Overview

Kroll Award Papers
Simulating the Behavior of Zirconium-Alloy Components in Nuclear Reactors p. 3
Physical Phenomena Concerning Corrosion Under Irradiation of Zr Alloys p. 20
Second-Phase Particles
Role of the Second-Phase Particles in Zirconium Binary Alloys p. 33
Discussion p. 56
Synchrotron Radiation Study of Second-Phase Particles and Alloying Elements in Zirconium Alloys Discussion p. 78
The Behavior of Intermetallic Precipitates in Highly Irradiated BWR LTP-Cladding p. 80
Effects of Hydrogen Pickup and Second-Phase Particle Dissolution on the In-Reactor Corrosion Performance of BWR Claddings p. 96
Alternative Zr Alloys with Irradiation Resistant Precipitates for High Burnup BWR Application p. 119
Discussion p. 132

Oxides
Mossbauer Investigations of the Chemical States of Tin and Iron Atoms in Zirconium Alloy Oxide Film p. 135
Discussion p. 152
Chemical State Analysis of Sn and Fe in ZrO[subscript 2] by Mossbauer Spectroscopy p. 154

The Role of Lithium and Boron on the Corrosion of Zircaloy-4 Under Demanding PWR-Type Conditions p. 169
Discussion p. 189
Study of the Mechanisms Controlling the Oxide Growth Under Irradiation: Characterization of Irradiated Zircaloy-4 and Zr-1Nb-O Oxide Scales p. 190
Discussion p. 218
Discussion p. 243
Corrosion and H Pickup
The Influence of Material Variables on Corrosion and Deuterium Uptake of Zr-2.5Nb Alloy During Irradiation p. 247
Discussion p. 272
The Cause for Enhanced Corrosion of Zirconium Alloys by Hydrides p. 274
Discussion p. 295
The Effect of Minor Alloying Elements on Oxidation and Hydrogen Pickup in Zr-2.5Nb p. 297
Discussion p. 311
Role of Microchemistry and Microstructure on Variability in Corrosion and Deuterium Uptake of Zr-2.5Nb Pressure Tube Material p. 313
Discussion p. 337
Temperature and Hydrogen Concentration Limits for Delayed Hydride Cracking in Irradiated Zircaloy p. 339
Discussion

Basic Metallurgy and Fabrication

Experimental Study and Preliminary Thermodynamic Calculations of the Pseudo-Ternary Zr-Nb-Fe- (O,Sn) System

Discussion

Activated Slip Systems and Localized Straining of Irradiated Zr Alloys in Circumferential Loadings

Discussion

Effects of Neutron Irradiation on the Microstructure of Alpha-Annealed Zircaloy-4

Discussion

Plastic Deformation and Fracture During the Zr1% Nb Tube Production

Discussion

Development of Crystallographic Texture in CANDU Calandria Tubes

Discussion

In Reactor Behavior and H Effects

Impact of Hydrogen on Dimensional Stability of ZIRLO Fuel Assemblies

Discussion

In-PWR Irradiation Performance of Dilute Tin-Zirconium Advanced Alloys

Discussion

Predicting the In-Reactor Mechanical Behavior of Zr-2.5Nb Pressure Tubes from Postirradiation Microstructural Examination Data

Discussion

The Influence of In-Situ Clad Straining on the Corrosion of Zircaloy in a PWR Water Environment

Discussion

Characteristics of Hydride Precipitation and Reorientation in Spent-Fuel Cladding

Discussion

Test Reactor Studies of the Shadow Corrosion Phenomenon

Discussion

An In-Reactor Simulation Test to Evaluate Root Cause of Secondary Degradation of Defective BWR Fuel Rod

High Temperatures, RIA, and Storage Effects

The Effect of Short-Term Dry-Out Transients on the Cladding Properties of Fresh and Pre-Irradiated Fuel Rods

Discussion

Effects of Alpha-Beta Transformation on High Temperature (LOCA) Creep Behavior of Zr-Alloys

Discussion

Influence of Hydrogen Content on the [alpha]-[beta] Phase Transformation Temperatures and on the Thermal-Mechanical Behavior of Zy-4, M4 (ZrSnFeV), and M5 (ZrNbO) Alloys During the First Phase of LOCA Transient

Discussion

On the Embrittlement of Zircaloy-4 Under RIA-Relevant Conditions