Modelling the chemical speciation of trace metals in surface waters of the river Zenne

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Trace metal speciation in aquatic environments is inherently complex due to the large number of possible interactions of the metal with dissolved and particulate components. However, adsorption on solid surfaces and formation of metal-ligand complexes plays important roles in controlling metal fate and behaviour. These reactions for example modify the bioavailability, and hence toxicity of the metal towards biota. Speciation study provides information on potential metal bioavailability under various environmental conditions and, therefore, may support environmental management decisions. However, no single analytical method can provide a detailed description of all the species involved, but will measure a certain proportion of the total complexes (Sigg *et al.*, 2006). The objective of this study is to describe and understand the metal speciation in the river Zenne, a complex and heterogeneous system influenced by the Brussels' sewage disposal and characterised by a strong human impact on a small catchment (i.e. 1260 inhab/km²).

Geochemical codes for equilibrium modelling with Visual MINTEQ will be used to predict metal speciation in the Zenne, as well as the impact of incidental discharges in the Brussels' region. The model will be applied totime seriesmeasurements gatheredfrom September 2009 to July 2011 using longitudinal profiles between Lembeek and Heffen (Belgium).

References

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