



The Distribution of Zr, Hf and Y in the soils of Iași Municipality: Case Study

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Abstract

Zr, Hf and Y contents were determined via 54 samples collected from the topsoils of the Botanical Garden in Iași. Statistical parameters suggest the presence of a relatively homogeneous population whose mean values ($Zr = 265.733 \text{ mg}\cdot\text{kg}^{-1}$, $Hf = 7.287 \text{ mg}\cdot\text{kg}^{-1}$, $Y = 27.524 \text{ mg}\cdot\text{kg}^{-1}$) fall within the Zr, Hf and Y content variation range, determined in other urban soils in the world, but they are higher than the mean values calculated by various authors for the upper continental crust. Although positive, the correlation coefficients have significant values only for Zr-Hf (0.539) and Zr-Y (0.325). The values of the geochemical background determined via the upper 95% confidence limit of the 95th percentile, namely $267.174 \text{ mg}\cdot\text{kg}^{-1}$ (Zr), $7.297 \text{ mg}\cdot\text{kg}^{-1}$ (Hf) and $34.079 \text{ mg}\cdot\text{kg}^{-1}$ (Y), are higher than the mean calculated values for the upper continental crust. The distribution of values of the $Zr\cdot Hf^{-1}$, $Zr\cdot Y^{-1}$ and $Hf\cdot Y^{-1}$ ratios reflects, first of all, the geochemical characteristics of the predominant lithology, namely loesses in the northern area and clays in the southern area, potential anthropic inputs being limited to fertilizers specific to the flora in the Botanical Garden.

Keywords: soil, zirconium, hafnium, yttrium, geochemical background, Iași, Romania.