MINERALOGY - GEOCHEMISTRY - GENESIS AND METALLOGENETIC SIGNIFICANCE OF LAMPROPHYRES FROM THE STRATONI - OLYMPIAS AREA. KERDILIA FORMATION, EASTERN CHALKIDIKI

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Thin grayish green, dark green to grayish black porphyritic, phlogopite dominant dykes, occur in the eastern Chalkidiki and crosscut the Paleozoic or older metamorphics of the Kerdilia Formation of the Servo-Macedonian Massif as well as the 30 Ma Stratoni granodiorite. On the basis of form, texture, mineralogy, mineral chemistry and geochemistry they can be classified as lamprophyres and more specifically as minettes. Tha chondrite normalized rare-earth element and primordial mantle normalized HYG element patterns, for the lamprophyres and the Stratoni granodiorite, suggest a common origin and processes of formetion. Mg - values and certain incompatible trace element ratios (e.g. Zr/Hf, Y/Ta) indicate that a mantle component has participated in their genesis, whereas the LFS (e.g. Rb, K, Ba, Th etc.) and a number of the HFS (e.g. Zr/Ce, Ce/Ta etc.) element abundances and ratios suggest contamination by crustal rocks most likely through mantle-crust magma interaction. The La/Ta ratios, the decoupling of LFS from HFS elements and the Ta-Nb trough in the primordial mantle normalized HYG element plot, point to an arc environment for the formation of the lamprophyres. In addition, the hydrothermal alteration of the lamprophyres suggest their participation in the Pb-Zn (Au, Ag) sulfide ore formation.

GEOCHEMICAL AND THERMOBAROMETRIC CHARACTERISTICS OF FLUIDS ASSOCIATED WITH QUARTZ-SCHEELITE VEINS OF METAGGITSI-SALONIKIO, E. CHALKIDIKI PENINSULA

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Quartz-scheelite vein systems of the Pyrgadikia-Metaggitsi-Salonikio area are hosted by two-mica gneisses, and schists of the Paleozoic or older Vertiskos Formation, in the E. Chalkidiki Peninsula, N. Greece. Host rocks have been affected by regional amphibolite facies metamorphism spanning from Jurassic to Upper Cretaceous, followed by retrogression to the greenschist facies. Individual quartz veins strike from NE to E, have variable widths up to 1 m, sharp contacts, and measure up to 1 Km length. Scheelite in the veins is accompanied by traces of powellite, stolzite, arsenopyrite, molybdenite and goethite.

Optical microscopy and heating-freezing studies of fluid inclusions in quartz and scheelite revealed the presence of four kinds of fluid inclusions: type A (CO_2–H_2O; CO_2, 3-12 mole%), type B (CO_2–H_2O; CO_2, 20-45 mole%), type C (pure CO_2) and type D (pure aqueous inclusions). Type A, B and C inclusions are primary and/or pseudosecondary, and are considered contemporaneous, whereas type D are secondary inclusions.

The four types of inclusions have the following physicochemical characteristics; type A: temperature of partial homogenization of liquid and gaseous CO_2 (final phase, liquid CO_2), 18.4 – 28°C; melting temperature of CO_2 hydrate, 6.8-10°C; total homogenization temperature (final phase, liquid), 230-325°C; salinites and bulk densities range from 0-6.10 equiv. wt% NaCl, and 0.81-0.99 g/cm^3 respectively; type B: temperature of partial homogenization of liquid and gaseous CO_2 (final phase, liquid CO_2), 10-24°C; melting temperature of CO_2 hydrate 5.5-10°C; total homogenization temperature (final phase, «gas»), 220-331°C; salinites and bulk densities range from 0 to 8.3 equiv. wt% NaCl, and 0.81-0.92 g/cm^3 respectively; type C: temperature of partial homogenization of liquid and gaseous CO_2 (final phase, liquid), 6.5-23.9°C; bulk densities range from 0.75 to 0.88 g/cm^3; and type D: final homogenization temperature (final phase, liquid), 110-135°C. The temperature of melting of CO_2 indicates that the noncondensable gas in all the inclusions is pure CO_2 with traces of CH_4.

Isochoric path calculations, combined with the total homogenization of type A and B inclusions which produce different phases in a similar temperature range (220-330°C), indicate that these inclusions were entrapped from boiling, CO_2-bearing, saline hydrothermal solutions, at temperatures of 250-400°C and pressures between 1 and 2 kbars during retrograde greenschist facies metamorphism. Progressive CO_2 loss from the hydrothermal fluid by immiscibility may have shifted the solution pH to higher values thus causing tungsten deposition. CO_2 plays an important role in the transport and deposition of tungsten.

EVOLUTION OF EASTERN VARNOUNTAS PLUTONITE (NW. MACEDONIA): MAJOR AND TRACE ELEMENT FRACTIONAL CRYSTALLIZATION MODELS

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The Eastern Varnountas plutonite occurs in the Pelagonian zone north of Florina, intruding the metamorphic basement with which it forms contact metamorphism phenomena (formation of various types of hornfelses).

It comprises Hb-Bi-monzodiorites, Hb-Bi-quartz monzonites, Bi-quartz monzonites, Bi-granites, leucogranites and aplitic veins. The main rock type is Hb-Bi-quartz monzonite. Augen and spotted gneisses, considered to have genetical relations with the plutonic rocks, are also examined. Lastly, xenoliths of monzonitic composition, enclosed both in the plutonic and the gneissic rocks, were found.

The geological relations between the various rock types of the plutonite support a frac-