

Hydrothermally Mobilized Nickel Sulfide at the Fortaleza de Minas Mine, Minas Gerais State, Brazil

BRENNER, T.L., CARVALHO, S.G., ZANARDO, A.

The Fortaleza de Minas nickel deposit occurs within a shear zone in komatiitic volcanic rocks, in the Morro do Ferro greenstone belt, located in southwestern Minas Gerais. A complex tectonic evolution introduced morphological, chemical and mineralogical changes in the magmatic orebody, generating four types of ore: massive Breccia (BR), Interstitial (IN), Disseminated (DS) and BIF hosted (SC). Associated with the last tectonic event, under low grade metamorphic conditions, a new type of ore called hydrothermal massive (MH) was formed, showing extremely high grades of nickel and PGE.

This ore type occurs as thin lenses of massive sulfides, remobilized from the main ore body into secondary faults and fractures (NE-SW) in the hanging wall serpentinite host. The MH ore shows hydrothermal zonation, with coarse crystals of pentlandite and preserved nuclei of the BR ore in the inner zone, surrounded by a younger porous pentlandite-rich sulfide mass. Toward the host rocks, typical wall rock hydrothermal alteration formed in the MH ore, haloes or centimetric bands, of talc, ankerite and chalcopyrite. This alteration front penetrates through older fractures and foliations, causing generalized brecciation and replacement of the host rocks, where carbonatization dominates, with subordinate amounts of pyrite and pyrrhotite.