Carbonate mineral scaling is commonly associated with geothermal fluid utilization, both in the reservoir as well as in production and re-injection wells and surface pipelines. Problematic aspect is to visually investigate on-going geochemical processes. The Lack of information on porosity changes, total reactive surface area, fluid-rock kinetics makes difficult to predict such interaction and leads to malfunction during geothermal utilization. Understanding the $CO_2$-water-rock interaction at geothermal conditions is therefore of significant importance.

For this reason batch-type experiments ($CO_2$-$H_2O$-olivine) were conducted as a function of time and acid supply under hydrothermal conditions. Such series of experiments tell us more about typical dissolution, nucleation, crystal growth macroscopic patterns of secondary phases or how evolves reactive surface area with time. For dissolution patterns olivine, crystalline basalt and basaltic glass powders were dissolved in 1D flow-through columns. These experimental examples of porous media can answer how is mass transfer affected with distance in porous media. Moreover how is evolving porosity and reactive surface area with reaction progress.

Morphology of typical grains in porous media (scale bar is 100 μm):
a) prior dissolution
b) after 1 month dissolution on inlet side of acidic solution