minerals

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Article

Arsenic in soils of various settings in the historical ore mining and processing site Radzimowice, Western Sudetes

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Supplementary Materials

Table S1. Procedure of sequential extraction according to Wenzel et al. (2001)

Fraction	Supposed As Species	Extractant	Extraction Conditions	Soil : Solution Ratio (m:v)	Washing Step
F1	non-specifically-bound (easily soluble)	0.05 M $(NH_4)_2SO_4$	4 h shaking, 20 °C	1:25	-
F2	specifically bound	0.05 M $(NH_4)H_2PO_4$	16 h shaking, 20 °C	1:25	-
F3	amorphous hydrous oxide- bound	0.2 M NH_4-oxalate buffer; pH 3.25	4 h shaking in the dark, 20 °C	1:25	0.2 M NH_4-oxalate, pH 3.25: m:v 1:12.5; 10 min shaking in the dark
F4	crystalline hydrous oxide- bound	0.2 M NH_4-oxalate buffer + 0.1 M ascorbic acid; pH 3.25	30 min in a water bath, 96 ± 3 °C, in the light	1:25	0.2 M NH_4-oxalate, pH 3.25: m:v 1:12.5; 10 min shaking in the dark
F5	residual	HCl:HNO3 (3:1)	Microwave digestion	1:50	-

non-specifically-bound (F1), specifically-bound (F2), amorphous hydrous oxide-bound (F3), crystalline hydrous oxide-bound (F4) and the residual (F5) species

Table S2. Mineralogical composition of samples, as determined by microscopic observations

Components	Origin	Occurrence* of Components in the Sample No								
		1	2	3	4(S)	5(S)	6	7	8	9
Rocks										
Magmatic	Primary	+++	+++	+++	++	+++	+++	+++	+++	+++
Metamorphic	Primary	++	++	++	++	++	++	++	++	++
Minerals										
Quartz	Primary	++	+	+++	++	++	++	++	++	++
K-feldspar	Primary	+++	++++	++	+++	+++	+++	+++	+++	+++
Muscovite	Primary	++	++	++	++	++	++	++	++	++
Ti-oxide	Primary	–	+	–	–	–	–	–	–	–
Calcite	Hydrothermal	–	++	–	–	–	–	+	–	–
Piryte	Hydrothermal	–	++	+	+	–	–	–	–	–
Pihrotyte	Hydrothermal	–	+	+	–	–	–	–	–	–
Arsenopyrite	Hydrothermal	+	++++	++	–	–	–	+	–	–
Chalcopyrite	Hydrothermal	–	+++	+	–	–	–	–	–	–
Goethite	Secondary	++	++	+	+++	++++	+++	+++	+	+
Hematite	Secondary	+	++	+	++	++	+	+	+	+
Organic matter	Secondary	+	++	+++	+	++	+++	++	++++	+
Glass or slag	Anthropogenic	+	–	–	+	+	+	+	+	–

* Explanations:
Frequency of occurrence: ++++ very often; +++ often, ++rarely, + very rarely; – absent (not detected)

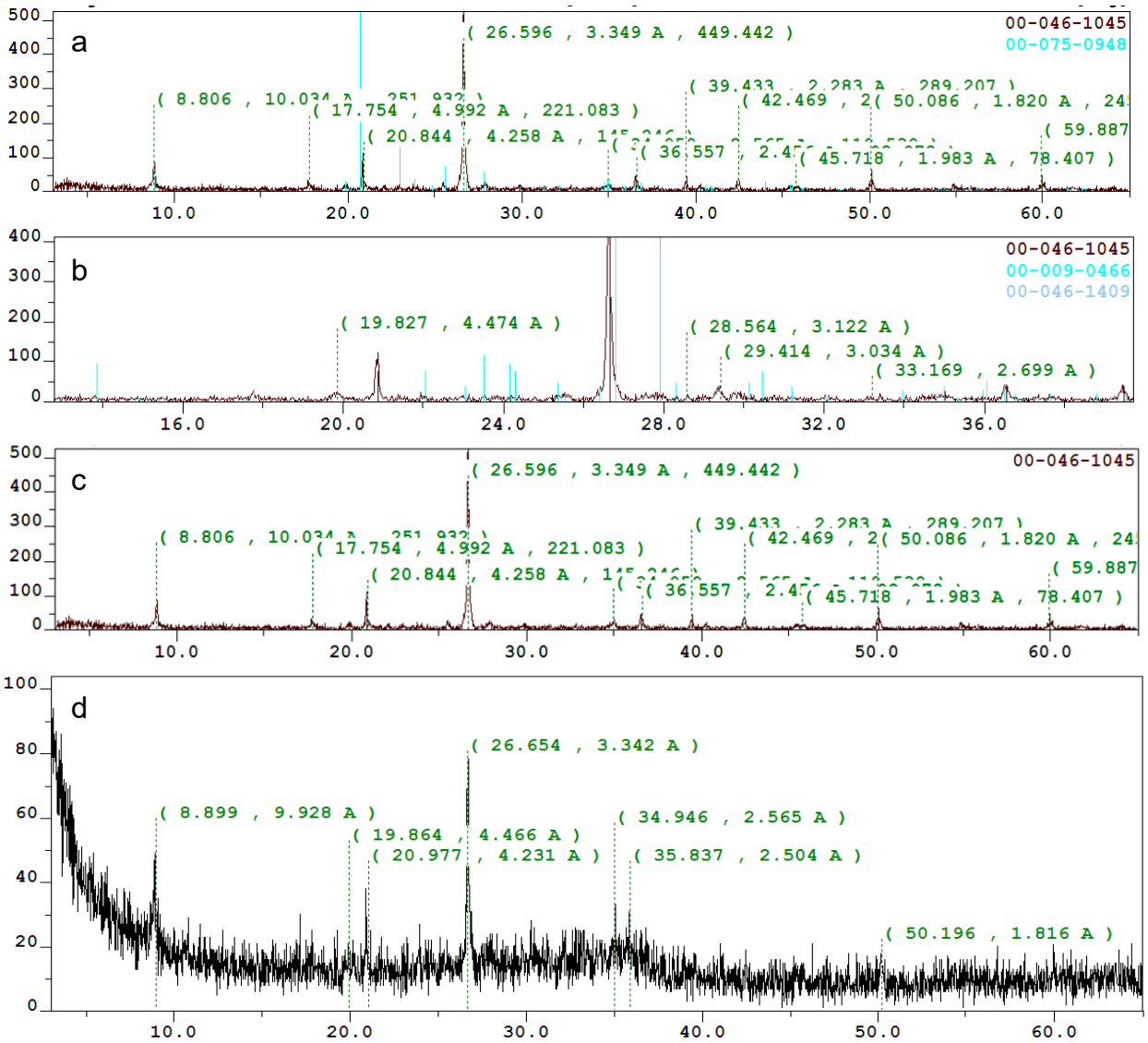

Figure S1. Examples of representative XRD diffractograms that identify the main rock forming minerals in soil samples: a) Quartz (black) and muscovite (blue) in the dump sample No 2, b) K-Feldspar (albite) in powdered subsample No 2; , c) Quartz in the sample of stream sediments No 4(S), d) Quartz, goethite, clay minerals and poorly crystalline minerals in the sample of sediments No 5(S). Possible occurrence of scorodite