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

[S-RD33]Resource Geology

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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-P04]Characteristics of Epithermal Gold Mineralization and Ore Forming Fluid in Sesame Vein, Sangilo Mine, Baguio District, Northern Luzon, Philippines

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The Baguio mineral district is a major gold copper mining area in the Philippines. The district is located at southern end of the Central Cordillera magmatic arc, which is formed by subduction of the South China Sea. The district is characterized by a diversity of mineralization types, including porphyry copper, skarn and epithermal gold deposits. There are a number of research studies focusing on the Baguio mineral district. However, there have been limited information on the Sangilo epithermal gold deposit, despite its mineralized quartz veins extending from the adjacent well-studied Acupan epithermal deposit. The objective of this study is to understand the characteristics of gold mineralization and ore forming fluid in the Sesame quartz vein, which is one of the major gold-bearing veins in the Sangilo mine. The study area is floored by Cretaceous to Eocene metavolcanics rocks, which is overlain by Oligocene to Pleistocene sedimentary sequences. Miocene to Pleistocene island arc-related dioritic to gabbroic plutons intrude these formations. The epithermal veins in Sangilo are hosted by these igneous intrusions. Samples were collected from underground workings and outcrops of the Sesame vein with an orientation of N37°E, dipping 68°SE. Elevation are 983m at underground workings and 1169m at outcrops. Underground samples were divided into thirteen zones and collected from each zone: quartz, clay, fault gouge and altered dark diorite zone. Quartz were characterized by white, whitish gray and darkish gray in color with several portions exhibiting bladed, drusy, and brecciated textures. On the other hand, surface samples are composed of quartz, calcite and alternation layer of them. Quartz were subdivided into white and whitish gray in color with several portions exhibiting colloform, brecciated, bladed and dendritic textures. Illite and chlorite were identified as hydrothermal alteration

mineral by XRD analysis and thin section observation. Based on the clay mineral assemblage identified, the characteristic of the pre-forming fluid is neutral pH condition at between 230 degree celsius and 320 degree celsius. Several electrum grains were observed as gold-bearing mineral both from the underground and outcrops. Electrum from underground samples is associated with pyrite, arsenopyrite, marcasite and covellite as ore minerals and is quartz and illite as gangue minerals. On the other hand, electrum from outcrop samples is associated with pyrite, chalcopyrite, sphalerite, galena, marcasite and acanthite as ore minerals and is quartz and calcite as gangue minerals. Not only the association of electrum with gangue minerals, but also the association with quartz size was also observed. Quartz area was segmented fine-grained and coarse-grained based on the size of quartz at underground. The spatial relationship between electrum and fine-grained quartz was observed. On the other hand, quartz was divided into fine-grained, medium-grained and coarse-grained quartz at outcrops. Coarse-grained quartz was often spatially associated with electrum grain. Electrum in underground samples has lower silver atomic ratio than those from the outcrop. Furthermore, FeS mol% of sphalerite in underground samples shows higher value than that of outcrop samples. Based on these mineral chemistry results, sulfur fugacity and temperature of hydrothermal fluids related with underground mineralization was relatively higher. Temperature restricted by hydrothermal alteration minerals are consistent with the temperature deduced from mineral chemistry results. The difference of sulfur fugacity and temperature suggests the physico-chemical properties changed during the ascent of the ore-forming fluid.