[EJ] Evening Poster | S (Solid Earth Sciences) | S-RD Resources, Mineral Deposit & Resource Exploration

[S-RD33]Resource Geology

convener:Tsubasa Otake(Division of Sustainable Resources Engineering, Faculty of Engineering, Hokkaido University), Daisuke Araoka(Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology), Ryohei Takahashi(秋田大学大学院国際資源学研究科, 共同), Tatsuo Nozaki(Research and Development Center for Submarine Resources, Japan Agency for Marine-Earth Science and Technology)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Ore deposits consisting of supracrustal concentrated valuable elements and minerals result from the Earth's dynamics including magmatism, hydrothermal activity, metamorphism, and weathering. The formation of ore deposits is also closely associated with global environmental changes and biological evolution in the Earth's history. Involvement of different academic fields in Earth Science including Geology, Petrology, Mineralogy, and Microbiology is required to understand the genesis of ore deposits. The filed of Resource Geology is essential not only for efficient exploration and development of ore deposits but also for better understanding and assessment of hazardous elements that may be caused by resources development. This session widely covers various topics of field investigation and observation, laboratory experiments, theoretical calculation, development of analytical methods and others related to the supracrustal migration and concentration of elements.

[SRD33-P05]Textures and mineral chemistry of Ag-Zn-Pb ores from Los Gatos epithermal vein-type deposit, Mexico

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The Los Gatos epithermal silver-lead-zinc vein-type deposit, located in north-western part of Mexico, is embedded in Paleogene volcanic rocks of the Sierra Madre Occidental. The geology and the mode of occurrences of the deposit have well been clarified so far. However, the mineralization has not been studied from the ore geological point of view. In this study, mineralogy, textures and mineral chemistry of ores from the deposit are described, and an attempt is made to figure out the features of mineralization of the deposit.

The veins of the deposit are mainly composed of sphalerite, galena, and quartz, associated partially with fluorite, pyrite, chalcopyrite, marcasite, acanthite, polybasite, and Ag-tetrahedrite. Based on mineral composition and growth textures, the veins are classified into six zones in growth order: ZONE 1 (brecciated zone), ZONE 2 (banded sulfides zone), ZONE 3 (massive sulfides zone), ZONE 4 (fine-banded sulfides zone), ZONE 5 (fine quartz zone), and ZONE 6 (coarse quartz zone). Sphalerites from ZONE 1 to ZONE 3 are characterized by zonal structures with different color and FeS content. Meanwhile, zonal structures of sphalerites in ZONE 4 are unclear with many inclusions of fine sulfides (<50μm). The FeS contents in sphalerites are ranging from 2.45 mol% to 22.02 mol%, the averages of which tend to increase from wall rock side (ZONE 1) to center of veins (ZONE 4). This FeS content and occurrence of sulfides in sphalerites suggest that ZONE 4, ZONE 5, and ZONE 6 were deposited in different mineralization stage.

By these characteristics of sphalerites and other minerals, mineralization of Los Gatos deposit can be classified into two stages: the early Zn-Pb mineralization stage and the late Ag mineralization stage. In early stage, mineralization is characterized by deposition of sphalerites and galenas. Zonal structures in sphalerites suggest that composition and/or temperature of fluid might have changed repeatedly. In contrast, mineralization in late stage is characterized by the formation of silver-minerals in sphalerites and galenas,

being due to the additional supply of Ag, Fe, and S-rich fluid. Occurrence of silver-minerals and iron-minerals, and FeS content suggest that this fluid would have dissolved sphalerites and deposited sulfides in sphalerites.