Geothermometry of Dardvay anomaly skarn zones, Sangan mining area

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(Received: 11/3/2019, in revised form: 3/7/2019)

Abstract: Dardvey iron skarn ore deposit is located in the central part of the Sangan mining area, northeastern Iran. In this study, silicate geothermometry were used to estimate the formation temperatures of skarn zones in Dardvey Fe-skarn deposits. The main metamorphic minerals in prograde and retrograde skarn zones are garnet-clinopyroxene-tremolite/actinolite-amphibole-chlorite-epidote-feldspar-phlogopite-dolomite. Two feldspar geothermometry indicate that endoskarn zone in Sarnowsar granite form at temperatures between 635 to 725 °C, which is not consistent with fluid inclusion temperatures. Based on clinopyroxene-garnet geothermometry, temperature of 300 to 505 °C was calculated for prograde skarn stage. Chlorite and Ca-amphibole geothermometry of retrograde zone indicates temperature of 200 to 290 °C and 200 to 300 °C respectively. Silicate minerals geothermometry of prograde and retrograde skarn zones are in accordance with fluid inclusion data. Both geothermometry methods of prograde and retrograde skarn zones indicate that contact metamorphic skarn development occurred in <600 °C that is consistent with hornblende hornfels facies.

Keywords: Sangan iron mining area; Dardvay anomaly; geothermometry; Skarn zones; Sarnowsar.

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