

Geology and ore mineralogical study of Undurnaran gold deposit, South Mongolia

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Undurnaran deposit (109° 34' ' 23' .1 E. 44° 40' ' 51' .7" N) locates in Saikhandulaan sum of Dornogovi aimag. Detailed geological prospecting work using scale of 1:10000 was carried out from 2009 up to 2011. The geological map and data were prepared during detailed geological prospecting work. Mineralization of the Undurnaran deposit is related to Upper Carboniferous Gunbayan formation volcanogenic-sedimentary rocks and Late Carboniferous Mandakh complex diorite. Microquartzite, quartzite and carbonate veins contain gold micrograins. Sometimes gold is included in metaandesite and diorite. Alteration zone with a little arched form directs from southeast to northward. Size of the alteration zone is ranging from 20 meters up to 30 meters in wide and its length continues approximately 500 meters. Gold grade reaches approximately 3.5-4.5 g/t within mineralization zone. Gold mineralization is mainly controlled by Saikhandulaan abyssal fault which continues from northeast to southwest. Host rocks such as diorite, andesite and their tuff are suffered to phyllic and argillic alterations. Ore minerals of gold-bearing rocks are represented by martitized magnetite (hematite), goethite, and hydrogoethite, arsenopyrite, pyrite, pyrrhotite, chalcopyrite, sphalerite, galena, covellite, chalcosite, malachite, azurite and plumbojarosite. Mineral assemblages are pyrite+chalcopyrite+sphalerite+galena. Oxidation mineral assemblages is represented by goethite+ secondary pyrite+ plumbojarosite. According to the results of fluid inclusion study, quartz veins origin of gold-bearing deposit is mesothermal (308°C up 335°C). Gold mineralization is originated from H₂O-NaCl-CO₂ composition solution under low pressure. Second stage fluid inclusions found in re-crystallized quartz grains temperature is 183° up 197°C. Ice melting temperature is ranging from -4.2°C up to -1°C and salting 1.7-6.7. Gold mineralization of the Undurnaran deposit is from epithermal to mesothermal. Aging data analysis of the host rocks is 303±6 MA Rb-Sr and 303± 5 MA by U-Pb methods.

Keywords: Undurnaran, gold, sulfide mineralization, carboniferous diorite, andesite