INTRODUCTION

The Pojuaçu Cu-Zn deposit (58 Mt @ 0.87% Cu and 0.9% Zn), located in the northern part of the Carajás Province (Fig.1), has been considered since its discovery as a VMS deposit of Archean age, metamorphosed to amphibolite facies (Doegego 1988). Late veins or remobilization ascribed to the Pojuaçu Granite or to the superimposition of an IOCG system to the syngenetic mineralization have been admitted (Winter 1994; Schwartz & Frantz 2013). The main reasons for classifying the Pojuaçu ore in the VMS model include its association with metavolcanogenic-sedimentary rocks of the Itacaiúnas Supergroup, the strata-bound nature of the ore as well as the alteration zones that are typical of volanocongenic deposits. The study of drill cores of Pojuaçu (Corpo Quatro) and of the Furnas Cu-Au deposit (500 Mt @ 0.6% Cu and 0.28 g/t Au), situated in the northeastern part of Carajás (Fig.1) indicates significant similarities between these two deposits.

WALL ROCKS AND FOOTWALL ALTERATION ZONES

Considering their wall rocks, both the Pojuaçu and Furnas deposits are hosted in steeply dipping, metamorphosed and tectonically inverted volcanic-sedimentary rock piles (Figs.2,4). The stratigraphic footwall to the ore comprises alteration rocks derived in their majority from ancient basalts, composed of chlorite, amphiboles, quartz, ilmenite and syenitc gneiss, which locally develop cordierite-cummingtonite-antophyllite assemblages.

At Pojuaçu this alteration constitutes authentic halite-mantles made up of large rounded cordierite porphyroblasts (Figs.3a,b,c). At Furnas the cordierite-cummingtonite-antophyllite alteration extends for more than 100 m below the mineralized zone constituting strongly foliated and crenulated schists with lens-like cordierite porphyroblasts (Figs.5a,b,c,d,e). In several VMS deposits worldwide the cordierite-cummingtonite-antophyllite alteration typically occurs below the orebodies and has been interpreted as the amphibolite facies equivalent of chloritic alteration.

WALL ROCKS AND HYDROTHERMAL ALTERATION ASSOCIATED WITH THE POJUÇA AND FURNAS DEPOSITS, CARAJÁS PROVINCE

METAEXHALITES

Another feature shared by the Pojuaçu and Furnas deposits is the presence of metaexhalites associated with the mineralized zones. Exhalites are finely-banded, generally iron-rich chemical sedimentary rocks, including BIF, chert, tourmalinitie and garnetite, which occur in the immediate vicinity of VMS mineralization and typically lie above, within or along strike from the main ore deposits. They have been interpreted as direct precipitates from hydrothermal fluids deposited on the seafloor with a variable contribution of clastic/volcanoclastic material (Spry et al. 2000).

In the Pojuaçu deposit the ore is associated with iron-rich metacherts composed of quartz bands intercalated with layers containing chalcopyrite, magnetite, pyrrhotite, sphalerite and actinolite (Figs.6a,c,d). Distinctly banded actinolite metacherts intercalate with and overlie the mineralized horizon (Figs.6b,e,f). In the Furnas deposits most of the ore is associated with a thick BIF horizon made up mainly of granulite, almandine, magnetite and quartz, with disseminated bornite, chalcopyrite, chalcocite and molybdenite (Figs.7a,b,c).

Stratigraphically above this horizon lies a package of laminated metaexhalites consisting of alternate beds of chert, tourmaline and garnet (Figs.7d,1) which grades into an impure metachert (Figs.7e,g) and from this on into dominantly clastic metasedimentary rocks.

CONCLUSIONS

The above-exposed characteristics show that, despite being affected by late mineralizing events, the Pojuaçu and Furnas deposits preserve hydrothermal alteration zones and other features that are typical of VMS deposits, indicating that they evolved from primitive volcanic systems.

REFERENCES


