

Geochemical background and threshold for emerging inorganic contaminants at the European scale

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To identify areas with unusually high (or low) concentrations of potentially toxic elements (PTEs) or high-tech critical elements (TCEs) in Europe geochemical background and threshold values need to be established for a number of sample materials at the European and the local scale [1].

At present, many elements that have not been much used before find strongly increasing technological applications, e.g., the rare earth elements (REEs), Be, Ga, Ge, In, Li, platinum group elements (PGEs), Te and Tl. In contrast, classical PTEs like As, Cd, Hg and Pb have been extensively used throughout human history. It is thus often considered as difficult to establish a geochemical background for PTEs.

TCEs have not been emitted much until quite recently and thus the unique chance exists to still document and map their natural occurrence and distribution patterns. Many of these elements have routinely been determined in geochemical mapping projects of Geological Surveys. The natural geochemical processes governing the regional distribution and concentration levels of these elements in a variety of sample materials (soils, sediments, plants and water) at a variety of scales can thus still be unravelled without anthropogenic disturbances.

Examples from several recent local to European-scale geochemical surveys will be presented. The question whether it is possible to define meaningful threshold values at the continental scale will be discussed.

[1] Reimann et al. (2017) Applied Geochemistry
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