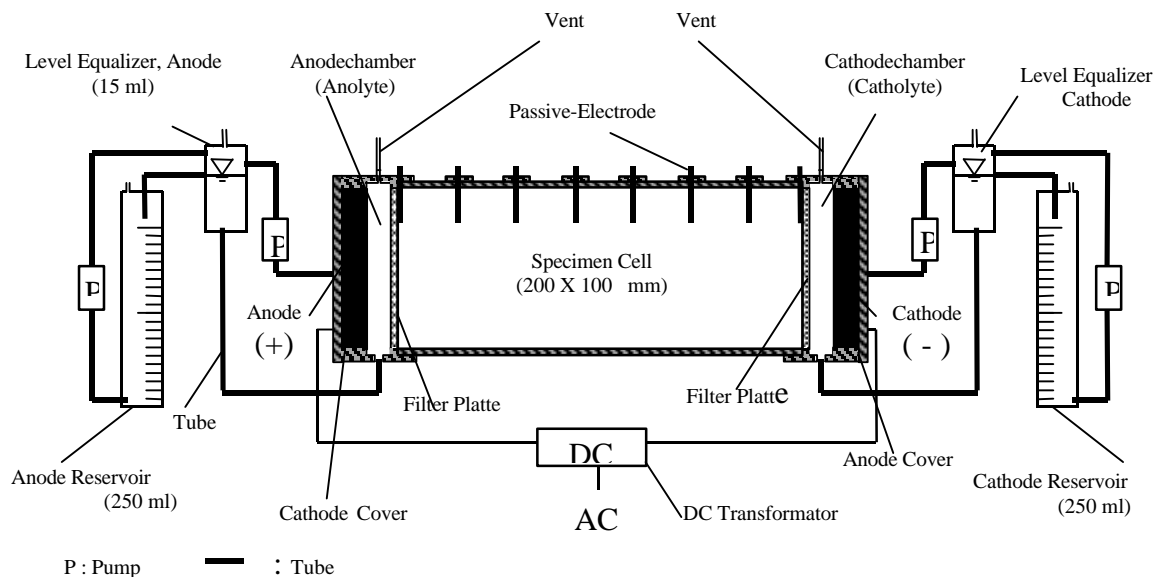


Elektrokinetic remediation of contaminated soil

Electrokinetic remediation is an innovative method for removing especially heavy metal contaminants from soil - using in situ technics. Like other in situ methods such as bioremediation, vapor extraction or soil flushing - electroremediation has advantages in avoiding high costs and human health risks of excavation. Electroremediation is an appropriate remediation method for the decontamination of heavy metal contaminants in fine grained soil with a low permeability.

In this process where an electrical current is passed through an array of electrodes that is embedded in the soil, an induced water and ion transport occur towards the electrodes. These processes are known as electroosmosis and electromigration. Charged ions are moved toward the electrodes due to their polarity. Uncharged contaminants such as soluble organic molecules can be moved with the bulk liquid by electroosmosis. The contaminants reach the electrode reservoirs and then the solutions can be easily pumped out and treated.

To obtain a better understanding about electrokinetic processes in soil investigations have been carried out at the Department of Geotechnical Engineering, Freiberg University of Mining and Technology using the test set up as shown in the following figure.



By understanding the basic processes occurring in the soil during the remediation it is easy to control and to influence these processes. The tests were carried out on kaolin specimens which were contaminated with 1000 ppm Pb^{2+} . The results of these tests show that by using electrokinetics it is possible to remove the contaminants from the soil nearly completely. It is planned to carry out tests on different naturally contaminated soil specimens.