

# **DISSOLUTION-REPRECIPITATION DURING MELT-ROCK INTERACTION IN PARTIALLY MOLTEN SILICATES**

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Crystal-melt two-phase aggregate is an inevitable but very often transient product of melt generation and solidification processes. Interactions between partial melts and crystalline matrix have profound effects on the chemical and physical properties of the melt and solid matrix. The main objective of my lectures is to understand the mechanisms and processes of crystal-melt interaction in partially molten silicates and their geological implications. In part I of my lecture, I will review the thermodynamic driving forces for diffusion, diffusion equations for binary and multicomponent systems, and selected solutions of moving boundary problems. In part II of my lecture, I will introduce the concept of dissolution-reprecipitation during crystal-melt interaction. Examples of dissolution-reprecipitation in binary and ternary mono-mineralic systems and ternary bi-mineralic systems will be discussed. In part III of my lecture, I will focus on melt-rock interaction, using examples from laboratory experiments and numerical calculations. If time permits, I will also discuss briefly the dynamics of melt-rock reaction during magma transport in the mantle. My last lecture is sort of a lab or practical during which the attendees will have a chance to play and study movies of crystal-melt interactions compiled from numerical calculations. I will also bring a simple MatLab script for interested attendees to run their own simulations.