Heavy metals content in Belgrade soils

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The main goal of the paper is to present results of researches held from 2004 to 2006 regarding heavy elements content in the Belgrade city soils. Lot of 153 soil samples from 24 different locations were taken and analyzed from 2004 to 2006 in laboratory "MOL" (Belgrade).

Methods

Samples were taken from exact localites, from the topsoil (surface soil) – 0-15 or 0-20 cm of depth. Each sample was prepared as a composite of few sub-samples using standard techniques (EPA method 3040).

Different instrumental methods were used to determine concentrations of desired elements: (EPA 213.2), (EPA 239.1), (EPA 206.2), (EPA 249.1), (EPA 220.1), (EPA 218.1), (EPA 289.1) and (EPA 245.1); spectrophotometric technique was used for determining chromium concentrations.

Discussion of results

	Min. conc. (ppm)	Max. conc. (ppm)	MAC* (ppm)
Pb	1.22	792	100
Cd	0.02	36	3
Hg	0.1	18	2
As	0.2	85	25
Ni	0.60	228	50
Cr	5	230	100
Zn	1.01	3375	300

* according to Serbian Instruction on Soil Quality

On the most of the localities (21 out of 24) certain excess of concentration of elements, which are important for soil pollution assessment, is determined. Only in a single case exceeding concentration of chromium was related to geological factors; in other 152 out of 153 cases – human activities were only source of pollution.

Nickel concentration in soil samples from Belgrade area exceeds MAC of 50 ppm in 20 of 24 samples. Concentration reaches up to 228 ppm in soils from New Belgrade.

On the localities of Ada Ciganlija excess in concentrations for six elements and in New Belgrade of four elements were determined. Samples of river mud from Ada Ciganlija lakeshore showed very high level of contamination with lead, nickel, copper and especially zinc.

References

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Low water contents in minerals from Gakkel ridge abyssal peridotites, Arctic Ocean

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We report the first water contents ever measured in abyssal peridotite minerals. The analyses are made possible by the exceptionally fresh state of a few Gakkel Ridge peridotites that show almost no serpentinization. Gakkel ridge is the slowest spreading ridge on Earth (Michael *et al*., 2003). The three preliminary samples analyzed so far come from dredge haul PS66-238 (Snow *et al*., 2007) from an amagmatic region where no basalts were found, and the extent of melting is low to none. FTIR spectra of olivines and pyroxenes ressemble previously published ones (e.g., Miller *et al*, 1987, Skogby *et al*., 1990). Water contents in one peridotite correlate with grain size in olivines and are variable in orthopyroxenes, whereas those of the two other samples are homogeneous. No water variations are observed within individual grains.

Calculated water concentrations in H_2O ppm are <1-5 for forsterites, 25-60 for enstatites, and 130-200 for diopsides. These water contents are 2 to 3 times lower than typically found in continental spinel and garnet peridotites (e.g., Peslier *et al*., 2002; Peslier and Woodland, 2006). Recalculated whole-rock water contents of the abyssal peridotites are, at most, 50 ppm, about half the amount calculated from MORB-glass analyses for the depleted-MORB mantle (DMM) (e.g., Dixon *et al*, 2002). The low water contents of the abyssal peridotites also contrast with water contents measured in MORB glasses from Gakkel Ridge which are higher than those of MORB globally (Michael *et al*, 2006). If the low water content of Gakkel ridge abyssal peridotites is representative of that of the Earth's oceanic mantle, models for extents of melting, major and trace element trends and crustal thickness at mid-oceanic ridges (e.g., Asimow and Langmuir, 2003) need reassessment.

References

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