

Petrogenesis of Polygenetic Magnesian Skarns Associated With Central Iranian Granitic Intrusions

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Magnesian skarn are developed in metamorphic aureoles of certain granitic intrusions in Yazd and Isfahan areas of central Iran. Field evidences have shown that in many of these aureoles the first intrusion is a noritic gabbro which intrudes dolomites of different ages. Dolomites at the gabbro contact are transformed into zoned magnesian skarns. The successive zones from contact of gabbro are: (1): Plagioclase + Fassaite skarn zone. (2): Melilite-Monticellite skarn zone (3): Forsterite marble zone (4) Periclase marble zone.

The next intrusive phase is a granitic-granodioritic magma which invades both gabbro and its surrounding skarns and obliterates igneous paragenesis of gabbro and metasomatic paragenesis of skarns and marbles.

Careful textural examination of mineral assemblage of skarn have shown that: (1) Many metasomatic reactions of the primary paragenesis at the time of gabbro intrusion are realized by a bimetasomatic process in which " $\text{CaAl}_2\text{Si}_2\text{O}_6$ " and " SiO_2 " in form of structural complexes are supplied by gabbroic magma and Mg, Ca by dolomites. (2) Many earlier gabbroic skarn paragenesis have transformed to new paragenesis by metasomatic exchange between " KAlSi_3O_8 ", " SiO_2 ", " H_2O " complexes from granitic intrusion and earlier paragenesis. First anhydrous minerals of skarns produced by gabbro intrusion are transformed into hydrated minerals like vesuvianite, phlogopite, clintonite, serpentine, brucite, chondrodite, chlorite.

It is concluded that: (1) Skarns of central Iran are polygenetic skarn produced by two stage metasomatism. (2) In metasomatic processes elements do not migrate from magma in form of free cations and anions but in form of structural complexes like " $\text{CaAl}_2\text{Si}_2\text{O}_6$ ", " SiO_2 ", " KAlSi_3O_8 ", " H_2O ".