



Redox Measurements in Water-saturated Bentonite

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Knowledge of the redox conditions in geological media is important, e.g., for predicting the behaviour of dissolved species with regard to their solubility, speciation, sorption and transport properties. The redox conditions are often expressed in terms of the potential between a reference electrode and a measuring electrode consisting of a wire of a noble metal like gold or platinum. This technique works well when the redox-determining agents are present in relatively high concentrations, in which case both gold and platinum electrodes give the same redox potentials. However, when the redox-determining species are present at low concentrations, the gold and platinum electrodes may yield quite different redox potentials. The interpretation of the results is then associated with the problem of determining whether both electrodes show wrong values or determining which one gives correct values.

This presentation contains our results from redox measurements carried out with gold and platinum electrodes in sodium bentonite and in various aqueous solutions. The importance of electrode cleaning was also studied. The results demonstrate that gold and platinum electrodes can be successfully used in studies of the redox conditions in such a complex geological medium as bentonite, but also that a healthy awareness of the difficulties involved in redox measurements is required.