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PYRRHOTITE-A CLUE TO GOLD AT PORTION OF THE HIRED₂ GOLD MINERALIZATION, EASTERN IRAN

HAIDARIAN SHAHRI, Mohammad Reza¹, KARIMPOUR, Mohammad Hassan², and MALEKZADEH, Azadeh¹, (1) Geology, Ferdowsi University, Mashhad, 91775, Iran, hshahri@ferdowsi.um.ac.ir, (2) Geological Sciences, CU- Boulder & Ferdowsi Mashhad, Boulder, CO 80309

Hired₂ is a big gold prospecting area and is located in the province of South Khorasan, Eastern Iran. Gold mineralization is found in 4 areas covering about 24 Km². Host rocks are mainly Tertiary andesite, dacite and some Jurassic and Cretaceous shale, limestone, sandstone and conglomerate. Two types of sub-volcanic rocks intruded the Tertiary and older rocks. The older types are belonging to magnetite series and their composition ranges between gabbro to diorite. The younger group does not have magnetite and are belonging to ilmenite series and their composition is between granite-granodiorite-monzonite. Important styles of mineralization are: stockwork, skarn, vein, and replacement. Mineral paragenesis in the stockwork area is: Quartz-tourmaline-pyrrhotite-arsenopyrite-gold-chlorite ± carbonate ± sericite ± chalcopyrite ± pyrite. Skarn, vein and replacement do not have pyrrhotite. Stockwork gold mineralization is found only within or around the granite-granodiorite-monzonite (ilmenite series). Detail core logging carried in 4-target areas with respect to Gold content, mineral paragenesis, types of veinlets, rock types, and measuring the magnetic susceptibility. Within the stockwork mineralization, (target -I) there is good correlation between gold grad, amount of pyrrhotite, and magnetic susceptibility. Magnetic susceptibility of the granite-granodiorite-monzonite (ilmenite series) is less than 40×10^{-5} SI and the gabbro-diorite (magnetite series) are between $150-900 \times 10^{-5}$ SI. Magnetic susceptibility of stockwork is between $200-3500 \times 10^{-5}$ SI. Within the area of stockwork mineralization only ilmenite series and shale are present. Therefore the country rocks have low magnetic susceptibility. Based on this information ground magnetic survey was conducted over target-1 and 3. Total Magnetic field Intensity (TMI) was measured in 1020 points on 34 lines. Sample spacing was 2 meter. Magnetic profiles, contour map, and image revealed big anomalies only in Target-I

Keywords: Pyrrhotite, Magnetic susceptibility, Magnetic survey, Hired₂, Iran