Paleoproterozoic U-Pb SHRIMP ages of low- and high-Al low-K calc-alkaline granitoids in the Brasília Fold Belt basement

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The Tocantins granite-greenstone terrane constitutes the basement of the Brasília Fold Belt bordering the northwestern margin of the São Francisco Craton. Granitoid plutons compose wide granite-gneiss complexes, which intrude narrow greenstone belts. These granitoids are grouped into two low-K calc-alkaline suites. Suite 1 comprises amphibole bearing tonalites and includes units of granodiorite, trondhjemite, quartz-diorite and quartzo-monzodiorite. These units have low Al, Sr/Y and $(La/Yb)_n$ and high #Mg, Cr and Ni, and are interpreted as derived from an ultramafic source, admittedly the mantle edge overlying a subduction zone. Suite 2 is composed of tonalite, trondhjemite, and granodiorite that have high-Al, high Sr/Y and $(La/Yb)_n$ and low #Mg, Cr and Ni; and are considered as derived from metabasalts partial melting. These basalts could belong to either subducted oceanic lithosphere or newly underplated basaltic crust. Suite 1 amphibole bearing tonalite yielded an age of 2200±5 Ma (zircon). Suite 2 samples yielded ages of 2204±4 Ma (zircon), 2206±5 Ma (zircon) and 2455±14 Ma (titanite). These SHRIMP data show that both suites have similar age (~2.2Ga), except for a ~2.45Ga age obtained from a granitoid of Suite 2. The chemical data suggest that subduction related processes contributed to build, during the Paleoproterozoic, what later on would constitute the northwestern margin of the São Francisco Craton. SHRIMP ages imply that both metabasaltic and ultramafic sources were operating around ~2.2Ga. Furthermore, the titanite age from Suite 2 suggests that a metabasaltic source was active since ~2.45Ga. Thus, the building up of granite-gneiss complexes may have taken at least ~250Ma.