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High-temperature skarn from the Odaira area of the Ofunato Quarry

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Marbles of Carboniferous limestone origins are mined from the Odaira area of the Ofunato Quarry in the Iwate Pref. Marbles were intruded by many Cretaceous dikes, along whose boundaries small -scale metamorphic skarns were formed. We report occurrences of a high-temperature skarn characterized by wollastonite + scapolite assemblage in this mine.
The high-temperature skarn was found from the "Kakuchobu quarry" in the southeastern part of the Odaira mining area. A 20 m thick Skarn occur along with a 80 m thick diorite dike. The skarn is a irregular mixture of red parts consisting of garnet + wollastonite and white parts of wollastonite + plagioclase + scapolite or wollastonite + plagioclase + K-feldspar. The white parts are also accompanied by idioblasts of jet-black garnet (melanite) and clinopyroxene. The whitish skarns show coarse equigranular-like textures of idiomorphic wollastonite + plagioclase, xenomorphic scapolite, and poikilitic K-feldspar.
Jet-black garnet is Ti-rich andradite rimmed by rims richer in grossular contents. Grossular garnet were also formed as film-like reaction rims among wollastonite, plagioclase, and scapolite. Secondary plagioclase was formed at interstices. These occurrences resulted from a reaction: Wollastonite + scapolite = grossular + anorthite + CO2. THERMOCALC caluculation suggest a cooling across a temperature higher than 700 degC with relatively high XCO2. -mphibole-plagioclase geothermometry suggests 810-890 degC for crystallization of dike minerals. Migmatite-like heterogeneity and igneous-like textures imply a possibility of magmatic origin for the skarn.

Keywords: skarn, scapolite