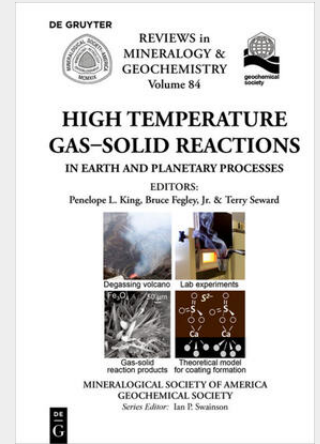


High Temperature Gas-Solid Reactions in Earth and Planetary Processes

High temperature gas-solid reactions are ubiquitous on planetary bodies, distributing chemical elements over a range of geologic settings and temperatures. This volume reviews the critical role gas-solid reactions play in early solar system formation, volcanism, metamorphism and industrial processes. The field evidence, experimental and theoretical approaches for examining gas-solid reaction are presented, building on advances in fields outside of Earth Sciences. Computational chemistry techniques are used to probe the nature of molecular clusters and solvation in volcanic vapors and mineral-gas reaction mechanisms. Specialised analytical methods for characterising solid reaction products are included since these reactions commonly form thin or dispersed films and metastable minerals. Finally, the volume contains rich field examples, laboratory experiments and thermodynamic modelling and kinetics of gas-solid reactions on Earth, Venus and beyond.



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