

Sulfosalt Minerals from the Hydrothermal System of Southwestern Hokkaido, Japan: Its Genetic Significance

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Introduction

Epithermal gold-silver deposits from southwestern Hokkaido share a number of similarities being not only defined as one geologic unit but also as one metallogenic province (Bamba, 1977). One of its similarities is the high content of sulfosalts minerals from the deposits in the area. Sulfosalts are a subgroup of sulfides that contain a diverse and complex group of minerals and synthetic compound with complex composition and structures.

According to Makovicky (1989), sulfosalts are defined as complex sulfides (rarely also selenides and tellurides) having the general formula $A_mB_nX_p$, where A is a metal, commonly Cu, Pb, Ag and rarely Zn, Hg, Ti, Fe and Mn, and B is a typically a Group 15 semi-metal, As^{3+} , Sb^{3+} , Bi^{3+} but rarely also Te^{4+} , while X are anions usually S^{2-} but may also be partially substituted by Se^{2-} and Te^{2-} . The content of silver, copper and lead in sulfosalts minerals are of interest because of the large number of minerals reported in the group.

The sulfosalt minerals in ore have both economic and scientific interest. However, there is still a lack of reliable data on the characteristics of many of the sulfosalt minerals and synthetic phases, making them interesting for detailed studies of their natural and synthetic systems.

In this study, we provide up to date data for sulfosalt mineral compositions at the hydrothermal system of some deposits of southwestern Hokkaido. Detail microscopic studies and electron microprobe

analysis, coupled with comparisons with other phase equilibrium experiments by earlier workers, are used to identify the association of sulfosalt minerals in these areas.

Geological – Mineralogical Overview of the Deposits

The geology of the southwestern Hokkaido area in relation to mineralization has been described in detail by Bamba (1977), Watanabe (1990, 1989, 1987, 1986), Yajima (1979), Ishihara (1974), Yahata (2002) etc. Based on its geotectonic, Hokkaido is divided into three geologic units, those are west, central and east Hokkaido which are bounded by the Sapporo – Tomakomai lowland belt and the eastern margin of the Tokoro – Toyokoro tectonic belt (Minato et al., 1965 in Yajima, 1979). Southwestern Hokkaido is geologically the northern extension of the inner zone of northern Honshu (Fig. 1).

Overlying the basement rocks of Paleozoic to lower Mesozoic strata, there occur thick volcanic formations of Miocene period, which constitute the “green tuff region”. Yajima (1979) divided west Hokkaido into three sub – provinces, by the nature of sediments and tectonic features. The first one, characterized by the terrestrial sediments of Fukuyama stage, covers the areas from Matsumae to Kudo and around Shimamaki.