

Preliminary study of the rocks of Golo Das and surrounding areas, Gilgit-Baltistan, Pakistan in the perspective of gold and base metals mineralization

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The study area, covering Golo Das and surrounding areas, is a part of Ghizar district in Gilgit-Baltistan province, Pakistan. Geologically the study area is located at the northern margin of Kohistan island arc adjacent to the Shyok Suture Zone / Main Karakorum thrust and is mainly composed of the rocks of Shamran / Teru volcanics, Chalt volcanic group and meta-sediments intruded by Kohistan batholiths. Field studies show that the Chalt volcanics are green in color, highly foliated and sheared rocks with intensive quartz veining along the shear zones. At some places these veins contain sulfide bearing phases, especially pyrite in higher amount. The Shamran / Teru volcanics are fine-grained, green to greyish-green colored compact rocks. Sulfide mineralization in the form of chalcopyrite, tetrahedrite and pyrite is noticed along shear zones and in the vicinity of thick marbalyzed beds and silicified alteration zones within the Shamran / Teru volcanics. The leaching of these sulfides into malachite and azurite is very common. At certain places pods like iron ore, containing magnetite, limonite and specularite, were also found in the vicinity of the marbalyzed and silicified alteration zones. The dioritic intrusions, a part of the Kohistan batholiths, are well exposed in the area and exhibit chilling effects in contact with the Shamran / Teru volcanics.

Bulk samples (>10 kg) were collected from the fresh rocks and altered/sulfide zones for laboratory investigations. These samples were crushed through jaw crusher and then pulverized to -200 mesh size by the tungsten carbide ball mill. Representative portion of the sample was treated with aqua regia (3HCL:1HNO₃) for base and other metals (i.e., Ag, Cu, Pb, Zn, Cr, Ni, Co, Cd) while the gold (Au) was extracted in the methyle isobutyle ketone (MIBK). The concentrations of Au, Ag and other metals were determined by Perkin Elmer 700 electrothermal atomic absorption spectrometer. Au is ranging from 3ppb to 112ppb, Ag from <0.1ppm to 3ppm, Cu <1ppm to 3496ppm, Zn from <0.1ppm to 50ppm, Pb from >1ppm to 7ppm, Ni from <1ppm to 48ppm, Cr from <1 to 182ppm, Co from 3ppm to 56ppm and Cd from 1ppm to 6ppm. The field and geochemical studies suggest that the alteration/sulfide zones in the study area have possible potential for the occurrence of gold. Detailed study of these alteration zones and other rocks in the area is in the process to get information about the genesis of mineralization.