

Preface

The contributions of this book arose from a conference on “Mineralogy and analytics of highpurity SiO_2 raw materials” held in June 2011 in Freiberg, Germany. The 15 chapters are written by international experts and reflect the state of the art in the field of quartz and silica raw materials. The book covers the broad field of SiO_2 minerals and rocks and shows the progress made during the last decades in the evaluation of deposits and the application of advanced characterization methods to study the genesis and properties of these materials.

In the broad sense the subject of this book belongs to the properties and specifics of both natural and synthetic materials of the SiO_2 system. The chapters are dealing mainly with the mineral quartz, which is one of the most frequent minerals of the Earth’s crust and also an important raw material in the industry. Therefore, the book is addressed to graduate students and scientists in mineralogy, geology, chemistry, physics, materials science and engineering, as well as to people from the industry, who are working with the processing and technical application of quartz and SiO_2 material.

The 15 chapters of the book should be divided into at least three parts. The first chapter provides a general overview about the classification, mineralogy and industrial potential of SiO_2 -minerals and rocks. The next five chapters deal with aspects of exploration and qualification of potential deposits of quartz raw materials in terms of certain technical applications. Examples are given for potential deposits of SiO_2 raw materials in Argentina, Brazil, Germany and Norway. The third part of the book is focused on modern analytical methods, which are being used for a thorough investigation of quartz and SiO_2 materials in geosciences and in the industry. Each chapter presents fundamentals of chemical and structural characterization methods such as microprobe analysis, LA-ICP-MS trace-element analysis, fluid inclusion studies, electron paramagnetic resonance spectroscopy, and cathodoluminescence microscopy and spectroscopy. All these methods are recently used for the microcharacterization of quartz and SiO_2 material in science and industry.

The editors of this book are highly appreciated because this book represents a fruitful international collaboration between scientists from Australia, Brazil, Canada, Germany, Norway, Switzerland and the USA.

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Quartz: Deposits, Mineralogy and Analytics

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2012, XVI, 360 p., Hardcover

ISBN: 978-3-642-22160-6