

## WATER-ROCK INTERACTION

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# WATER-ROCK INTERACTION

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Front cover: Title page illustration from the first printed publication on “German Spas” by Hans Foltz, about 1480. It shows the Spa “Wildbad” where people are bathing in pools that are filled by warm springs flowing from the rocky cliffs to the right. The warm waters are mineralized by “water-rock-interaction”, specifically the interaction of meteoric water with gneisses and granites of the Black Forest basement. The waters have been utilized in “Wildbad” for more than 700 years and the bath is still in operation to day.

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# Preface

The chemical interaction of water and rock is one of the most fascinating and multifaceted process in geology. The composition of surface water and groundwater is largely controlled by the reaction of water with rocks and minerals. At elevated temperature, hydrothermal features, hydrothermal ore deposits and geothermal fields are associated with chemical effects of water-rock interaction. Surface outcrops of rocks from deeper levels in the crust, including exposures of lower crustal and mantle rocks, often display structures that formed by interaction of the rocks with a supercritical aqueous fluid at very high pT-conditions. Understanding water-rock interaction is also of great importance to applied geology and geochemistry, particularly in areas such as geothermal energy, nuclear waste repositories and applied hydrogeology. The extremely wide-ranging research efforts on the universal water-rock interaction process is reflected in the wide diversity of themes presented at the regular International Symposia on Water-Rock Interaction (WRI).

Because of the large and widespread interest in water-rock interaction, the European Union of Geosciences organized a special symposium on “water-rock interaction” at EUG10, the biannual meeting in Strasbourg 1999 convened by the editors of this volume. In contrast to the regular WRI symposia addressed to the specialists, the EUG10 “water-rock interaction” symposium brought the subject to a general platform. This very successful symposium showed the way to the future of water-rock reaction research.

In this book, the reader will find a selection of papers about groundwater – aquifer rock interaction, origin of solutes in groundwater, reaction of hydrothermal waters in geothermal areas, water – rock interaction in mineral and gas hydrate deposits, groundwater reaction with rocks in active volcanic areas and an experimental study of surface reactions in silica-bearing solutions.

The editors would like to express their thanks to the authors for investing so much time and effort in this venture and for their willingness to share their ideas with the Earth Science community. We also are very grateful to all colleagues who took their time and effort to constructively reviewing the contributions and in doing so helped to significantly improve the quality of the presentations. Without the generous effort of competent reviewers modern science would be impossible.

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Ingrid Stober and Kurt Bucher

Freiburg, September 27. 2001