



Biogeochemistry of emerging trace elements in aquatic and terrestrial systems

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New technologies in the fields of communication, mobility and energy drive the increasing extraction and use of a range of trace elements, including platinum group elements (PGE), certain rare earth elements (REE), Nb, Ta, Ga, In, Tl, Ge, Te and others. Due to limited resources and supplies on the one hand and increasing demands on the other hand, most of these elements are considered technology critical elements (TCE), and initiatives at national and international levels are introduced to secure their availability in the future. Although there is evidence that these elements are released into the environment as a result of their increasing extraction and uses, little is known about their natural cycling, anthropogenic emissions, geochemical behavior, environmental fate and their interaction with biota. This lack of knowledge and the increasing use make TCE and other rare elements contaminants of emerging concern. Understanding the fate of TCE and associated biogeochemical processes (sorption, complexation, precipitation) might also lead to improved recovery of these valuable metals. For this special symposium, we invite contributions concerned with the detection, monitoring, quantification of anthropogenic emissions, chemical speciation, abiotic and biotic transformation processes, geochemical modelling, transport and environmental fate and potential ecological and toxicological effects of these emerging trace elements in aquatic and terrestrial systems. We think a special symposium on this topic is timely based on the increasing economic and environmental relevance of these emerging trace elements.