The study of continuous and discontinuous zoning of garnet mineral in the migmatites of the Hamedan region and its petrogenetic applications

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Abstract: In the Hamedan region, migmatitic rocks with various structures cropped out that stromatic structure is the most abundant. Index minerals of metapelites such as garnet (almandine), staurolite, andalusite, sillimanite, kyanite, fibrolite, cordierite, plagioclase (andesine) and spinel (hercynite) are present in these rocks. Garnet has occurred in all three parts of leucosome, paleosome, and melanosome of migmatites and has been affected by various metamorphic events (progressive, retrograde, and partial melting). Garnets have continuous and discontinuous chemical zoning for index elements Fe, Mg, Mn and Ca, where the behavior of these elements is not the same. Some factors such as the presence of multi-nucleus single crystals, the participation or none participation of garnets in the process of partial melting and polymetamorphism of area have important role in it. The discontinuity in the growth of crystals represents a re-growth during an individual metamorphic event, and it can represent two metamorphic events.

Keywords: Zoning; garnet; partial melting; migmatite; Hamedan.