

PARAGENETIC RELATIONS AMONG CARBONATES, OLIVINES
AND PYROXENOIDES IN METAMORPHIC CARBONATE-SILI-
CATE MANGANESE PROTORES FROM BRAZIL

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The main epigenetic manganese deposits from Brazil--
are derived from metamorphic protores (queluzites), present--
ing the following parageneses with increasing metamorphism --
from green schist to amphibolite facies of manganese carbon--
ate-silicate sediments:

1) Silica poor protores:

rhodochrosite + Mn - phyllosilicates; rhodochrosite +
manganophyllite + rhodochrosite + spessartite; rho-
dochrosite + tephroite + spessartite + pyroxenoides.

2) Siliceous carbonatic protores:

quartz + rhodochrosite quartz + rhodochrosite + man-
ganophyllite; quartz + pyroxmangite and/or rhodonite
+ spessartite; pyroxmangite / rhodonite + rhodochro-
site + spessartite; pyroxmangite / rhodonite + spes-
sartite + rhodochrosite + tephroite.

3) Silicatic protores or silicatic veins in carbonatic --
protores:

quartz + spessartite; pyroxmangite / rhodonite + spes-
sartite + Mn. amphibole + sulfides.

These parageneses are in close agreement with the --
experimental hydrothermal results in the $\text{MnO} - \text{SiO}_2 - \text{CO}_2 -$
 $\text{H}_2\text{O} - (\text{CaO})$ system.