Introduction

The papers in this volume were presented at an ASTM symposium held on 20 June 1983 in conjunction with the 24th Annual Rock Mechanics Symposium at Texas A&M University, College Station, TX.

The purpose of these papers is to present recent developments in the measurement of rock properties at elevated pressures and temperatures, and to examine and interpret the data produced by such measurement.

The need for measuring rock properties at elevated pressures and temperatures has become increasingly important in recent years. Location and design of nuclear waste repositories, development of geothermal energy sites, and design and construction of deep excavations for civil, military, and mining engineering require significantly improved capabilities for measuring rock properties under conditions substantially different from those prevailing in most laboratory and in situ work. The development of high-pressure, high-temperature capabilities is also significant for the analysis of tectonic processes.

More than empiricism is needed. To extend the ability to predict physical behavior under conditions of elevated pressures and temperatures requires more than superficial understanding of the physical processes involved. Since the material is rock—heterogeneous, anisotropic, discontinuous—and is really many materials, the tasks undertaken by the authors are formidable. We see in these papers the blending of distinctly different disciplines and of the pure and the applied.

The papers have benefited from both the spirited and detailed discussions that followed their oral presentations and from the thorough peer reviews of the written versions. Considerable thanks are due all of those unnamed contributors.

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