

MRS Advances

Scientific Basis for Nuclear Waste Management XLIII

<https://doi.org/10.1557/adv.2020.164> Published online by Cambridge University Press

MRS Advances: Scientific Basis for Nuclear Waste Management XLIII

Associate Editor:

David F. Bahr, *Purdue University, USA*

Principal Editor:

Nicholas Smith, *Department of Nuclear Energy, IAEA, Austria*

MRS Advances Editorial Board:

Editor-in-Chief: David F. Bahr, *Purdue University, USA*

Meenakshi Dutt, *Rutgers University, USA*

Norbert Huber, *HZG (Helmholtz-Zentrum Geesthacht Centre for Materials and Coastal Research), Germany*

Marian Kennedy, *Clemson University, USA*

Praveen Kumar, *Indian Institute of Science, India*

John Stuart McCloy, *Washington State University, USA*

Ruth Schwaiger, *Karlsruhe Institute of Technology, Germany*

Jeremy Theil, *Mountain View Energy, USA*

Materials Research Society Editorial Office, Warrendale, PA, USA:

Ellen W. Kracht, *Publications Manager*

Susan Dittrich, *Editorial Associate*

Kirby L. Morris, *Editorial and Production Associate*

Eileen M. Kiley, *Director of Communications*

Disclaimer

Authors of each article appearing in this Journal are solely responsible for all contents in their article(s) including accuracy of the facts, statements, and citing resources. Facts and opinions are solely the personal statements of the respective authors and do not necessarily represent the views of the editors, the Materials Research Society, or Cambridge University Press.

MRS Advances (EISSN: 2059-8521) is published by Cambridge University Press, One Liberty Plaza, Floor 20, New York, NY 10006 for the Materials Research Society.

Copyright © 2019, Materials Research Society. All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopying, or otherwise, without permission in writing from Cambridge University Press. Policies, request forms and contacts are available at: <http://www.cambridge.org/rights/permissions/permission.htm>. Permission to copy (for users in the USA) is available from Copyright Clearance Center at: <http://www.copyright.com>, email: info@copyright.com.

Purchasing Options:

Premium Subscription- Premium Subscription includes current subscription and one year's lease access to the full MRS Online Proceedings Library Archive for \$7,219.00 / £4,888.00 / €6,647.00. *Subscription*- Subscription with perpetual access to the content subscribed to in a given year, including three years of back-file lease access to content from the MRS Online Proceedings Library Archive. The price for a 2018 subscription is \$3,019.00 / £1,948.00 / €2,625.00. *MRS Members*- Access to *MRS Advances* is available to all MRS members without charge.

Contact Details:

For all inquiries about pricing and access to *MRS Advances*, please get in touch via the following email addresses: online@cambridge.org (for the Americas); library.sales@cambridge.org (for UK, Europe, and rest of world).

cambridge.org/adv

CONTENTS

ARTICLES

- Microstructure of Aged ^{238}Pu -doped La-monazite Ceramic and Peculiarities of its X-ray Emission Spectra 1**
Andrey A. Shiryayev, Boris E. Burakov,
Vasily O. Yapaskurt, Alexander V. Egorov,
and Irina E. Vlasova
- Instant Release Fractions for ^{14}C , ^{60}Co , and ^{125}Sb from Irradiated Zircaloy Oxide Film. 9**
Tomofumi Sakuragi and Yu Yamashita
- First Determination of Dissolution Rates of Oriented UO_2 Single Crystals 19**
S. Bertolotto, S. Szenknect, S. Lalleman,
R. Podor, L. Claparede, A. Magnaldo,
P. Raison, A. Mesbah, B. Arab-Chapelet,
and N. Dacheux
- A Feasibility Investigation of Laboratory Based X-ray Absorption Spectroscopy in Support of Nuclear Waste Management 27**
L.M. Mottram, M.C. Dixon Wilkins,
L.R. Blackburn, T. Oulton, M.C. Stennett,
S.K. Sun, C.L. Corkhill, and N.C. Hyatt
- Preliminary Investigation of Chlorine Speciation in Zirconolite Glass-ceramics for Plutonium Residues by Analysis of Cl K-edge XANES. 37**
Amber R. Mason, Stephanie M. Thornber,
Martin C. Stennett, Laura J. Gardner,
Dirk Lützenkirchen-Hecht, and Neil C. Hyatt
- Hot Isostatic Pressing (HIP): A Novel Method to Prepare Cr-doped UO_2 Nuclear Fuel 45**
Theo Cordara, Hannah Smith, Ritesh Mohun,
Laura J. Gardner, Martin C. Stennett,
Neil C. Hyatt, and Claire L. Corkhill
- $\text{Ba}_{1.2-x}\text{Cs}_x\text{M}_{1.2-x/2}\text{Ti}_{6.8+x/2}\text{O}_{16}$ (M = Ni, Zn) Hollandites for the Immobilisation of Radiocaesium. 55**
D.J. Bailey, M.C. Stennett,
and N.C. Hyatt

Synthesis, Characterisation and Preliminary Corrosion Behaviour Assessment of Simulant Fukushima Nuclear Accident Fuel Debris	65
Clémence Gausse, Calum W. Dunlop, Aidan A. Friskney, Martin C. Stennett, Neil C. Hyatt, and Claire L. Corkhill	
The Effect of A-site Cation on the Formation of Brannerite (ATi₂O₆, A = U, Th, Ce) Ceramic Phases in a Glass-ceramic Composite System.	73
Malin C. Dixon Wilkins, Martin C. Stennett, and Neil C. Hyatt	
Investigation of Silver Behavior in the Glass Melt and its Effect on the IMCC Conditions in an Industrial-scale Furnace During Vitrification of HLLW Simulants	83
A. Yu. Abashkin, I.N. Skrigan, E. Yu. Ivanov, A.O. Pleshakov, D.B. Lopukh, A.V. Vavilov, and A.P. Martynov	
Influence of Transition Metal Charge Compensation Species on Phase Assemblage in Zirconolite Ceramics for Pu Immobilisation	93
L.R. Blackburn, S.K. Sun, L.J. Gardner, E.R. Maddrell, M.C. Stennett, and N.C. Hyatt	