Reconnaissance study of Mongolian Zn deposits: perspective for indium resource

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Indium is recovered as a by-product of zinc ore. After the closure of the Toyoha mine, the major producer (˜30 %) of world indium resource, discovery of alternative indium resources is expected. Here, we report recent progress of reconnaissance field survey for Zn-Pb ore deposits in Mongolia to evaluate as indium resource potential.

Several Zn-Pb deposits distribute in northeastern Mongolia near the border to China. The ages of mineralization are Mesozoic. Based on the host rock lithology, igneous activity responsible for the mineralization, wall-rock alteration, mineral association, and ore texture, these ore deposits have been grouped into 4 types: 1) Fe-Zn skarm, 2) Ag-bearing Zn-Pb vein type, 3) epithermal Ag-Pb-(Zn) vein type, and 4) unique Zn-fluorite breccia pipe deposits. We have visited Tumurtin Ovoo, Ulaan, Mukhar, Tsav and Mungun Undur deposits and took samples for research. Outlines of these deposits are as follows.

Tumurtin Ovoo deposit (Type 1): Devonian sedimentary-volcanic units (diabase, limestone and shale) were intruded by Late Paleozoic leucocratic granite, and a part of limestone was skarnized. Massive or banded brown color sphalerite is accompanied in magnetite-garnet-epidote skarn.

Tsav deposit (Type 2): Veinlets, stringer-impregnated and nest-like mineralization hosted in Upper Jurassic to Lower Cretaceous acidic to mafic volcanic sequence is characteristic. Although the thickness of individual vein is not wide (10-20 cm), it consists of high-grade ore of massive galena and brown sphalerite. Rhodchrosite is a major gangue mineral in this deposit.

Mungun Undur deposit (Type 3): Epithermal vein system distributes in sandstone-shale unit of Tsargiin gol Formation (Cretaceous). Polymetallic mineralization is characteristic in this deposit, and ore consists principally of galena, dark brown sphalerite, chalcopyrite and pyrite.

Ulaan deposit (Type 4): Four mineralized breccia pipes intruded into Jurassic volcanic sequence (800-1200 m of total thickness) of rhyolite, andesite and basalt are orebodies of this deposit. Breccia pipes continue at least 200-500 m from the surface. The rock of breccia pipe at higher elevation levels is comprised of strongly silicified brecciated fragments of host rock and massive mixture of fluorite-galena-sphalerite that cemented fragments, and those of lower levels is comprised of mixture of epidote-actinolite-sphalerite-galena that cements breccia.

Chemical analyses for major and trace elements are now on progress, and the result will be reported.