

Petrology of Fe-Ti-rich rodingites from Western Carpathians

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Rodingite represents a relatively uncommon metasomatic rock type occurring as dykes or lenses in association with serpentized ultramafic rocks and typically consist of Ca-rich often hydrated silicate minerals. Rodingites have recently been recognized as a source of information on fluid compositions and their circulation in both ocean floor and subduction zones. Yet, the nature of the protoliths, the origin of fluids, the details of fluid-rock interaction and the metamorphic context remain often obscure. Here, we address some of these questions in the case of rodingites from Western Carpathians.

Rodingites are associated in the field with dismembered serpentized bodies of ultramafic rocks, Mesozoic in age, overlying Carboniferous metasediments. They mostly consist of vesuvianite, diopside and hydrated garnet with minor titanite, chlorite, epidote, calcite and Fe-Ti oxides. The latter represent the oldest mineral phase, followed by diopside, vesuvianite and garnet. The latest hydrothermal alteration is outlined by the formation of a well equilibrated epidote-chlorite-calcite association. Vesuvianite clearly forms several generations including some monomineral veins. Whole rock analyses allow to identify two groups of rodingites: 1) Fe-Ti-rich rodingites dominated by garnet, titanite, ilmenite and rutile;

2) Fe-Ti poor rodingites dominated by vesuvianite and diopside. Trace elements content indicates a significant enrichment compared to chondrite and commonly a strong positive Eu anomaly.

The high modal amount of vesuvianite and the immobility of Al during metasomatic events suggest that the protolith was relatively Al-rich. Taking into account the REE patterns of whole-rock and minerals, the high TiO₂ content (up to 9.2 wt.%) and the local Fe-Ti-rich accumulations, we suggest that the protoliths were more or less Fe-Ti-rich gabbroic rocks. First thermodynamic modeling suggests an important control of the CO₂ and the *f*O₂ of the metasomatic fluid(s) on the rodingite paragenesis.

Mots-Clés : rodingite, mineralogy, geochemistry, vesuvianite, Western Carpathians