

Chemical and isotopic evidences of mantle source heterogeneity in the Rosário do Sul Kimberlite Province

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The Rosário do Sul Kimberlite Province (RSKP) is composed of four clusters of intrusive kimberlitic/lamproitic rocks. This study is based on one of the RSKP cluster, called “Rosario do Sul-6” (R-6), which is located on the Southeastern edge of the Paraná Continental Flood Basalt (CFB), South Brazil. This is the only intrusion known with cohesive rock of the entire RSKP. R-6 is an olivine kimberlite, whose bulk rock geochemistry presents Contamination and Ilmenite Indexes of 1.5 and 0.5, respectively. R-6 shows high Al₂O₃ and SiO₂ contents as most micaceous kimberlites, but low K₂O and relative high TiO₂ and MgO as most non-micaceous kimberlites. However, inter-trace element ratios (e.g. La/Yb, La/Sm, Th/Nb, Ce/Pb), as well as the Sr/Sr and Nd/Nd isotopic ratios, around 0.704 and 0.512 respectively, suggest that R-6 has the affinity with non-micaceous kimberlites [1].

Such diversity on the geochemical characteristic for R-6 kimberlites (similarity with non micaceous and micaceous kimberlites well known in the literature) suggest some heterogeneity in the source of R-6 kimberlite. R-6 Sr and Nd isotopic compositions show similarity with OIB samples, but also with normal MORB and the average compositions of Paraná basalts. U-Pb analysis in magmatic perovskites from the R-6 groundmass provide an age of 128±5 Ma [2], which inspires discussions about the RSKP contemporaneity with the Paraná Flood Basalts. Such data suggest a very complex and heterogeneous mantle process, and the occurrence of anomalous geothermal variation underneath South American Plate, on the region of Paraná-Etendeka CFB.

[1] Becker & Le Roex (2006) *J. of Petrology* **47(4)**, 673-703

[2] Conceição *et al* (2011) *Min. Magazine* **75(3)**, 691