Preface

Stable isotope investigations in the earth sciences continue to grow, maybe faster than ever before. After publication of the 5th edition, tremendous progress has been achieved in many subfields of stable isotope geochemistry. To name a few:

- Applications of Multicollector - ICP-MS has grown rapidly and now enable investigations on natural isotope variations of a wide range of transition and heavy elements that could not previously be measured with adequate precision.
- Precise ion probe measurements on the micrometer scale allow the detection of the growth and dissolution history of minerals.
- Evidence for mass-independent fractionation in a variety of compounds and elements has increased considerably.
- High precision analysis of the multiple rare isotopes of a specific element permit the distinction of different mass-dependent fractionation mechanisms.
- Precise measurements of molecules containing more than one rare isotope indicate non-random distributions of the rare isotopes, which potentially may be utilized as one-mineral thermometers.

These recent advances made a further revision necessary. Again I have tried to provide a contemporary overview of the entire field of stable isotope geochemistry enabling a quick access to the most recent literature, although many references date back to the 1960 and 1970s when seminal papers were published. I am fully aware of omissions and shortcomings, but I hope the new edition gives a well balanced discussion of the whole field including the new isotope systems introduced mainly by MC-ICP-MS techniques.

My colleagues Michael Böttcher, Max Coleman, Alan Matthews and Harald Strauß have reviewed an early draft, which is gratefully acknowledged. Yongsheng He was of great help during the preparation of some figures. I take, however, full responsibility for any shortcomings that remain.