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A K-Ar PROFILE THROUGH THE JOINVILLE MASSIF AND THE DOM FELICIANO BELT, SOUTHERN BRASIL - TECTONIC IMPLICATIONS.

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A K-Ar cooling age profile using biotite, amphibole, plagioclase, K-feldspar and whole rock data from metamorphic rocks of the Ribeira Belt, Joinville Massif and Dom Feliciano Belt is presented. The results are fairly coherent with crustal modeling previously obtained from geological and gravimetric data. Three main geochronological domains are distinguishable, from NW to SE: 1)Ribeira Belt (RB) and the northern part of the Joinville Massif (NJM); 2)southern part of the Joinville Massif (SJM); and 3)Dom Feliciano Belt(DFB). All domains are separated by major thrust faults probably related to lithospheric discontinuities. Geochronological domains 1 and 3 yielded K-Ar values of 750-500 Ma and 600-500 Ma, respectively, which show a clear influence of the Brasiliano Cycle. The granulite terrain comprising the SJM exhibits ages between 2200 and 1800 Ma, indicating that this area was cool during the Late Proterozoic Brasiliano Cycle. More detailed analysis of the profile reveals thermal differences at the tectonic contacts, interpreted here as a result of the geometrical characteristics of the nappes related to these boundaries. The SJM and NJM limit is marked by a rapid transition from Early Proterozoic ages (2000-1800 Ma) in the SJM, to Late Proterozoic ages (600 Ma) in banded gneisses of the NJM. This boundary is also delimited by a discontinuous belt of mafic bodies and an increase in regional metamorphism near the southern limit of the NJM. By contrast, the contact between the SJM and DBF is interpreted as a thrust at a high, relatively cool crustal level.

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THE CRUSTAL EVOLUTION OF SOUTH AMERICA

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Integrated interpretation of Sr, Pb and Nd isotopes has led to the estimation of the continental growth of South America. The continent has been divided into crustal domains with internally coherent structure and geochronological patterns. Assuming an uniform crustal thickness for the Brazilian Shield, and considering the special case of the Andes, the crustal volumes of each of the domains have been calculated. Then, from the available isotopic constraints, the estimated amounts of continental crust accreted in each period of time have been established.

The main periods of episodic crustal growth for South America are related to the Late Archean and Early to Mid-Proterozoic. During Late Proterozoic and Phanerozoic, some accretion occurred, but crustal reworking and crustal contamination of mantle derived material were the predominant processes.

Considering the geological constraints of each domain, their age and isotopic geochemical parameters, the following proportions of continental growth through geological time were estimated:

Early and Late Archean	33%
Early Proterozoic	40%
Middle Proterozoic	15%
Late proterozoic	5%
Phanerozoic	7%

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Sr AND S ISOTOPIC CONSTRAINTS ON THE GENESIS OF STRATA BOUND (MANTO TYPE) COPPER DEPOSITS OF CHILE.

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Volcanic-hosted, strata-bound (manto type) copper deposits constitute, in terms of production, the second most significant group in Chile. The source of metals, mineralizing fluids, timing and concentration processes for these deposits remains controversial, and models for their genesis range from volcanic syngenetic, to epigenetic with fluids of magmatic, burial metamorphic, oceanic or meteoric origin. In an attempt to constrain the genetic hypotheses and establish a baseline for comparison among deposits, we have analyzed the isotopic compositions of Sr in carbonates and S in sulphides from (A) Carolina de Michilla and Mantos Blancos, hosted by Triassic-Jurassic rocks, and (B) Lo Aguirre, El Soldado and Punta del Cobre, hosted by Mid-Cretaceous rocks.

$^{87}Sr/^{86}Sr$ ratios for calcite within (A) range from 0.7055 to 0.7068, whereas those from (B) are lower at 0.7040-0.7056. Unmineralized marine limestones of Jurassic and Cretaceous age within the host sequences have compositions of 0.7066-0.7093 and 0.7069-0.7071, respectively. $^{87}Sr/^{86}Sr$ in the calcites is indistinguishable from that of the host volcanic sequences and of essentially coeval intrusives.

$\delta\ ^{34}S$ values for ore sulphides in (B) range from -5.2 to +1.5 per mil and cluster around 0, suggesting a minor amount of fractionation, whereas those of (A) range from -2.4 to -6.5 per mil.

The data preclude the participation of large volumes of seawater in the genesis of most of the deposits and are compatible with the low water/rock ratio deduced for them by other authors. These deposits may not all have a common genesis, despite similarities in mineralogy and setting.

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Sr ISOTOPIC COMPOSITIONS IN FLUID-ROCK SYSTEMS IN EL TATIO AND PUCHULDIZA GEOTHERMAL FIELDS: NORTHERN CHILE

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Rb and Sr concentrations and $^{87}Sr/^{86}Sr$ compositions have been measured in neo-formed minerals, host-rocks and in thermal mineral waters from Puchuldiza and El Tatio geothermal fields in northern Chile.

The investigated areas are located in the Andean Chain along the Altiplano Block wich is made up by the Pliocene-Quaternary volcanic belt (12 to 4 ma.). This unit is composed by large ignimbrite sheet intercalated with clastic sediments and dacitic-andesitic flows.

The neo-formed minerals are: halite, polyalite, santite, thenardite, sulfur, cinnabre, jarosite, kaolinite, smectite, illite and amorphous silica.

The isotopic data are:

EL Tatio: $^{87}Sr/^{86}Sr$ = 0.7089 - 0.7109 for neoformed minerals and 0.7073 - 0.7096 for host-rocks.

Puchuldiza: $^{87}Sr/^{86}Sr$ = 0.7061 - 0.7070 for neoformed minerals; 0.7061 - 0.7077 for host-rocks and about 0.7065 for thermal water.

From the above isotopic data it is clear the Sr isotopic homogeneization during the fluid-host-rocks interaction process. Thus the measured Sr initial ratio for epithermal deposits reflect the mean Sr isotopic composition of the host rocks.