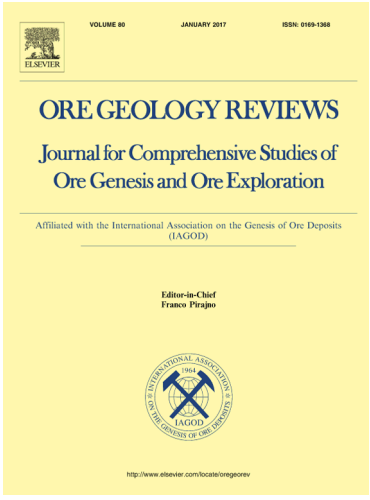

Thick chromitite of the Jacurici Complex (NE Craton São Francisco, Brazil): Cumulate chromite slurry in a conduit

Juliana Charão Marques, João RodrigoVargas Pilla Dias, Betina Maria Friedich, José Carlos Frantz, Waldemir José Alves Queiroz, Nilson Francisquini Botelho

PII: S0169-1368(16)30461-9
DOI: http://dx.doi.org/10.1016/j.oregeorev.2017.04.033
Reference: OREGEO 2201

To appear in: *Ore Geology Reviews*

Received Date: 31 July 2016
Revised Date: 26 April 2017
Accepted Date: 30 April 2017

Please cite this article as: J.C. Marques, J.R.P. Dias, B.M. Friedich, J.C. Frantz, W.J.A. Queiroz, N.F. Botelho, Thick chromitite of the Jacurici Complex (NE Craton São Francisco, Brazil): Cumulate chromite slurry in a conduit, *Ore Geology Reviews* (2017), doi: http://dx.doi.org/10.1016/j.oregeorev.2017.04.033

Thick chromitite of the Jacurici Complex (NE Craton São Francisco, Brazil): Cumulate chromite slurry in a conduit

Juliana Charão Marques[1], João RodrigoVargas Pilla Dias[1], Betina Maria Friedich[1], José Carlos Frantz[1], Waldemir José Alves Queiroz[2], Nilson Francisquini Botelho[3]

[1]Instituto de Geociências – Universidade Federal do Rio Grande do Sul – Av. Bento Gonçalves 9500, Prédio 43129, Porto Alegre, RS, Brazil. CEP 91501-970 (juliana.marques@ufrgs.br);

[2]Companhia de Ferro Ligas da Bahia – FERBASA, Pojuca (BA)

[3]Instituto de Geociências – Universidade de Brasília

ABSTRACT

The Jacurici Complex, located in the NE part of the São Francisco Craton, hosts the largest chromite deposit in Brazil. The mineralized intrusion is considered to be a single N-S elongated layered body, disrupted into many segments by subsequent deformation. The ore is hosted in a thick, massive layer. Two segments, Ipueira and Medrado, have been previously studied. We provide new geological information, and chromite composition results from the Monte Alegre Sul and Várzea do Macaco segments located farther north, and integrate these with previous results. The aim of this study is to determine and discuss the magma chamber process that could explain the formation of the thick chromitite layer. All segments exhibit similar stratigraphic successions with an ultramafic zone (250 m thick) hosting a 5 to 8 m thick main chromitite layer (MCL), and a mafic zone (40 m thick). The chromite composition of the MCL, *Mg*-numbers (0.48-0.72) and *Cr*-numbers (0.59-0.68), is similar to chromites from layered intrusions and other thick chromitites. Previous work concluded that the parental magma of the mineralized intrusion was very primitive based on olivine composition (up to Fo_{93}) and orthopyroxene composition (up to En_{94}) from harzburgite samples, and that it originated from an old subcontinental lithospheric mantle. We estimate that the melt from which the massive chromitite layer crystallized was similar to a boninite, or low siliceous high-Mg basalt, with a higher Fe/Mg ratio. The petrologic evidence from the mafic-ultramafic rocks suggests that a high volume of magma flowed through the sill, which acted as a dynamic conduit. Crustal contamination has previously been considered as the trigger for the chromite crystallization, based on isotope studies, as the more radiogenic signatures correlate with an increase in the volumetric percentage of amphibole (up to 20%). The abundant inclusions of hydrous silicate phases in the chromites from the massive ore suggest that the magma was hydrated during chromite crystallization. Fluids may have played an important role in the chromite formation and/or accumulation. However, the trigger for chromite