

**Proceedings of
2022 29th International Conference on
Nuclear Engineering
(ICONE29)**

Volume 9

**August 8-12, 2022
Shenzhen, China and Virtual, Online**

**Conference Sponsor
Nuclear Engineering Division**

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Two Park Avenue * New York, N.Y. 10016

© 2022, The American Society of Mechanical Engineers, 2 Park Avenue, New York, NY 10016, USA
(www.asme.org)

All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of the publisher.

INFORMATION CONTAINED IN THIS WORK HAS BEEN OBTAINED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS FROM SOURCES BELIEVED TO BE RELIABLE. HOWEVER, NEITHER ASME NOR ITS AUTHORS OR EDITORS GUARANTEE THE ACCURACY OR COMPLETENESS OF ANY INFORMATION PUBLISHED IN THIS WORK. NEITHER ASME NOR ITS AUTHORS AND EDITORS SHALL BE RESPONSIBLE FOR ANY ERRORS, OMISSIONS, OR DAMAGES ARISING OUT OF THE USE OF THIS INFORMATION. THE WORK IS PUBLISHED WITH THE UNDERSTANDING THAT ASME AND ITS AUTHORS AND EDITORS ARE SUPPLYING INFORMATION BUT ARE NOT ATTEMPTING TO RENDER ENGINEERING OR OTHER PROFESSIONAL SERVICES. IF SUCH ENGINEERING OR PROFESSIONAL SERVICES ARE REQUIRED, THE ASSISTANCE OF AN APPROPRIATE PROFESSIONAL SHOULD BE SOUGHT.

ASME shall not be responsible for statements or opinions advanced in papers or . . . printed in its publications (B7.1.3). Statement from the Bylaws.

For authorization to photocopy material for internal or personal use under those circumstances not falling within the fair use provisions of the Copyright Act, contact the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923, tel: 978-750-8400, www.copyright.com.

Requests for special permission or bulk reproduction should be addressed to the ASME Publishing Department, or submitted online at: <https://www.asme.org/publications-submissions/journals/information-for-authors/journalguidelines/rights-and-permissions>

ISBN: 978-0-7918-8644-1

CONTENTS

Proceedings of 2022 29th International Conference on Nuclear Engineering Volume 9

Decontamination and Decommissioning, Radiation Protection, and Waste Management

ICONE29-88888	V009T09A001
Study for the Optimization of the Decommissioning Project of Nuclear Facilities <i>Yukihiro Iguchi, Daisuke Kawasaki, and Satoshi Yanagihara</i>	
ICONE29-88931	V009T09A002
Discussion on Optimization of Protection Effect of Shielding Doors in High Level Waste Treatment Facilities <i>Jingyi Shen, Liying Zhang, Bingheng Wang, and Guiling Gao</i>	
ICONE29-89098	V009T09A003
Numerical Simulation of Aerosol Generation and Aerosol Spray Scavenging During Fukushima Daiichi Decommissioning <i>Hui Liang, Erkan Nejdet, Kai Wang, Avadhesh Kumar Sharma, and Shunichi Suzuki</i>	
ICONE29-89610	V009T09A004
Decommissioning Considerations for Layout Design of Nuclear Buildings <i>Wei-ting He and Wei-feng Jiang</i>	
ICONE29-90126	V009T09A005
A Novel Transmission Reconstruction Algorithm for Radioactive Drum Characterization <i>Hui Yang, Hao Zhou, Bing Dong, Wentao Zhou, Weiguo Gu, Xinyu Zhang, Qingxin Lei, Chenyu Shan, and Dezhong Wang</i>	
ICONE29-90275	V009T09A006
Study on Preparation and Radioactive Methyl-Iodine Adsorption Performance of TEDA Ionic Liquids <i>Xin Li, Yongguo Li, Jie Yu, Xin Chen, Jianrong Hou, Jian Li, Dangui Qiu, and Xu Shi</i>	
ICONE29-90433	V009T09A007
Research and Practice on Environmental Dose Reduction in Nuclear Power Plant Core Instrument Room <i>Long Tang, Binghan Gao, Long Yu, Dongdong Zhao, and Feihua Luo</i>	
ICONE29-90445	V009T09A008
Study on the Influencing Factors of Oxidation Degradation for High Concentration Polyvinyl Alcohol Wastewater in Heterogeneous Fenton System <i>Ye He, Dongsheng Zhou, Feng Liu, Xuefei Li, Xingdong Su, Jiawen Li, and Jie Zhan</i>	
ICONE29-90716	V009T09A009
High Efficient Mineralization of Cesium in Waste Liquid by Hydrothermal Method <i>Kai Gao, Wendong Feng, Xiaojun Yan, Xiaobin Guo, Xiaoyan Cui, and Xiliang Guo</i>	
ICONE29-90894	V009T09A010
Comparison of the Powderization Effect of Non-Equilibrium Plasma Oxidation and Thermochemical Oxidation Powders of Uranium Dioxide Solids for Actinide Analysis <i>Zhuoran Ma, Takaharu Tatsuno, Yoshiya Homma, Kenji Konashi, Katsuya Suzuki, and Tatsuya Suzuki</i>	

ICONE29-91215	V009T09A011
Study on the Growth and Scintillation Properties of CLLB Crystals	
<i>Kun Wu, Leilei Zhang, Haijun Li, Guangwei Huang, Jiaming Li, Libin Wang, Siyuan Zhang, Zhiyuan Li, Qinhuai Wei, Chunzhi Zhou, Zungang Wang, Huilan Liu, Hongying Zhu, and Yushou Song</i>	
ICONE29-91233	V009T09A012
Simulation of Detection Efficiency of High Integrity Container Gamma Scanning Device for Nuclear Power Plant Based on CZT Detector	
<i>Wenzhang Xie, Jia Huang, Chenyu Shan, Qingxin Lei, Kang Chang, Hao Zhou, Feng Liu, Peng Lin, Xiajie Liu, and Li Li</i>	
ICONE29-91465	V009T09A013
The Location of Spent Fuel Pins in Heavy Water Research Reactor in the Spent Fuel Pool	
<i>Jin Lu, Peng Nie, Ren Ren, Yaping Guo, Qi Wang, Xinwang Zhang, and Lijun Zhang</i>	
ICONE29-91515	V009T09A014
High Power Electron Beam Dump at DAL5	
<i>Kai Tao, Liming Huang, Yadong Ding, Zhenhai Zou, and Dejun E</i>	
ICONE29-91566	V009T09A015
Study on Performance of New Flexible Shielding Materials and First Demonstration Application in CPR Nuclear Power Plant	
<i>Yulong Li, Feng Liu, Xiajie Liu, Li Li, Zheng Kang, and Ye He</i>	
ICONE29-91624	V009T09A016
Assessment and Control Value Formulation on Radiological Consequence of On-Site Worker due to Radioactive Component Failure for Pressurized Water Reactor Plant	
<i>Zhou Jing, Ran Wen Wang, Gong Quan, and Lv Wei Feng</i>	
ICONE29-91672	V009T09A017
Estimation of Decommissioning Radioactive Wastes Quantity for Nuclear Power Plant	
<i>Senquan Li</i>	
ICONE29-91843	V009T09A018
Research and Development of Rock Cavity Disposal Technology in China	
<i>Wencheng Yin, Yuelong Pan, Xueling Zhang, Yu Liu, Jian Ma, and Tongtong Li</i>	
ICONE29-91897	V009T09A019
Mechanical Vapor Re-Compression Evaporation Treatment of Radioactive Waste Water	
<i>Liu Qiaofen, Huo Ming, Gao Fei, Yang Linjun, and Liu Yong</i>	
ICONE29-91904	V009T09A020
Novel Syntheses Method of Grafted Chelating Resin and Its Application Study for Depleted Zinc Production	
<i>Feng Liu, Ye He, Jiawen Li, Jie Zhan, Xingdong Su, Xuefei Li, and Xiajie Liu</i>	
ICONE29-92182	V009T09A021
Effect of Hydration Time on the Hydro-Mechanical Behavior of Compacted GMZ Bentonite With an Artificial Annular Gap	
<i>Hewen Luo, Weimin Ye, Qiong Wang, and Libo Xu</i>	
ICONE29-92195	V009T09A022
The Dose Assessment Method Based on the Local Method of Characteristics and Skeletal Animation	
<i>Lun-xiu Cao, Nan Chao, Yong-kuo Liu, and Zhi-tao Chen</i>	
ICONE29-92372	V009T09A023
New Gamma Scanning Technology for 200L and 400L Low and Intermediate Level Solid Waste	
<i>Dezhong Wang, Hui Yang, Weiguo Gu, Jie Qiu, and Wentao Zhou</i>	

ICONE29-92385	V009T09A024
Study on Methodology for Quantification of Radioactive Discharges and Limits for Pressurized Water Reactor HPR1000 Based on Operating Experience <i>Yujia Chen, Weifeng Lv, Zhenyu Jiang, and Yonghai Zhou</i>	
ICONE29-92401	V009T09A025
The Study on Microwave Process for Spent Resin <i>Gao Chao, Jia Meilan, and An Hongxiang</i>	
ICONE29-92404	V009T09A026
Study on Improvement of Cement Curing Formula of Wet Radioactive Waste <i>Xiaojun Yan, Xiliang Guo, Kai Gao, Xiaobin Guo, and Yahui Xi</i>	
ICONE29-92600	V009T09A027
Simulation of Neutron and Proton Displacement Damage in Ultra-Wide Bandgap Semiconductor Ga ₂ O ₃ <i>Zhuang Shao, Ziqi Cai, and Qingmin Zhang</i>	
ICONE29-92658	V009T09A028
Selection and Economic Benefit Analysis of Current Limiting Circuit Breaker in a Project of a Newly-Built Large Nuclear Chemical Plant <i>Shuo Gao, Shizhong Tian, and Zhi Huang</i>	
ICONE29-92665	V009T09A029
Preparation and Characterization of Radioactive Aerosol Protective Nanofiber Membranes <i>Jiawen Li, Mingyi Chen, Li Li, Feng Liu, Yufei Gao, Jian Zhu, Jie Zhan, Jian Chen, Yuan Zeng, Rouxi Chen, and Hsing-Lin Wang</i>	
ICONE29-92683	V009T09A030
Analysis of Reliability and Life of Fission Ionization Chamber of Nuclear Instrumentation System (NIS) <i>Yulin Zhou, Shunli Qiu, Mengtuan Ge, Guangzhi Sun, Wei Xiao, and Haifeng Liu</i>	
ICONE29-92765	V009T09A031
Preparation and Properties of Ceramic Solidified Product Containing Cs and Sr <i>Hongji Sang, Zhengcheng Gu, Zheng Cui, Ruoxue Zou, and Yan Wu</i>	
ICONE29-92807	V009T09A032
Research on the Expected Carbon-14 Production and Discharge in Pressurized Water Reactors <i>Pengtao Fu</i>	
ICONE29-92816	V009T09A033
Optimization of the Tritium Production and Discharge in HPR1000 <i>Pengtao Fu and Mingliang Dai</i>	
ICONE29-92822	V009T09A034
Study on Time-Dependent Co-58 and Co-60 Activities in the Primary Coolant of CPR1000 PWRs <i>Xiaoqian Zhang and Pengtao Fu</i>	
ICONE29-93047	V009T09A035
Commissioning and Cold Test of HLLW Vitrification Plant of China <i>Minzhi Ruan, Yingzi Liu, Jinyao Zhang, Minhang Sun, and Xuelian Liu</i>	
ICONE29-93212	V009T09A036
Structure Control of a HLW Immobilized Zirconolite Glass-Ceramic Matrix <i>Haiqing Li, Yutong Pan, Chao Gao, and Shuming Wang</i>	
ICONE29-93254	V009T09A037
Current Situation and Development Trend of Decommissioning of Nuclear Power Plants <i>Cao Guochang, Kang Yunding, and Li Zhihua</i>	

ICONE29-93364 **V009T09A038**
 Engineering Application and Research Progress of Low-Level Radioactive Waste
 Incineration Technology in China
Chu Haoran, Xu Wei, Zheng Bowen, and Ruan Jiasheng

ICONE29-93603 **V009T09A039**
 Software of Radioactivity Measurement and Control System for Barreled Nuclear
 Waste With Segmented Gamma Scanning
*Liu Yitang, Shi Rui, Wang Zhou, Wang Zhenchuan, Lan Yunliang, Zhao Wei, and
 Tuo Xianguo*

ICONE29-93771 **V009T09A040**
 Study on the Substitute Nuclides of Actinides in High-Level Radioactive Waste Liquid
Yingzhe Du, Lili Li, Kunfeng Li, Peng Lin, Yugang Zhang, and Juan Diwu

ICONE29-93802 **V009T09A041**
 Study on the High Temperature Melting Treatment of Nuclear Waste Glass Fiber
ChunYu Liu and YanLi Wen