Zonal distribution and chemical variation of ore samples from the Rokuromi gold skarn deposit, Kamaishi city, Iwate prefecture, Japan

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Abstract

Samples having a zonal structure of diorite, skarn, sulfide mineral-rich skarn and limestone from the gold-rich Rokuromi skarn deposit were examined to consider transportation mechanisms of heavy metals. The diorite consists of plagioclase, pyroxene (salite-ferrosalite), amphibole (hastingsite-ferropargasite, edenite), and biotite with small amounts of pyrrhotite, arsenopyrite, loellingite and chalcopyrite. The mineral assemblages of skarn are large amounts of plagioclase, pyroxene (salite-ferrosalite), garnet (grandite) and magnetite with small amounts of pyrrhotite, arsenopyrite, loellingite and chalcopyrite, and those of are sulfide mineral-rich skarn large amounts of pyroxene (salite-ferrosalite), garnet (grandite), and pyrrhotite with lesser amounts of magnetite, pyrite, arsenopyrite, chalcopyrite, native bismuth and bismuthinite. The limestone consists of a large amount of calcite and a small amount of pyrrhotite. The SiO_2, Al_2O_3 and TiO_2 contents of those rocks decrease from diorite to limestone, while the CaO content increases from diorite to limestone. The FeO and S contents are high in the sulfide-rich skarn between the limestone and skarn. The patterns of chemical variations are different between the group of SiO_2, Al_2O_3 TiO_2 and CaO components and the group of FeO and S components. The variations of SiO_2, Al_2O_3 TiO_2 and CaO contents are thought to have been formed by diffusion during the period of skarn formation, while the variations of FeO and S contents suggest that Fe and S were supplied by hydrothermal solution passing through the boundary between limestone and skarn.