Mechanism of Cr^{6+} immobilization in different soils

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We carried out experimental studies on the changes of Cr^{6+} concentration in the solutions with different pH which were reacted with different soils containing large amount of Cr^{6+} (1,000ppm) at room temperature. Soils used for the experiments include Kanto loam (weathered basaltic soil), weathered acidic soil and kaolinite bearing soil derived from weathered granitic rocks. The results obtained from the study indicated that Cr^{6+} released within a very short period (three minutes), but it decreased rapidly with time when the Kanto loam soil was used in the experiment and in this case the Cr^{6+} concentration in the solution (after 3 minutes) was 0.36 µg mL^{-1}. This decrease may be due to the reduction of Cr^{6+} by Fe^{2+} in the soil. Therefore, this study suggests that the basaltic weathered soil (Kanto loam soil) is very useful material for the immobilization of Cr^{6+} from the soils and sediments.

Noble gases in Frontier Mountain ureilites

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Introduction. We report results from noble gas analyses of four ureilites from the Frontier Mountains area, Antarctica. These noble gas data complement cosmogenic radionuclide data obtained by [1] thus sheddding light on the cosmic ray exposure history of these meteorites. Of interest are also the trapped noble gases, since ureilites represent a unique class of achondritic meteorites with high abundances of carbon and trapped noble gases.

Cosmogenic noble gases. Results are summarized in Table 1. FRO 90036 and FRO 90054 may be paired, with a common GCR exposure age of ~ 9 Ma. They may belong to an extensive shower as indicated by radionuclides of additional FRO ureilites [1]. FRO 97013 and FRO 01030 are separate falls. While the latter has an exposure age of ~ 4 Ma, the former was irradiated under high shielding and possibly received the bulk of its exposure on the parent body.

meteorite	$^{3}He_c$	$^{21}Ne_c$	$^{38}Ar_c$	$(^{22}Ne/^{21}Ne)_c$
FRO 90036	15.4	2.64	--	1.171
FRO 90054	15.1	2.12	~0.33	1.225
FRO 97013	2.88	0.731	--	1.052
FRO 01030	9.64	1.022	~0.9	1.224

Table 1: Abundances of cosmogenic nuclides (units: 10^{-8} cc STP/g) and shielding parameter $(^{22}Ne/^{21}Ne)_c$.

Trapped noble gases. Trapped Ar, Kr and Xe abundances are listed in Table 2. Most remarkable are the low (compared to other ureilites) abundances in FRO 90054 – in line with its very low reported carbon content [2] - and the very high Ar/Xe and Kr/Xe ratios of FRO 01030, which even exceed those for the previous record holder Goalpara [3].

meteorite	^{36}Ar	^{84}Kr	^{132}Xe
FRO 90036	190	1.78	0.601
FRO 90054	9.46	0.0415	0.0252
FRO 97013	508	2.65	0.295
FRO 01030	66.8	0.866	0.233

Table 2: Trapped Ar, Kr and Xe (units: 10^{-8} cc STP/g).

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