Petrological Exploration of podiform chromitite by using of detrital spinel, Sangun Zone, southwest Japan.

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Sangun zone ultramafic rocks and chromitite

Many ultramafic complexes some of which have chromitite bodies are exposed in the Sangun zone in central Chugoku district, Southwest Japan. All complexes are harzburgite-dominant, and dunite is various in amount on each complex and sometimes has small amounts of chromitite in it [1]. A chromitite pod is always enclosed by dunite envelopes and large chromitite bodies are exclusively found in relatively dunite-dominant complexes or portions [1, 2]. Largest chromite mines of Japan that are Wakamatsu and Hirose are exists in the northern part of Tari-Misaka complex.

Detrital chromian spinel as a tool for exploration of podiform chromitite

Exploration of podiform chromitite has been difficult, because its occurrence is usually very irregular in ultramafic complex. Matsumoto and Arai (1997) proposed the petrological exploration of podiform chromitite by using of spinel chemistry and morphology from the rocks from the outcrops [2, 3]. Above study is epoch-making as an investigating method for exploration of podiform chromitite. However, an investigation precision does not go up by this Method. Because it dose not have the good exposure of ultramafic rocks in the Sangun zone. In this research, we observed detrital spinel in bottom sediment of small creek in and around the ultramafic complex. By this method, there is an advantage that can analyze much spinel grain at once. Moreover, it is expected that we can evaluate a large locality (complex) with a comparatively sufficient precision.

Cr# (Cr/Cr+Al) of detrital chromian spinels from the creek around relativery dunite rich ultramafic complex varies from 0.55 to 0.65. In contract to this, from the creek around dunite free or poor ultramafic complex, Cr# of detrital chromian spinels varies from 0.40 to 0.60. And complex with relativery large chromitite show high in Cr# and Mg# (Mg / (Mg+Fe^{2+})) of chromian spinel. Above results are basically same as Matsumoto and Arai (1997). However, it is very significant results for exploration of chromitite that we have calculated the quantitive chromitite's existence rate each ultramafic complex separately. That is northern part of Tari-Misaka complex is the place where most high potenciality of chromitite deposit. This result also concordant with the idea of chromitite formation proses [4, 5].

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Microbial characterization at iron-clay interfaces after 10 years of interaction *in situ* in an argillaceous formation (Tournemire, France)

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Introduction

Microbial activity has been proven to occur in argillaceous formations, as well as the development of exogenous microorganisms within disturbed areas [1]. In the context of a geological disposal of radioactive waste in clayey formations, the consequences of such a microbial activity are of concern regarding the corrosion of metallic materials. In particular, sulfate- or thiosulfate-reducing bacteria may influence localised corrosion processes [2], that may lead to a premature loss of watertightness of containers. Moreover, the passive film, which is formed progressively during the generalised corrosion process and induces a decrease of corrosion rates, may react with iron-reducing bacteria which could thus promote corrosion [3]. The purpose of the present work was to characterise the microbial diversity that may have impacted corrosion processes at the interface between re-compacted argillite and steel coupons after 10 years of interaction under *in situ* conditions inside the Toarcian argillite layer in Tournemire (France).

Results and Conclusion

The characterization of the microbial diversity was carried out using 16S rRNA genes cloning and culture media. More than 630 clone sequences were analyzed and 123 isolates were identified. Altogether, 19 phylotypes and 55 taxa were defined. They were affiliated to only 3 bacterial phyla: *Firmicutes*, *Actinobacteria* and *Proteobacteria*. The biodiversity identified differs depending on the steel type and the location of the sample, indicating the influence of *in situ* physico-chemical conditions. Moreover, isolates and clone sequences have revealed that sulfate-reducing bacteria, iron-reducing bacteria as well as thermotolerant strains able to grow at temperatures up to 75°C could develop in this environment. Different microbial populations can colonize the interfaces between materials in a very short period of time compared with the timescales of a geological disposal. These results should be considered to assess the consequences of microbial activities on the evolution of the metallic disposal components.

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