

Northern Chilean Frontal Andes: Evidences for the last stages of Pangea assemblage

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The Chilean Frontal Andes (28°- 31°S) comprises a vast number of late Paleozoic – Triassic granitoids which give information about the last stages of Pangea assemblage. Previous studies determined two tectonic configurations during this time: subduction related compressional setting (late Carboniferous – Late Permian) and non-subduction post-collisional extensional setting (Late Permian – Triassic). However, new O-Hf and Re-Os isotopic data along new U-Pb SHRIMP ages in zircon, and whole rock major and trace geochemistry have shown that this model should be modified. $\delta^{18}\text{O}$ values indicate a strong change in the tectonic configuration approximately 270 Ma (earliest middle Permian) and thus, units can be divided into 2 mayor groups: late Carboniferous to earliest middle Permian and middle Permian to Triassic. The oldest group shows slightly low values of ϵHf_i with high $\delta^{18}\text{O}$, indicating an supracrustal component and the addition of less radiogenic continental-like material, which along significant residence time (T_{DM2} : Mesoproterozoic) can be interpreted as magmas formed at depth in a subduction-related continental arc with normal-to-thickened crust, and contaminated with supracrustal material and/or oceanic sediments transported through the subducted slab to the mantle-wedge. Subsequently, middle Permian – Triassic rocks show a wider range of ϵHf_i values with relatively low, mantle-like $\delta^{18}\text{O}$ and low γOs , with some samples characterized as A-type granites, indicating a source of magmas without the addition of supracrustal material for some plutons, whilst for others, a slight input. This data can be interpreted as rocks formed as the result of melting of an old thinned mafic in an extensional setting due to changes in the slab configuration during the last stages of Pangea assemblage.