

MAGMATIC EPIDOTE IN CALCALKALINE TONALITE, DEHNOW (NW MASHHAD, NE IRAN)

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Introduction

The granitoids of Dehnow in NE Iran are part of a calc-alkaline stock (tonalite to granodiorite and diorite) that intruded the remnants of the Paleo-Tethys Ocean in the Triassic [1]. Epidote is commonly known as primary igneous mineral in intermediate plutonic rock [2]. In Dehnow granitoid it occurred as inclusions in the phenocrystic garnet grains or as subhedral grains associated with biotite.

Mineral Chemistry

The major element composition of epidote indicates a Xep (Fe/(Fe+Cr+Al-2)) between 0.43 to 0.65. The average pistacite (Ps) component of the epidote is 0.15 and 0.18 for the inclusions in the garnets and Dehnow granitoid, respectively.

Discussion and Conclusion

Textural criteria may be used to distinguish magmatic and subsolidus (deuteric) epidotes. [3] and [4] argued that euhedral, weakly pleochroic epidote enclosed within biotite is magmatic. The low TiO₂ contents (<0.17%) of most epidote inclusions and epidote in the groundmass suggest that they are primary according to [5], who ascribe TiO₂<0.2% to primary epidote. Based on [6], the Ps values indicate a low *f*O₂ condition but suggesting that the epidote inclusions crystallized under relatively lower *f*O₂ conditions.

[1] Samadi *et al.* (2013) Island Arc (Submitted). [2] Dessimoz & Müntener (2009) Goldschmidt A286. [3] Tulloch (1979) *Cont Min Pet* **69**, 105-117. [4] Zen & Hammarstrom (1984) *Geol* **12**, 515-518. [5] Evans and Vance (1987) *Con Min Pet* **96**, 178-185. [6] Sial *et al.* (1999) *Pak J Sci Ind Res* **42**, 342-244.