

10<sup>TH</sup> ANNUAL  
CHEMISTRY & MASS SPECTROMETRY CONGRESS  
OCTOBER 18-19, 2017 OSAKA, JAPAN

## Identification and origin of geochemical anomalies of trace elements in soils

Agnieszka Gałuszka

Jan Kochanowski University, Poland

Natural variability of trace element distribution in the environment and substantial input of these elements from anthropogenic sources cause a large heterogeneity of geochemical data sets even on local scales. This is clearly visible in different post-industrial areas where the abundances of elements in soils can range over several orders of magnitude within very short distances. The term geochemical anomaly refers to an element concentration which is not typical for samples collected in a given area. In environmental geochemistry, the anomalous concentrations of elements can be estimated by comparison of the element concentration in the sample with that in a reference material, such as the post-Archean standard shale, the earth's crust (Clarke value) etc. This comparison can be used for calculation of many geochemical indices, for example Enrichment Factor (EF), Pollution Load Index (PLI), Geo-accumulation Index (GI). Geochemical anomalies can be separated from background values on the basis of statistical interpretation of results derived from environmental sample analyses. This study presents methodology of identification and interpretation of geochemical anomalies. Three datasets representing concentrations of As, Cd, Co, Cr, Cu, Ni, Pb and Zn in contaminated surface soils affected by multiple pollution sources were analyzed. The element concentration ranges were divided into background and anomalous populations with the use of the iterative  $2\sigma$  technique. The results showed that separation of geochemical anomalies from background concentrations can be helpful in selection of sites for detailed study on the origin of geochemical enrichments.

### Biography

Agnieszka Gałuszka has been a Full Professor at the Institute of Chemistry, Jan Kochanowski University in Kielce since 2015. She has completed her PhD and DSc degrees at the Faculty of Earth Sciences and Environmental Management, University of Wrocław in 2002 and 2008, respectively. Her research interests are environmental geochemistry and biogeochemistry, stable isotope geochemistry, trace element geochemistry and green analytical chemistry. She has published 47 papers in scientific journals from the JCR database. She is an Associate Editor of the *International Journal of Environmental Science and Technology*.

agnieszka.galuszka@ujk.edu.pl

### Notes: