

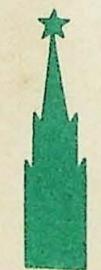


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построение геодинамических и физико-химических моделей, характеризующих зарождение источников различных видов и процессы их эволюции во времени и пространстве.

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#### MAGNETOMETRIC EXPLORATION IN PRIMARY MANGANESE OXIDE DEPOSIT WITH JACOBSITE IN THE URANDI DISTRICT, BRAZIL

Jacobsite occurs in a primary manganese oxide deposit in Lagoa D'Anta, in the manganese district of Urandi, in the southwest of the State of Bahia, Brazil.

Discontinuous lenses of manganese oxide ore are interbedded in iron formation of a Precambrian metamorphic sequence of quartzites, itabirites and marble, with quartzites being the most abundant rock type and marble the least. The assemblage of manganese minerals in the ore consists of jacobsite and  $\alpha\text{MnO}_2$ .

The deposit comprises manganiferous rocks with 25-42% Mn, 8-18% Fe, 7-22%  $\text{SiO}_2$ , 3-4%  $\text{Al}_2\text{O}_3$  and 0.04% P. Mn, Fe,  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$  values vary for different types of ore.

Magnetometric values in the area were found to vary between 15,000 to 31,000 gammas. The exploration method is suitable both for establishing the form and dimensions of the primary lenticular ore and for distinguishing the primary ore from the supergene secondary ore.

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#### ISOTOPIC STUDIES OF THE BABBITT Cu-Ni DEPOSIT, DULUTH COMPLEX, MINNESOTA, U S A : THE IMPORTANCE OF MELT-COUNTRY ROCK INTERACTION IN SULFIDE GENESIS

The Babbitt Cu-Ni deposit occurs in the basal section of the Duluth Complex, within a sequence known as the Partridge River Troctolite. Country rocks consist of pelitic metasedimentary rocks of the Proterozoic Virginia Formation (V.F.) and the Biwabik iron formation. Mineralization occurs as fine disseminations (2-3%) and rare massive areas of pyrrhotite, chalcopyrite, cubanite, and pentlandite. Ore is hosted by troctolite and in restricted localities by orthopyroxene-cordierite hornfels.

Sulfur isotopic studies strongly indicate that sulfur in ore zones has been derived from metasedimentary country rocks.  $\delta^{34}\text{S}$  values of sulfides in the troctolites range from 6.0 to 13.5 ‰, whereas values of pyrite and pyrrhotite from metamorphosed and unmetamorphosed V.F. range from 1.5 to 20 ‰. Sulfur was produced in the country rock by reactions similar to:  $\text{FeS}_2 + 3 \text{H}_2\text{O} + \frac{5}{2} \text{C} = \text{FeS} + \frac{3}{2} \text{CO}_2 + \text{CH}_4 + \text{H}_2\text{S}$ .