

Secondment: Flavia Digiaco (Arcadis GmbH -> University of Copenhagen)

The time that I spent at the University of Copenhagen (KU) was used to optimize the set-up of the column experiments on which I am focused. Column tests are important tools to understand the transport behaviour of the reactants (known and newly synthesized GR/LDH) as they are injected in soil or rock.

The reactant injection needs to be studied in detail in a simple model system which allows assessment of their mobility and activity once they are injected in porous media. To meet this goal, the transport potential of GR particle suspensions was evaluated in a series of laboratory water-saturated column experiments. The preliminary transport tests were conducted using two different-size (internal diameter: 1 cm and 2,7 cm and length: 13 cm) self-made plastic columns (figure 1). At the bottom and top of each column were located nylon net filters (80 μm pore size) to prevent porous media from being displaced into the tubing. A peristaltic pump was used to inject the different solutions/suspensions.



Figure 1 Water-saturated columns used for the preliminary and tracer tests (University of Copenhagen).

Following several preliminary and tracer tests, the columns were moved in an oxygen-free glovebox to carry out the injection of GR suspensions under anaerobic conditions. As a first attempt, I have injected suspensions containing different concentrations of Al-GR(Cl) (synthesized at KU by my colleague Marco, ESR 1 of our project). The concentration of the reactants is a very important factor for mobility experiments. During transport through the column the original suspension undergoes dilution and this may change their properties and consequently their behaviour when released into an aquatic system.

During the time that I spent at KU, I had the opportunity to learn more about UV-Vis and AAS techniques and gain helpful information to optimize the column set-up. I will be continuing my experiments in Karlsruhe at KIT where I will use the new acquired expertise. The following experiments will be focused on testing different kinds of reactants and comparing their transport behaviour. The secondment was a great experience because it allowed me to work very closely to some of the other ESRs of the project and to learn from the other scientists who were always glad to share their knowledge with us. I am looking forward to doing another secondment.