



HAL
open science

Editorial on Oxidation of Novel Metallic Materials (Intermetallics, MMCs, HEAs...)

Clara Desgranges, Jérôme Favergeon, Bruce Pint, Daniel Monceau, Stéphane Mathieu, Fernando Pedraza

► **To cite this version:**

Clara Desgranges, Jérôme Favergeon, Bruce Pint, Daniel Monceau, Stéphane Mathieu, et al.. Editorial on Oxidation of Novel Metallic Materials (Intermetallics, MMCs, HEAs...). High Temperature Corrosion of Materials, 2024, 101, pp.1353-1354. 10.1007/s11085-024-10320-4 . hal-04889563

HAL Id: hal-04889563

<https://hal.science/hal-04889563v1>

Submitted on 15 Jan 2025

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Editorial on Oxidation of Novel Metallic Materials (Intermetallics, MMCs, HEAs...)

Clara Desgranges¹ · Jérôme Favergeon² · Bruce Pint³ · Daniel Monceau⁴ ·
Laurence Latu-Romain⁵ · Stéphane Mathieu⁶ · Fernando Pedraza⁷

Published online: 4 October 2024

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature
2024

Over the past ten years, new methodologies have emerged that have markedly accelerated the development of new alloys. In particular, the utilisation of rapid high-throughput techniques and novel numerical alloy design approaches now enables the development of alloys with multiple optimised characteristics for a specific application. These characteristics may concern thermomechanical properties (such as strength and creep resistance), or other properties (such as density or cost), and may

✉ Clara Desgranges
clara.desgranges@cea.fr

Jérôme Favergeon
jerome.favergeon@utc.fr

Bruce Pint
pintba@ornl.gov

Daniel Monceau
daniel.monceau@toulouse-inp.fr

Laurence Latu-Romain
laurence.latu-romain@univ-grenoble-alpes.fr

Stéphane Mathieu
stephane.mathieu@univ-lorraine.fr

Fernando Pedraza
fernando.pedraza@univ-lr.fr

- ¹ CEA, Université Paris-Saclay, Gif-sur-Yvette, France
- ² Université de Technologie de Compiègne, Roberval (Mechanics Energy and Electricity), Compiègne, France
- ³ Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA
- ⁴ CNRS, CIRIMAT/Université de Toulouse, Toulouse, France
- ⁵ SIMaP, Université Grenoble Alpes, Grenoble, France
- ⁶ CNRS, Université de Lorraine, Nancy, IJL, France
- ⁷ LaSIE, La Rochelle Université, La Rochelle, France

also relate to the ability of the alloy to achieve good behaviour in a corrosive environment at high temperature. In this context, the emergence of high-entropy alloys (HEAs) and concentrated complex alloys (CCAs), comprising four to six concentrated elements, has led to the emergence of new fields of research. However, in this new paradigm of ‘combinatorial metallurgy’, there is also an increased scope for innovation in the case of ‘conventional’ steels or nickel-based alloys or light alloys, since they may contain an even greater number of alloying elements.

This issue presents a few of studies in this area, including an article focusing on the development of a rapid methodology for characterising the high-temperature oxidation properties of alloys. Another article explores the effect of Si on the oxidation behaviour of new grades of titanium alloys, while an additional paper presents a review on studies on high-temperature oxidation of additively manufactured HEAs.

The following papers are contributions from the ‘Oxidation of Novel Metallic Materials (Intermetallics, MMCs, HEAs...)’ session of the 11th International Conference on High-Temperature Corrosion and Protection of Materials (HTCPM 2024), held at Les Embiez Island, France, on 9–14 June 2024.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.