



Rhyacian crustal evolution of Brasília Belt's basement in central Brazil

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The Brasília Belt, in central Brazil, is the thrust and fold belt developed during Neoproterozoic by convergence of three major cratonic landmasses: the São Francisco craton, the Amazonian craton and the Paranapanema craton. An ensemble of Paleoproterozoic rocks among Brasília Belt is understood as its basement and encompasses tonalites, granodiorites and granites intrusive in volcano-sedimentary sequences. This basement is considered a prolongation of the São Francisco craton underneath the thick sedimentary layers of the belt.

U-Pb ages indicate an interval from 2.46 to 2.12 Ga for the igneous crystallization of the granitic basement and xenoliths from volcano-sedimentary rocks are found in the granites.

From 2.46 to 2.12 Ga, four stages of magmatism are recognized: (i) the first, older than 2.3 Ga, (ii) the second, between 2.2 and 2.3 Ga, (iii) the third, between 2.16 and 2.18 Ga and (iv) the last between 2.12 and 2.15 Ga.

Tonalites and granodiorites are the main products of the three first stages, whilst the fourth has essentially granites. Whole rock chemistry shows rocks from the first three stages evolved through a calc-alkaline trend, by enrichment in potassium. In contrast, geochemistry from the last magmatic stage indicates samples do not belong to a calc-alkaline trend, being plotted in a high potassium series. This happens not necessarily because they evolve through a high-K series, but because these rocks are product of crustal melting, incorporating high contents of LILE.

Rocks from the fourth stage are strongly peraluminous and present the most negative $\epsilon\text{Nd}(t)$. The three first stages are metaluminous or slightly peraluminous with $\epsilon\text{Nd}(t)$ ranging around zero.

The first three stages of magmatism are interpreted as developed in volcanic arc system, though it is still not clear whether one or more arcs developed during this period. The last stage of magmatism is attributed to the arc collision against another landmass, triggering crustal fusion and generating granites with S-type characteristics.

Two possibilities are considered: the arc developed in the western margin of São Francisco craton during the convergence of another landmass or it started as an island arc and collided against the craton.

This Rhyacian orogeny seen in Brazil is coeval with continental agglutination during the transition Paleo-Mesoproterozoic described in other parts of the world, and referred to as a supercontinent pre-Rodinia.