Mineralogy and geothermo-barometry of metapelitic schists, amphibolites and garnet amphibolites from Gol-Gohar metamorphic complex, SW Sirjan, Central Iran.

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Abstract: The Gol-Gohar metamorphic complex, a part of east Sanandaj-Sirjan zone, is located 55 km southwest of Sirjan. This complex consists of metapelitic, metapsammitic and metacarbonatic rocks. Field and geochemical evidence indicate that these sedimentary protolith sequences were composed of shale and sandstone alternation with carbonate layers in the upper parts. In the studied metapelites, garnets are almandine-rich, composition of biotite is between sidrophyllite and annite and plagioclase varies from albite to anortite (in amphibolite and garnet amphibolite) and oligoclase and andesine (in schists). Our studies show that amphibolite and garnet amphibolite are types of para amphibolite. The results of thermometry, based on the garnet-biotite pair and barometry through GBPQ method for these rocks, demonstrate that Gol-Gohar metapelite schists were formed within a temperature range of 550-578°C and a pressure range of 3.7-4.6 kbar (greenschist and lower amphibolite facies). The thermo-barometry studies, based on chemistry of amphibole, mineral in the amphibolites and garnet amphibolites demonstrate 589-613°C and 613-641°C temperatures, 4.7-4.9 kbar and 4.3-5.6 kbar pressure ranges respectively which are indicating amphibolite facies of metamorphic conditions for these rocks. Field evidence and geochemical studies indicate that the evolutionary trend which resulted increasing temperature and pressure from schists to amphibolites and garnet amphibolites are consistent with the mineral paragenesis.

Keywords: Geothermo-barometry; metapelite; schist; amphibolite; garnet amphibolite; Gol-Gohar Sanandaj-Sirjan zone; Central Iran.