

The Evolution of Post-collisional Magmatism Associated to the Neoproterozoic Southern Brazilian Shear Belt

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The Neoproterozoic-Cambrian Brasileiro/Pan-African orogenic cycle is represented, in southern Brazil, by arc and collisional settings, with very expressive granitic magmatism. The post collisional stage, 650-580 Ma, is marked by intensive magmatism along the major transcurrent shear zones which compose the Southern Brazilian Shear Belt. The early post-collisional magmatism is a high-K, calc alkaline one, found along gently dipping shear zones; biotite-bearing granites and granodiorites are the most common rock types, often containing mafic microgranular enclaves. This magmatism is immediately followed by peraluminous two-mica leucogranites, emplaced either along flat lying or steeply dipping shear zones. The next magmatic manifestation has a shoshonitic affinity and is found either within the shear belt or far from deformation sites, piercing through cratonic areas. Shoshonitic rocks range from acid to basic, as extrusive or plutonic terms. The last magmatic event is a silica-saturated alkaline magmatism which occurs either within or outside the shear belt, controlled by steeply-dipping transcurrent structures, or discordantly intrusive in the previous types. Metaluminous biotite granites are widespread, with a coeval basic magmatism of mildly alkaline affinity. The shear belt is thought to have acted as a conduit for magmas and also to have promoted decompression of mantle higher levels, reactivating the sources of previous, calc-alkaline, pre-collisional magmatism. The role of previously modified mantle wedge in the generation of southern brazilian post-collisional magmatism is here emphasized over the contribution of crustal melting processes.