

IPUEIRA-MEDRADO SILL AND ITS ANOMALOUS THICK CHROMITITE SEAM (JACURICI REGION-NE BRAZIL)

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The Ipueira-Medrado sill is a 7 kilometers-long Paleoproterozoic chromite-mineralized mafic-ultramafic intrusion located in the São Francisco Craton, Brazil. The sill is 300 meters-thick, consists mainly of interlayered dunite and harzburgite with minor chromitite, pyroxenite and gabbro. It hosts the largest chromite deposit in Brazil. Mining is currently restricted to an exceptionally thick (5-8 meters-thick) chromitite seam.

The main chromitite seam is a stratigraphic marker of the petrologic evolution of the sill. This remarkable change is recorded by olivine and orthopyroxene compositional trends. The Fo content in olivine (Fo 89-92) and En content in orthopyroxene (En 88-91) are nearly constant below the main chromitite seam, with minor Mg/Mg+Fe increase toward the top. This slow evolution of mineral compositions toward more primitive compositions suggests crystallization concomitant with frequent replenishment of the magma chamber with primitive magma. Above the main chromitite seam, both Fo content in olivine (Fo 85-90) and En content in orthopyroxene (En 69-90) show a steady upward decrease suggesting close-system crystallization.

The anomalous thickness of the main chromitite seam presents major problems for current genetic models for the origin of massive chromitite layers. However, it reinforces the importance of new influxes of magma and open-system dynamic magma chamber for the formation of massive chromitite layers.