Compositional zoning in calcic amphibole of intermediate rocks of Mishu granitoid, NW Iran

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Abstract: The Mishu garnitoidic complex is cropped out in NW of Mishu mountains, in southwest of Marand, northwest Iran (East Azarbaijan) which is intruded into Kahar Formation. Based on petrographic studies, this pluton is composed of intermediate rocks including granodiorite, quartzmonzodiorite and diorite. Plutonic rocks are mainly composed of quartz, plagioclase, orthoclase, biotite, amphibole and pyroxene minerals. Amphiboles are one of the most important minerals in intermediate rocks. Based on results of electron microprobe analyses, amphibole minerals are calcic and show magnesiohornblende to actinolitic hornblende and actinolite compositions. Also these Amphiboles have compositional zoning from magnesiohornblende, actinolitic hornblende or actinolite with cores of magnesiohornblende or actinolitic hornblende. Actinolite and actinolitic hornblende rims occured patchy compositional domains or crystal aggregates around subhedral cores of actinolitic hornblende or magnesiohornblende. The mineralogical studies show cores of phenocrysts crystallized under conditions of low oxygen fugacity, indicated by low Mg content. Whereas high Mg content in the rims displays higher oxygen fugacity during their crystallization. There is no evidence for actinolite or actinolitic hornblende resulting from late hydrothermal activity, nevertheless patchy domains of actinolite or actinolitic hornblende are probably the result of subsolidus reactions of clinopyroxene in the presence of exsolved fluid.

Keywords: Compositional zoning; oxygen fugacity; subsolidus reactions; Mishu granite.

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