



## Leachability of sulfate ions from the sulfur ore pile (Jeziórko sulfur mine, southeastern Poland)

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Sulfur is an element that takes part in many geochemical processes in natural environment. These processes are multi-faceted and strongly dependant on physical and chemical conditions, often leading to enrichment in sulfate ions and acidification of soils and waters. Both well and opencast exploitation of sulfur deposits has an impact on environment quality and human health. Except for this direct influence of sulfur mining, the other activities related to sulfur extraction play an important role in increasing an overall environmental impact. The sulfur mining sites and neighboring lands are potentially jeopardized areas.

The aim of this study was to determine the amount of sulfate ions which are leached with rainwater from the sulfur (over 90% S) ore pile more than 5 m high. In all, 33 sulfur ore samples were collected from different depths of 11 boreholes and several soil samples. Water extracts were prepared according to the validated procedure. The gravimetric method was applied to determine sulfate ions in water extracts.

Table 1 presents the concentrations of  $\text{SO}_4^{2-}$  in water extracts from sulfur ore samples collected from two boreholes O-1 and O-9. A strong correlation between the sulfate ions concentration and sampling depths was noted. The lowest sulfate concentration was recorded in samples collected near the top of sulfur ore tip. This evidence suggests that sulfate ions are washed out from the pile top as a result of weathering.

The results of the laboratory analysis enabled us to establish the amount of leachable sulfate ions, as well as the degree of influence of sulfur ore pile on the environment.

Table 1. Concentration of sulfate ions in water extracts from samples collected from boreholes O-1 and O-9

Borehole	Sampling depth (meters below sulfur pile top)	$\text{SO}_4^{2-}$ (g/kg of dry weight)
O-1	0.5	6.4
	2.0	10.3
	3.5	11.6
	5.4	13.7
O-9	0.5	4.6
	2.0	7.0
	4.0	23.0