

OCCURRENCE MODEL FOR SEDIMENTARY MANGANESE DEPOSITS

By

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All of the world's large manganese deposits are either primary sedimentary accumulations or supergene enrichments on manganiferous sediments. The more important class of sedimentary deposits are what we call marine transgressive deposits. These account for 80% of world manganese resources and include the Nikipol and Chiatura deposits of the Soviet Union, Groote Eylandt, Australia, Molango, Mexico, Moonda, Bagon and Morro do Urucum, Brazil. All of these deposits are related in that they occur in transgressive marine sequences commonly only a few tens of meters, but occasionally as much as 300 meters, above the unconformity at base of the marine sequence. The host rocks are commonly widespread shallow marine, dominantly clastic, sequences deposited on stable platforms, although in some cases the platforms have been reactivated by post-ore tectonism.

The manganese ore consists of beds of manganese oxides, carbonates or mixture of both. Known deposits show a great range of ages (lower Proterozoic to Oligocene), paleolatitudes (tropical to temperate), salinities (brackish to highly saline), climatic regimes (humid to arid). Local sedimentologic settings of ore deposits also vary widely. In short, no common denominator seems to link these deposits other than their unmistakable genetic dependence on marine transgression. As a result, no detailed occurrence model is possible at this time. We feel, however, that the awareness that shallow marine transgressive clastic sequences could bear important manganese ore deposits, a fact not generally appreciated in North America, is important for anyone working with these kinds of rocks. Be suspicious of any earthy looking beds, they may be weathered manganese oxides or carbonates. Also be suspicious of carbonate beds, especially dolomitic-looking (brownish weathering) beds or nodular carbonate beds. They could be manganese carbonates.

Important manganese ore beds and their subeconomic fringes are large, covering hundreds of thousands of square kilometers, so although detailed exploration guides cannot be devised, the targets are large and might well be found by reconnaissance field examination if we are on the lookout for them.

References

- Roy, Supriza, 1981, Manganese deposits: Academic Press, London, 458 p.
Varentosov, I. M., and Grassely, G. Y., eds., Geology and Geochemistry of Manganese, v. 2, Manganese Deposits on Continents, E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 513 p., the proceedings of the 2nd International Symposium on Geology and Geochemistry of Manganese, Sydney, 1976.