

GEOCHEMISTRY OF THE INTRUSIVE THOLEIITIC MAGMATISM IN THE PONTA GROSSA ARCH

Fábio Braz Machado¹, Antonio José Ranalli Nardy², Leila Soares Marques³, Adilson Viana Soares Jr.¹, Iata Anderson de Souza², Ana Olivia Barufi Franco - Magalhães⁴, Marly Babinski³

1 – Universidade Federal de São Paulo; 2 – Universidade Estadual Paulista; 3 – Universidade de São Paulo; 4 – Universidade Guarulhos

RESUMO: The Ponta Grossa Arch (PGA) is a large uplifted and deformational structure, which extends for about 600 km and dips towards the center of the Paraná Basin (Southeastern Brazil), being characterized by important NW trending magnetic lineaments. During the Early Cretaceous the PGA region was affected by a huge intrusive magmatic activity of tholeiitic nature, which gave rise to the Ponta Grossa Dyke Swarm (PGDS), as well as an expressive number of sills. The PGDS is characterized by hundreds of basic dykes, trending NW-SE (mainly) and NE-SW, and cutting both the crystalline basement and the Paleozoic sedimentary rocks from the Paraná Basin, whereas the sills were mainly emplaced in the Irati and Ponta Grossa formations from the Paraná Basin. Both the dyke swarm and the sills belong to the Paraná Magmatic Province, which is one of the largest continental flood basalts of the world. New geochemical (major, minor and trace elements) and Sr-Nd isotopic data in PGA are presented. Almost all dykes are characterized by high concentrations of titanium (between 1.9 and 3.8%wt) and strontium (varying from 222 and 550 µg/g). In general, the same geochemical behavior is observed in the tholeiites from the sills, although there is some compositional variability caused by in situ differentiation processes, which took place especially in thicker intrusions. The initial Sr isotopic ratios ($^{87}\text{Sr}/^{86}\text{Sr}_i$; calculated back to 133 Ma) vary from 0.70565 to 0.70666, with the highest values corresponding to dykes that are located at the eastern border of the APG and intruding the crystalline basement. Taking into account the relatively high Sr concentrations of the investigated dykes, the $^{87}\text{Sr}/^{86}\text{Sr}_i$ compositions indicate that those intrusions emplaced at the APG eastern border were distinctively affected by crustal contamination processes. The present-day $^{143}\text{Nd}/^{144}\text{Nd}$ ratios range between 0.512353 and 0.512455, being similar to those of the high-Ti volcanic rocks from the Paraná Basin. Considering only the rocks with $^{87}\text{Sr}/^{86}\text{Sr}_i < 0.7060$, that is, uncontaminated or poorly contaminated by crustal material, the $^{87}\text{Sr}/^{86}\text{Sr}_i$ and $^{143}\text{Nd}/^{144}\text{Nd}$ compositions plot on the field of the EMI mantle component.

PALAVRAS CHAVE: Ponta Grossa Arch; Ponta Grossa Dyke Swarm; Paraná Basin