Bulletin of the Geological Society of Greece, Sp. Pub. **7** Ext. Abs. GSG2019-041

Mineralogical and Fluid Inclusions Study of Epithermal Type Veins Intruding the Volcanic Rocks of the Kornofolia Area, Evros, NE Greece (Preliminary results).

F. Aravani[1], L. Papadopoulou[1], V. Melfos[1], T. Soldatos[1], T. Zorba[2], P. Voudouris[3]

(1) Department of Mineralogy-Petrology-Economic Geology, School of Geology, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece, faravani@geo.auth.gr
(2) Solid State Physics Section, Department of Physics, Aristotle University of Thessaloniki, Greece
(3) Department of Mineralogy-Petrology, Faculty of Geology and Geoenvironment, National and Kapodistrian University of Athens, 15784, Greece

The aim of the present research is the mineralogical and microthermometric study of epithermal type veins that intrude the volcanic rocks of the Kornofolia area, Evros. The volcanic host rocks are high-K calc-alkaline andesites that penetrate the boundary between the Rhodope Massif and the Circum-Rhodope Belt in eastern Thrace, NE Greece. The host rocks of the Kornofolia area have been dated with the K/Ar method at 30.7 Ma (Christofides *et al*. 2004). They show indications of hydrothermal alteration (Voudouris *et al.* 2018). Optical (polarized and reflected) and scanning microscopy were employed to determine the mineralogical and textural characteristics of the host rocks and the veins. Additionally, the samples were analyzed with Fourier-transform infrared spectrometer (FT-IR) in order to determine any structural differences among the various vein minerals

Mineralogical and fluid inclusion studies have been conducted on the amethyst occurrences in the same veins by Voudouris *et al*. 2018.

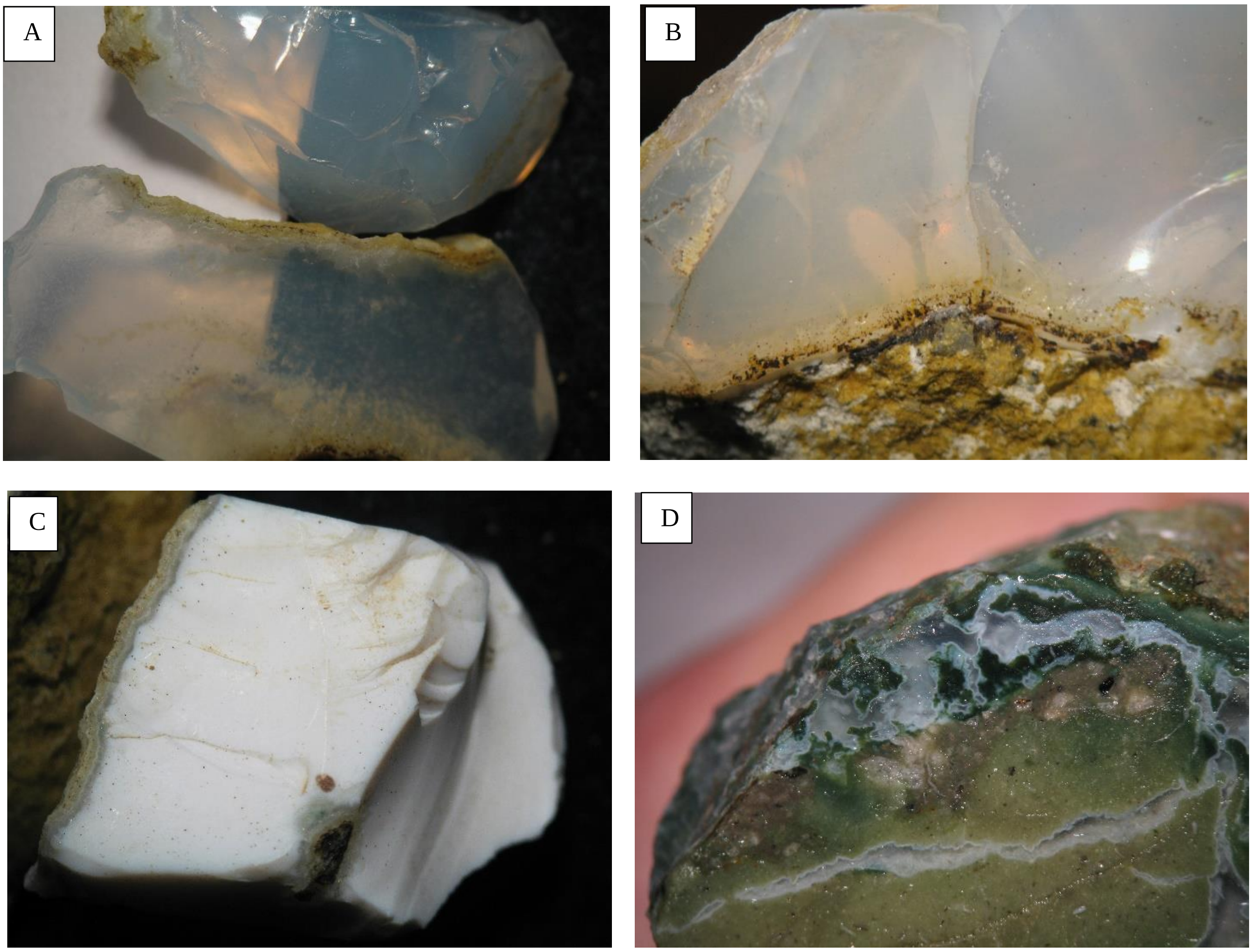

Figure 1. Photos of the three opal samples (X6.5). A, B: transparent opal, C: white opal, D: green opal

The andesite host rock comprises a hydrothermal breccia (Sillitoe 1985). The rock is generally silicified and the rock's matrix is zeolitized. The main mineral assemblage of the host rock, emerging from macroscopic and microscopic observations as well as microanalysis, is zoned plagioclase, magnesiohornblende, biotite and celadonite. The veins consist of quartz, chalcedony, three different types of opal (white, green and transparent), calcite and zeolites (clinoptilolite and mordenite). The veins show lateral zonation. The succession of the mineral phases in the veins, outwards to inwards, is unaltered andesite – celadonite - clinoptilolite and/or quartz - chalcedony - mordenite and (sometimes) euhedral clinoptilolite. The relation between the calcite and the other minerals has not been determined yet.

As mentioned above, three different opal types have been recognized in the veins of Kornofolia: transparent opal, green opal with a dull lustre and white milky opal (Figure 1).

FT-IR analysis was performed on the three opal types from the veins in order to determine variations in the crystallinity of the samples. The FT-IR spectra displayed significant variations among the three opal types (Figure 2), which are attributed to differences in their crystal structure (Adamo *et al*. 2010). The crystal structure of the white and the transparent opal is identical with that of christobalite (Farmer 1974) suggesting a well-ordered structure (opal-C) (Jones *et al.* 1971). On the contrary, the spectrum acquired from the green opal approaches the spectrum of quartz and is more amorphous (not well-ordered) (opal-CT, opal-A) (Jones *et al.* 1971) compared to the other opal samples. Moreover, the spectrum of the green opal displays indications of impurities, possibly clay minerals that may be responsible for its color. However, further investigation on the opals is required in order to extrapolate definite conclusions on the composition of the impurities.

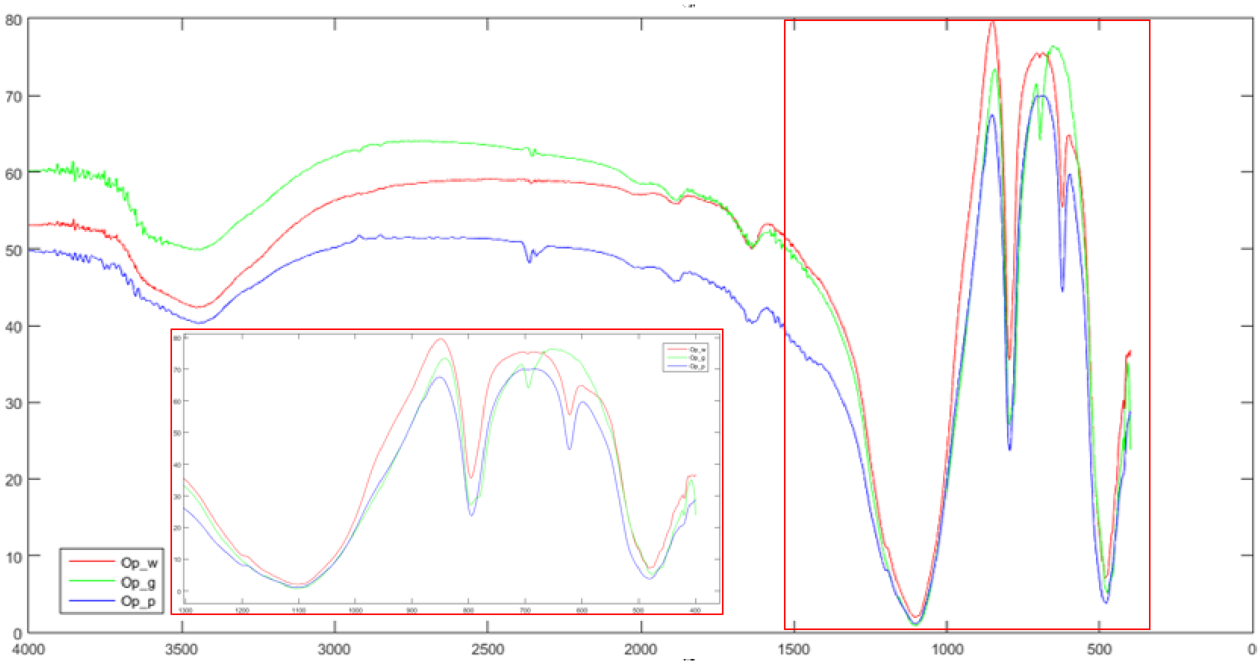

Figure 2. FT-IR spectra from the opal samples. Op_w: white opal, Op_g: green opal and Op_p: transparent opal

References

Adamo, I., Ghisoli, C., Caucia, F., 2010. A contribution to the study of FTIR spectra of opals. N. Jb. Miner. Abh. 187/1, 63-68.

Christofides, G., Pecskay, Z., Eleftheriadis, G., Soldatos, T., Koroneos, A., 2004. The Tertiary Evros volcanic rocks (Thrace, northeastern Greece): Petrology and K/Ar geochronology. Geologica Carpathica 55(5), 397-410.

Farmer V.C., 1974. The infrared spectra of minerals, in: Moenke H.H.W. (Ed.), Mineralogical Society Monograph 4. Silica, the three-dimentional silicates, borosilicates and beryllium silicates, 16, 365-370.Jones, J.B., Segnit, E.R., 1971. The nature of opal I. Nomenclature and constituent phases. Journal of the Geological Society of Australia 18, 57-68.

Sillitoe, R.H., 1985. Ore-Related Breccias in Volcanoplutonic Arcs. Economic Geology 80(6), 1467-1514

Voudouris, P., Melfos, V., Mavrogonatos, C., Tarantola, A., Götze, J., Alfieris, D., Psimis, I., 2018. Amethyst occurrences in Tertiary volcanic rocks of Greece: Mineralogical, fluid inclusion and oxygen isotope constraints on their genesis. Minerals 8, 324, p. 26.