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

R. Mirzaei[1], A. Ahmadi[*1], H. Mirnejad[2], M, Boomeri[1], K. Nakashima[3]

1- Department of Geology, Faculty of Sciences, University of Sistan and Baluchestan, Zahedan, Iran
2- Department of Geology, Faculty of Sciences, University of Tehran, Tehran, Iran
3- Department of Earth and Environmental Sciences, Faculty of Science, Yamagata University, Yamagata, Japan

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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 evidences indicate that these sedimentary protolith sequences are composed of shale and sandstone with alternation of carbonate layers in the upper parts. In the studied metapelites, garnets are almandine-rich. Composition of biotite ranges between sidrophyllite and annite and plagioclase varies from albite to anortite (in amphibolite and garnet amphibolite). Oligoclase and andesine are present 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 of amphibolite facies metamorphic conditions for these rocks. Field evidence and geochemical studies indicate that the evolutionary trend which resulted to the increasing of 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.*

[*]Corresponding author, Tel: 09133979232, E-mail: Rezvanmirzaei@pgs.usb.ac.ir

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