Lead isotopic compositions for Pb-Zn deposits in the Eastern South Korea

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In this paper, the lead isotopic compositions of galena, collected from 15 lead-zinc deposits in the eastern part of South Korea were analyzed, mainly aiming at understanding the regional variation and the geochemical evolution of Pb isotopic composition of lead-zinc deposits in Korea.

For 9 lead-zinc deposits in the Ogcheon system and the Yeongnam massif, Pb isotopic compositions of galena are ranging 18.562-19.784 for $^{206}Pb/^{204}Pb$, 15.729-15.934 for $^{207}Pb/^{204}Pb$, and 38.849-39.859 for $^{208}Pb/^{204}Pb$.

In contrast, for galena samples collected from 6 lead-zinc deposits in Gyeongsang basin, the lead isotopic composition varies in a relatively small range; those isotopic compositions of $^{206}Pb/^{204}Pb$, $^{207}Pb/^{204}Pb$ and $^{208}Pb/^{204}Pb$ are in the range of 18.265-18.441, 15.581-15.726 and 38.332-38.993, respectively, which are slightly lower than those observed in the Gyeongsang basin.

Based on our observations, it seems that lead isotopic compositions in Korea can be classified according to the tectonic boundary between the Gyeongsang basin and the Yeongnam massif. Also, it appears that Pb for lead-zinc deposits in the Ogcheon system and the Yeongnam massif seems to have been originated from upper crustal materials of old continental, because they fit well onto the general trend of lead isotopic compositions of Precambrian basement rocks in South Korea.

Ni and Cr speciation in soils formed on ultramafic rocks from Barberton Greenstone Belt (South Africa)

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Five soil samples were collected by Jolanta Mesjasz-Przybyłowicz (from the depth of about 10 cm) near the Agnes Mine in Mpumalanga Province, the Republic of South Africa. Soils are formed on amfibole-talc shists and serpentinites of Onverwacht Group in Barberton Greenstone Belt. Soils are characterised by mean Mg/Ca ratio 4, 27 and mean pH_{H2O} value 5, 43 [1].

Soil samples and the bedrock fragments were analyzed using optical microscope, SEM EDS and X-ray diffraction. Seven-step sequential extraction (exchangeable ions, carbonates, manganese oxides, amorphous iron oxides and hydroxides, crystalline iron oxides, organic matter and sulfurs, residual fraction) was executed on 4 soil samples. Chemical composition of soils and extracts was determined using IPC MS and ICP AES.

Soils are composed mainly of amfibole, talc, serpentine, chlorite, quartz and various clay minerals. According to EDS measurements of weathered rock fragments form soils, the most important Ni and Cr bearing phases are rarely occurring Mn-oxides, Fe-oxyhydroxides and commonly occurring various phyllosilicates. Mean and maximal values are listed in Table 1.

wt.%	Phyllosilicates		Fe-oxyhydroxides		Mn-oxides	
	NiO	Cr_2O_3	NiO	Cr_2O_3	NiO	Cr_2O_3
Mean	0,12	0,21	0,43	1,76	9,69	0,05
SD	0,58	1,11	1,25	2,7	4,28	0,15
Max.	12,53	3,85	6,81	16,74	17,74	0,42

Table 1: Mean and maximal concentrations of NiO and Cr_2O_3 (wt.%; EDS results) in weathered rock fragments

Sequential extraction experiment results agree with EDS studies. About 50% of Ni and Cr are bound to residual phases which are mainly silicates. Almost 50% of Cr is accumulated in crystalline Fe-oxides. Very important Ni containing phases are crystalline and amorphous Fe-oxides (respectively 27% and 8%) and to a lesser amount Mn-oxides (5%).

[1] Mesjasz-Przybyłowicz *et al*. (2007) *Plant Soil* **293**, 61–78.