Preliminary investigations of the rocks of Shigari Bala area, Skardu, Gilgit-Baltistan, Pakistan in the perspective of gold and base metal mineralization

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Shigari Bala area, a part of the Skardu district, is the main focus of this study. It is located southwest of Skardu town in the Gilgit-Baltistan province. Tectonically the study area is a part of the Laddakh arc domain of the Kohistan-Laddakh island arc (KLIA). The geology of the study area consists of meta-sediments and meta-volcanics intruded by diorites belonging to the Kohistan batholith. The meta-volcanics (greenschists) are green colored, highly foliated and sheared rocks having greater resemblance with the Chalt volcanics. The meta-sediments are fine-grained, green to gray colored rocks with well-developed fabrics. Diorite occurs as intrusive bodies within the meta-volcanics where the honfelsic rocks are found at the contact zones. The Cu-bearing sulfide mineralization is dominantly chalcopyrite with lesser amount of bornite along with pyrite is noticed within the diorites and also along sheared zone within the hornfelse. At certain places porphyry type copper mineralization is well observed within the diorite, where leaching of the Cu-bearing phases to malachite and azurite is common.

Due to the presence of visible copper mineralization in the study area, the geochemical investigations of the rocks of the area was carried out in regard to gold, silver and other base metals. For this purpose, bulk samples (>10kg each) from the various rocks, especially mineralized diorites, have been collected during field. These samples were crushed to smaller size by the Jaw-crusher and then powdered to -100 mesh size by the tungsten carbide ball mill. Representative portion of each sample was selected for chemical analysis by quartering and conning method. The known quantity of powdered sample was digested by using hydrofluoric acid and aqua regia ($1HNO_3$:3HCL) for the analysis of gold, silver and other base metals. The analysis of Au, Ag, Cu, Pb, Zn, Ni, Cr, Co and Cd were performed by the Perkin Elmer 700 electrothermal atomic absorption (AA). Gold was extracted in methyle isobutyle ketone (MIBK) before its determination by AA. The concentration of Au, Ag, Cu, Pb, Zn, Ni, Cr, Co and Cd occur in the range of 1ppb to 545ppb, <0.05ppm to 5ppm, 8ppm to 254ppm, <0.1ppm to 9ppm, <0.1ppm to 131ppm, 2ppm to 40ppm, 4ppm to 88ppm, 2ppm to 82ppm, and <01ppm to 3ppm respectively. The occurrence of copper-bearing sulfides and the geochemical anomaly of Cu and Au in the diorites of the study area are indicative of the existence of possible source rock for Cu and Au. The detailed study of the area in regard to the genesis of mineralization and its economic potential is underway