

## 熱水によるクロマイトの晶出および融解：クロムおよびクロミタイトの新たな振る舞い

### Precipitation and dissolution of chromite by hydrothermal solutions: new behavior of Cr and chromi

荒井 章司<sup>1\*</sup>, 秋澤 紀克<sup>1</sup>

Shoji Arai<sup>1\*</sup>, Norikatsu Akizawa<sup>1</sup>

<sup>1</sup> 金沢大学・自然システム・地球

<sup>1</sup>Dept. Earth Sci., Kanazawa Univ.

Chromite is one of typical refractory igneous minerals, precipitated from mafic magmas at relatively high temperatures. Chromites commonly occur in sedimentary, metamorphic and metasomatic rocks, where they are interpreted as relics of an igneous phase and serve as the source of Cr for low-temperature Cr-bearing minerals. We present evidence for nucleation of chromite within hydrothermal solution. We found minute euhedral chromite grains enclosed by uvarovite in a diopsidite, metasomatically replacing layered gabbro of the Oman ophiolite. The uvarovite shows oscillatory concentric zoning in terms of Cr# (= Cr/(Cr + Al)), and the chromite is embedded only in the high-Cr# zones of the uvarovite. Another diopsidite, replacing peridotite in the underlying upper mantle section, contains xenocrystal chromite, which is in part dissolved. These probably indicate that a hydrothermal solution collected Cr by digestion of chromite within the mantle and precipitated chromite with high-Cr# uvarovite within the lower crust upsection. The metasomatic agent involved was CO<sub>2</sub>- and SO<sub>2</sub>-bearing hydrothermal solution containing appreciable silicate components, and could carry Cr via carbonate and/or sulfate complexes. The hydrothermal chromite is similar in chemistry to commonly found igneous one (e.g., Cr# = 0.8, Mg/(Mg + Fe<sup>2+</sup>) = 0.13, TiO<sub>2</sub> < 0.3 wt% and Fe<sup>3+</sup>/(Cr + Al + Fe<sup>3+</sup>) < 0.2), but its Cr# is clearly different from that (0.6-0.7) of mantle chromite in peridotites and chromitites from the Oman ophiolite. We should re-consider the origin of some chromites in rocks that involved hydrothermal activity in genesis. Even hydrothermal chromitite is possible if chromite grains are effectively concentrated.

キーワード: クロマイト, 熱水, ウバロバイト, ディオプシダイト, オマーン・オフィオライト

Keywords: chromite, hydrothermal solutions, uvarovite, diopsidite, Oman ophiolite