZHANG Shunxiao, WU Jinde, ZHANG Yanlong(835)
Influence of Alkalizer on Corrosion Behavior of Structure Material in Pressurized Water Reactor Secondary Circuit	CAO Linyuan, WANG Hui, YANG Mingxin, PI Lixin, ZHANG Peng(842)
Study on Angular Resolution of Associated Particle Fast Neutron Imaging System	SUN Shifeng, OUYANG Xiaoping(850)
SEU Characterization of High-speed Analog-to-digital Converter Based on Beat Frequency	PENG Huixin, LI Zhe, ZHENG Hongchao, YU Chunqing(857)
Design of the Second Stage Irradiation Effect Beamline of 100 MeV Proton Cyclotron	YANG Xinyu, GUO Gang, PENG Zhaohua, ZHANG Yanwen, QIN Yingcan, YIN Qian, XIAO Shuyan(863)
Design of 325 MHz High Power RF Window	QIN Cheng, ZHU Zhibin, YANG Yu, WU Qingfeng, DOU Yuling, WANG Xiulong(870)
Study of Micro X-ray Diffractometer and Its Application	JIANG Qili, LIU Jun, SHUAI Qilin, LI Rongwu, CHENG Lin(876)

Production of Sodium Isotope Radioactive Ion Beam on BRISOL Facility TANG Bing,
 CUI Baoqun, MA Xie, MA Yingjun, MA Ruigang, CHEN Lihua, HUANG Qinghua, WANG Yunfeng(882)
 Characteristics of Radial Distribution of Key Nuclides in Spent Fuel Rod and Effect on Measurement Accuracy of
 Leached Hull BAI Lei, WANG Zhongqi, LIU Xiaolin, HE Lixia, XIA Zhaodong, LYU Niu(888)

CHEMISTRY

Radiochemical Separation of Trace Europium and Terbium in Gramme Uranium
 WANG Xiufeng, DING Youqian, MAO Guoshu, MA Peng, YANG Lei(895)
 Stability Monitoring of L-edge Densitometer and Measurement of U and Pu KANG Haiying,
 LUO Zhongyan, ZHENG Weiming, TAO Miaomiao, ZHU Haiqiao, ZHANG Tong, LIU Lianwei, LIU Guijiao(903)

REACTOR ENGINEERING

Comparison of Modular and Integral Three-dimensional Numerical Simulation Schemes for Flow Resistance Characteristic of
 Core Fuel Assembly YANG Hongyi, ZHOU Zhiwei, LIN Chao, LI Song, WANG Yuye(908)
 Experimental Research of Air Natural Circulation and Hydrogen Distribution in Fuel Building after Loss of Coolant
 Accident LU Yuzhou, YUN Xiangyu, ZHANG Huiyong, ZHANG Shiqi(916)
 Aerosol Pool Scrubbing Model under Low Velocity Discharge ZHOU Yan, TONG Lili, CAO Xuewu(923)
 Parallel Optimization Development of Transport Calculation Module in Neutronics Lattice Code KYLIN-II
 TU Xiaolan, CHAI Xiaoming, LIU Dong, LU Wei, WANG Xin, LI Xunzhao, FU Yuanguang, GUO Fengchen(930)
 Design and Simulation of Internal Model Controller for Liquid Molten Salt Reactor Core Power
 ZENG Wenjie, ZHU Weicong, XIE Jinsen, JIANG Qingfeng, YU Tao(937)
 Fuel Selection of Long Life Small Natural Circulation Lead-based Fast Reactor
 LIU Zijing, ZHAO Pengcheng,
 REN Guangyi, KE Guotu, YU Tao, XIE Jinsen, CHEN Zhenping, HE Lihua, XIE Qin, ZENG Hao(944)
 Study on Numerical Analysis Method of Elastic-plastic Correction Factor for Titanium Alloy TA16
 SHAO Xuejiao, DU Juan, YANG Yu, FU Xiaolong, ZHANG Ying, LI Hui, ZHENG Liangang(954)
Editors WANG Tiaoxia, HOU Cuimei, TANG Xiaohao, MA Yingxia, WANG Baojin, ZHANG Xiuping, HAN
 Cuie