In some materials but not in others is very complex, the net result of all environmentally induced fracture is the reduction in the force and energy associated with the tensile or shear separation of atoms at the crack tip.

For many years it has been recognized that engineering materials that are tough and ductile can be rendered susceptible to premature fracture through their reaction with the environment. Over 100 years ago, Reynolds associated hydrogen with fatigue failure. This phenomenon is one of the most important areas of research in materials science and engineering, as it affects the performance and longevity of many structural and mechanical components. The term "fatigue" refers to the progressive weakening of a material due to repeated loading, which can lead to failure in the absence of a detectable defect. Fatigue cracking is a critical concern in many industries, including aerospace, automotive, and power generation, where it can lead to accidents and fatalities. The handbook provides a comprehensive overview of the fundamentals of fatigue, including the mechanisms of crack initiation and propagation, the role of environmental factors, and the assessment of fatigue life. The authors also discuss the development of advanced materials and processes to mitigate fatigue cracking, as well as the importance of design, fabrication, and inspection in preventing fatigue failures. The handbook concludes with a summary of the key findings and recommendations for future research in the field of fatigue. This handbook is an essential resource for researchers, engineers, and students who are interested in understanding the complex mechanisms of fatigue and developing strategies to prevent and mitigate fatigue failures.
The understanding of the dependence of crack propagation processes on internal forces is the key issue of fracture mechanics. Fatigue and fretting corrosion are treated in the present book. The authors are well supported by the numerous results of their own research and other research results.

Corrosion of Metals - T. W. Crooker - 1983

Fractography and Materials Science - L. N. Gilbertson - 1981


Fatigue Mechanisms

Naval Research Reviews

Mechanical Behaviour of Materials - VI

This textbook is of conical type, contains important topics, and is written for the use of students and researchers who are interested in the mechanics of solids. It is a comprehensive book on the mechanics of solids and its applications, containing well-structured and well-argued material. It is a valuable resource for students and researchers working in the field of mechanics.

Fractography and Materials Science - L. N. Gilbertson - 1981


Fatigue of Materials

Mechanical Behaviour of Materials - VI

This book serves as a reference for engineers, scientists, and students concerned with the use of materials in applications where reliability and resistance to corrosion are important. It updates the coverage of its predecessor, including coverage of corrosion of metallic materials, corrosion of non-metallic materials, corrosion of composite materials, and intermetallic compounds. The Sixth International Conference on Mechanical Behaviour of Materials (ICM-6), taking place in Kyoto, Japan, 29 July - 2 August 1991 addressed these topics. In commemorating the fortieth anniversary of the first International Conference on Mechanical Behaviour of Materials held in Kobe, Japan, 29 July - 2 August 1991.

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