

Fluorite Mineralization Associated with Albitite and Skarn: An Example of Jinmu-Mihara Fluorite Deposit, Sanyo Belt, SW Japan

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Fluorite deposits in Japan occur as vein-type or skarn-type, associated with the Cretaceous ilmenite-series Sanyo-Belt granitoids in the Inner Zone of southwest Japan. The Jinmu-Mihara deposit is one of the skarn-associated deposits in the belt. We conducted geological mapping, petrography and quantitative analysis of minerals using electron micro-probe analysis (EMPA) to clarify fluorite mineralization of the deposit and its relationship to the albititization and skarnization.

The host rocks of the Jinmu-Mihara deposit consist of limestone, chert, and amphibolite of the Jurassic Tamba Belt, present as a roof pendant of the Late Cretaceous biotite granite. Skarn is distributed between the host limestone and biotite granite, while albitite is present in the biotite granite. The albitite is disseminated with fluorite, with accessory gittinsite, thorite, thorianite, and Nb-bearing titanite. Albite, together with fluorite, replaces plagioclase in the granite. In skarn, fluorite occurs in bands of either of garnet-vesuvianite-fluorite, or clinopyroxene-hornblende-albite-fluorite-(vesuvianite). The core and/or mantle of some garnet is replaced by vesuvianite. Fluorite occurs between grains of vesuvianite, clinopyroxene, and hornblende. These banded structures indicate that the skarn minerals are replaced by fluorine-rich vesuvianite and fluorite. The fluorine contents of vesuvianite and hornblende are 1.8 to 2.4 wt % and 1.7 to 2.9 wt %, respectively.

Our results show that the fluorite mineralization of the deposit occurred as (1) fluorine-rich vesuvianite and fluorite formed by replacing skarn minerals (garnet, clinopyroxene) and (2) plagioclase-replacing fluorite in albitized biotite granite. These two processes occurred independently in different rock types, possibly from the same Na-F rich metasomatic fluids.