

## **GEOCHEMICAL ANALYSIS OF SOILS IN THE OJCÓW NATIONAL PARK (POLAND)**

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This research project is aimed at the determination of the level of soil contamination in the area of the Ojców National Park, with particular emphasis on the pollution caused by a major transport route. The locality of the park is heavily unfavourable as it is situated within the immediate sphere of influence of large industrial centres such as the Upper Silesian Region and the cities of Olkusz, Jaworzno, Trzebinia-Siersza and Kraków.

The authors collected soil samples along the major transport route crossing the Ojców National Park area. Chemical analyses have revealed high concentrations of toxic elements (higher than the natural background) in the surface soil layers. All the samples collected contain amounts of hydrocarbons, both aromatic and aliphatic, significantly exceeding norms (the norm was exceeded over 100 times; PIOŚ, 1994). A comparison of concentrations of toxic substances in soils from the centre of the park and an area situated outside its borders shows small differences, with Cd contents within the park area even higher than in samples collected close to the heavily used Kraków-Katowice E-40 motorway (KABATA-PENDIAS & PENDIAS, 1993).

The soils of the Ojców National Park, however highly polluted, reveal good protective properties based on high sorption capacities associated with the presence of organic matter. The soils of the park also reveal substantial buffering properties, controlled by the presence of carbonate minerals. Due to their presence the pH of the soils is relatively high and, therefore, toxic elements are partly immobilized.

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### References

- KABATA-PENDIAS, A. & PENDIAS, H. (1993). 5-299, PWN Warszawa. (in Polish)  
PAŃSTWOWA INSPSEKCJA OCHRONY ŚRODOWISKA (1994). 3-89, Pios Warszawa. (in Polish)