Geology, mineralization, geochemistry and fluid inclusion studies of Mashkan copper prospect area, northeastern Sabzevar

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Abstract: Mashkan copper prospect area is located in northeastern Sabzevar and southern Ghochan-Sabzevar magmatic belt. Geology of the area includes Eocene volcanic unit (hornblende andesite) and sedimentary units (conglomerate, sandstone, limestone, shale and sandy limestone). Copper mineralization, as vein-type, mostly occurs with northeast-southwest trend in sedimentary units. Primary minerals include quartz, barite, pyrite, chalcocite, and bornite, which are oxidized to malachite, azurite, chalcocite, covellite, goethite, and hematite. Maximum geochemical anomalies in veins are 4.6% Cu (with an average of 2.1%), 100 ppm As (with an average 55.1 ppm), and 65 Sb ppm (with average 28.6 ppm). On the basis of fluid inclusion studies of quartz and barite, minimum formation temperature for mineralization is 170 to 240°C with salinity of 10.7 to 13.51 NaCl wt. % equivalent. Decreasing temperature and dilution by meteoric water can be the most important factors for sulfide deposition. Structural control of mineralization, limited alteration to vein margin, low temperature and salinity of fluid inclusions and simple mineralogy are similar to epithermal-type deposit.

Keywords: Mineralization; geochemistry; fluid inclusion; Mashkan; Sabzevar.

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