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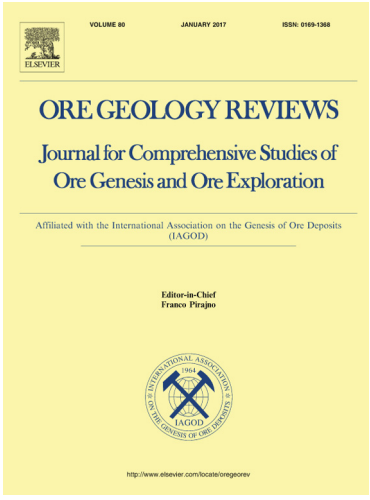

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Vein-type Tungsten Deposits in Rwanda, Rutsiro area of the Karagwe-Ankole Belt, Central Africa

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Abstract. The Rutsiro W (± Sn ± Nb-Ta) deposit consists of vein-hosted metal ores occurring within a black schist-dominated formation of the Rwandan Proterozoic metasediments supergroup. The collected samples revealed that the mineralised veins are mostly composed of quartz and ferberite. The ore microscopy studies of the polished sections of the mineralised vein material confirmed ferberite as the main W mineral in the quartz veins. Ilmenite occurs within the ferberite crystals as inclusions in addition to quartz. The concentrate samples contain a variety of minerals including cassiterite crystals, tourmaline and free ilmenite and rutile crystals which came from the hosting black schists. The SEM/EDS analysis showed that free crystals of REE minerals such as monazite and xenotime are common in the concentrate samples. Electron probe microanalysis using wavelength-dispersive spectrometry (WDS) confirmed the composition of W and Sn minerals to correspond to ferberite as the main W ore mineral together with some scheelite and cassiterite for tin ore mineral. The microprobe analysis also revealed the occurrence of columbite-tantalite and the association of indium and molybdenum traces with scheelite. The analysed monazites fall into two groups; monazite-Ce and monazite-Nd. The proposed mineralisation history suggests that there is a replacement stage of scheelite Ca^{2+} by hydrothermal Fe^{2+} to produce 'reinite' which is a ferberite polycrystalline pseudomorph. The occurrence of sulphides such as arsenopyrite, pyrite and pyrrhotite implies at least one sulphide phase in later stages of mineralisation. The occurrence of tourmaline as inclusions within cassiterite crystals and the tourmalinisation of the country rocks close to the mineralised veins confirm tourmaline as an important pathfinder for W-Sn mineralisation. The Rutsiro W-Sn mineralisation is classified as a vein-type deposit. However, two granitic cupolas underneath the deposit, which are probably greisenised, are suggested as source of the metal-rich mineralising fluids. Geophysical works are required to investigate the presence of these cupolas.

Keywords: Tungsten deposits, Ore microscopy, vein-type mineralisation

1. Introduction

Rwanda, like other developing countries, is at risk environmentally due to unorganised artisanal and small-scale mining. In Rwanda, this practice has been going on since the start of mining activities in the 1960s. Rutsiro is one of the areas in Rwanda where a large number of local people live on the artisanal mining of the 3Ts minerals (tungsten, tin and tantalum minerals). These artisanal miners work both the primary