



Temporal variations in the export of REE in boreal catchments of varying character and size

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Organic matter and iron colloids have a large impact on the mobilisation of trivalent elements such as aluminium (Al), rare earth elements (REE) and actinides.

Recent results of the relative importance of these colloids are diverging though (POURRET et al., 2007); STEINMANN and STILLE, 2008) and there is a general lack of information of the importance of flow pathways and landscape type on the relative importance of the various colloidal fractions that mobilizes REE from the catchment soils. In this study we present the data of water chemical analysis of a series of catchments with varying size and character but all within the boreal zone. Two speciation techniques and two column separation methods involving ion exchange were used to quantify the causes for the temporal variation of the dissolved amounts of trivalent ions in these water courses.

Our study indicates that REE export is controlled mostly by landscape type while changes in the acid-base character of organic matter are of minor importance. Changes in flow pathways in a riparian zone in one of the studied areas in a forested site may be used to decipher the effect of chemical versus physical processes for the mobilisation of REE and aluminium and open up the possibility for a quantitative modelling of the varying sources of REE.

Iron and aluminium are mobilized together with organic matter in varying amounts in different landscape types and this affects the REE export from the various landscape elements. While the amount of strongly bound aluminium mobilized from the catchments usually correlate positively with any of the REE this is not the case for strongly bound iron. Fractionation patterns of REE are discussed and the observed binding of REE to organic matter was modelled using the speciation program WHAM VI (TIPPING, 1998).

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