

# Introduction

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The symposium on Fracture Mechanics Applied to Brittle Materials from which this volume was taken was organized to provide a state-of-the-art review of the various test techniques currently being used to obtain fracture mechanics data on a wide variety of brittle materials including ceramics, glasses, rocks, and concrete. This volume is a compilation of papers describing and reviewing most of the commonly used fracture toughness measurement techniques for brittle materials. Particular attention is given to the problems and discrepancies observed in making these measurements. The articles discuss not only critical fracture toughness measurements but also methods for determining crack growth rates in these materials as a function of stress intensity. In the latter case data are used to provide a basis for lifetime predictions for brittle components under stress. The papers in this volume cover a wide variety of test techniques which are now being used. Although the list of techniques discussed is clearly not complete, the papers should describe for the reader the kind of assumptions, problems, and unknown factors involved in making fracture toughness measurements in brittle materials and the reproducibility from one technique to another. One must remember in reading the papers in this volume that there is currently no "standard" test technique for obtaining fracture mechanics parameters on brittle materials. It is in fact the objective of Subcommittee E24.07 on Fracture Toughness of Brittle Nonmetallic Materials under whose direction this symposium was organized, to provide the experimental basis for establishing standard test procedures. However, this book should provide the reader with current guidelines for choosing a particular test technique, as well as being a basis for future experiments needed to establish the parameters important for the determination of accurate values of fracture toughness and crack velocity. It is hoped that this volume will be useful to workers in the fracture mechanics field as well as to those attempting to use this kind of data to predict the fracture behavior of brittle materials.

*S. W. Freiman*

Fracture and Deformation Division, National  
Bureau of Standards, Washington, D.C.  
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