Comparison of two sequential extractions differ in extractants for leaching of reducible fraction from forest soil

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The sequential extraction scheme have been applied to assess the mobile fraction of different elements, as well as their relative proportions in various host phases of soils, sediments, and urban road materials. The comparison of the results obtained for the same set of samples in different extraction procedures can be a source of information about biding trace elements in the soil.

The aim of this work was to analyse and compare the results of two very similar schemes. The five step sequential extraction procedure have already been applied to forest soils *(parabraun)* deposited in the German Environmental Specimen Bank. The six step sequential extraction is a modification of the five step scheme. The extraction of elements with reducible reagent was split into two steps. Easily (MnOx) then moderately reducible (FeOx) fractions were leached. It is known that in the environment Mn- and Fe-oxides are differently soluble as a result of changes on the oxidation-reduction conditions and the pH.

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The fractions of elements: exchangeable with 0.01 M NH_4Ac, bound to carbonate with 0.1 M HAc, bound to oxides with 0.05 M $NH_2OH{\cdot}HCl$ in 25% HAc or bound to MnOx with 0.05 M $NH_2OH{\cdot}HCl$ then bound to FeOx with 0.1 M ascorbic acid in 0.2 M oxalate buffer, bound to organic matter with 30% H_2O_2 + 0.5 M NH_4Ac and residual with nitric acid were leached. Based on three sets of extraction Ca, Fe, Mg, Mn, and Zn were determined with ICP-AES, and the remaining trace elements (As, Cd, Co, Cr, Cu, Ni, Pb, Zn) with ICP-MS.

The study shows that under extraction conditions the trace elements are mainly bound to Fe-oxides and insoluble minerals (residual) whereas the elements bound to Mn-oxides and organic matter form a major mobile fraction. For such elements as Co, Ni, and Zn, carbonate and Mn-oxides fractions, whereas for Cr organic matter are particularly important. The reducible fraction of Co is preliminarily bound to Mn-oxides, but reducible fractions of As and Pb are mainly bound to Fe-oxides. In addition it is important to note that the splitting into two step extraction from reducible fractions did not change the sum of leaching.

Analysis of argon isotopes and other rare gases in Baszkówka meteorite

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In the frame work of 6 PO4D 031 13 project argon isotopes in three specimens of Baszkówka meteorite and one specimen of Tazerzait Mt. have been analysed. The main goal of this study was K-Ar dating of the L5 chondrites. Their classification is based on textural signatures and oxygen isotopic ratios. The previous study by Scherer et al. (1997) indicated that both meteorites was characterised by long exposure ages of 61±9 Ma and 76±10 Ma for Tazerzait Mt. and Baszkówka, respectively; in tourn, the K-Ar ages were 4.3 and over 4.6 Ga. The present authors also investigated isotopes of rare gases from He to Xe.

This study included an assestment of the helium content and the analysis of argon isotopes by means of an unspiked method and by using pure ^{38}Ar spike. The results have been shown in tab. 1. The K-Ar ages were calculated assuming the potassium content of 0.08% wgt. as a typical number for ordinary chondrites.

The content of radiogenic argon was calculated from measured ^{40}Ar and by substrating the atmospheric correction (295.5 x ^{36}Ar content). Because the mass spectrometer sensitivity was very stable over a long time, it was possible to use the unspiked method for the meteorite Tazerzait Mt.

Tab. 1. The K-Ar ages and the ^4He content of Baszkówka and Tazerzait Mt. meteorites

Sample	$^{40}Ar^*$ [nmol/g]	% $^{40}Ar^*$	Age# [Ga]	^4He [nmol/g]
Baszkówka (chondrules)	1.486	85.9	3.49±0.20	1.747
Baszkówka (bulk)	1.246	72.3	3.23±0.10	n.a.
Baszkówka (shell)	0.403	25.7	1.73±0.16	n.a.
Mt. Tazerzait	2.354	85.7	4.23±0.08	1.472

#The content of potassium was assumed 0.08% by weight

In this case the release of ^{38}Ar was observed. In addition Ne isotopes including ^{21}Ne and ^{22}Ne (^{20}Ne was overlapped by $^{40}Ar^{++}$ peak) were observed at the detection level of the applied mass spectrometer. The measured ^4He content was comparable to ^{40}Ar.

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