

Corrosion Testing in Nitrate Molten Salt Using Rotating Cylindrical Electrode

Ty Townsend¹ and Dev Chidambaram²

© 2022 ECS - The Electrochemical Society

ECS Meeting Abstracts, Volume MA2022-02, C03: Corrosion in Nuclear Energy Systems: From Cradle to Grave 2

Citation Ty Townsend and Dev Chidambaram 2022 *Meet. Abstr. MA2022-02* 766

DOI 10.1149/MA2022-0212766mtgabs

¹ University Of Nevada, Reno

² University of Nevada, Reno

Abstract

Molten salts are under consideration as the working fluid in thermal power generation. Nitrate molten salts store vast amounts of energy at high temperature and are an efficient energy production medium. Nitrate molten salts are corrosive to structural materials in these applications. Static corrosion studies may neglect the effects of fluid flow on corrosion and flowing test loops can be expensive and complex. A rotating cylinder electrode (RCE) can simulate the effects of fluid flow on the corrosion of structural materials and are more compact and economical then flow loops. We have developed a rotating cylinder electrode apparatus to study the corrosion of structural metals in flowing molten salts using accelerated electrochemical corrosion testing. In this study, we have evaluated the corrosion behavior in molten nitrate salts and used various surface characterization techniques to compare the results from static corrosion tests. Results and analysis of these studies will be presented.

Acknowledgement:

This research is being performed using funding received from the DOE Office of Nuclear Energy's Nuclear Energy University Programs under awards DE-NE0008889 and DE-NE0008236, and the US Nuclear Regulatory Commission (USNRC) under contract 31310018M0032. Dr. Kenny Osborne and Ms. P. Nancy Hebron will serve as the program managers for the DOE and NRC awards, respectively.



Export citation and abstract

[BibTeX](#)

[RIS](#)

◀ Previous article in issue

Next article in issue ▶

ECS Toyota Young Investigator Fellowship

For young professionals and scholars pursuing research in batteries, fuel cells and hydrogen, and future sustainable technologies.



A
J

[Learn](#)

You may also like

JOURNAL ARTICLES

[Alkali Chloride Molten Salt Corrosion Testing Using a Rotating Cylindrical Electrode](#)

[Spectroelectrochemistry of the Electrolytic Reduction of Trivalent Lanthanides in LiCl-KCl Eutectic Molten Salt](#)

[Surface Characterization of Candidate Materials for High Temperature Power Plants](#)

[Near Infrared Spectroscopy of Fission Products in Alkali Chloride Molten Salt – Structural Interpretation and Analytical Use](#)

[Corrosion of Additively Manufactured CoCrFeMnNi High Entropy Alloy in Molten NaNO₃-KNO₃](#)

[Recovery of Alkaline-Earths into Liquid Bi in Ternary LiCl-KCl-SrCl₂/BaCl₂ Electrolytes at 500 °C](#)

