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IDENTIFICATION OF Fe-BEARING DAUGHTER MINERALS FROM THE VYHNE–KLOKOČ SKARN DEPOSIT, SLOVAKIA

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Vyhne–Klokoč, the largest Ca–magnetite exoskarn in the Western Carpathians (KODĚRA & CHOVAN, 1994), is related to the emplacement of a granodiorite pluton in the central zone of the Banská Štiavnica Neogene stratovolcano. Fluid inclusion (FI) studies of granodiorite quartz from samples located close to the contact with altered Mesozoic carbonates revealed abundant FIs with variable vapour/liquid/solid ratios and often several solid phases at room temperature (KODĚRA *et al.*, 1998).

Fe-bearing daughter minerals (DM) are predominantly present in high salinity, liquid rich, probably secondary FIs, which are believed to represent evolved aqueous magmatic fluids. Only halite, hematite and sometimes sylvite were possible to identify based solely on the their optical properties. The other solids were identified using *in situ* analytical methods of individual solid phases: by scanning electron microscopy coupled to an energy dispersive X-ray spectrometer microanalyser (SEM-EDS) and by laser Raman spectroscopy (LRS). The optical and microthermometric properties of the different solid phases were integrated with analysis as an aid to identification.

SEM-EDS analyses showed the common presence of halite, a whole range of K-Fe-Cl solids, ranging from pure KCl (sylvite) up to pure Fe-Cl phases, hematite, magnetite and galena. The pure Fe-Cl phases are probably represented by ferropyrosmalite [$Fe_8Si_6O_{15}(OH,Cl)$] and/or by some Fe chloride hydrates. The common K-Fe-Cl solids were identified as $K_2FeCl_5.H_2O$ (erythrosiderite), an unnamed $KFeCl_3.nH_2O$ mineral and/or ferropyrosmalite/Fe chloride crystals, contaminated by precipitation of small sylvite crystals on their surface after opening.

Confirmation of the identification of daughter minerals by LRS analyses was performed by comparison with known published Raman spectra of pure minerals and with the analyses of a pure quartz host. The following solids were identified: ferropyrosmalite (in several FIs), hematite, magnetite, biotite, siderite, molybdenite. All these phases except for ferropyrosmalite are probably captive phases, as they are relatively rare in FIs and they did not dissolve during heating. The LRS method is not suitable for identification of Raman inactive solid phases, such as halite, sylvite, erythrosiderite etc.

The presence of multiple Fe-Cl bearing DMs suggests very high Fe contents in the magmatic fluid (several wt% Fe), that could be explained by subsolidus fluid–rock equilibrium reactions. Reactions add Fe to the fluid, providing the potential source for magnetite in skarns (KODĚRA *et al.*, 1998).

References

KODĚRA, P. & CHOVAN, M. (1994). Mineralia Slov., 26: 38–49.
KODĚRA, P., RANKIN, A.H. & LEXA, J. (1998). Miner. and Petrol., 64: 119–147.