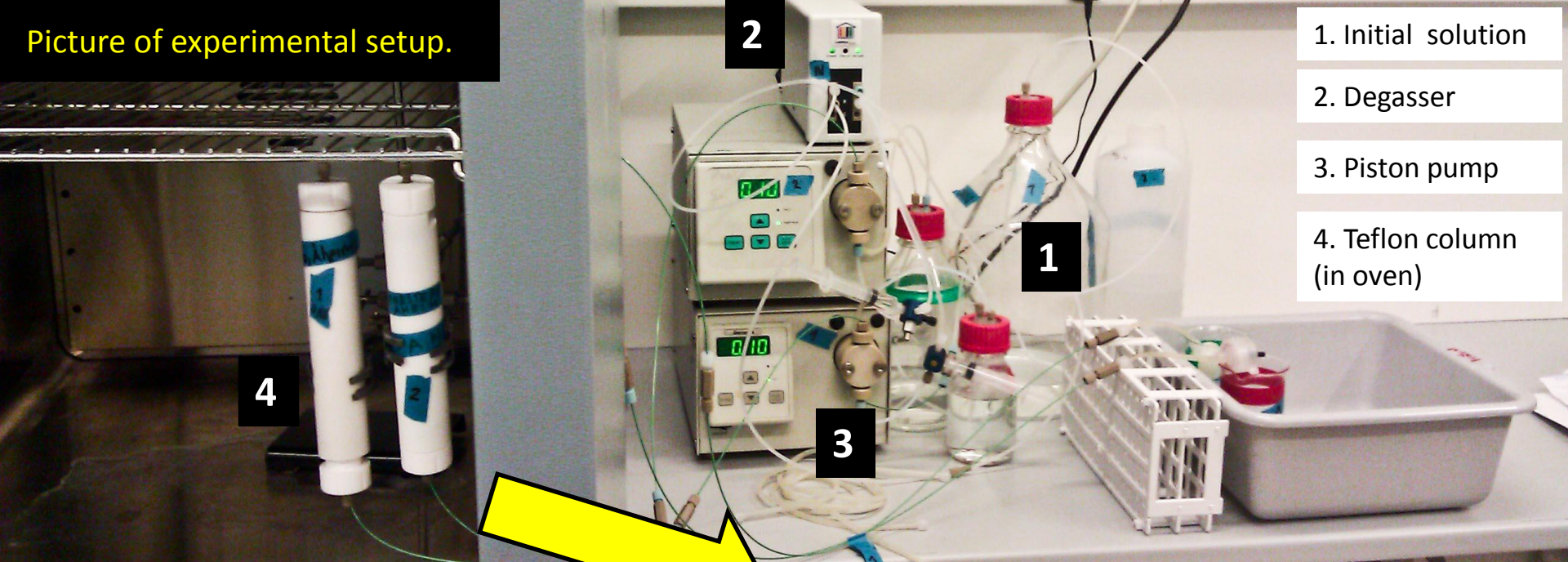
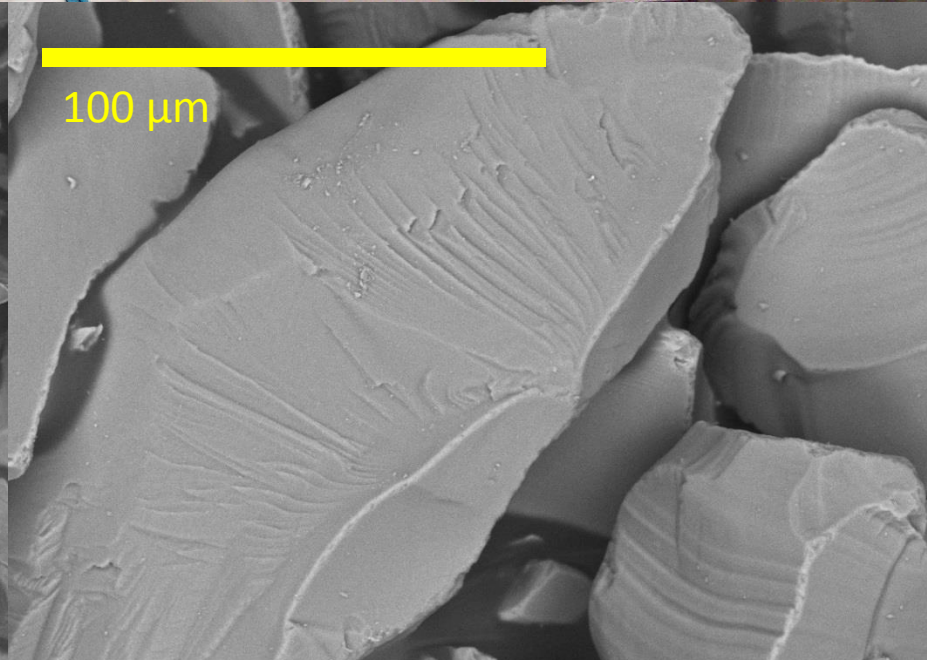


Picture of experimental setup.



- 1. Initial solution
- 2. Degasser
- 3. Piston pump
- 4. Teflon column (in oven)



SEM images of unreacted forsterite loaded to flow through reactor experiment.

Progress report, 1st semester: Jan Prikryl

Carbonate Scale formation in porous media

Project description:

Natural mineral scale precipitation occurs in basaltic rock formations via reaction with CO₂ rich waters. This leads to the formation of natural scale minerals (Ca, Mg, Fe-carbonates) that clog the rock pores and fill in fractures. This process is basically the natural analog to pipe scaling but in a much more complex media. In order to study the mineralization reactions upon continued injection of aqueous CO₂ solutions into porous media containing Mg-Fe rich rocks, reaction transport experiments and simulations will be conducted.

Current state:

In previous months the preparation work for experiments have been made (e.g. searching for and processing the suitable rocks, testing hydrological tracers, customizing the spectrophotometric methods for analyzing samples). Up to date the flow-through experiments just started and will be continuously running for months. The observed system involves reacting olivine (93 % forsterite) with aqueous solutions with CO₂ and NaCl at 6,5 and 9 pH values. The experiments are conducted using a 1-D flow-through reactor at 60°C. By using the solution chemistry, the reaction progress, carbonate mineralization rate and porosity changes are studied as a function of time.

Plans for the coming period:

Continue with flow-through interaction experiments of forsterite and water rich in CO₂. Plus adding more reactors under different conditions (solution composition, temperature, pressure etc.).

Some outreach activity.