

MAJOR AND TRACE ELEMENT EVOLUTION IN AUGITE, PIGEONITE AND PLAGIOCLASE FROM SILLS ALONG THE EASTERN BORDER OF THE PARANÁ BASIN

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Resumo: The objective of this work is to compare and explain the distributions of major, trace elements and REE in pyroxene (augite and pigeonite) and plagioclase from basaltic sills of the eastern portion of the Paraná Basin. The main techniques used are EPMA (Universität Stuttgart) and LA-ICP-MS (Universität Würzburg), particularly 2,000 quantitative analyses of K_2O , FeO , Na_2O , Al_2O_3 , TiO_2 , MnO , CaO , Cr_2O_3 , NiO , MgO and SiO_2 in minerals and 18 characteristic x-ray distribution of K, Na, Ca, Fe, Mg, Ti and Al; 17 BSE images were also obtained. Two pyroxene and two plagioclase grains were analyzed in each thin section for Li, Sc, Ti, V, Cr, Mn, Co, Ni, Cu, Zn, Rb, Sr, Y, Zr, Nb, Mo, Cs, Ba, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, Pb, Th and U, adding up to 217 analyzed spots. The evaluation of this large database is underway, but preliminary observation show the Th and U contents of plagioclase from Rio Grande do Sul sills are ten times higher than the other samples to the north. Normalized to primitive mantle, plagioclase has the expected negative anomaly of Sr, Ba and Eu, but a new contribution is the positive anomaly of Y, Zr and Nb. The pyroxenes have positive anomalies of Ti, Y, Zr and HREE but negative anomalies of Rb, Nb and Ba. Partition coefficients of trace elements indicate complex evolving conditions of the magmas from generation in the mantle through magmatic fractionation and possible crustal contamination. This is a novel contribution to the geochemical behaviour of trace elements in continental basaltic magmas.

Palavras-chave: Sills; Paraná Basin; Trace elements.