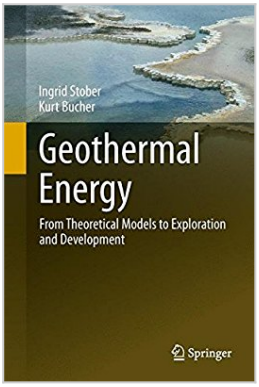

Geothermal Energy: From Theoretical Models to Exploration and Development

By Ingrid Stober, Kurt Bucher

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The internal heat of the planet Earth represents an inexhaustible reservoir of thermal energy. This form of energy, known as geothermal energy has been utilized throughout human history in the form of hot water from hot springs. Modern utilization of geothermal energy includes direct use of the heat and its conversion to other forms of energy, mainly electricity. Geothermal energy is a form of renewable energy and its use is associated with very little or no CO2-emissions and its importance as an energy source has greatly increased as the effects of climate change become more prominent. Because of its inexhaustibility it is obvious that utilization of geothermal energy will become a cornerstone of future energy supplies. The exploration of geothermal resources has become an important topic of study as geology and earth science students prepare to meet the demands of a rapidly growing industry, which involves an increasing number professionals and public institutions participating in geothermal energy related projects. This book meets the demands of both groups of readers, students and professionals. Geothermal Energy and its utilization is systematically presented and contains the necessary technical information needed for developing and understanding geothermal energy projects. It presents basic knowledge on the Earth’s thermal regime and its geothermal energy resources, the types of geothermal energy used as well as its future potential and the perspectives of the industry. Specific chapters of the book deal with borehole heat exchangers and with the direct use of groundwater and thermal water in hydrogeothermal systems. A central topic are Enhanced Geothermal Systems (hot-dry-rock systems), a key technology for energy supply in the near future. Pre-drilling site investigations, drilling technology, well logging and hydraulic test programs are important subjects related to the exploration phase of developing Geothermal Energy sites. The chemical composition of the natural waters used as a heat transport medium in geothermal systems can be used as an exploration tool, but chemistry is also important during operation of a geothermal power plant because of potential scale formation and corrosion of pipes and installations, which needs to be prevented. Graduate students and professionals will find in depth information on Geothermal Energy, its exploration and utilization.

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Editorial Review

Review

Book: Petrogenesis of metamorphic rocks (Bucher & Frey) Springer-Verlag 2002 Customer reviews on Amazon.com one of the best textbooks available, 10. April 2000 Von Katharina Dubach Petrogenesis of metamorphic rocks is probable the best textbook available for students of metamorphic petrology. In a short, concise form it introduces the reader to the principles of metamorphic petrology as well as to the evolution of different rock types under changing metamorphic conditions.

Excellent source for anyone studying metamorphic rocks., 2. Juni 1999 Von Ein Kunde This book is divided into two sections. The first section deals with the basic princiles of metamorphism, including composition of source rocks, types, processes and condidtions of metamorphism. A very detailed description on the construction of metamorphic projections is also included. Part two covers the metamorphism of different rock compositions including ultramafic, mafic, carbonate, pelitic, and granitoid rocks. This section is very detailed, without bogging down with specific examples of metamorphism.

From the Back Cover
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About the Author

Ingrid Stober: Studied Earth Sciences at the University of Freiburg (Germany). 1985 Ph.D. with the dissertation on “groundwater flow patterns in hard-rock aquifers, results from pumping- and injection-tests”. 1994 habilitation thesis on "hydrogeology of crystalline rocks of the Black Forest, Germany". She is working at the Geological Survey of Baden-Württemberg, with the responsibility for geothermal energy. Her research interests are geothermal waters and hydraulics.

Kurt Bucher: Studied Geology at ETH Zurich (Switzerland). 1977 Ph.D. in metamorphic petrology. Assistant professor at the University of Basel (Switzerland), Professor of Geology at the University of Oslo (Norway) and is currently Full Professor of Mineralogy and Geochemistry at the University of Freiburg (Germany). His research is focused on field studies of water-rock interaction processes in deep geothermal systems.

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