

CONTENTS

Introduction

KEYNOTE LECTURES

A Critical Evaluation of Current Environment-Sensitive Fracture Test Methods	5
Current Understanding of the Mechanisms of Stress Corrosion and Corrosion Fatigue	32
Application of Laboratory Test Data to Engineering Design	52

STRESS CORROSION CRACKING

Static Tests

Interlaboratory Evaluation of K_{Isc} Measurement Procedures for Steels : A Summary	75
Influence of Precracked Specimen Configuration and Starting Stress Intensity on the Stress Corrosion cracking of 4340 Steel	80
Stress Corrosion Evaluation of Titanium Alloys Using Ductile Fracture Mechanics Technology	98
Dicussion	113
Loading Mode (Mode I/Mode III) Testing for Stress Corrosion Cracking	114
Dicussion	127
Studies of Stress Corrosion Crack Growth in Al-Zn-Mg Alloys by the Double Torsion Method	128
A Fracture Mechanics Model for Iodine Stress Corrosion Crack Propagation in Zircaloy Tubing	150
Utilizing Various Test Methods to Study the Stress Corrosion Behavior Of Al-Li-Cu Alloys	173
Slow-Strain-Rate Stress Corrosion Testing of Aluminum Alloys	202
Dicussion	240
Slow-Strain-Rate Testing of Al 7075-T6 in Controlled Atmospheres	242
Evaluating the Intergranular SCC Resistance of Sensitized Type 304 Stainless Steel in Low-Temperature Water Environments	256

Effect of Material and Environmental Variables on SCC Initiation in Slow-Strain-Rate Tests on Type 304 Stainless Steel	271
Discussion	287
Application of Slow-Strain-Rate Tests to Defining the Stress for Stress Corrosion Crack Initiation in 70/30 Brass	288
Evaluation of SCC Test Methods for Inconel 600 in Low Temperature Aqueous Solutions	310
Cyclic and Sequential Loading	
An Evaluation of Environment-Enhanced Fatigue Crack Growth Rate Test as an Accelerated Static Load Corrosion Test	325
Experimental Methods for the Evaluation of Environmentally Assisted Cracking of Steel in Caustic	341
Threshold-Stress Determination Using Tapered Specimens and Cyclic Stresses	368
Effect of Sequential Load or Potential Changes on Stress Corrosion Cracking Behavior of Steels	383
Use of a load-Pulsing Technique to Determine Stress Corrosion Crack Velocity	399
CORROSION FATIGUE	
Development of a Navy Standard Test Method for Fatigue Crack Growth Rates in Marine Environments	415
Automated Corrosion Fatigue Crack Growth Testing in Pressurized Water Environments	426
Use of a Constant ΔK Test Method in the Investigation of Fatigue Crack Growth in 288° C Water Environments	443
Computer-Controlled Fatigue Crack Growth Rate Testing on Bend Bars In a Corrosive Environment	470
A Low-Cost Microcomputer Data Acquisition System for Fatigue Crack Growth Testing	484
Application of Ultrasonic Fatigue Testing Techniques to the Evaluation Of the Corrosion-Fatigue Strength of Materials	497
Effect of Water Vapor on Fatigue Crack Growth in 7475-T651 Aluminum Alloy Plate	513
Discussion	532
Corrosion Fatigue of 7000 Series Aluminum Alloys	534
SUMMARY	
Summary	551
Index	555