

Petrography and mineralogy in a skarn zone in the Matsitama area, Botswana

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The Matsitama area, located at northeastern Botswana, is distributed to the western part of the Zimbabwe Craton. Furthermore, some part of this area include copper mineralization. In early 1980's, JICA and MMAJ (currently JOGMEC) detected a skarn zone with minor Cu mineralization by a drilling campaign in the Matsitama area. However, detailed mineralogical work of the skarn is scarce. The purposes of this study are to identify skarn and copper minerals and to infer the condition of the crystallization of these minerals in the skarn zone.

Geology of the Matsitama area is composed of the Matsitama Metasedimentary Group. Lithology of this group consists of metavolcanics, metadolerite, limestone, quartzite and dolerite. Skarn zone in the studied borehole is observed in relatively shallow depth and contacts with dolerite. Furthermore, this zone is affected by later hydrothermal alteration. Minerals in the studied skarn zone are composed of garnet, clinopyroxene, quartz, carbonate and opaque minerals. Garnet grains are greenish in hand specimen and show both isotropic and anisotropic under microscope. Chemistry of garnet varies, especially for between Al and Fe (total). Clinopyroxene shows eu- and sub-hedral shape and occurs as moderate-sized grain. The chemical compositions of the clinopyroxene are typically diopside component with minor amount of Fe and Mn. Trace amount of Cu-sulphides (bornite, chalcocite and trace chalcopyrite) in the skarn zone occur as interstitial to skarn minerals and later alteration portion, implying that copper mineralization was later than the crystallization of garnet and clinopyroxene. In general, the amount of Fe (III) in a mineral is a good indicator for assuming redox condition. Therefore, based on the chemical compositions of garnet, it might be assumed that garnet was crystallized in relatively oxidized condition.

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