HÖGBOMITE IN SPINEL HORNBLENDITES OF THE MORRO DO CORISCO MINE, MINAS GERAIS - BRAZIL

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Brazil's oldest mine of garnieritic nickel is located in the ultramafic occurrence of the Morro do Corisco. The body includes serpentinites originated by fractional crystallization of underplated tholeiitic magma as indicated by petrography and geochemical data. Blocks of centimetrical scale of spinel hornblendite containing diopside and Ti-magnetite (in addition to spinel sensu stricto and magnesian hornblende) are associated with the ultramafic rocks. The texture and chemistry of the spinel hornblendite indicate concomitant formation of spinel, amphibole and clinopyroxene during high-grade metamorphism of an olivine- and anortite-bearing protolith. Högbomite occurs as a late stage mineral phase, showing close relationships with diopside (i.e. högbomite and clinopyroxene are always associated and högbomite does not occur in diopside-free samples). Microprobe analyses indicate that högbomite formation resulted by Ti - Al ion exchange processes involving Ti-rich diopside and spinel (probably during an increment of temperature) leading to reducing values of Ti diopside partition coefficients which, in turn, induced the migration of Ti to spinel. Recovery of the spinel occurred during retrograde metamorphism with exsolution of Ti and Fe in högbomite, giving rise to a spinel + Ti-magnetite association.