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Speciation of dissolved iron(II) and manganese(II) in a groundwater pollution plume

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General information
Iron and manganese in an anaerobic leachate plume

In the strongly anaerobic part of the leachate plume at the Grindsted Landfill very high concentrations of dissolved iron and manganese have been observed consistently; for example iron was found in concentrations exceeding 200 mg/l. Samples carefully obtained from the plume have been characterized in terms of colloidal content (cross flow filtration) and free ferro-ion activity (ion exchange resin technique). The results surprisingly suggest that more than 70% of the measured iron concentrations are due to free ferro-ions. This suggests strongly supersaturated conditions in the plume and currently the thermodynamic data for siderite (FeCO3) is being revisited and supplementary measurements made

Leaching of heavy metals from soils

Quality criteria for soils with respect to heavy metals have traditionally focused on the environmental issues related to the land use (ingestion of soil, skin contact, etc.) and very little attention has been given to protection of the groundwater. The complex form of heavy metals in polluted soils makes prediction of leachability difficult and leaching experiments or leaching test are usually the only way to assess the amount of metal to leach from the soil. Model scenarios are being developed to evaluate heavy metal leaching in the context of groundwater protection and allow for simplified methods to account for groundwater quality criteria, depth and location of polluted soil, reduction in infiltration and leachable amounts determined in leaching test. Experimental studies have been performed at actual sites and leaching experiments are conducted in the laboratory.

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