Scheelite-powellite and paraniite-(Y) from the Fe-Mn deposit at Fianel, Eastern Swiss Alps

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Abstract

Small syngenetic exhalative Fe-Mn deposits embedded in Triassic marbles of the Suretta, Starlera, and Schams nappes (Eastern Swiss Alps) were subjected to a Tertiary regional metamorphism under blueschist- to greenschist-facies conditions. In one of the deposits (at Fianel, Val Ferrera), this polyphase metamorphism led to the formation of quartz+dolomite veinlets containing beryl, scheelite-powellite, paraniite-(Y), monazite-(Ce), fluorapatite, bergslagite, fluor-roméite, and antimonian betafite; these veinlets crosscut dolomite breccia lenses that are embedded in hematite-quartz-carbonate ores. Scheelitepowellite displays a continuous range of compositions between 28 and 70 mol% CaMoO₄; its As_2O_5 contents range from 0.73 to 3.96 wt%, and are positively correlated with the Y_2O_3 contents that vary between 0.33 and 2.47 wt%. The scheelite-powellite grains display a two-stage chemical zoning: stage A generally produced a core and a rim that, relative to the core, is richer in W, As, and Y. During the second stage (stage B), W-rich scheelitepowellite replaces stage-A grains along fractures and rims. Crystals of paraniite-(Y), ideally (CaWO₄)₂·YAsO₄, occur as small inclusions (=1 μ m) in stage-B scheelite-powellite. The Fianel deposit is only the second locality where paraniite-(Y) has been reported. The paraniite-(Y) from Fianel displays, like the type material, no polysomatic stacking fault in the scheelite-YAsO₄ layering. At Fianel, paraniite-(Y) is characterized by elevated Mo contents, and seems to have crystallized under influence of W- and LREE-rich fluids during stage B, i.e., during the metasomatic replacement of Y- and As-rich scheelite-powellite produced in stage A.