

## Mineralogy and mineral chemistry of quartz-dioritic dykes of Sungun Mo-Cu porphyry deposit (NW Iran)

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**Abstract:** The study area is located in NW of Iran, East-Azarbaidjan Province in north Varzeghan. Plagioclase, amphibole and biotite are the major minerals and sphene, apatite, and quartz are accessory minerals. The texture of these dykes are porphyritic with fine to medium matrix. Mineral chemistry analysis revealed that the composition of Plagioclase varies from andesine to oligoclase and the biotite varies from annite to siderophyllite. Amphiboles are principally of calcic-type and show magnesio-hornblende composition. These amphiboles are related to subduction zones and are concordance with active continental margins related to subduction. Dykes thermo-barometry, using total  $Al^{3+}$  content in amphibole, shows that amphibole in quartz-dioritic dykes were crystallized at  $800^{\circ}C$  and  $4\pm 0.5$  kbars. Biotite thermometry in late dykes shows the crystallization temperature of  $700$  to  $750^{\circ}C$ . High oxygen fugacity ( $-10$  to  $-17$ ) imply an oxidation magma and its formation in convergent plates. Based on magma character and nature determining diagrams according to chemical composition of amphibole, studied samples lie in sub-alkaline to alkaline magma series. Based on tectono-magmatic diagrams, amphiboles of the area lie in the field of suprasubduction related amphiboles. According to the amount (less than  $1.5$ )  $Al^{IV}$ , all of studied amphiboles placed in active continental margins related to subduction field.

**Keywords:** *Mineral chemistry; quartzdioritic dykes; amphibole; biotite; Sungun.*

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