

Selected papers from the 13th International Conference on Tritium Science and Technology

Contents

- vii Foreword
Sebastian Davides Brad

RESEARCH ARTICLES

- 253** Study on Tritium Permeation from the Primary to the Secondary Water Coolant for Fusion Reactors
Akito Ipponsugi, Kazunari Katayama, Taku Matsumoto, Shogo Iwata, Makoto Oya, Youji Someya
- 260** Presentation and Preliminary Test of APRIL: A New Facility for the Characterization of Antipermeation Coatings for Fission and Fusion Applications
Francesca Papa, Alessandro Venturini, Marco Utili, Gianfranco Caruso, Alessandro Tassone, Mariano Tarantino
- 266** Radiological Impact Assessment of Acute Tritium Releases in Environment—A Soil Dynamic Model
Anca Melintescu
- 276** Tritium Content in Komatsuna Cultivated in Tritium-Contaminated Peat Soil
Portuphy Michael Ofotsu, Kazunari Katayama, Takahiro Matano
- 285** Organically Bound Tritium Activity Level in Plants During Growing Season and Environmental Factor Influences
Irina Vagner, Carmen Varlam, Ionut Făurescu, Denisa Făurescu, Diana Bogdan
- 291** A Passive System Technical Specification for CANDU 6 Generation II Reactor
Iulian Nita, Rodica Pancef, Luminita Nitulescu
- 303** In Situ Tritium Decontamination of the KATRIN Rear Wall Using an Ultraviolet/Ozone Treatment
Max Aker, Michael Sturm, Florian Priester, Simon Tirolf, Dominic Batzler, Robin Gröbtle, Alexander Marsteller, Marco Röllig, Magnus Schlösser

—continued—

Contents continued

VOLUME 80 · NUMBERS 3-4 · APRIL–MAY 2024

- 311** Possibilities of Reprocessing Solid Waste with Tritium from Fusion Using High-Temperature Heating
Jaroslav Stoklasa, Jan Hrbek, Lucie Karásková Nenádálová, Bence Mészáros, Mykhaylo Paukov
- 321** Detritiation of the Organic Material in the MSO Process
Vojtěch Galek, Anna Sears, Petr Pražák, Lucie Karásková-Nenádálová
- 330** Comparison of AWD to CECE for ITER-Scale Water Detritiation
Musharaf Rabbani, Anthony Busigin, Haiqin Mao, Nisa Halsey, Dayna La Barbera
- 340** Oxygen Stream Management in a CECE Process
Musharaf Rabbani, Anthony Busigin, Haiqin Mao, Nisa Halsey, Dayna La Barbera
- 351** Deuterium Stream Management Leaving the LPCE Column in a CECE Process for Heavy Water Detritiation
Musharaf Rabbani, Anthony Busigin, Haiqin Mao, Nisa Halsey, Dayna La Barbera
- 359** Thermal Adsorption Spectroscopy of Hydrogen Isotopes from CHA-Type Zeolites
Akira Taguchi, Haruka Hamashima, Takumi Nakamori, Yuki Yoneyama
- 365** Experimental Investigation of CECE Process to Recover Tritium and Deuterium from Low Tritiated/Deuterated Liquid Waste
Anisia Mihaela Bornea, George Ana, Ovidiu Balteanu, Diana Bogdan, Gheorghe Bulubasa, Ciprian Bucur, Ionut Faurescu, Denisa Faurescu, Alina Niculescu, Iuliana Stefan, Irina Vagner, Elvis Udrea, Carmen Varlam, Felicia Vasut, Mihai Vijulie, Marius Zamfirache
- 374** Modeling the Tokamak Exhaust Processing System in a Commercial Simulator for Process Monitoring Purposes
Eduardo Iraola, José M. Nogués, Lluís Batet, Josep A. Feliu, Luis Sedano
- 391** Tritium Behavior in Water and Gas Produced by a Fully Tritium-Compatible Electrolyzer
Carmen Varlam, Irina Vagner, Ionut Făurescu, Anisia Bornea, Denisa Făurescu, Diana Bogdan

—continued—

Contents continued

VOLUME 80 · NUMBERS 3-4 · APRIL–MAY 2024

- 399** Study of the Effective Torus Exhaust High Vacuum Pumping System Performance in the Inner Tritium Plant Loop of EU-DEMO
Tim Teichmann, Xueli Luo, Thomas Giegerich, Christian Day
- 411** Investigations on ^3He : Hydrogen Isotope Separation Employing Palladium/Silver Membranes
Gheorghe Bulubasa, Alina Niculescu, George Ana, Ciprian Bucur, Iuliana Ștefan, Maria Crăciun, Anisia Bornea
- 416** Integration of a Microchannel Reactor in a CECE Process for H_2 Removal from the O_2 Stream Produced by the H_2 Generator
Alina Niculescu, Gheorghe Bulubașa, George Ana, Ciprian Bucur, Maria Crăciun, Anisia Bornea
- 422** Preliminary Design of a Cryogenic System with GM Cryocooler for Testing the Hydrogen Condensers of the Distillation Columns
Catalin Brill, Sebastian Brad, Claudia Bogdan, Aleksandr Grafov, Oleksandr Sirosh, Alin Lazar, Mihai Vijulie, Viorel Badescu
- 431** Instrumentation and Control for Tritium-Compatible Hydrogen Generator
Ovidiu Balteanu, Iuliana Ștefan, Ciprian Bucur, George Ana
- 443** Design, Fabrication, and Test of a Prototype of Matrix Heat Exchanger for Cryogenic Distillation of Hydrogen Isotopes
Claudia Bogdan, Sebastian Brad, Horia Necula, Oleksandr Sirosh, Catalin Brill, Mihai Vijulie, Alin Lazar, Aleksandr Grafov
- 455** New Achievements of H_2 -HD- D_2 Isotopic Separation with the Cryogenic Distillation Experimental Stand from ICSI Cryogenic Laboratory
Sebastian Brad, Mihai Vijulie, Alin Lazar, Claudia Bogdan, Oleksandr Sirosh, Catalin Brill, Aleksandr Grafov, Anișoara Oubraham, Alina Niculescu, George Bulubasa
- 465** Four Years of Tritium Operation of the KATRIN Experiment at TLK
David Hillesheimer, Alexander Marsteller, Florian Priester, Marco Röllig, Michael Sturm, Stefan Welte, Johanna Wydra, Lutz Bornschein, Tobias Falke, Tobias Weber, Nancy Tuchscherer, Thanh-Long Le, Simon Niemes

—continued—

Contents continued

VOLUME 80 · NUMBERS 3-4 · APRIL–MAY 2024

- 472** Construction of a Test Facility and the Test of an Active Tritium Permeation Barrier
Joshua Kohpeiss, Stefan Welte, Ion Cristescu, Nancy Tuchscherer
- 479** Detritiation of JET Beryllium and Tungsten
Thomas Stokes, Mirjana Damjanovic, Joe Berriman, Stephen Reynolds
- 486** Synthesis of Erbium Deuterides via Deuterium Ion Implantation into Erbium Thin Films
J. Northall, M. S. B. Darby, A. Cooper, A. Hollingsworth, Y. Zayachuk, A. Wohlers, A. Simons, H. Smith
- 495** The Reaction of Uranium Deuteride with Nitrogen
J. Northall, E. H. Norris, J. P. Knowles, J. R. Petherbridge
- 504** Determination of the Surface-Rate Coefficients of Deuterium Through Nickel by Gas-Driven Permeation Experiments in Surface-Limited Regime
Nicolae Bidica, Narcisa Ghimis, Bogdan Monea
- 520** High-Energy Tritium Ion and α -Particle Release from the Near-Surface Layer of Lithium During Neutron Irradiation in the Nuclear Reactor Core
Erlan Batyrbekov, Mendykhan Khasenov, Mazhyn Skakov, Yuriy Gordienko, Kuanysh Samarkhanov, Andrey Kotlyar, Alexandr Miller, Vadim Bochkov
- 530** Generation and Analysis of Tritium-Substituted Methane
D. Díaz Barrero, T. L. Le, S. Niemes, S. Welte, M. Schlösser, B. Bornschein, H. H. Telle
- 540** Measurement of Hydrogen Permeation Fluxes Through Tungsten Deposition Layer Growing by Hydrogen Plasma Sputtering and Observation of Microstructure
Kentaro Masuta, Yuki Hara, Makoto Oya, Naoaki Yoshida, Kazunari Katayama
- 550** Refractive Index Measurements of Solid Hydrogen Isotopologues
Jiaqi Zhang, Akifumi Iwamoto, Keisuke Shigemori, Masanori Hara, Kohei Yamanoi
- 558** Speed of Sound Measurement of Hydrogen Isotopologues Containing Tritium for Reference Gas Sample Verification
Simon Niemes, James Robert Braun

—continued—

Contents continued

VOLUME 80 · NUMBERS 3-4 · APRIL–MAY 2024

- 563** Can Tritium Monitoring and Control Requirements for DEMO Be Met by Existing Technologies?
Teuntje Tijssen, Barry Butler
- 571** Comparison of Three Compact Raman Systems with Excitation Laser Wavelengths of 405, 532, and 660 nm (μ RA-RGB)
Florian Priester, Maximilian von Bentsen, Robin Gröble
- 576** Evaluation of Environmental Tritium Activity Levels and the Impact on the Public Health Around the Cernavoda Nuclear Power Plant after 25 Years of Operation
Simona Zaharov, Alexandru E. Nedelcu, Liliana A. Samson
- 582** Assessment of ^3He Release from Uranium Tritide Bed Considering Cyclic Operation Using Empirical Models
Jae-Uk Lee, Dong-you Chung, Hyun-goo Kang, Min Ho Chang, Pil-Kap Jung
- 590** Lithium Isotope Enrichment Effects in Liquid Metal/Chloride Molten Salt System
Ryo Ito, Fu Nomoto, Yasuyuki Ogino, Keisuke Mukai, Juro Yagi
- 596** Hydrogen Transport Model in Eutectic PbLi for Data Evaluation in an Absorption-Desorption Experimental Facility
Igor Peñalva, Gustavo A. Esteban, Natalia Alegría, Jon Azkurreta, María Urrestizala, Marta Malo, Belit Garcinuño, David Rapisarda
- 607** Tritium Opportunities and Challenges for Fusion Developments Worldwide—CNL and UKAEA View
Stephen Strikwerda, Paul A. Staniec, Monica Jong, Ben Wakeling, Stephen Reynolds, Ian Castillo, Sam Suppiah, Hugh Boniface, Donald Ryland, Todd Whitehorne, Kathrin Abraham, Steve Wheeler, Damian Brennan, Rachel Lawless
- 616** ViMA—The Spinning Rotor Gauge to Measure the Viscosity of Tritium Between 77 and 300 K
Johanna Wydra, Alexander Marsteller, Robin Gröble, Florian Priester, Michael Sturm